

# MAPPING THE LANGUAGE OF SPICES

A CORPUS-BASED, PHILOLOGICAL STUDY ON THE WORDS OF THE SPICE DOMAIN

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GÁBOR PARTI

*Doctor of Philosophy*

*The Hong Kong Polytechnic University*

Typeset in Brill Typeface version 4.0 with Lua<sup>T</sup>E<sub>X</sub> on August 27, 2022 (Revised on February 27, 2023).

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↓ Hong Kong

The Hong Kong Polytechnic University  
Department of Chinese and Bilingual Studies

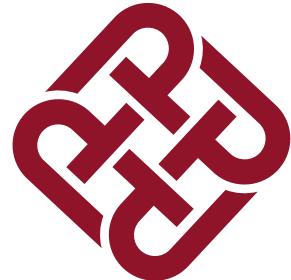
# MAPPING THE LANGUAGE OF SPICES



A CORPUS-BASED, PHILOLOGICAL STUDY ON  
THE WORDS OF THE SPICE DOMAIN

*by*

GÁBOR PARTI



*A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy*

August, 2022



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Gábor Parti

(Signed)

(Name of Student)



*Dedicated to my grandmother, who survived me finishing this PhD,  
and to my grandfather, who nearly did.*



# Abstract

The majority of existing literature on spices is found in the areas of gastronomy, botany, and history. This study investigates spices on a linguistic level and aims to be a comprehensive linguistic account on the items of the spice trade. Some of these dried plant matter were highly desired at certain points in history, due to their attractive aroma and medicinal value, thus they were ideal products of trade early on. Cultural contact and exchange, and the introduction of new cultural items begets situations of language contact and linguistic acculturation, and so in the case of spices, we not only have a set of items that traveled around the world, but also a set of names. This domain is very rich in loanwords and *Wanderwörter*, but also supplies us with a myriad of cases where spice names are conventional innovations. To make it more interesting, the thesis compares English, Arabic, and Chinese, languages that represent major powers in the spice trade at different times. After selecting a set of 24 spices, I have collected data on their names and related etymologies, and introduced 6 of them in detail regarding their identity, botany, history, spread, and names. The thesis has two main parts. Part one represents the geographic and linguistic diffusion of spices and their names. Basically, I track and explain word origins and subsequent spread by tracing the materials and the propagation of the accompanying *Wanderwort*. This part relies on philological literature, and tools from historical linguistics, such as etymological research, as well as geospatial visualizations. Part two examines the language of spices, referring to the terminology and nomenclature related to the spice domain from linguistic-cognitive perspectives. Focusing on the structure and components of 360 collected spice names, it is a systematic investigation on how humans name spices: what are the mechanism and motivations behind the naming principles, and how this possibly relates to the salient sensory features of the products (strong gustatory, olfactory, or visual stimuli). Conclusions are made on the connections between the physical properties of the spices, their patterns of diffusion, and the prototypical spices and their effect of naming principles. Besides being a novel and original approach to research and categorize spices from a linguistic point of view, this study offers new insights to our knowledge about wandering loanwords, and the effect of the highly sensory nature of spices in the naming process when adopted by a community. It is also intended to be a basis for a useful working database for future research, and aims to dispel some of the chaos and confusion surrounding spice names.



# Acknowledgments

First, I would like to thank my supervisor Prof. Chu-Ren Huang for his guidance and all the support and kindness he gave me in these three years, ever since my first email. He not only believed in my topic, but he taught me new ways to think about words, meanings, concepts, and language. I would also like to thank PolyU and the department for equipping me with a workspace and for the never-ending answers to all my questions regarding the PhD program. I want to praise the Pao Yue-Kong Library and its staff for supplying us with space, workshops, a wide range of books and materials, and their willingness to grant requests so promptly whenever we suggest a loan or purchase. The lovely people running the LibCafé also deserve a mention. Next, I would like to express my gratitude towards the two external examiners, Prof. Victor H. Mair and Prof. Baoya Chen, who took their time to read this work, gave invaluable comments, and encouraged me to continue on this path. I must also thank the Research Grants Council (RGC) of the University Grants Committee (UGC) of Hong Kong, who funded this PhD program under the Hong Kong Ph.D. Fellowship Scheme (HKPFS, ref. no. PF18-22990). Lastly, I want to thank the people of Hong Kong, who welcomed me to their intriguing city.

As probably this is the end of my *official* journey as a student—*official* because in reality we all know this road never ends—I want to thank all my teachers and professors from whom I learned so much throughout these years, especially at my alma mater the Eötvös Loránd University (ELTE) in Budapest. The list is so very long, but I must definitely mention Tamás Iványi, Zoltán Szombathy, Dóra Zsom, Sándor Fodor, István Ormos, István Hajnal, Saber el-Adly, Ágnes Birtalan, Mária Négyesi, Rama Yadav, Csaba Dezső, Bo-Guk Kim, Beatrix Mecsi, Mózes Csoma, Valéria Simon, Katalin Torma, Orsolya Saraç, and Panda Stojanovska. I am grateful for all the knowledge and insight I received from everyone.

Most importantly, I want to thank my friends in Hong Kong, who helped me all the way, especially Yun and Andreas, and my parents back home, who have always supported this life of study with patience.



# Contents

<b>Abstract</b>	vii
<b>Acknowledgments</b>	ix
<b>Contents</b>	xi
<b>List of Figures</b>	xv
<b>List of Tables</b>	xvii
<b>Glossary</b>	xix
<b>Acronyms</b>	xxi
<b>Symbols and Notation</b>	xxiii
<b>1 Introduction</b>	1
1.1 Significance . . . . .	1
1.2 Originality . . . . .	2
1.3 Problem Statement . . . . .	3
1.4 Aims . . . . .	4
1.5 Definitions . . . . .	5
1.6 Scope . . . . .	7
1.6.1 The Set of Spices . . . . .	7
1.6.2 The Languages . . . . .	9
1.6.3 The Time Frame . . . . .	10
1.7 Contribution . . . . .	10
1.8 Layout . . . . .	11
<b>2 Background</b>	13
2.1 Literature Review . . . . .	13
2.1.1 On Spices . . . . .	13
2.1.2 On Food and Foodways . . . . .	15
2.1.3 On Trade . . . . .	15
2.1.4 On Chemistry, Medicine, and Healing . . . . .	17
2.1.5 On the Role of Spices Through Time . . . . .	19
2.1.6 On Food and Language . . . . .	19
2.2 Research Gap . . . . .	20

2.2.1	Faulty Claims . . . . .	21
2.2.2	Research Questions . . . . .	22
2.3	Theoretical Framework . . . . .	23
2.3.1	On Wandering Loanwords: <i>Wanderwörter</i> . . . . .	23
2.3.2	On Sensation . . . . .	24
<b>3</b>	<b>Methodology</b>	<b>27</b>
3.1	Research Design Principles . . . . .	27
3.1.1	Identification, Confusion, Adulteration, Clarification . . . . .	28
3.1.2	Challenges in Spice Categorization . . . . .	29
3.2	Data Collection . . . . .	31
3.2.1	Collecting Spices . . . . .	31
3.2.2	Collecting Names, and Their Annotation . . . . .	33
3.2.3	Collecting Etymologies . . . . .	35
3.2.4	Collecting Additional Data . . . . .	35
3.3	Sources . . . . .	36
3.3.1	Primary Sources . . . . .	36
3.3.2	Etymological and General Dictionaries . . . . .	36
3.4	Corpora . . . . .	37
3.5	Illustrations . . . . .	38
<b>4</b>	<b>The Spices</b>	<b>39</b>
4.1	Allspice . . . . .	43
4.1.1	The Botany, Origin, and Cultivation of Allspice . . . . .	44
4.1.2	The History of Allspice . . . . .	45
4.1.3	The Names of Allspice . . . . .	47
4.2	Asafoetida . . . . .	54
4.2.1	The Botany, Origin, and Cultivation of Asafoetida . . . . .	55
4.2.2	The History of Asafoetida . . . . .	55
4.2.3	The Names of Asafoetida . . . . .	55
4.2.4	The Diffusion of Asafoetida . . . . .	60
4.3	Cardamom . . . . .	62
4.3.1	The Botany, Origins, and Cultivation of Cardamom . . . . .	63
4.3.2	The History of Cardamom . . . . .	63
4.3.3	A Crowd of Cardamoms: Identity and Confusion with Other Spices . . . . .	64
4.3.4	The Names of Cardamom . . . . .	67
4.3.5	The Diffusion of Cardamoms . . . . .	73
4.4	Cinnamon & Cassia . . . . .	75
4.4.1	The Botany, Origin, and Cultivation of Cinnamon and Cassia . . . . .	77
4.4.2	The Identity of Cinnamon and Cassia . . . . .	78

4.4.3	The History of Cinnamon and Cassia . . . . .	79
4.4.4	The Names of Cinnamon and Cassia . . . . .	83
4.4.5	The Contemporary Distribution of Spice Terms: The Case of Cinnamon . . . . .	92
4.5	Black Pepper & Long Pepper . . . . .	101
4.5.1	Long Pepper and other False Peppers . . . . .	103
4.5.2	The Botany of Black Pepper . . . . .	103
4.5.3	The History of Black Pepper . . . . .	105
4.5.4	The Names of Black Pepper . . . . .	106
4.5.5	The Diffusion of Pepper . . . . .	112
4.6	Turmeric . . . . .	116
4.6.1	The Botany, Origins, and Cultivation of Turmeric . . . . .	117
4.6.2	The History of Turmeric . . . . .	117
4.6.3	The Names of Turmeric . . . . .	118
<b>5</b>	<b>The Diffusion of Spices</b>	<b>123</b>
5.1	The Geographic Distribution of Spices . . . . .	123
5.1.1	The Spreadability of Spices . . . . .	125
5.2	The Linguistic Diffusion of Spices . . . . .	129
5.2.1	Borrowings: Loanwords and <i>Wanderwörter</i> . . . . .	130
5.2.2	Spatial Trajectories: Tracing Spice Terms Around the Globe . . . . .	132
5.2.3	Temporal Trajectories: The Attestation of Spice Words . . . . .	137
5.2.4	The Donor Languages . . . . .	141
<b>6</b>	<b>The Language of Spices</b>	<b>143</b>
6.1	Overview: Spice Names in Numbers . . . . .	143
6.2	The Analysis of Spice Nomenclature . . . . .	145
6.2.1	Analyzability and Structure . . . . .	146
6.2.2	Spice Term Anatomy: Prototypes and Distinguishing Words . . . . .	147
6.3	Spice Name Analysis: The Example of Star Anise . . . . .	151
<b>7</b>	<b>Conclusion</b>	<b>155</b>
<b>Conclusion</b>		<b>155</b>
7.1	Limitations . . . . .	158
7.2	Future Studies . . . . .	158
<b>Primary Sources</b>		<b>161</b>
<b>Bibliography</b>		<b>163</b>



# List of Figures

4.1	Photographs of the spices in this dissertation (I) . . . . .	41
4.2	Photographs of the spices in this dissertation (II) . . . . .	42
4.3	Allspice berries, powder, and leaves from <i>Pimenta dioica</i> . . . . .	43
4.4	Asafoetida in various forms. . . . .	54
4.5	Diffusion of names for asafoetida, and their etymological stages. . . . .	61
4.6	True cardamoms . . . . .	62
4.7	False cardamoms . . . . .	64
4.8	Diffusion of names for cardamom, and their etymological stages. . . . .	74
4.9	Cinnamon quills, powder, and leaves from <i>Cinnamomum verum</i> . . . . .	75
4.10	Cassia sticks and “buds” from <i>Cinnamomum cassia</i> . . . . .	76
4.11	Cinnamon tree in a 10 <sup>th</sup> -century Arabic manuscript. . . . .	98
4.12	Distribution of words for tea from Sinitic <i>cha</i> and Minnan <i>te</i> . . . . .	99
4.13	Distribution of words for cinnamon in a few languages around the globe. . . . .	100
4.14	True peppers: black, white, and green. . . . .	101
4.15	False peppers: long, cubeb, and pink. . . . .	104
4.16	Diffusion of names for pepper, and their etymological stages. . . . .	114
4.17	Turmeric in various forms. . . . .	116
5.1	Distribution of spice plants by the macroarea of their native habitat. . . . .	123
5.2	Spices ranked according to the total number of regions they grow in. . . . .	124
5.3	Spices ranked by their spreadability index. . . . .	127
5.4	The approximate geographical origins of the spices in this thesis. . . . .	128
5.5	Ratio of borrowed and not borrowed terms in the spice nomenclature. . . . .	129
5.6	The diffusion of spice terminology in English. . . . .	133
5.7	The diffusion of spice terminology in Arabic. . . . .	135
5.8	The diffusion of spice terminology in Chinese. . . . .	136
5.9	Attestation timeline for spice terms in English. . . . .	137
5.10	Attestation timeline for spice terms in Arabic. . . . .	138
5.11	Attestation timeline for spice terms in Chinese. . . . .	139
5.12	Comparative timelines for attested spice terms, indicating borrowings. . . . .	140
5.13	Top donor languages of English, Arabic, and Chinese loanwords in the spice domain. .	141
5.14	Top source languages of English, Arabic, and Chinese loanwords in the spice domain. .	142
6.1	The distribution of spice names across the three languages. . . . .	143
6.2	Top and bottom spices by number of names. . . . .	144
6.3	Top spices by number of names, broken down by language. . . . .	145

6.4	The ratios of the analyzable words in the spice name dataset.	147
6.5	Top 5 headwords appearing in spice names, by language.	149
6.6	Top 5 headword types in spice names, by language.	150
6.7	Top 5 modifiers appearing in spice names, by language.	150
6.8	Top 5 modifier types in spice names, by language.	150
6.9	Proportion of the sensory modalities in among the modifiers.	151

# List of Tables

1.1	The set of 24 spices included in this thesis. . . . .	8
3.1	The list of corpora consulted in the thesis. . . . .	37
4.1	Various names for allspice in English. . . . .	51
4.2	Various names for allspice in Arabic. . . . .	52
4.3	Various names for allspice in Chinese. . . . .	53
4.4	Conventionalized names for allspice in English, Arabic, and Chinese, found in dictionaries. . . . .	53
4.5	Various names for asafoetida in English. . . . .	57
4.6	Various names for asafoetida in Arabic. . . . .	58
4.7	Various names for asafoetida in Chinese. . . . .	60
4.8	Conventionalized names for asafoetida in English, Arabic, and Chinese, found in dictionaries. . . . .	60
4.9	Cardamoms in the genera <i>Amomum</i> , and <i>Aframomum</i> . . . . .	65
4.10	Various names for cardamom in English. . . . .	67
4.11	Various names for cardamom in Arabic. . . . .	70
4.12	Various names for cardamom in Chinese. . . . .	72
4.13	Conventionalized names for cardamom in English, Arabic, and Chinese, found in dictionaries. . . . .	73
4.14	<i>Cinnamomum spp.</i> cultivated for commercial cinnamon and cassia, their common names and native regions. . . . .	80
4.15	Various names for cinnamon in English. . . . .	86
4.16	Various names for cinnamon in Arabic. . . . .	90
4.17	Various names for cinnamon in Chinese. . . . .	92
4.18	Conventionalized names for cinnamon in English, Arabic, and Chinese, found in dictionaries. . . . .	92
4.19	Various names for pepper in English. . . . .	107
4.20	Various names for long pepper in English. . . . .	109
4.21	Various names for pepper in Arabic. . . . .	109
4.22	Various names for long pepper in Arabic. . . . .	110
4.23	Various names for pepper in Chinese. . . . .	110
4.24	Various names for long pepper in Chinese. . . . .	112
4.25	Conventionalized names for pepper in English, Arabic, and Chinese, found in dictionaries. . . . .	112

4.26	Conventionalized names for long pepper in English, Arabic, and Chinese, found in dictionaries. . . . .	113
4.27	Various names for turmeric in English. . . . .	119
4.28	Various names for turmeric in Arabic. . . . .	120
4.29	Various names for turmeric in Chinese. . . . .	120
4.30	Conventionalized names for turmeric in English, Arabic, and Chinese, found in dictionaries. . . . .	121
5.1	Spice nomenclature, showing if the terms are borrowed or not. . . . .	130
6.1	Analyzability of words in the spice name dataset. . . . .	146
6.2	Comparative analysis of the names of star anise in English, Arabic, and Chinese. . .	153

# Glossary

Ayurveda	traditional Indian medicine <a href="#">19</a>
bencao	the Chinese term for <i>materia medica</i> , works that record the sources and applications of medicinal substances (本草) <sup>1</sup> <a href="#">18</a>
cultigen	a cultivated plant species with no known wild ancestor <a href="#">117</a>
materia medica	an encyclopedic treatise of medicinal materials obtained from plants, animals, and minerals <a href="#">7</a>
pharmacopeia	a treatise on medicinal drugs and their formulas <a href="#">7</a>
phytonym	a plant name (non-taxonomic) <a href="#">84</a>
taxon	taxonomic group or unit, especially when hierarchic rank is not specified <sup>2</sup> <a href="#">32</a>
Wanderwort	a word borrowed from one language to another across a broad geographical area often as a result of trade or adoption of newly introduced items or cultural practices <sup>3</sup> <a href="#">4</a>

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<sup>1</sup>Z. Zhao et al., [2018](#).

<sup>2</sup>A back-formation from *taxonomy*.

<sup>3</sup>Merriam-Webster, [n.d.](#), Wanderwort.



# Acronyms

AHD	American Heritage Dictionary of the English Language 5
BCGM	Bencao Gangmu 59
BHL	Biodiversity Heritage Library 32
BNC	British National Corpus 131
CAD	Chicago Assyrian Dictionary 70
CBETA	Chinese Buddhist Electronic Texts Association 38
CTP	Chinese Text Project 38
EHBC	English Historical Book Collection 38
EI2	Encyclopedia of Islam, Second Edition 36
EIr	Encyclopedie Iranica 36
EJ	Encyclopedia Judaica 85
FAOSTAT	UN Food and Agriculture Organization Statistical Database 78
FoC	Flora of China 32
GBIF	Global Biodiversity Information Facility 32
IPNI	International Plant Names Index 32
KSUCCA	King Saud University Corpus of Classical Arabic 38
LSJ	Liddel-Scott-Jones: A Greek-English Lexicon 68
MC	Middle Chinese 27
MW	Merriam-Webster's Unabridged Dictionary 5
NFCM	Nanfang Caomu Zhuang 71
NS	Nişanyan Sözlük 70
OC	Old Chinese 90
OED	Oxford English Dictionary 5
PIE	Proto-Indo-European 56
POWO	Plants of The World Online 32
PWN	Princeton WordNet 29
SCB	Serbian-Croatian-Bosnian 126
SEAlang	Southeast Asian Languages Library 66
SkE	Sketch Engine 37
SS	Scripta Sinica 38
TCM	Traditional Chinese Medicine 18
TLFi	Trésor de la Langue Française informatisé 83
TPGJ	Taiping Guangji 59
TPL	The Plant List 32

<b>WALS</b>	The World Atlas of Language Structures <a href="#">35</a>
<b>WFO</b>	World Flora Online <a href="#">32</a>
<b>WOLD</b>	The World Loanword Database <a href="#">146</a>
<b>YYZZ</b>	Youyang Zazu <a href="#">59</a>

## Symbols and Notation

*	reconstructed form
<	developed from
>	developed into
<?	uncertain development
†	obsolete
<i>fragrance</i>	italic: lexical item, a word or phrase
[fragrance]	square brackets: gloss, literal meaning
‘fragrance’	single quotation marks: meaning, sense
FRAGRANCE	small capitals: a concept



# Introduction

UPON reading about the different spices that nature has gifted us with, I have come across a unique one. There is a small aromatic tree native to the islands of the Greater Antilles on the Caribbean, bearing little berries. The indigenous people used this tree and its fruit in various ways in the stages of food preparation, as a medicine and flavoring agent. It is still an important crop today, only growing in Central America. The wood is used to smoke meat, the leaves are added to stews and rum for their aroma (similarly to the bay-leaf in Europe), but most importantly the dried berries are used as a spice. Outside this region it is not a particularly well-known ingredient, still, many cuisines use it in various ways since its diffusion starting from the 17<sup>th</sup> century. In English, we can call it *Jamaica pepper* or *pimento*, but it is mostly known today as *allspice*. In Arabic, it is *fulful ifranjī* literally [Frankish pepper] meaning ‘European pepper’ or *bahār hulw* [sweet spice], and in Chinese, it is mostly known as *duoxiangguo* [many-spice/fragrant-fruit]. Furthermore, Hungarians call it *szegfűbors* [clove-pepper], in Turkish it is *yenibahar* [new-spice], in Iceland it is known as the ‘handy spice’, *allrahanda*, and the Polish call it *ziele angielskie* [English herb]. What a variety! The tree itself is also called Caribbean laurel. However, this plant is not a laurel, it is not a pepper, nor chili, and it is not an herb. What is this versatile spice exactly? How come that this material has so many so different names? And what is the explanation and motivation behind these names; what is their story? This dissertation is about answering such questions and telling the story of spices through examining their nomenclature.

## 1.1 Significance

Understanding the language of spices is a key to open a door to this world. A door that leads to the realization that our words—and material culture—are deeply interconnected, and that they have been so for thousands of years. I will try to demonstrate this by introducing these fascinating substances from a new perspective, the perspective of language. It is trendy nowadays to talk about *foodways*, a term that refers to “the eating habits and culinary practices of people, regions, or historical periods” (L. H. Allen et al., 2013, vol. 2, p. 289), and food history, a relatively young interdisciplinary academic field is starting to gain traction as well. However, the connections between language and food are one of the most interesting examples of contemporary humanities research I have come across (see Jurafsky, 2014). There is a segment of this topic—the spice domain—which encompasses products that have had profound effects of human imagination, culture, and history. Although somewhat overshadowed by more “serious” questions of nutrition, modern scientific research on spices was never a fringe field. It is enough to look at the many pharmacological studies that dive into the chemistry of these materials to realize that people are still interested in their health effects—just as they were thousands of years ago—as much as their taste and aroma.

Spices were never a necessity to human survival, but commanded intense desire and efforts,

and as such they constitute an enthralling phenomenon throughout human history, which can be studied from many angles. Therefore, research on spices has been embraced by a few historians, many botanists, and countless culinary enthusiasts. Scholars also realized the cultural significance of these products and their trade early on and following the path of these materials tried to uncover the stories they can tell us about cultural contact and exchange. Spices in the past conveyed the mystery and riches of faraway lands, they were considered remedies for sickness, and they were the ultimate gifts of paradise. It may be so that spices are not vital for humans, but sustenance itself is just enough to maintain life, not to live it to the fullest. Spices today represent the excitement, the joy and vigor, as it is so clear from expressions in our language: to *spice up* your life is to enliven it!

## 1.2 Originality

This thesis aims to do a systematic investigation on spice names and related terminology, including products that were used (or still being used) medicinally, as incense, or as perfume. Aromatics that were at some point considered spices have been traded and transported across long distances since antiquity and before, and the most coveted ones have slowly dispersed throughout the globe. Spices and the spice domain as a topic are usually discussed within the broad disciplines of history, botany, chemistry, and gastronomy, all concerned by very different aspects of these materials. To the best of my knowledge, there is no academic work that puts the field of linguistics in focus when discussing spices as a whole, and so this project is a unique contribution to our linguistic knowledge about the spice domain.

But why should anyone care about spices and their names? Because exploring the names of the products of the spice trade—traveling on vast networks of historic trade routes such as the Silk Road (small volume of trade), and its nautical counterpart the Maritime Silk Road (large volume of trade)—helps us to map and better understand linguistic contact and cultural exchange. These ever-expanding trade networks, first regional, later connecting East and West were a precursor to today's globalized, interconnected world, and one of their most lucrative products was dried plant-matter. These aromatic substances were lightweight, easy to transport, and resistant to spoilage. And, of course, they were highly valued for their fragrant and pungent properties, and their reputed—both putative and real—benefits for the human body and soul. Exotic and rare spices and their role in rituals, medicine, and later cuisine made them sought after, and the spice business inspired people to trade, travel, explore, and wage wars. Spices are important in world history as they are directly responsible for discoveries, colonization, and the birth of capitalism. We know a great deal about the nature of spices thanks to botanists and naturalist, their medicinal effects thanks to pharmacists and chemists, and their uses and culinary values thanks to experts of gastronomy. There is also a vast literature on the spread and economy of spices thanks to researchers of history, but the careful study of their names is often neglected. The meticulous study of spice terminology is important, because the words can tell us a huge deal about the material's origins and journey, even at a time depth where textual or archeological evidence is not available. This work was born out of fascination with the etymologies and global dispersion of spice terms, and hopefully the attempt to collect them in one

study can be original and interesting.

### 1.3 Problem Statement

Soon, my attention slightly shifted towards a problem that could be best described by a lack of consistent and comprehensive knowledge regarding spice names. I noticed a gap when it comes to spice terminology, as very few scholars have turned their focus towards the nomenclature. The absence of proper research regarding spice terminology have resulted in a lack of understanding, and a decline of trust in the (secondary) literature. Authors often give misguided and contradicting information regarding the source of a name, or simply erroneously speculate on their meanings and origins. There are no two authors that use the same set of names when discussing a spice, which in itself is not a problem, but it leads to issues in case of lesser known or exotic items. There is also a great deal of confusion on the relationship between names and identities in the literature, especially in lay areas aimed at the general public, such as popular histories or guidebooks. The reasons for this are several.

Firstly, the experts of herbs, spices, and other aromatics are chiefly botanists, food industry professionals, chemists, chefs and food writers, merchants and historians. Most people conducting research related to spices focus on aspects other than the names of the products; from plant morphology, to chemical composition and pharmacological effects, to social and cultural histories, their symbolism in literature, not to mention the myriad of ways on how to buy, store, mix, and use spices in creative recipes as discussed by the handy spice encyclopedias tailored for gastro-enthusiasts. Relatively few linguists devoted their time and attention to trace spice origins and even fewer to compile them. In other words, the topic of spices requires a highly multidisciplinary expertise, and when a plant taxonomist writes about linguistics, or a culinary writer approaches history, some mistakes are due.

Secondly, there is no reference work or an agreed upon inventory of spice names to cover the multitude of spices that exist, and their many names in various languages (and in different time periods), least of all a complete list of *every spice*. Truthfully that seems rather impossible, or at least quite a daunting task to embark on. Although the internet nowadays is full of compact guides and indices assembled by people who are fascinated with spices and their colorful uses listing their names in many languages, these are not always trustworthy, and often cite no sources. Similarly, blogs and articles are most often than not dubious, and almost always require fact checking as many are just permutations of historically inaccurate anecdotes and origin stories. Most recently, I have found spice lists that are clearly just a dump of computer generated information floating around on the internet using web scraping and machine translation: these lists are highly inaccurate and should be avoided. I will further elaborate on the inaccuracies regarding names and etymologies found in the spice literature under the literature review in the next chapter.

There is no comprehensive treatise on spice terms within academia until today, and no database that focuses on, lists, explains, analyzes, clarifies, traces, or compares spice names. Hence, there is an obvious need for a standard work for others to turn to, and I hope that this dissertation can lay the foundation for future efforts to achieve this.

This is not to say that there is no work done on spice terminology, there are a number of high-

quality writings from philologists, linguists, and historians well versed in one or more relevant linguistic and cultural area. The problem is that this kind of research requires a highly specialized knowledge, and in result the information already out there is sporadic, less accessible, and grossly unorganized. Key pieces of information are often hidden between the pages of books on traditional philology and material culture, literary critique, economic history, and even botany, medicine, and archaeology of a given region. Not to mention the many old works that are the primary sources for the aforementioned publications. Consequently, since little effort have been made to collate the data, there is a chasm between the critically researched reliable information and what the end user—whether it is a fellow researcher or a spice zealot—can easily access.

## 1.4 Aims

The original goal in the beginning of this work was to gather and augment the existing information about spice names and their origins, and track their diffusion on spatial and temporal trajectories. This still constitutes the core of this thesis, and I hope to achieve it by combing through the existing literature, collecting the names of spices, amending the gaps, and correcting possible errors on the way. By doing so, the results should also give birth to a carefully researched compendium of spice nomenclature, grounded in philology and linguistics, but with the awareness of what spices are to botany, and what their role was in history. Chapter 4 [The Spices](#) presents you parts of this process and displays the data seriatim, and introduces some of the spices.

The procedure shall manifest a dataset of spice names, with complete lexicographical annotation including etymological information and attestation dates. This in turn would allow me to trace the words and track the linguistic diffusion of spices through space and time, which then can be discussed hand-in-hand with the physical diffusion of the materials. Eventually, the spread of the spices will be the basis for a discussion on the implications of linguistic and cultural contact and exchange, and it makes up Chapter 5 [The Diffusion of Spices](#). This chapter ties well together with the concept of *Wanderwörter*, “wandering loanwords”, a phenomenon known in the field of historical linguistics related to the topic of borrowing and material culture. The goal of this chapter is to map the diffusion of the terms of the spice domain, as informed by etymological research.

In addition to this, the data of spice names will also be the basis of a linguistic analysis, focusing on the characteristics of terms, and the methods and strategies languages use to name spices as presented in Chapter 6 [The Language of Spices](#). This part will include a deep dive into how spice names are devised or created, how prototype items beget prototype words to generate new names for novel items of trade, and what are the mechanisms and motivations of linguistic acculturation and spice name propagation. The goal of this part is to shed light in how spice names are born and how they operate on linguistic-cognitive levels, what type of information they convey and what sensory modalities they tie to.

## 1.5 Definitions

The first step is to clarify what is meant under the term *spice*. According to the *Oxford English Dictionary* (OED), the definition of *spice* is as follows: “One or other of various strongly flavored or aromatic substances of vegetable origin, obtained from tropical plants, commonly used as condiments or employment for other purposes on account of their fragrance and preservative qualities.”<sup>1</sup> Similarly, the first meaning for *spice* as a noun in *Merriam-Webster’s Unabridged Dictionary* (MW) is “any of various aromatic vegetable products (such as pepper or nutmeg) used to season or flavor foods.”<sup>2</sup> The *American Heritage Dictionary of the English Language* (AHD) adds examples: “Any of various pungent, aromatic plant substances, such as cinnamon or nutmeg, used to flavor foods or beverages.”<sup>3</sup> The Wikipedia entry on *Spice* gives slightly more information, hinting on which plant parts are frequently used as spices and mentions their food-coloring properties, while also—very appropriately—ventures beyond the culinary stance of usual dictionary definitions, stating that “spices are sometimes used in medicine, religious rituals, cosmetics or perfume production.”<sup>4</sup> This notion is much more important than expressing it with a mere “sometimes” could imply as we will see; before modern times, spices were much more important for their medicinal properties.

There is no universal definition on what a spice is; botany, pharmacology, gastronomy, and history all have different perspectives. However, the idea about “spices” that the reader currently has in mind, is bound to be a culinary one. Some authors try to give a definition according to plant morphology, Czarra (2009, p. 9) writes about “an aromatic part of a tropical plant”, and goes on to mention bark, flower, root, and seed. J. Turner (2004, p. xix) adds gum and resin, fruit, and stigma to this listing. For a full picture, we must complement it further, as spices can come in many forms: dried tree barks (cinnamon); twigs (cassia twigs); flower buds (cloves); stigmas or styles (saffron); fruits (pepper, chili); fruit walls or pericarps (star anise, Sichuan pepper); berries (allspice, juniper); seeds (nutmeg, coriander); seed coverings or arils (mace); seed pods (cardamom, vanilla); and roots and rhizomes (ginger, turmeric). Technically, every dried part of a plant can be referred to as spice, except the leaves. The green leaves—fresh or dried, but mostly used fresh—are considered herbs, and they are used for similar purposes to spices nowadays: flavoring, seasoning, garnishing. Dried leaves of herbs, such as basil, oregano, and thyme, can be categorized as “spice herbs” (see van Wyk, 2014). The category of herbs can be problematic, because there is a botanical definition, and also a culinary definition, and the literature often confuses the two. Botanically, an herb is an annual, biennial, or perennial plant that has a soft stem (never becomes woody), and dies after flowering.<sup>5</sup> A culinary herb is an herb where the fresh leaves are used in food preparation, as opposed to other, dried plant parts. Medicinal herbs are those that are primarily consumed for their medicinal properties. O’Connell (2016, pp. 9, 16) backs this view in his informative compendium, but also cites Rosengarten (1969/1973, p. 16), who maintained that it is “extremely difficult to determine where a spice ends and

<sup>1</sup>OUP, n.d., spice.

<sup>2</sup>Merriam-Webster, n.d., spice.

<sup>3</sup>AHD, 2022, spice.

<sup>4</sup>Wikipedia, 2022.

<sup>5</sup>OUP, n.d., herb.

a herb begins". According to him, culinary herbs are just one group of spices. Along these lines, the Encyclopedia Britannica (2022) for example treats herbs and spices in a single entry.

The above distinction—that herbs are the greens and spices are every other (dried) parts of a plant—is essentially nonsense to a botanist since it echoes the needs of a chef. We can give examples for both spice and herb from the same species: coriander seeds and coriander leaves (also called *cilantro* or *Chinese parsley* in the U.S.) are both from the plant *Coriandrum sativum*. Or see an even more elaborate example for culinary categorization: mustard (*Brassica juncea*, brown mustard). Mustard in Europe is mostly known in the form of a creamy yellow paste, often very pungent, this is called a condiment. This condiment is made from the mustard seeds, which are considered to be the spice. Some regions enjoy mustard greens in their salads for example, here we can categorize it as a (salad) herb, and the roots of the mustard plant are popularly fermented in Chinese cuisine to make pickles, known as 榨菜 *zha cai* [to press, extract juices, salted vegetable-vegetable, dish]. Another often mentioned difference is that herbs are soft stemmed—as I just mentioned—that die at the end of the growing season in contrast to woody, spice yielding trees or shrubs. This, on the other hand, is a botanical definition, and not very useful for somebody active in the culinary arts (G. Allen, 2012, p. 10). Moreover, most plants we consider herbs grow in temperate climates, while spices tend to grow in tropical regions (J. Turner, 2004), a further classification on ecological basis. Herbs can also be divided into culinary and medicinal herbs, and in both cases, the leafy, green parts of foliage are used for their aroma and flavor, and supposed health benefits, respectively, but this division is a modern afterthought, not applicable to past times. In short, defining spices and herbs is difficult because the definitions vary by discipline, depending on the needs of the expert: the gardener, the herbalist, the chef.

Just as *herb* has two main definitions—botanical and culinary, the term *spice* also has two definitions: a culinary, and a historical. In the present study, I focus on dried, plant-based aromatic commodities that traveled long distances due to trade and were at certain points in history considered a desired commodity or even a luxury. This is basically the definition of the historian, where the implications of climate and remoteness translated as value. Spices were difficult to obtain, and thus were often instantly expensive. Long distance transportation was possible because the plant products were hauled across deserts and oceans in a dried form, making them lightweight and less susceptible to rot. Culinary and medicinal herbs had their value in their freshness, and thus were not ideal products of trade; they spread through naturalization and transplantation and were generally available locally, commanding much more modest sums of money. Contrary to herbs, spices were more versatile in their applications, they were used as medicine due to their (real, putative, or exaggerated) health benefits, as incense and perfume due to their aroma, as coloring pigments, as flavoring agents, and even as spiritual offerings. In connection with Portugal's role in the 15-16<sup>th</sup>-century European spice trade, Halikowski Smith (2001) distinguishes four categories of spices along the same lines: spices as *pharmacia*; spices as *aromata*; spices as *pigmenta*; spices as *condimenta*. Historically speaking, anything rare and aromatic can be considered a spice, including incense for burning, coffee in the early days, chocolate, perfumes, or even exotic fruits, such as pomegranates; anything 'special' (even if today nobody would agree so).

This is well observed in the origins of the English name: the word *spice*, via Old French *espice*, coming from Late Latin *speciēs* (plural) ‘spices, goods, wares’ with the original meaning in Classical Latin being ‘kind, sort’. English *species* and *special* are obvious cognates of the same Latin etymon: *speciō*, which referred to anything observable: a sight, ‘spectacle’ (cf. *inspect*), and also anything extraordinary, *specific* kind of item (Glare, 1982/2012, pp. 1983–84). This implies that in different periods, the meaning of the term *spice* covered different substances, based on what products were considered special, desirable, and difficult to obtain; the definition constantly changed. From this point on, whenever spices are mentioned, I refer to this broader definition, using *spice* as an umbrella term for any historic *exotica*. These definitions and the differences between the terms *spice*, *incense*, *herb*, *condiment*, etc. will be explored in detail in the dissertation, as well as the shift in meaning considering spices (Section 2.1.5).

## 1.6 Scope

The scope of this study can be delimited by three factors: the subjects under study (i.e., the spices); the languages involved; and the time frames covered.

### 1.6.1 The Set of Spices

Due to the lack of a single definition and the vast number of both popular and rare materials, the lists of herbs and spices are as many as the books written on them. Every compiler—cook, linguist, or historian—comes up with his or her own list, there is no standard approach. Czarra (2009) discusses only 5 premier spices, ‘the foremost five’ as he calls it, Nabhan (2014) works with 26 ‘spice boxes’, to use his terminology, and Rosengarten (1969/1973) mentions 41 ‘of the world’s most popular spices’. van Wyk (2014) in his reference guide introduces 120, and the glossary of spice names in Dalby (2000) contains more than 200 entries. The Encyclopedia Britannica simply lists 70 (Petruzzello, 2021).

The attempt to collect and describe spices in their entirety is not a modern phenomenon, people tried to collect and assemble the knowledge on aromatic and medicinal plants and products ever since the day we started to use them; proof being the countless *herbariums*,<sup>6</sup> *materia medicas*, and *pharmacopeias* of the last two millennia, e.g., the *De Materia Medica* of Dioscorides. Besides focusing on medicinal properties, spices were listed as commodities of trade. We know for example that for reasons motivated by customs tariff and taxation, Roman ports, such as Berenike<sup>7</sup> had inventories of *speciēs* that required special attention (Parthasarathi, 2015), and as a later example we can mention an Italian merchant’s book on trade from the 14<sup>th</sup> century, which contains 188 “spices” (Pegolotti, ca. 1335–1343/1936, pp. 411–435). Modern considerations and regulations related to commercial shipping can also be consulted, the Harmonized System (HS)4 tariff codes (0901–0910) used in international trade differentiates around 20 different spices, mostly driven by practical reasons related to storage

<sup>6</sup>A collection of preserved plants with descriptions and botanical analysis.

<sup>7</sup>For the history of the ancient Indo-Mediterranean trade through archeological research in the port of Berenike, see Sidebotham (2011).

and transportation requirements.<sup>8</sup>

A comprehensive list of the world's spices is likely to be extremely long and collecting them all in this short period of time seems to be an unattainable aim, so I must limit my scope, I must select a small set of spices from the many. I have studied how others perform this selection, and I concluded that unless we include every known item, there is no scientifically sound way of selecting just a few, it will always reflect the compilers' knowledge, interest, and cultural background. I have planned to include a number of spices, as much as needed for an attempt to find patterns in diffusion and language use, keeping in mind the expected variations per cuisine and cultural sphere.

#	Species	English	Chinese	Translit.	Arabic Translit.
1	<i>Pimenta dioica</i>	allspice	多香果	duōxiāngguǒ	فلفل إفرنجي <i>fifil ifranjī</i>
2	<i>Pimpinella anisum</i>	anise	茴芹	huíqín	ينسون <i>yansūn</i>
3	<i>Ferula assa-foetida</i> et al.	asafoetida	阿魏	āwèi	حتىت <i>hiltīt</i>
4	<i>Carum carvi</i>	caraway	葛缕子	gělǚzi	كراويا <i>karāwiyyā</i>
5	<i>Elettaria cardamomum</i>	cardamom	荳蔻	dòukòu	هال <i>hāl</i>
6	<i>Cinnamomum cassia</i>	cassia	肉桂	ròuguì	سليخة <i>salīkha</i>
7	<i>Capsicum annuum</i> et al.	chile	辣椒	lājiāo	فلفل حار <i>fulful hārr</i>
8	<i>Cinnamomum verum</i>	cinnamon	錫蘭肉桂	xīlánròuguì	قرفة <i>qirfa</i>
9	<i>Syzygium aromaticum</i>	clove	丁香	dīngxiāng	قرنفل <i>qaranful</i>
10	<i>Coriandrum sativum</i>	coriander	芫荽	yánsui	كزبرة <i>kuzbara</i>
11	<i>Cuminum cyminum</i>	cumin	孜然	zīrán	كمون <i>kammūn</i>
12	<i>Anethum graveolens</i>	dill	莳蘿	shíluó	شب <i>shibitt</i>
13	<i>Foeniculum vulgare</i>	fennel	茴香	huíxiāng	شمر <i>shamar</i>
14	<i>Trigonella foenum-graecum</i>	fenugreek	胡蘆巴	húlúbā	حلبة <i>ḥulba</i>
15	<i>Zingiber officinale</i>	ginger	薑	jiāng	زنجبيل <i>zanjabīl</i>
16	<i>Piper longum</i>	long pepper	薑撥	bībō	دار فلفل <i>dār filfil</i>
17	<i>Myristica fragrans</i>	mace	肉荳蔻皮	ròudòukòupí	بسباسة <i>basbāsa</i>
18	<i>Myristica fragrans</i>	nutmeg	肉荳蔻	ròudòukòu	جوز الطيب <i>jawz al-tīb</i>
19	<i>Piper nigrum</i>	pepper	胡椒	hújiāo	فلفل <i>filfil, fulful</i>
20	<i>Crocus sativus</i>	saffron	番紅花	fānhónghuā	زعفران <i>za'farān</i>
21	<i>Zanthoxylum spp.</i>	Sichuan pepper	花椒	huājiāo	فلفل سیتشوان <i>filfil sītshuwān</i>
22	<i>Illicium verum</i>	star anise	八角	bājiǎo	ينسون نجمي <i>yansūn najmī</i>
23	<i>Curcuma longa</i>	turmeric	薑黃	jiānghuáng	كركم <i>kurkum</i>
24	<i>Vanilla planifolia</i>	vanilla	香草	xiāngcǎo	فانيلا <i>fānilīyā</i>

Table 1.1 The set of 24 spices included in this thesis, with scientific names of the source plant, names in English, Chinese, Arabic, and their transliterations.

As aromatic plant products are far greater in number than initially expected (in the hundreds), I had to delimit my study by selecting a small set of spices as the subjects of this study. One of the clearly intended future goals of this project is to include all known historically important aromatic products, but for the sake of this dissertation be finished on time, I had to make some choices, and I have set up a list of criteria. The subjects under scrutiny shall adhere to the followings: (1) a plant-based material,

<sup>8</sup>The Harmonized Commodity Description and Coding System is a standardized international system to classify globally traded products (<https://www.freightos.com/freight-resources/harmonized-system-code-finder-hs-code-lookup/>).

with (2) aromatic or pungent properties, (3) traded over great distances, (4) known and used since pre-modern times, and preferably (5) once of significant value. The more criteria the substance has fulfilled, the higher it climbed on my list as I assembled a set of spices while reading through the literature. Most importantly, I tried to include globally popular spices that people can be familiar with. In the end, I have finalized my set including 24 spices for this thesis, which you can see in Table 1.1.

In the dissertation, I have followed the criteria laid out above, and included the most prominent spices, for example black pepper (*Piper nigrum*). Pepper is the world's most traded and consumed spice, followed by cinnamon (Senaratne & Pathirana, 2020, p. 16). In many parts of the world, pepper is also the *prototype* spice. Considering popularity, I have worked downwards, considering the most consumed, and most traded spices. The current set of 24 in my opinion is enough to grasp the big picture, as it includes a large variety of spices from relatively<sup>9</sup> diverse areas. In the future I hope to extend this project and include more aromatic materials to the fold.

The scientific literature usually categorizes spices by their taxonomy governed by rules from the discipline of botany. Although above I mentioned standards of international trade and shipping that use different categorizations, I discussed spices from a historical perspective, and I should emphasize that this is a linguistic study and therefore the basis of comparison will be the spices as conceptual categories revolving around words, and the spice names themselves. Strict botanical or other categorizations would be only secondary. What I mean under this is that, even if the botanical reality tells us that chile peppers are in fact several different species and varieties on a taxonomic ladder, I will treat them as a unit according to the broad sense the term *chili pepper* conveys. Therefore, the close organizational units are words, meanings, and concepts. I will clear this up more in the methodology chapter. Now that we have identified the subjects in our scope, let us move on to the languages to be included, and the time frames to be covered.

### 1.6.2 The Languages

To make this study more interesting, I will look at three languages, namely English, Arabic, and Chinese. All from distant language families, with very distinct features, these languages represent three very different cultural spheres that had all participated in the spice trade in different historical periods and were at times highly influential players. Investigating spices and spice names through the lens of these languages offers us an opportunity to take a step back from the usual Eurocentric viewpoint, and observe the spice domain from a more global, intercultural perspective, investigating it via three pillars of human high culture as equals. These civilizations not only had interactions with each other, but their representative and languages—rich in literary traditions—have left a mark on many of the world's languages through migration, trade, cultural and religious influence, colonization, and imperialism. By tracing the words' histories up until contemporary English, Arabic, and Chinese, I must touch on the many other languages that have played a role in transmitting the words as source and donor languages in the spice domain, such as Latin, Persian, Sogdian, Sanskrit, and many more. Focusing on the three languages however, will allow for a comparative approach,

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<sup>9</sup>Keeping in mind that almost all spices around the world originate from regions with tropical or subtropical climates.

without overwhelming ourselves with the many related languages that would make for a scope too wide, and beyond my abilities.

### 1.6.3 The Time Frame

Lastly, a few words on defining the time periods to be covered. I will start the linguistic investigation using a set of contemporary names in the three languages mentioned above, and I will trace the histories of the words to the periods where the etymologies lead me. Consequently, the historical periods that saw the greatest exchange and knowledge production about spices will be treated with a much greater emphasis than others.

These significant eras for example include the 7–12<sup>th</sup> centuries, a period significant from both Arabic and Chinese points of view. In the Middle East we have seen the rapid expansion of Islamic empires in the form of the Umayyad (661–750) and Abbasid caliphates (750–1258), stretching over vast swathes of land from North Africa on the west, to the eastermost extremities of Persia. On the Far East, the Tang dynasty (618–907) illustrated the peak of classical Chinese civilization—usually regarded open and cosmopolitan—controlling the regions on the eastern terminus of the Silk Road, followed by the similarly important Song dynasty (960–1279). In both cases, this time is regarded as an important cultural and economic golden age: poetry, literature, science, and trade flourished. Important *materia medica*s are extant from the Tang era (J.-N. Wu, 2005), and Islamic authors were occupied producing heavy tomes on geography, alchemy, medicine, philosophy, and other topics (Meri, 2006, p. 131). During the 8<sup>th</sup> century both powers reached each other's spheres of influence in Central Asia, and at 751 the Battle of Talas—ending with the victory of the Arab forces and their Tibetan allies—affected the fate of the region for centuries.

In the case of English, the appropriate, matching historical period would be that of Old English, however, this earliest recorded period is not abundant in spice related terms, although attested wandering loanwords include *pepper*, *copper*, *gem*, and *mint* (Wollman, 1993). In the case of English, the most relevant historical period would correspond to that from Middle English (ca. 1150–1450) to Early Modern English (late 15<sup>th</sup> to late 17<sup>th</sup> c.), where the dichotomy in the domain of spice terminology between contemporary and historic times is still observable. This is the historical period marked by England's slow emergence from the ragged periphery of Europe during the Age of Discovery, into becoming a global superpower thanks to its advances towards maritime supremacy, the zenith<sup>10</sup> of which begins with the foundation of the East India Company in 1600, and later culminates in the expansion of the British Empire.

## 1.7 Contribution

The main contribution of this thesis would be a working database of spices and their accompanying names that can serve as a basis for further study in historical linguistics, typology, and more. Spices and aromatic products with varying importance and relevance in different places and in different

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<sup>10</sup>From Arabic *samt* ‘astronomical path’.

times are essentially endless, so there is always a room (and need) to expand. This thesis treats these materials as unique witnesses of cultural interaction and tracks their physical and linguistic diffusion. Collecting the *Wanderwörter* of the spice domain and examining their linguistic history makes an interesting window to look at early human contact, exchange, and the dissemination of plants, materials, words, and knowledge.

Furthermore, a look into the role of spices' highly sensory nature can be an exciting point of study regarding human cognition and language, and especially our attitude towards naming and conceptualizing novel substances.

## 1.8 Layout

Chapter 2 *Background* deals with the literature review, further explains the research gap, and introduces the theoretical framework, Chapter 3 *Methodology* introduces the research design principles, its challenges, and the data collection process regarding spices, names, and etymologies. Chapter 4 *The Spices* introduces a few spices in more detail one by one, including their uses, botany, and history besides their names. The empirical chapters Chapter 5 & Chapter 6 will present *The Diffusion of Spices* and *The Language of Spices*. In the end, a short conclusion closes the thesis, with the mentioning of limitations and future plans.



# Background

**K**NOWLEDGE and familiarity about spices varies greatly from person to person. One can live a life of actively pursuing, disseminating, and creating knowledge about spices, while others die without caring or knowing a thing about them. However, presumably both of these types of people would use and consume similar amounts of these substances, depending on which culinary or medicinal tradition they were born into. Spices are various, mainly plant-based substances that have played essential roles in human civilization for millennia. As I mentioned earlier, the assumed roles can be numerous: culinary, medicinal, cosmetic, and ritualistic, and different cultures display varying degrees of importance to different products. In this chapter, I will explore the different fields that have generated information about spices, review and evaluate the existing literature, and present the available and appropriate sources for investigating these materials relevant to this project. I will also introduce the theoretical framework that this thesis and its methodology builds on.

## 2.1 Literature Review

### 2.1.1 On Spices

When we hear the word *spice*, our imagination rushes through far-flung tropical islands, busy seaports, lush jungles, and arid deserts; it invokes the sight of massive ocean-going ships, oriental traders, and camel caravans. A quick internet image search on the “spice trade” shows us antique maps in sepia and neatly arranged Moroccan spice markets in eclectic colors. We can almost smell the word *spice*. These envisioned, heavily stereotypical landscapes go hand in hand with stories of exotic peoples, fantastic creatures, prized commodities, tales of exploration, and much less glorious accounts of colonization. What I described here is an exclusively Westernized viewpoint. While most of the images in our minds are distorted under the influence of romantic orientalist paintings, and tales of triumphant discoveries retold over generations, the essence of the image is very true, and much more gruesome. Arguably, the peoples living in the native habitats of a once overvalued plant species have different experiences etched in their collective memories. One could argue that Europeans imported spice, but often exported horrors. The spice trade and its romantic imagination gave birth to many books, from historical non-fiction on influential characters, such as *Nathaniel's Nutmeg* (Milton, 1999), to popular histories, such as *The Spice Route* (Keay, 2006), and more popular science accounts, such as *Fruit From the Sands: The Silk Road Origins of the Foods we Eat* from paleo-ethnobotanist Spengler (2019a).

Today, spices are mostly discussed from a culinary point of view. The volumes of cookbooks and spice & herb companions are almost infinite. Gastronomy professionals, chefs, food writers, and hobbyists all participate in an endeavor to introduce spices to us in a fashionable manner, creating

references for home cooks and health enthusiasts. Many authors tend to attempt an overarching collection, presented in encyclopedic directories (Craze, 1997; Farrell, 1985; Herman, 2015; Lakshmi, 2016; Norman, 2002/2015; O'Connell, 2016; Opara & Chohan, 2021).

On a more scientific note, we find authors from the plant sciences, such as plant taxonomist and ethnobotanist van Wyk (2014) who delivers an excellent compendium titled *Culinary Herbs and Spices of the World* where he introduces dozens of aromatic plants, with a clear explanation on their uses and categorization. In her *Food Plants of China* S.-Y. Hu (2005) describes hundreds of edible plants relevant to Chinese eating habits, with the precision of a true botanist. Agricultural ecologist and ethno-biologist Nabhan (2014) takes the reader on a “spice odyssey”, with his illuminating *Cumin, Camels, and Caravans*, discussing the materials in chronological steps of global trade—on the Incense trail, the Silk Road, and the spice trade.

Beyond general and introductory histories of spices, such as those offered by J. Turner (2004)'s *Spice: The History of a Temptation*, or Czarra (2009)'s *Spices: A Global History*, most historians and philologists approach the topic in depth, from their own areas of expertise. Culinary historian Krondl (2007) compartmentalized the story of spices, and writes about Venice, Lisbon, and Amsterdam, “the three great cities of spice” in his *The Taste of Conquest* and presents the story of spices through the vying eyes of European powers. Spices in Greek mythology are explored in *The Gardens of Adonis* by an expert of Ancient Greece, Detienne (1994), while Schivelbusch (1992), a cultural historian discovers the social history of spices, stimulants and intoxicants in his *Tastes of Paradise*. Freedman (2008), a historian and expert on medieval cuisine, in his book *Out of the East: Spices and the Medieval Imagination* explores how the European fascination with spices fueled the quest for new lands and colonial expansion. The initial voyages to America by Columbus, Pizarro, and others were motivated by the search for spices, and the mirage of *La Canela*, a legendary valley abundant in cinnamon, equally promising to that of gold in El Dorado (Dalby, 2001). One of the most valuable works for us is Dalby (2000)'s *Dangerous Tastes: The Story of Spices*. Andrew Dalby is a linguist and historian, and besides Latin and Greek he has command of other languages, such as Sanskrit and Burmese, which allows him to present the topic of spices with the pen of a truly versatile philologist and convey authentic scholarly information on spice names bridging East and West. A thought-provoking volume titled *The Poetics of Spice* by Morton (2006) is a literary critical study that discusses how spices were represented in Romantic and Victorian era English literature, and how the topic connects to romantic tropes; ideologies, such as consumerism, capitalism; and ideas, such as abstinence and luxury. “Spice is a complex and contradictory marker: of figure and ground, sign and referent, species and genus; of love and death, epithalamium and epitaph, sacred and profane, medicine and poison, Orient and Occident; and of the traffic between these terms.” (Morton, 2006, p. 9).

Looking beyond holistic, comprehensive tomes on the history of spices attempting to gather all of them in a single book, some commodities have already been explored thoroughly in a more concentrated approach. The history of salt (Kurlansky, 2002), tea (Mair & Hoh, 2009), pepper (Shaffer, 2013), and vanilla (Rain, 2004) are worth mentioning, and treatises on other popular substances of trade (chocolate, sugar, tobacco, etc.) are abundantly available. Even more outstanding are the works that focus their investigation on a specific area, whether it is the “cultural biography” of the chile

pepper in China (Dott, 2020)—retelling an unquestionably influential incorporation of a new item to a diet—or the allure of musk and perfume in the Islamic tradition (King, 2007). These works contain valuable linguistic information as well, regarding the origins and spread of the names of spices, and they help us to investigate their spread and diffusion.

Studies on specific spices are one of the most important sources for this thesis, and highly related to the project for example are the studies on the loanword status of ginger (Ross, 1952), on the diffusion of chile (Wright, 2007), on the identity and etymology of Sichuan pepper (Austin & Felger, 2008), and on the “trade-language origin” of turmeric (Guthrie, 2009). Recent advances regarding the name and identity of cinnamon and cassia in ancient vs. modern times published by Haw (2017), and the Eurasian itinerary of asafoetida (Leung & Chen, 2019) are crucial pieces of research in order to trace the products accurately. These and similar types of research were highly influential in the preparation of this thesis.

For an overview about the concept, function, and uses of spices in the classical Islamic periods, please refer to Dietrich (2004a); for the same in a Chinese cultural and historical context, please see S.-Y. Hu (2005, pp. 147–153), and Yan and Zhang (2006).

### 2.1.2 On Food and Foodways

Literature on gastronomy and the culinary sciences is plenty, but high-quality scholarly works are fewer. Reference works include Davidson (2014)'s *The Oxford Companion to Food* and Katz (2003)'s *Encyclopedia of Food and Culture*, and other key publications include Toussaint-Samat (2009)'s *A History of Food*. Remarkable contributions to ancient and medieval culinary history were made by Dalby, focusing on the cuisines of Rome, Greece, and Byzantium (Dalby, 1996, 2003, 2010; Dalby & Grainger, 1996)

In a Chinese context the definitive work is still Chang (1977)'s *Food in Chinese Culture*, while in the Islamic tradition, medieval cuisine and recipes are explored in details by Zaouali (2007). A few works on the culinary history of the Middle East are also results of great scholarship, including the translation of Nawal Nasrallah, who made a 10<sup>th</sup>-century Baghdadi cookbook accessible for us in the *Annals of the Caliphs' Kitchens* (Ibn Sayyār al-Warrāq, 2007), and Lewicka (2011) who introduced us the *Food and Foodways of Medieval Cairenes*.

### 2.1.3 On Trade

I must point out that spices are mostly explored through their trade. And, as most spices originate in tropical Asia, our center of attention will be directed towards the continent. The term *spice trade* loosely refers to the cross-cultural, economic, and diplomatic ventures of historic kingdoms, empires, and companies, agglomerating around the Indian Ocean, and other regions such as the Mediterranean, East Africa, Maritime Southeast Asia, and by land Central Asia. The history of the spice trade is one of its own, covers hundreds of years, and it is fundamentally connected with the history of globalization. Naturally, the story of spices is intertwined with trade routes and geopolitical events, involving contact between peoples, cultures, religions, ideas, and languages. See general works on economic history,

such as the *Spice Islands* (Burnet, 2011), or on political history *The Scents of Eden: A Narrative of the Spice Trade* (Corn, 1998). Specific eras and regions related to our topic include the ancient Indo-Roman trade (Cobb, 2019; Sidebotham, 2011), the medieval Indian Ocean sea trade spanning from the Persian Gulf to China championed by Arab seafarers (Hourani, 1975; Pearson, 1996), and the Southeast Asian maritime trade (Chen, 2019; Donkin, 2003; Hall, 2010; Reid, 1988). Young scholars are also doing incredible work, I would like to highlight the thesis of Hoogervorst (2012), who combines historical linguistic and archaeological approaches in the research of Southeast Asia in the ancient Indian Ocean world. Southeast Asia was the source for Chinese spices as well, in their paper Xu and Sun (2021) detail the history of the spice trade between China and Srivijaya (and other kingdoms of maritime Southeast Asia), its rise during the Han and Tang, peak during the Song and Yuan, and decline during the Ming and Qing dynasties. They consult historical records regarding the volume of the trade and the nature of the tribute-trade relationships. For more on the spice trade from a Chinese perspective (in Chinese), refer to Yan (2016), Yan and Hui (2007), and Yan and Zhang (2012).

Besides a degree of domestication and long-standing cultivation practices, the abundance of spices today are a result of long-distance trade and cultural exchange. New advances in the field of archaeobotany concerning Roman and Islamic times for example, helps us to map the routes of the materials and trade-connections better (see van der Veen & Morales, 2015; van der Veen, 2018).

One surprising fact that I have learned from my reading, is that the Silk Road, the trade network of roads and desert pathways connecting Central Asia with China did not really feature spices; or at least not to the extent I previously believed. Valerie Hansen (2012)'s well-informed book based on unearthed documents of the region show a trade that is small in volume, and much less lavish in terms of luxury goods than previously thought. Most of the trade covered short distances and whirled around everyday goods and just a minute amounts of exotic perfumes and aromatics, especially musk. Silk often acted as a currency. The word *spice* only occurs two times in her book as she highlights the most traded products in each period. This is not to say that spices did not exist here at all—we know that many spices were introduced to China on the silk roads, and that traveling merchants carried pepper and propagated other spices via their journeys—but that the bulk of the spice trade between East and West did not happen overland.

Many of the contemporary works I mentioned that trace the initial steps of certain spices and other foodstuff relay accounts from primary sources. For example Spengler (2019b) writes that the black pepper of tropical India is first mentioned by Chinese sources in during the Han dynasty (202 BC–9 AD; 25–220 AD), in the *Hou Hanshu*, quoting Laufer (1919, p. 374). I have noticed that in a lot of cases, we can thank a few giants for the reports, legendary scholars whose research we still use and reference. These are the people who laid down the groundwork for future studies by their hard work and language skills, including Berthold Laufer (1919) and his invaluable *Sino-Iranica*, which catalogues “Chinese contributions to the history of civilization in ancient Iran, with special reference to the history of cultivated plants and products”; and Edward H. Schafer (1985), and *The Golden Peaches of Samarkand*, which lists luxury exotica that reached the Tang court, exploring cultural interactions with other regions. I would also like to mention Isaac Burkill (1935), who recorded every economically important plant and mineral under the sun of the Malay Peninsula, annotated with local names,

traditional knowledge, and regional historical significance in his monumental *A Dictionary of the Economic Products of the Malay Peninsula*. Their command and knowledge in history, sinology, and botany is immeasurable.

In the study on spices, incense, and aromatics through the tools of Semitic philology, I should mention the recent addition of Amar and Lev (2017)'s *Arabian Drugs in Early Medieval Mediterranean Medicine*, and Lev and Amar (2008)'s *Practical Materia Medica of the Medieval Eastern Mediterranean According to the Cairo Genizah*, but we cannot leave out *Domestication of Plants in the Old World* by plant geneticist D. Zohary et al. (1988/2012), which supplies a great overview of the agronomic development of the region, or *Duke's Handbook of Medicinal Plants of the Bible* (Duke et al., 2008).

#### 2.1.4 On Chemistry, Medicine, and Healing

Besides history, archaeology, and botany, progress in spice related research in recent times are predominantly from the field of medicine. There are uncountable pharmacological—clinical and in vitro—studies on the effects of various medicinal plants (Boy et al., 2018), and many of them are motivated by food and nutritional science research, such as Baker et al. (2013)'s survey on the effects of cooking with and ingesting cinnamon, nutmeg and cloves. In the dissertation I will try keep away from deep deliberations of scientific treatises from medical, biochemical, and pharmacological journals as much as possible, however, I might comment on issues related to folk uses and traditional knowledge if it is relevant for the greater cause.

I must briefly mention the fields closely knit with the food industry: chemistry and pharmacology. The authoritative *Handbook of Herbs and Spices* (Peter, 2012) and *The Encyclopedia of Herbs & Spices* (Ravindran, 2017a) are for industry professionals. These works detail the physical and chemical properties of the materials, and the plants and their products are described in detail. Besides botanical information, the plants' chemical compounds and volatile oils are in focus, but general knowledge about the origins, names, uses, and functions are also presented. The chemistry of spices is an interesting topic, scientific and popular books were both published on it.<sup>1</sup> The science behind how spices work is a fascinating one, there are two questions we should pose, one: "Why are spices spicy?", and two: "Why humans like spices?". The answer to the first question is that the pungency we feel—a mild rush of heat or minutes of tingling lips—is in fact a toxic shield, it is the plant's evolutionary response to herbivores, bugs and pests (J. Turner, 2004, p. 21). However, this is not a crucial component in the organism's life cycle; these substances (the volatile oils causing flavor and pungency) are so-called secondary metabolites, they are insignificant to the plant's biology (Parthasarathy et al., 2008, p. 18). The heat to the chili is effectively the same as thorns to the rose. The spiciness of a spice is a weapon, and while bugs and insects would run amok trying to have a taste of the fruit of *Myristica fragrans* (the tree of nutmeg and mace), it made humans—quite ironically—sail to the end of the world to find it. No obstacle was great enough to stop mankind's appetite for fragrant, pungent, and spicy flavors. In answering the second question, we can expect that if the spiciness of spices has a Darwinian explanation, the human desire for them should also sound like one. Sherman

<sup>1</sup>For a highly visual and novel take on a book introducing the chemistry of spices, see Farrimond (2018)

and Billing (1999) in their influential, and aptly titled article *Darwinian gastronomy* claimed that spices taste good because they help us fight hostile bacteria and microorganisms responsible for digestive issues such as food poisoning; they are beneficial for our health. The authors also compared cuisines of the world based on how much spice they use in their everyday cooking. The piquancy of some capsicums is essentially an irritation, Spence (2018) explores, why do so many people find the “oral burn” so appealing, Carstens et al. (2002) investigates the neural mechanism of oral irritation from spices and carbonated drinks, and we can learn about pungency and personal preference from Prescott and Stevenson (1995). The antibacterial and antioxidant effects of spices are known for millennia, and recent research (Billing & Sherman, 1998; Nilius & Appendino, 2013; Yashin et al., 2017) shows that the old wise ones were not at all wrong compiling their *materia medicas* and *bencaos* to guide future generations on herbal healing. Of course, there were plenty of exaggerated claims on the potential healing effects of some products, from them being an antidote for snake venom to the cure for death itself.

### Materia Medicas, Pharmacopeias, Bencaos

*Materia medica* (Latin for ‘medical material’) refers to a descriptive collection of knowledge about substances—plant-based, mineral, or from an animal source—with therapeutic properties, usually in the form of a book, often illustrated. It is a term from the history of medicine, named after the highly influential book of Dioscorides, a Greek physician and pharmacologist from the 1<sup>st</sup> century AD. The term *pharmacopeia* is closely related to this, but this refers to a more technical book that contains directions on how to combine different materials for effective healing remedies. Basically, it is a drug making manual.

*Bencao* (本草) [measure word for books-herb] is essentially the Chinese equivalent of *materia medica*. It refers to compilations of classical Chinese medicinal literature. The *Shennong Bencaojing* from circa 200 AD, although lost, is generally considered the first (see Nugent-Head, 2014; Yang, ca. 206 B.C.E.–220/1998). A great explanation of the *bencao* tradition can be found in the introduction of J.-N. Wu (2005)’s *An Illustrated Chinese Materia Medica*, and Z. Zhao et al. (2018) offers a brief overview on the classification of *bencao* literature, and how it connects to traditional Chinese medicine. The most famous *bencao* however, is the *Bencao Gangmu*, 16<sup>th</sup>-century Chinese encyclopedia of *materia medica* and natural history written by Li Shizhen. It is probably the most important book of *Traditional Chinese Medicine* (TCM), building on the knowledge of earlier Chinese pharmacological works. It is often translated to English as the *Compendium of Materia Medica*, and the first complete English translation project is currently under way headed by Paul Unschuld (2022). A modern, scientific example for a *materia medica* style compilation would be Duke (2002)’s *CRC Handbook of Medicinal Spices*.

In the Arabic context on the other hand, we must acknowledge the advances of Islamic medicine, and the fruitful decades of the Islamic Golden age that saw many scholars publish extensively, forwarding the tradition of the Greeks, building on the works of Dioscorides, Galen, and Hippocrates. The writings of philosopher and polymath Ibn Rushd (Averroes), physician and pharmacologist Ibn Juljul, botanist Ibn al-Bayṭār, and alchemist Abū Bakr al-Rāzī were all influential in the history of

Western medicine and pharmacology. Maybe the most prominent of all was Ibn Sīnā (c. 980–1037; latinized as Avicenna) inspiring many future scholars for over centuries, such as Thomas Aquinas (1225–1274) (Smith, 1980). His book *al-Qānūn fi l-Tibb* completed in 1025 was used as a standard textbook at universities up to the 17<sup>th</sup> century (Musallam, 1987–2011). Scholars still discuss him and his contributions (Sajadi et al., 2009), and compare his findings with recent pharmacological studies. For example, on the traditional uses and health benefits of saffron (see Hosseinzadeh & Nassiri-Asl, 2013).

### 2.1.5 On the Role of Spices Through Time

I must also touch on the change in meaning on what spices once were, and what they are now. It can be now clear that in the past spices were more valued for their ceremonial or medicinal use, but I would like to make the shift in usage explicit.

For example, the ancient Romans imported and used cinnamon in large quantities, but they did not eat it or cook with it. They treasured it as incense and medicine instead. It is often repeated that emperor Nero have burned (as incense and offering) a year's supply of Rome's cinnamon on his wife's funeral (whom probably he himself have killed) in 65 AD (Toussaint-Samat, 2009, pp. 437–438). Even if we stopped burning cinnamon, is not because of these practices disappeared—the Catholic Church still uses 50 tons of frankincense a year (Ash, 2020)—it rather seems that most materials in question gradually gained more favour for their culinary appeal.

In the notion that the role of spices changed over time, there is a universally observable pattern: the gradual shift from their relevance in medicine towards gastronomy. Freedman (2015) writes on social and cultural implications of the role in spices and their importance in health and wealth during the Middle Ages. The shift is mainly due to the emergence of modern medicine and the marginalization of traditional folk medicine, especially in developed, western societies. What can be more telling than the term “alternative medicine”, clearly indicating the switch: what was the “only” medicine once, is now a secondary (and sometimes frowned upon) option, as opposed to just “medicine” or in some places “Western medicine”. In many cultures with strong roots in folk healing, the widespread use of medicinal plants, herbs, and spices are thriving and in recent years these practices are even gaining international popularity. We could think of Traditional Chinese Medicine, the Indian *Ayurveda*, or the Indonesian practice of *jamu*.<sup>2</sup> Besides this well-known shift regarding spices and the healing factor, it is important to point out that in the past the line between food and medicine were much more blurred, this can still be observed for example in modern Chinese food therapy, 食療 *shiliao*, rooted in ancient dietetic traditions (Engelhardt, 2001).

### 2.1.6 On Food and Language

One of the best examples for a linguistic study related to gastronomy is *The Language of Food: A Linguist Reads the Menu* by Jurafsky (2014). Dan Jurafsky, a computational linguist and authority in

<sup>2</sup>*Jamu* is the name for the traditional medicine of Indonesia, encompassing practices or herbal healing with Javanese origins, usually in the form of mixing ingredients in drinks and potions. For more, see Beers (2012)

the field of Natural Language Processing (NLP), explores our connection to food and eating in a series of interesting studies. From tracing the historic and linguistic origins of ketchup, macaroni, or salami, to what the wording of a restaurant menu can tell us about prices. From a Chinese perspective, food and menus are explored by Yao and Su (2019), while the topic of fruit-words is presented by Depner (2019).

This thesis will involve sensory words—nouns, verbs, and adjectives of gustation, olfaction—surrounding spices and other aromatics, and in this aspect, previous studies of linguistic synesthesia will definitely prove useful (see Huang & Xiong, 2019; Q. Zhao et al., 2019). Some cognitive studies on sensory information have been conducted involving spices, most interesting are the ones that explore cross-modality relations. For example, an fMRI experiment concluded that reading words with strong olfactory associations, such as ‘garlic’, ‘jasmine’, or ‘cinnamon’ activates the olfactory regions of the brain (González et al., 2006). Another unique study looked at the possible corresponding sound attributes to spiciness/piquancy, and a series of experiments found that fast tempo, high pitch, and distortion are indeed linked to the sensation (Q. J. Wang et al., 2017). On a more linguistic note, Zhong and Huang (2020) explored taste, examining the sensory lexicon around the realm of desserts. They showed that “mouthfeel”, a multi-sensory concept plays more important role than the quality of “sweetness”. Bagli (2021)’s *Tastes We Live by* is a very recent publication that deals with the linguistic conceptualization of taste in the English language.

## 2.2 Research Gap

I have started this chapter with discussing the literature on spices through the eyes of different disciplines. I mentioned gastronomy, botany, history, trade and economics, and after a brief touch of classical medicine I have circled back to philology, and finally landed on research combining language and food, and the sensory modalities. So far, we saw that studies on spices—specific or in general—are available, most notably in the form of historical works focusing on some aspect of the spice trade or tracking the story of the material itself. Besides history, the availability of literature from food and nutritional science, biology and medicine is satisfactory, quenching the need of industry professionals. In this field we see a more rapid development, new studies and findings are relatively frequent, especially about popular spices.

What we also have seen is the obvious lack of linguistic studies themed around spice. A handful of scholars have investigated questions related to language, almost exclusively from a historical linguistic point of view—trying to unearth etymologies. The few available findings however are not collected, knowledge on spice names and related terminology is found sporadically in many disciplines. In the face of such scarcity of linguistic studies on spice terminology it is not surprising that the *Handbook of Herbs and Spices* of Peter (2012)—a standard reference work for chemistry and food industry professionals—often relies on an online blog to list spice names! This online blog created in the early 2000s is a personal website of one Gernot Katzer, who currently rules over the internet with his exhaustive collection of spice information, also including spice names in numerous languages. Katzer (2006) supplies a massive amount of valuable information to the public, but his lists on spice

names are often inaccurate, and—since he is an individual writing about his own travels and empirical experiences and not aiming at academia—sparsely cited.

In the problem statement of the previous chapter, I have briefly mentioned that in my opinion, the lack comprehensive publications regarding spice names causes a deficit of understanding among authors who write about spices. Take for example the very recent *Culinary Herbs and Spices: A Global Guide* by Opara and Chohan (2021, p. 11), where the authors in an attempt to give the Hindi name for allspice, write “*Kebab Chini*”, which is the Hindi name for cubeb pepper (*Piper cubeba*), कबाबचीनी *kabābcīnī*, a completely different spice. The problem cannot be better illustrated than the examples below.

### 2.2.1 Faulty Claims

The following is a collection of erroneous, incorrect, inaccurate, or misleading quotes where historians, botanists, and food writers failed to look up the names of the very subjects of their treatises, supplied with my comments.

- “Cinnamon is derived from the Greek word for spice and the prefix ‘Chinese.’” (Czarra, 2009, p. 10)—a popular folk etymologization, with no proof.
- “The name saffron is derived from *zafarán* or *za’fran*, the Arabian word for yellow.” (van Wyk, 2014, p. 124)—it does not mean yellow, but it was conflated with the word for yellow by Europeans (also, “Arabian” is not a language).
- “The name [of saffron] comes from the Arabic for ‘thread.’” (McGee, 1984/2004, p. 422)—it does not, the Arabic word is a loanword from Persian, and it only means ‘saffron’.
- “Pliny named the plant *coriandrum*, from the Latin for bug, *coris*. But it has other names—*cilantro* (in the United States and Latin America), *dhana* [sic!] (in India), *Chinese parsley* (in China, presumably).” (O’Connell, 2016, p. 87)—an ill-informed presumption and goes against common sense. *Chinese parsley* is a name in English, not in Chinese.
- “In Sanskrit, black pepper is known as *maricha* or *marica*, meaning an ability to dispel poison, and it is taken to aid digestion, improve appetite, ease pain, and to cure colds [...]” (Shaffer, 2013, p. 3)—the fact that the author wrote “*maricha* or *marica*” shows that she does not know that these are two different ways to transliterate one Sanskrit word (which has no such meaning she described).
- “The name ‘paprika’ came from the Greek term for black pepper, *peperi*.” Other name changes occurred as the spice moved through regional languages such as Greek, in which it is called *piperia*.” (Czarra, 2009, p. 103)—while not entirely wrong, many steps were skipped in this explanation, making it difficult to evaluate.

There are fallacies not only regarding the names but the circumstantial information regarding the nature and history of the spices and the spice trade as well, ranging from failure to distinguish between spices and spice mixtures, to confusing cities and travelers important in the spice trade.

- “The main distinction between the Indian and Japanese curries is that the Indian version uses a combination of spices, while Japanese *karē* is made with curry powder.” (<https://www.tasteatlas.com/kare>)—absolute nonsense, curry powder is a combination of spices as well.
- “And Malacca (Singapore today), a port poised at the gateway to the oceanic routes to Europe, [...]” (Hill, 2004, p. vi)—this statement is horribly wrong, Malacca is not Singapore.
- “Chinese traveller Sulaiman visited Kerala coast—recorded the black pepper cultivation and trade with China.” (Ravindran, 2000, p. 3)—Sulaymān was not a Chinese traveler, the excerpt talks about Sulaymān at-Tājir, a 9<sup>th</sup>-century Muslim merchant from the Sassanid port of Siraf.

These few selected lines can make it feel like we are doomed if we look for accurate spice names and origins in the spice literature, but the situations is not that bleak. I merely wanted to show that in many instances, there is simply no awareness or effort to supply the reader with the correct information, especially when it comes to names and etymologies.

Up to date, a comprehensive study on spices from a linguistics perspective is lacking. The information already out there is sporadic and unorganized, and as I have introduced above it was botanists, historians, chefs, and historical linguists who contributed to the research on aromatic products, their origins, and their place in the human culture and lexicon. In a few cases, findings happen to be misinformed, thanks to some authors making presumptions along erroneous lines, which only adds to the confusion. This is bound to happen when botanists attempt venture into the lands of etymology, or when food writers choose to sail the high seas of historiography. For a good illustration of this problem, see the criticism of Haw (2017) on Austin and Felger (2008)’s attempt to trace the etymology of *fagara* (Sichuan pepper) where the authors with a background in botany have made questionable assumptions related to Classical Arabic phonology and morphology. I must be careful and not make similar mistakes, never give in to the temptation of baseless speculations, especially outside the realm of linguistics and philology. With that being said this dissertation would fill the gap that exists regarding research on spice terminology.

Beyond my proposal to fill this gap with a study attempting to group and categorize aromatic materials of the spice domain, I also aim to analyze the diffusion of spices informed by tracing the journeys of loanwords and wandering words of three languages: English, Arabic, and Chinese. The quest for exploring patterns of spice diffusion and spice terminology could yield new insights and open possibilities for future research. Furthermore, an analysis of spice nomenclature based on linguistic-cognitive features has not yet been made and constitutes an original approach.

### 2.2.2 Research Questions

I will now try to formulate the questions I aim to answer. The first two questions arise from the investigation on the “diffusion of spices” and are more related to the philology component of the thesis. The third question is more related to the corpus linguistic and cognitive component of the study, investigating the “language of spices”.

- Q1 Does the propagation of *Wanderwörter* within the domain of the spice trade follow the

diffusion of the materials?

- Q2 Is there any underlying pattern behind the mechanisms of spice diffusion, considering both the materials and the nomenclature?
- Q3 Is there any influence on the naming spices, in terms of sensory words and synesthetic properties?

## 2.3 Theoretical Framework

### 2.3.1 On Wandering Loanwords: *Wanderwörter*

Terms of the spice domain are often loanwords, likely to be *Wanderwörter* meaning wandering words. A *Wanderwort* (also known as *Kulturwort* “culture word”), itself a loan from German, is “a word borrowed from one language to another across a broad geographical area often as a result of trade or adoption of newly introduced items or cultural practices” (Merriam-Webster, n.d.). We can observe this linguistic curiosity typically on names of foodstuff, plants, animals, metals, and other artifacts, such as copper, tobacco, potato, tomato, lemon (Trask, 2000, p. 366), materials which spread significantly due to trade. Further examples are numerous: cumin, ginger, orange, pepper, silver, soap, sugar, wine, the most famous example being tea. The case of tea is well-known, for its names have multiple origins in different Sinitic languages. Mair and Hoh (2009, pp. 262-268) identifies three groups of names for tea: *te*, *cha*, and *chai*. Mandarin and Cantonese use *cha*, while *te* is from Hokkien, a Southern Min language variant. Tea trade was prevalent at the port of Xiamen (Amoy), especially with Europeans after the mid-1500s, while land routes such as the Tea Horse Road and the Silk Road already exported tea for centuries from Yunnan and Sichuan, the homeland of *Camellia sinensis*. Eventually both *te* and *cha* entered the English lexicon, but more important is that almost all other languages adopted either of these words for tea (Mair & Hoh, 2009) in the wake of merchant ships and trading caravans. Depending on geopolitical circumstances, the maritime or continental name variants—*te* and *cha*—spread so, that in a drastic oversimplification we might say: it is *te* if transmitted by sea, *cha* if transmitted by land.

This linguistic distribution is not unique to tea, genealogies of names for other consumables with similar global stories are observable in many other *Wanderwörter*, such as *chili*, and ‘pepper’. Both the far-reaching journey of the Nahuatl word *chilli*<sup>3</sup> from the Aztecs of Mexico, and the ancient Sanskrit term for the Indian long pepper, *pippali*<sup>4</sup>, have intriguing stories to tell for linguists, historians, or anybody else; see Dott (2020) for the chili pepper’s “cultural biography” in China, and Shaffer (2013) for the story of black pepper. This becomes especially apparent when we think of the compelling fusion in the term ‘chili pepper’. One of the objectives of this study is to address peculiarities arising from complex histories of spice names just mentioned above, and while trying to provide answers, a holistic view of the spice domain should be kept in mind. An overarching linguistic study of substances

<sup>3</sup>S. Wood, 2000–2022, chili.

<sup>4</sup>Macdonell, 1929, pippala.

with similar features has not been conducted and might reveal new knowledge and patterns yet to be found.

The instance of tea as a *Wanderwort* is relatively recent, and thus we are able to reconstruct the steps of diffusion. Nonetheless, the origins of *Wanderwörter* are often obscure, and to some extent enforcing this connotation some scholars (chiefly Indo-Europeanists) still “borrow” this term to refer to a specific group of loanwords, where transmission through one or more unknown languages is suspected, and/or the donor language is uncertain, as Michiel de Vaan writes (Mooijaart & Wal, 2008, pp. 199–201). In his short definition, Trask (2000, p. 366) fails to mention this latter issue with *Wanderwörter*. Another concern we must also remember is that ‘wandering words’ are not always easily distinguishable from loanwords. In fact, in the mid-19th century, the beginnings of the Indo-European tradition of reconstructing a proto-language was briefly misguided by the failure to recognize and separate inherited lexical items from introduced ones (Polomé, 1990, p. 137). In hindsight, *Wanderwörter* should be considered a subgroup in the general category of loanwords. Appealing to this idea, Polomé (1990) renders it in English ‘wandering loanwords’. One could argue that the main problem with *Wanderwort* research is that sometimes—to put it bluntly—they are just too old to trace with surety. There are hardly any means for uncovering origins and deciphering etymologies beyond a certain time-depth.

### 2.3.2 On Sensation

The spread of spice related words is not limited only to the nomenclature of new products—which presumably embraces foreign words, loanwords, and calques (loan translations) in high concentration—but also to the different categories of terminology that describe the substance. New sensations invoke new words, (or give way to new meanings of existing ones) driven by the need to express and describe taste, smell, color, and texture. With the help of corpora, we can collect sensory words surrounding aromatics, and explore how humans discuss flavor, fragrance, heat, and spiciness. We shall see if the function of modifiers and adjectives are there to help to identify spices, and we shall see if patterns of spice diffusion (directionality, quantity of transmission) differ based on sensory properties. With enough data we will be able to examine tendencies that pertain to land-based or maritime trading routes.

Apart from words related to the sensory domains, mainly olfaction and gustation, it might be worth examining the “language of spices” from another angle as well. By comparing linguistic behavior of various spices, I expect to see different degrees of adaptation, ranging from just the basic existence of the borrowed/translated name for a newly introduced substance, to highly dynamic and versatile presence in everyday language use. Beyond the (a) name *pepper*—for example—we can observe and effortlessly identify other “degrees” of linguistic use: (b) the incorporation of words for the sensations induced by the spice or other characteristics of its nature (*peppery*); (c) cognate verbs of seasoning and cooking (*to pepper*); and (d) denominal metaphors and idioms (*to have pepper in the nose*). I hypothesize that the presence or absence of spice related terminology and derivationally related words in a language correlates with the levels of acceptance and familiarity in a society, i.e., the language

use reflects the degree of adaptation of the product, and ultimately its embeddedness in the culture. For example, if a language names a color after *coffee*, *cinnamon*, or *saffron*, it is a good guess that a large portion of the society is familiar with the product. This direction is one of the future goals, as stated in Section 7.2, and maybe this thesis will be a good base for such a study. Furthermore, we can ask questions, such as: Would considering different spices affect the categories of linguistic presence discussed above? Would patterns of spice diffusion make a difference when looking at linguistic “behavior”?

Spice names and collocates invoke sensations from different sensory domains, and are strong “carriers” of synesthesia. Zhao (2018) writes that linguistic synesthesia “describes a situation where perceptions in different sensory modalities are associated in both perceptual experiences and verbal expressions”. Evidence for cross-sensory conventions occur in the nomenclature of spices as well, they are sometimes obvious, but cumbersome to unearth and explain the reasons.

In Spanish, the word for pepper is *pimienta*, from the plural form of Latin *pigmentum*, which is “a material for coloring, a color, paint, pigment”, with an additional, transferred meaning in post-classical Latin, “the juice of plants” (Lewis & Short, 1958, p. 1375), and a Spanish etymological dictionary indicates “plant juice, food seasoning” (Gómez de Silva, 1985, p. 415). The emergence of this meaning of the word for ‘pigment’ is believed to be a due to the observed Mesoamerican practice of using dried chilies of the genus *Capsicum* for seasoning dishes, which also worked as an organic food coloring substance. After Christopher Columbus returned to from the New World with *Capsicum annuum* in 1493, the impact of the new sensation was so strong that it technically replaced the existing Catalan word—*pebre*, the derivative of the already mentioned Sanskrit etymon, *pippalī*, via the Latin *piper*, referring to black pepper (*Piper nigrum*)—with *pimienta*. But, if *pimienta* is now black pepper, then what is the Spanish word for chili pepper, the fruit of *capsicum*? Well, it seems it is *chile* in Mexico, *pimiento* in South America, but it is not that simple. Further adding to our perplexity, *pimiento* is masculine, *pimienta* is feminine in Spanish. And what is *paprika*, then? We start to see the piquancy of the problems, and the confusion is no less clear in Spanish than in English. And, to raise the level distress a bit more, it is worth mentioning that chilies in Hindi are named *mirch*, which in turn comes from Sanskrit *marica/marīca*, the word for “pepper-shrub, pepper-corn; black pepper” (Macdonell, 1929b, p. 219; Monier-Williams, 1899, p. 790).

The goal of these examples on a few spicy *Wanderwörter* was to demonstrate the chaos surrounding conventions and common names of occasionally unrelated plants and their fruits, berries, and seeds; their confluence with historical and geopolitical developments. We hope that a systematic overview of the literature and methods combining corpus linguistics and philology will not only help to untangle the threads of vernacular names ungoverned by rules, but also gain insight into the connection between spice names and sensory domains.

The most exciting part of this novel approach is to see the “attitude” of different cultures. Are the properties of spices universal? Would speakers belonging to the Chinese cultural sphere describe a certain spice with the same tastes as Arabic speakers? Turmeric is often described as bitter in English; would other languages do this as well? Cross-cultural and cross-linguistic perspectives in research on cognition, pragmatics, and semantics are copious, one of the pioneers of which is Anna

Wierzbicka, who has worked on the concept of semantic primes for decades. Finding universal, equivalent core meanings spanning across languages has been a kind of holy grail in linguistics. Following her framework, we will adapt ideas related to physical qualities and linked metaphors (Goddard & Wierzbicka, 2014, pp. 55-79).

# Methodology

**R**EALIZING that there is little work done on building a spice name database, or on analyzing spice nomenclature from historical and linguistic-cognitive perspectives, I have set out to assemble one that would facilitate this kind of analysis. To introduce very briefly, I have built a database of spices and spice terminology by combing through secondary and primary literature, botanical databases, encyclopedias and dictionaries, and searching for the spices in contemporary and historical corpora. I then used a few selected features of these materials (region of origin, spreadability, etc.) and the corresponding terms (analyzability, borrowed status, etc.) and looked at the set of spices as a whole, trying to find patterns and make some observations about the geographic and linguistic diffusion of spices, and various aspects of their naming.

## 3.1 Research Design Principles

To achieve these aims, I first needed think of an ideal way to compile and arrange complex sets of information, from sources that are highly interdisciplinary in nature. From the very beginning of the design of this study, the following principles were kept in mind regarding the database of spice names:

(1) The database must be grounded in the close study of the materials—the plants and their products—especially from a historical and botanical standpoint. Awareness of the material’s physical journey will help us to contextualize some of the ways the associated names spread. Take for example the Sanskrit term referring to asafoetida (the dried oleoresin gum from *Ferula assa-foetida* et al.): हिरूग् *hirigu*, which is the etymon of both Chinese 興藁 *xīngqú* (*Middle Chinese (MC)* /hiŋ giʌ/), and English *hing*, but they took very different paths: while the Chinese term is a learned loan from during the spread of Buddhist scriptures on the overland Silk Road, the English word is a late 16<sup>th</sup>-century borrowing via the sea trade with Mughal India. And if we study the source of the materials and learn about the plants, we will also realize that all the asafoetida that was exported from India in the early modern period was in fact imported from Persia and Afghanistan.

(2) The database must be thoroughly cited; every word, statement, date, or other piece of information should be carefully referenced. I have already explained the motivation and necessity behind this practice in Chapter 1, it is enough to say that currently no one is citing sources for the names they give (except philologists), and sometimes it hard to find the motivation and inspiration behind a term. It is always a good scholarly practice to record where we found certain pieces of information, and when it comes to spice etymologies, this should make it easier for future experts to verify or refute the findings.

(3) The database should be easily expandable. Because of the limited time, it is impossible for me to include *every* spice. Therefore, I tried to create a pipeline, where a new material and its names can be easily added to the fold, and quickly analyzed. This in principle can also accommodate for the future inclusion of incense, perfume, and herbs, which I will mention in Section 7.2 when discussing

future plans to expand on this research.

### 3.1.1 Identification, Confusion, Adulteration, Clarification

The ideal first step of all types of research related to spices, herbs, incense, and other aromatics is to identify the product exactly. In the case of spices and incense, this is overwhelmingly a botanical question, while in the case of other exotic aromatics, such as musk or ambergris, we must involve the animal kingdom. Medical, pharmaceutical, and food industry studies are heavy on the hard sciences—chemistry, biology—but they sometimes also contain valuable information about both common and scientific names. All medical studies must start with the proper identification of the substance, in fact, there is a range of studies about various techniques on identification and differentiation (cf. Ford et al., 2019). The reasons for this are twofold.

Firstly, in many cases it is not a straightforward task to tell the substances apart, different spices can have very similar physical qualities. E.g., the fruits of Chinese star anise (*Illicium verum*) and Japanese star anise (*Illicium anisatum*) basically look the same, but the latter is toxic; see the excellent points made by Small (1996) on the confusion of their common names. Uncertainty in nomenclature and identity poses a further challenge to clinical trials if the origins of a substance is not properly identified. Take for example Oketch-Rabah et al. (2018), who writes on the confusion of cinnamon and cassia nomenclature and its implications in pharmaceutical research. Consider first cinnamon (*Cinnamomum verum* syn. *C. zeylanicum*). Common names include *true cinnamon* and *Ceylon cinnamon*. However, the cinnamon sold in the US and in the UK markets are generally not the same spice: most of the product labelled as cinnamon on American shelves is in fact cassia (*Cinnamomum cassia* syn. *C. aromaticum*) (Oketch-Rabah et al., 2018), which is sometimes called ‘fake cinnamon’ or ‘bastard cinnamon’. In retrospect, the Latin scientific name of the former makes bit more sense now: *verum* means ‘real, true, genuine’. But why is cassia fake cinnamon? This is due to historical reasons, from when the introduction of the much cheaper cassia pushed down the cinnamon prices drastically in the 19<sup>th</sup> century (Wijesekera & Chichester, 1978). Most scholars consistently refer to *C. zeylanicum* as cinnamon, and to *C. cassia* as cassia but it is not uncommon in everyday language use to confound the two, especially in referring to cassia as cinnamon, out of innocent ignorance. For more detail and on the identity of cinnamon and cassia please see Section 4.4.2. Uncovering confusions from under heaps of synonyms lead us to interesting historical events that sometimes explain the vernacular names of a particular product, such as the case of cinnamon and cassia shows.

Secondly, adulteration and contamination are rampant in the industry. Saffron (*Crocus sativus*)—the most expensive spice by weight nearing the price of gold—is famous for being knocked up (and substituted) with the much cheaper safflower petals (*Carthamus tinctorius*). Even their names reflect these practices: although the two are very different and unrelated plants, their similar dyeing properties and constant confusion have left its mark. *Safflower* has been influenced by the French word for saffron, but if they have different origins (both ultimately from Arabic). And, on account of the adulteration, safflower have also come to be known as *bastard saffron*, first attested in 1548.

We do not need to lurk modern pharmacological studies to find examples of confusion, the identity

of saffron was also elusive in ancient China, where at its introduction in the early Middle Ages, it was confused with safflower, and both were casually called 紅花 *honghua*. It is said that Buddhist monks picked up saffron in Kashmir on their way from India to China, but the knowledge about it was not clear until the Yuan dynasty, when it was actually used and imported (Laufer, 1919). During Tang times, it was connected with the—also strongly yellow—turmeric. Turmeric came first, and got the name 郁金 *yujin* [yü-gold], and later saffron was named 郁金香 *yujinxiang* [yü-gold-aromatic] (Schafer, 1985). The confusion of saffron and turmeric (and truthfully every other yellow spice used as a dye) is also observable in Classical Arabic, *kurkum* ‘turmeric’, historically also ‘saffron’ (etymon of the word *curcuma*), and the perceived “similarity” of Sanskrit कुङ्कुम *kunkuma* ‘saffron’ did not help to clear the waters either. See Section 4.6 for more on this issue.

Keeping all this in mind, I feel I must lean on rudimentary botanical identification in the investigation, linking the plants and plant parts to the products and their vernacular names. This is important, as it can clear up some of the confusion when two or more product names are used interchangeably, and it will highlight problematic cases from the start.

### 3.1.2 Challenges in Spice Categorization

One of the most challenging parts of this project, is to choose a meaningful way to categorize spices and spice names. The design should make sense on multiple dimensions: botanically, historically, and maybe even gastronomically, but at all times keeping in mind the linguistic focus. The main goal is to assign a spice name to the appropriate product/material, which is correctly identified on a botanical level. This is not always straightforward, as some materials can have multiple botanical sources, one plant can yield multiple differently used plant products, and the same names can be used for different substances.

One problem arises from the fact that many terms can have a meaning on different levels of specificity, depending on context and intent. Spice words are rich in senses. For example, according to the *Princeton WordNet* (PWN) *black pepper* can be both a hypernym and a hyponym to *pepper*, depending on if it refers to the plant, or the dried fruits with the husks on (Fellbaum, 1998). In this specific case, *black pepper#2* and *white pepper* are sister terms, but *white pepper* is also a subordinate to *black pepper#1*. This situation is then further complicated with the fruit of the *Capsicum* (and its endless cultivars), that also have the name *pepper*. Thus, it is not immediately clear if we should treat black and white pepper as two different spices, or two manifestations of the same spice. There are many other examples where a term can be understood on different levels: as a plant, a family of similar plants, a specific spice, or a group of spices. In an everyday setting, lexical semantic hierarchies are not always adhered to, and people organize spices in their heads according to their own convictions. One author might mention white pepper under the heading black pepper on account of their biology (a botanically driven categorization), while another might separate them and discuss them as different spices based on their different uses (a culinary approach). As for the historian, mentioning white pepper might be just not at all important. The reasons for these variations are usually determined by what is the intention of the categorization, and who is the target behind the treatise. For us layman

however, spice entities are most prominently structured by way of their names: the words are the handrails to cling to if we are not familiar with an item. So what about pink peppers? Pink peppercorns (*Schinus terebinthifolius*; *S. molle*) are so-called “false peppers”, meaning that they are not from the *Piperaceae* family. Pink peppers are fruits of botanically unrelated trees in South America, matching the shape and size of peppercorns. Are they a kind of pepper?

My point with the above—admittedly rather confusing example—was to show that if one were to debate whether black pepper and white pepper are the same spice (or not, for that matter), we would need some gastronomical or botanical grounds to make some arguments. And despite all imaginary arguments, the real answer goes beyond the botanical or gastronomical reality (illustrated by adding pink pepper to the problem), and answers the question: What is pepper conceptually? We will see from the names and naming practices, that the word *pepper* and its equivalents carry a sense of ‘prototype pungent spice’, and overarching biology or function it is ultimately a concept of PEPPER that matters. And, I propose that whenever a novel spice is considered appropriately close to the existing concept, it could also fit the category of pepper, reflected by the names.

Even more challenging for categorization, is when we are not sure which spices were meant under certain names in different times. Cinnamon and cassia are a great example for this (Section 4.4.2), as it is not sure whether the cinnamon and cassia of antiquity were the same spices or not. But, parallel to the question of identity, we also have seen that it does not always matter, attitudes differ from place to place: while Europeans do sometimes differentiate, in China and the United States the concept of cinnamon is singular. For the analysis, I had to decide if I treat them as one item, or make a distinction. In a few cases, a spice name became obsolete and got “lost”, meaning that it cannot be identified with certainty, and we have to guess what the name referred to based on botanical and historical data, and categorize accordingly; as it is the case with *amomum*. The most extreme situation is when a spice goes extinct, as it happened to silphium in antiquity. At present, this thesis does not contain such items. In these cases, we need historical knowledge to say anything about the identity of said spices and where they belong in between the others.

Our knowledge or lack thereof also determines the concept we have of a certain item. For example, most people who know that nutmeg and mace come from the same fruit of the same plant and from the same place will always connect the two in their heads, the two spices are literally inseparable (until harvest, of course). From historical records however, it is clear that the knowledge regarding these substances was spiked with misunderstandings and inaccuracies, even among people who were in the spice business. According to an anecdote, during the Dutch monopoly of the Banda islands, an officer back home have written an angry letter to the colony on the Spice islands, ordering them to plant more mace trees, because there was a higher demand for it than nutmeg—a request that must have raised some eyebrows on the plantations (National Geographic, 2014). This shows that botanical organization is accessible to those with botanical knowledge.

Lastly, I must also mention that the language and words we use for these materials also defines our understanding of them. Analyzable, descriptive names help us to identify certain materials, while loanwords with forgotten original meanings (cf. *mace*) might not say much. For example, no Chinese would have the above misconception of mace, when faced with its name: 肉豆蔻皮 *roudoukoupi*,

which means the ‘skin/cover of the nutmeg’, which is what it actually is. On the converse, the Chinese initially confused some cardamoms and nutmeg (unrelated plants), simply because they were both round, and sourced from the same region. Today, both are 豆蔻 *doukou*, with modifiers attached to distinguish between them.

Another point to make is the myriad of “fake” spices that feature especially in English. False peppers, false cardamoms, bastard cinnamon, and bastard saffron, are a reflection of historical economic attitudes, often pointing at the problem of adulteration. Names, such as *true pepper* and *true cinnamon* summon a sense of authenticity. This, however, is highly subjective to a culture and language, after all, bastard cinnamon is just “normal” cinnamon for others, and false cardamoms are just cardamoms to those who have a different prototype for what is a cardamom. In a sense, it all boils down to translation, which can be arbitrary. Who decides if Chinese 桂 *gui* should be rendered *cinnamon* or *cassia* in English?

To avoid getting lost in the details of lengthy binomial names or botanical genera, I have opted to use a set of common names of the spices to be used for identification, under which the various spice names belong. These IDs are sometimes arbitrary (e.g.: all spicy, red, hot, chili peppers of the *Capsicum* genus and their names go under “chile”), but always clear cut and explained in the data chapter. I have therefore grouped some spices and spice names into larger categories, trying to find a smallest common denominator within the three languages. This only affects a few items: various false cardamoms in the *Amomum* genus will be grouped under the umbrella term: false cardamom. One better way would have been to divide the categories on a purely botanical basis, but I prefer this solution to make this set of closely related spices more accessible to the reader and avoid these items to fritter away in the crowd. Also, they constitute a linguistic and conceptual category as well, using similar prototype words in all three languages in their names. Using common names as identifiers also facilitates for a linguistically driven comparison, and so the IDs are essentially the same as the set of spices determined earlier in Table 1.1: allspice, anise, asafoetida, caraway, cardamom, cassia, chile, cinnamon, clove, coriander, cumin, dill, false cardamoms, fennel, fenugreek, ginger, long pepper, nutmeg, pepper, saffron, Sichuan pepper, star anise, turmeric, vanilla.

## 3.2 Data Collection

The data collection for this project was conducted in three stages. One for assembling the set of spices, one for gathering and analyzing their names, and one for researching etymologies. The result of these three stages are three datasets open for inspection as the electronic files `spices.csv`, `names.csv`, and `etymologies.csv`, available on my GitHub page: <https://github.com/partigabor/phd-thesis-viz/tree/main/data>. Chapter 4 will introduce and explain the data in all three levels.

### 3.2.1 Collecting Spices

In the first stage, after I have assembled the set of spices, I collected information about them from encyclopedic handbooks written by experts in the plant sciences and spice industry professionals. I

have made great use of van Wyk (2014), Mabberley (2017), and S.-Y. Hu (2005) at the start, especially when matching plant products to plants. At this stage, I have focused on the identity and characteristics of spices including geographical distribution and native habitats, especially where I saw any room for confusion. As I collected scientific names, I also recorded the common/vernacular names for each spice as an initial exploration, and I linked them to a botanical database that can supply further information. I have also collected information regarding their cultivation, and basic uses.

Surprisingly, the abundance of synonyms is also palpable in the scientific nomenclature, sometimes one plant species has dozens of binomial taxa. In an attempt towards standardization of taxonomic data, collaborative efforts have sprung across numerous authoritative institutions to assemble and link their respective databases and sources. These online projects are usually run by a consortium of leading botanical institutions worldwide, among the key entities are the Royal Botanic Gardens at Kew and Edinburgh, the Missouri Botanical Garden, the Harvard University Herbaria & Libraries, Geneva Conservatory and Botanical Garden, the Muséum National d'Histoire Naturelle in Paris, the South African Biodiversity Institute, the Australian National Botanic Gardens, and the Kunming Institute of Botany, just to name a few.

When it comes to botanical information, navigation in the ocean of scientific binomial names hiding the identity of a plant can be overwhelming (Spencer & Cross, 2020). To alleviate this, I turned to a range of botanical databases for the purposes of correct identification, and information gathering. I used databases such as *The Plant List* (TPL) (<http://www.theplantlist.org>), which was recently superseded by the *World Flora Online* (WFO) (<http://www.worldfloraonline.org>); the *International Plant Names Index* (IPNI) (<http://www.ipni.org>); *Plants of The World Online* (POWO) (<http://www.plantsoftheworldonline.org>); the *Global Biodiversity Information Facility* (GBIF) (<https://www.gbif.org>); the *Flora of China* (FoC) hosted on eFloras (<http://www.efloras.org/index.aspx>) and the *Biodiversity Heritage Library* (BHL) (<https://www.biodiversitylibrary.org/>). TPL for instance claimed to be “a working list of all known plant species”, now under WFO it is “an online flora of all known plants”, and as such also connects different plant checklists and biodiversity databases using the nomenclatural and publishing information. In my dissertation I will frequently refer to POWO, which contains botanical descriptions and geographic data (native and introduced habitat), besides the usual taxonomic and botanical information.

In addition to online databases, I will occasionally also turn to reference books from the field of food technology and nutritional science, such as the *Handbook of Herbs and Spices* (Peter, 2006, 2012), and *The Encyclopedia of Herbs & Spices* (Ravindran, 2017a). These encyclopedias, although aimed at chemistry-focused food industry professionals, also contain holistic information on the plant-based products and discuss the origins and vernacular names, besides the usual particulars on usage and medicinal qualities. It is also worth noting that various dictionaries usually mention the scientific names of plants.

Regarding traditional medicine systems, I frequently consulted modern inventories of TCM to identify materials and extract Chinese names, including the connecting databases of Hong Kong Baptist

University: the HKBU Medicinal Plant Images Database<sup>1</sup>, the HKBU Chinese Medicinal Material Images Database<sup>2</sup> HKBU Chinese Medicine Specimen Database<sup>3</sup>; and the PolyU Chinese Herbal Medicine Database<sup>4</sup>. Armed with the botanical knowledge, we shall have an ideally clear picture on the spices, and a firm base to connect linguistic data to.

### 3.2.2 Collecting Names, and Their Annotation

In the second stage, I have collected the names of spices by combing through the published literature and online databases, whether botanical as described above, historical, or culinary. Always, prioritizing the existing linguistic and philological treatises, of course. I have linked the collected spice names to the respective spices and the result of this is an inventory of around 360 spice names that link to the initial set of 24 spices. For each spice, I tried to collect their names in the three languages, and it was also my goal to record where I have found these names. Therefore, thorough citations are available in the dataset pointing towards books, journal articles, databases, dictionaries, or sometimes even Wikipedia. As a preparatory step for the linguistic analysis, I have added some annotations.

#### Conventionalized Terms

First and foremost, I have checked the words against dictionaries to see if their use is conventionalized or not, and I have marked words that appear in a dictionary. If a word occurs in multiple dictionaries, I only recorded the one that I deem the most authoritative or reliable, unless they are both extremely interesting entries (or contradict each other).

#### Present Status of the Terms

Then, as an internal operational measure, I have assigned the names into categories regarding their lexicographic status as spice terms: default, alternative, historic, archaic, and obsolete. This was mostly done for myself to better orientate after the terms started to accumulate, and I used the following scheme:

“Default” marks the names the spices are mostly prevalently known by today, the terms that most people are familiar with. They comprise the words that should be most commonly found in a dictionary, or most frequent in a corpus. These are also the names you see as section-headers in the thesis, and also act as IDs in my datasets. The term “default” as an indicator is somewhat arbitrary, since there is no reason for one item not to have several equally relevant synonyms (e.g., *chili* vs. *chili pepper*), but I needed to choose one main term to represent one spice. The reasons for this are the following: (1) I needed a convenient way to “call” each item, so they can be efficiently compared across the three languages. (2) I needed an identifying key for all of the other names of the same spice,

<sup>1</sup><https://library.hkbu.edu.hk/electronic/libdbs/mpd/index.html>

<sup>2</sup><https://library.hkbu.edu.hk/electronic/libdbs/mmd/index.html>

<sup>3</sup><https://libproject.hkbu.edu.hk/was40/search?channelid=44273>

<sup>4</sup><https://herbaltcm.sn.polyu.edu.hk/>

and (3) I wanted to avoid any possible confusion between item that have overlapping common names (i.e., *pepper* vs. *pepper* is problematic, so I settled with *pepper* vs. *chile*<sup>5</sup>).

“Alternative” refers to any other current name that a spice can be known by, regardless of popularity, context, or reason. For example, *aniseed* is an alternative for *anise* (the default term), and *Chinese parsley* is an alternative name (and also an alias) for *coriander*.

“Historic” refers to once important terms that were at a certain point in history would have been considered default, but—due to their role and popularity in the past—still relevant today. This category especially includes cases where a spice was attested under a different name from what it is known by now. For example, *badian* is now a chiefly historical term and was attested before the now standard *star anise*.

“Archaic” refers to historic words that are rare and not relevant today, but still recognizable, such as *Guinea pepper*, anno an early name for Cayenne pepper (a name for chile, *Capsicum annuum*), but referring to one of three African spices today unrelated to chile.

“Obsolete” refers to names that are essentially dead, cf. *amomum*, which was last used to denote a specific spice in the 19<sup>th</sup> century. Most of the above categorizations were made by following dictionaries. If a dictionary uses these remarks, (e.g., obsolete), I comply with the dictionary. I have identified a couple of cases that could be best characterized as “speculative”, this refers to spice names that are not attested anywhere, and I assume them to be the author’s invention/translation. One example for this would be the term *English spice* for ‘allspice’, found in Raghavan (2007, p. 64) but nowhere else, where I think the author decided to translate this name from some other language which does use this name (e.g., Polish). The motivation behind the name is that Jamaica, where allspice is sourced from, was a British colony, and it was the English, who disseminated allspice in Europe during that time.

I have highlighted the so-called default items in bold throughout the tables in Chapter 4, as they also act as a keys or identifier (ID) to the rest of the alternative names corresponding to the same spice.

## Borrowed Terms

In my analysis, I have marked spice terms according to their borrowed status. Based on data from dictionaries, etymological dictionaries, primary and secondary literature and my own judgment, I have indicated if the name is a borrowing or not, or whether it needs further checking. I have annotated spice names with ‘yes’, ‘not’, and ‘maybe’. Whenever available, I relied on word origins from general and etymological dictionaries for this information, but for a number of words I could not find existing entries or published research, and I introduced my own theories.

## Meanings, Literal Meanings, Glosses

For every term in Arabic or Chinese, I added a gloss, so the literal meanings could be decoded, and most names also have written notes and comments on their logic, formation, origin, or any other remarkable aspect. Sometimes a short explanation is needed to understand the emergence of a term, or the grounds for its existence. The dataset of spice names was populated with terms corresponding

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<sup>5</sup>In my dataset and code, I use the more botanically affiliated term, *chile*, to avoid confusions/errors due to spelling.

to the botanically informed binomial names and the materials they represent, and based on the information from stage one, the names were also annotated with the macro-areas of their native geographic origin.

### Attestation

I have recorded the details concerning attestation where available, noting a date, approximate date, century, and period (i.e., early Old English, Tang dynasty, etc.). For this information I used dates from the [OED](#), in English, and historical corpora for Arabic and Chinese where available. The source of the attestation dates are noted in the dataset. Whenever this was not available, I resorted to estimation based on circumstantial historical sources. These are all marked in the relevant dataset.

I have also tried to gather the pre-modern documents where each name was recorded, with the title and author of the historical works for future reference.

#### 3.2.3 Collecting Etymologies

In the third stage, I have collected detailed etymological information on selected names: the terms that were marked as default, and a few historic and highly relevant alternative names. Doing so, we now have a parallel set of spice nomenclature of the three languages for 24 spices, and we can compare them in terms of borrowed status, and their etymological development and origins. The etymologies will be discussed in the next chapter in detail, under every spice, and I also highlighted them using dedicated environments called *Etymology boxes* (see for example [Etymology 1](#)).

In terms of representation and storage, I deviated from the usual text format, and I have recorded etymological data in a way that it is machine-readable, but still easy to grasp and edit for the human eye as well. I have separated etymological stages, and types of information for each word, creating large spreadsheets that is relatively easily accessible and modifiable for both man and machine. Doing so, I enabled a way to extract only specific information when needed (sources, attestation dates, donor languages, etc.). I also facilitated for geospatial plotting that can be found in Chapter 6, which gives a visual representation of the etymological stages the words have embarked on.

#### 3.2.4 Collecting Additional Data

To facilitate for geospatial mapping, I needed language data that supplies coordinates. For this purpose, I used the [The World Atlas of Language Structures \(WALS\)](#) (Dryer & Haspelmath, 2013) and chiefly the Glottolog 4.6 (Hammarström et al., 2022) datasets published by the Max Planck Institute for Evolutionary Anthropology under Creative Commons Attribution 4.0 International License. I have altered my data to conform to the above datasets in two ways. One, variation in language names were mapped to Glottolog *languoids*<sup>6</sup>, for example, Middle Persian is mapped to Pahlavi. Two, I have added coordinates to some (dead) languages that did not have a location, for the sole purpose of putting them onto a map. For example, Medieval Latin lacked coordinates, and I have added the approximate geographical midpoint of Western Europe, where it was primarily used.

<sup>6</sup><https://glottolog.org/glottolog/glottologinformation>

### 3.3 Sources

#### 3.3.1 Primary Sources

One core component of this study is philological research. Philology is the meticulous study of literary texts, primarily of historical documents, to study language, history, philosophy, literature, culture, religion, or any traditional knowledge of exceptional importance strongly connected to a society, primarily through the analysis of historic texts (sometimes written in now dead languages). Modern philological research relies on two types of sources: primary and secondary literature. Primary literature denotes historical texts, the so-called classics, for example, the already mentioned *De Materia Medica* of the Greek physician Dioscorides (c. 40–90 AD) (Dioscorides, ca. 50–70/2005), books of Roman historians, such as Pliny the Elder (23/24–79 AD) and his *Naturalis Historia* (Pliny the Elder, 77/1855) are good examples, not to mention the or 1<sup>st</sup>-century cookery book by Apicius (Apicius, 1977). There also available *materia medicas* from the Islamic scientific golden-age, such as the *al-Qānūn fī l-Tibb* [Canon of Medicine] of Ibn Sīnā/Avicenna (980–1037) (Ibn Sīnā, 1025/1329) and fantastic miscellanies from the Tang dynasty era, such as the *Youyang Zazu* [Miscellaneous Morsels from Youyang] from the 9<sup>th</sup> century (Duan, ca. 860). Indeed, we must not forget the Bible or Quran, as they are also rich historical and linguistic sources for our topic. A number of these primary texts are available in their original form through museums' and libraries' online databases, as transcribed editions in historical corpora, and of course published English translations. A vast number of classical texts (Greek and Latin) can be accessed through the Perseus Digital Library (Crane, n.d.). Critical editions of a classical text, such as that of the famous *Periplus Maris Erythraei* by Casson (1989), or de Goeje (1870)'s *Bibliotheca Geographorum Arabicorum* series are also considered primary. Ancient and Classical dictionaries, such as the *Shuowen Jiezi*, or the *Lisān al-‘Arab* are also an integral part of philology. Secondary literature is everything else building on these works, monographs, histories reviewing a multitude of authentic texts, published in recent times.

#### 3.3.2 Etymological and General Dictionaries

Besides the literature itself discussed earlier, a core part of the philology component in this research are etymological dictionaries. Etymological thirst, the seeking of word origins was one of the cardinal thrills for early thinkers ever since Plato, and we will make use of the advances made in the past centuries. The OED has detailed etymological information based on previous works on English and for other languages, a couple of works to be mentioned are for Greek Beekes and van Beek (2010), Hebrew, Klein (1987), Old Chinese Schuessler (2007) and Chinese Liu et al. (1985). Unfortunately, Arabic lacks an authoritative etymological dictionary for many reasons<sup>7</sup>, but we can still turn to essential reference works such as the *Encyclopedia of Islam, Second Edition* (EI2)<sup>8</sup> (Bearman et al., 1960–2005) or the *Encyclopaedia Iranica* (EIr)<sup>9</sup> (Foundation & Yarshater, 1996–present).

<sup>7</sup>For a brief overview on the matter, see Blažek (2006)

<sup>8</sup>Limited access online at <https://referenceworks.brillonline.com/browse/encyclopaedia-of-islam-2>

<sup>9</sup>Accessible online at <https://iranicaonline.org/>

**Note 3.3.1.** References to dictionary entries are made very frequently in this dissertation, and so I made the decision to use a compact way of citing dictionaries. Instead of following the standard APA 7<sup>th</sup> guideline and referencing every entry separately, I will indicate the entry as a page number or headword and reference every dictionary just once. This would save us from the pain of reading (Oxford University Press, n.d.-a) (Oxford University Press, n.d.-b) (Oxford University Press, n.d.-c) and its endless permutations. This minor deviation from the APA style will make the number of dictionary entries in the bibliography less oppressive, and the running citations more reader-friendly. I will also use footnote citations whenever I reference a dictionary, and I stick to this practice throughout the dissertation to make reading more comfortable.

### 3.4 Corpora

The second major component of this study is corpus linguistics, and I will use corpora from three major languages: English, Arabic, and Chinese. I chose these languages for two reasons. One, they represent three influential civilizations in the history of spices, as well as powers actively participating in trade throughout history, each having its zenith at slightly different historical periods, as I described previously. Two, these languages have historical corpora available.

For modern corpora, I will use the English Web 2020 (enTenTen20, circa 36.5 billion words),<sup>10</sup> the Arabic Web 2012, preprocessed with the Stanford tagger (arTenTen12, ca. 7.5 billion words),<sup>11</sup> and the Chinese Web 2017, Simplified version(zhTenTen17, ca. 13.5 billion words),<sup>12</sup> all hosted on the *Sketch Engine* (SkE) (<https://www.sketchengine.eu/>) (Kilgarriff et al., 2004, 2014). Enormous web corpora such as the above contains billions of words, therefore I will certainly have enough instances even for spices more rare.

language	type	period	corpus	size
English	web	modern	enTenTen20	36,5 billion words
Arabic	web	modern	arTenTen12	7,5 billion words
Chinese	web	modern	zhTenTen17	13,5 billion words
English	books	historic (15–19 <sup>th</sup> c.)	EHBC	826 million words
Arabic	books	historic (7–12 <sup>th</sup> c.)	KSUCCA	47 million words
Chinese	books	historic ( –20 <sup>th</sup> c.)	Chinese Text Project	25 million characters
Chinese	books	historic ( –20 <sup>th</sup> c.)	Scripta Sinica	797 million characters
Chinese	books	historic ( –20 <sup>th</sup> c.)	CBETA	? million characters

Table 3.1 The list of corpora consulted in the thesis.

In terms of historical corpora, I have consulted a few collections. For English, I relied on the

<sup>10</sup> Accessible at <https://www.sketchengine.eu/ententen-english-corpus/>

<sup>11</sup> Accessible at <https://www.sketchengine.eu/artenten-arabic-corpus/>

<sup>12</sup> Accessible at <https://www.sketchengine.eu/zhtenten-chinese-corpus/>

*English Historical Book Collection (EHBC)* (EEBO, ECCO, Evans) hosted on the Sketch Engine, that is around 826 million words and contains books published between 1473–1820, with a vast majority written around 1600, but the OED itself is full of historical quotations and attestation dates. For Arabic, I have settled on using the *King Saud University Corpus of Classical Arabic (KSUCCA)*, which is around 47 million words containing literature on various genres between the 7–11<sup>th</sup> centuries, ranging from books on medicine, geography, law, history, and religious texts (Alrabiah et al., 2013; Alrabiah et al., 2014). As for Chinese, I have frequented the *Chinese Text Project (CTP)* (Sturgeon, 2021, n.d.) which has base of 25 million characters pre-modern Chinese documents, not including the community edited texts. I also used the *Scripta Sinica (SS)*<sup>13</sup>, around 754 million words containing classics ranging from ancient times up until 1949 (Academia Sinica, 1993–2008); the *Quan Tangshi*<sup>14</sup> [Tang poetry collection], which contains around 48,900 poems; and the *Chinese Buddhist Electronic Texts Association (CBETA)*<sup>15</sup> project, which contains the Chinese Buddhist Canon, also known as the Chinese Tripitaka (Ch'en, 1964, pp. 365–386). Thus, accommodating textual heritage from ancient times up until the 20th century.

### 3.5 Illustrations

All photographs of spices displayed (except where stated otherwise) are by courtesy of Christine Latour at Aromatiques Tropicales, a spice vendor in Dégagnac, France (<https://www.aromatiques.com/en/>). Credit is due to the photographers Felix Farmer<sup>16</sup> and Philippe Janina<sup>17</sup>. For some images of incense, photo courtesy by Glorian (<https://glorian.org/>).

<sup>13</sup> Accessible at <http://hanchi.ihp.sinica.edu.tw/ihp/hanji.htm>

<sup>14</sup> Accessible via the CTP: <https://ctext.org/quantangshi>

<sup>15</sup> Accessible at <https://cbetaonline.dila.edu.tw/en/>

<sup>16</sup> <http://www.felixfarmer.com/>

<sup>17</sup> <https://philippejanina.wixsite.com/photograph>

# The Spices

AFTER outlining the background and methods for this study, I will now introduce the data that this project is build on: the spices and their names. Every section in this chapter introduces a spice, on some occasions two or more closely related items. Introducing all 24 from the set of spices included in this study would make this dissertation extremely long, so I selected six items that I think are interesting from a diffusion point of view. This sample of spices will be now presented alphabetically, and all sections are adhering to the following structure:

(o) A *Spice profile box*, a name card-like environment for the spice under discussion with short, factual information, linked to a botanical database. This box also identifies the spice by listing its vernacular names in multiple languages. This is intended to be a convenience for the reader, a reference point of sorts one can return to anytime.

(1) A brief description about the nature, characteristics, and importance of the spice. This is intended as an introduction to the spice and its uses, and it includes the physical description of the material, its role as medicine, culinary seasoning, perfume, or dye, and its cultural significance, either locally or globally.

(2) A subsection on the botany, origins, cultivation, and identity of the spice, where the latter is included only if deemed necessary because of the situation is unclear or confusing. Under the heading “botany” I only discuss basic information regarding geographic distribution, native and introduced habitats, and conditions of growth that factor into a plant’s “spreadability”, which is tightly-knit to its value as a crop. Agronomy and harvesting will also be mentioned where it commits to interesting notions about scarcity and demand.

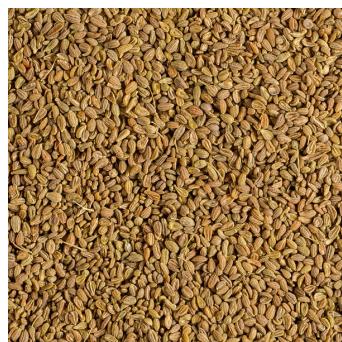
(3) A subsection on the history of the spice follows, focusing on the first mentions, whether it is evoked in religious scriptures, described in pharmacopeias, documented in historiography, or praised in poetry. Besides this, key steps and events on the spices’ journey and spread will be introduced, especially where an item’s history is not widely known, or there are a lot of misconceptions. Materials whose cultural history, itinerary, and names have already been researched and written about will be only discussed concisely, directing the reader to existing scholarly publications.

(4) Lastly, I will examine the spice terminology in a subsection on the names of the spices under scrutiny, focusing on word origins and etymological analysis on one hand, and collecting and explaining synonyms on the other. This step will be conducted in three languages, English, Arabic, and Chinese, and will cover historic and closely related or alternative names. An inventory of spices treated in this dissertation follows below, and I highlighted with bold those that will be discussed in this chapter.

1. allspice ( <i>Pimenta dioica</i> )	43	13. fennel ( <i>Foeniculum vulgare</i> )
2. anise ( <i>Pimpinella anisum</i> )		14. fenugreek ( <i>Trigonella foenum-graecum</i> )
3. asafoetida ( <i>Ferula assa-foetida</i> et al.)	54	15. ginger ( <i>Zingiber officinale</i> )
4. caraway ( <i>Carum carvi</i> )		16. long pepper ( <i>Piper longum</i> )
5. cardamom ( <i>Elettaria cardamomum</i> )	62	17. mace ( <i>Myristica fragrans</i> )
6. cassia ( <i>Cinnamomum cassia</i> et al.)	75	18. nutmeg ( <i>Myristica fragrans</i> )
7. chile ( <i>Capsicum annuum</i> et al.)		19. pepper ( <i>Piper nigrum</i> )
8. cinnamon ( <i>Cinnamomum verum</i> )	75	20. saffron ( <i>Crocus sativus</i> )
9. clove ( <i>Syzygium aromaticum</i> )		21. Sichuan pepper ( <i>Zanthoxylum spp.</i> )
10. coriander ( <i>Coriandrum sativum</i> )		22. star anise ( <i>Illicium verum</i> )
11. cumin ( <i>Cuminum cyminum</i> )		23. turmeric ( <i>Curcuma longa</i> )
12. dill ( <i>Anethum graveolens</i> )		24. vanilla ( <i>Vanilla planifolia</i> )



(a) allspice



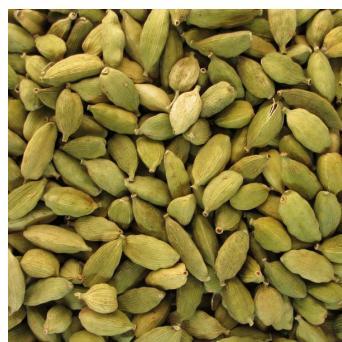
(b) anise



(c) asafoetida\*



(d) caraway



(e) cardamom



(f) cassia



(g) chile



(h) cinnamon



(i) cloves



(j) coriander



(k) cumin



(l) dill

Figure 4.1 Photographs of the spices in this dissertation (I). Credit: Aromatiques; \*Glorian.



Figure 4.2 Photographs of the spices in this dissertation (II). Credit: Aromatiques.

## 4.1 Allspice

### 1. ALLSPICE

POWO

**English:** allspice; pimento; Jamaica pepper. **Arabic:** فلفل إفرنجي *fulful ifranjī* [Frankish pepper]. **Chinese:** 多香果 *duōxiāngguǒ* [many-spice-fruit]. **Hungarian:** szegfűbors [clove-pepper]; *jamaicaibors* [Jamaican-pepper]; *amomummag* [amomum-seed].

Plant species:	<i>Pimenta dioica</i> (L.) Merr. (syn. <i>Pimenta officinalis</i> Lindl.)
Family:	Myrtaceae
part used:	unripe fruit; leaf
Region of origin:	S. Mexico to C. America; Caribbean
Cultivated in:	Jamaica; Mexico; Honduras
Color:	dark brown



(a) berries



(b) powder



(c) leaves

Figure 4.3 Allspice berries, powder, and leaves from *Pimenta dioica*.

**Note 4.1.1.** Introducing the *Spice profile box*. As it can be seen above in *Spice profile 1* presenting allspice, this business-card-like environment gives a quick reference of the spice under scrutiny in a concise way. This is intended to be a convenience for the reader to return and glance back at brief, factual information about a particular item whenever necessary. The box also contains a clickable link to the related plant species in a botanical database, [POWO](#), where more information can be found, such as the plants' biodiversity, distribution, botanical synonyms, as well as images of specimens.

Allspice, also known as pimento and Jamaica pepper, refers to the dried unripe fruits of a tropical evergreen tree growing in the Caribbean: the *Pimenta dioica*. The dried berries are dark brown, hard to the touch, and 4–6 mm in diameter (thus larger than black pepper). Their signature crown is by a small ring of the calyx (van Wyk, 2014, p. 210). It is one of the few spices that do not come from the East; chili, vanilla, and allspice are the traditional three when one is listing spice products native to

the Americas (disregarding cacao which is not considered a spice today). It is also the only spice that is exclusively cultivated on the western hemisphere (Duke, 2002, p. 21). The term *allspice* is a coinage playing on the notion that the flavors and aroma of allspice is similar to that of clove, cinnamon, nutmeg, and black pepper (Mabberley, 2017, p. 717)—the most popular spices in Europe at the time when Europeans got in contact with this New World spice. People who only saw ground allspice but not whole, often tend to think that is in fact a spice mixture, after its name and rich flavor profile. Usually ground to powder, allspice is one of the key ingredients of Caribbean cuisine, especially jerk style dry-rub meat preparation. It is also used in European sausage making, pickling, baking, and flavoring liqueurs, it an overall “handy spice”.<sup>1</sup> It also found its way into some Middle Eastern spice blends.

**Note 4.1.2.** Allspice is sometimes called pimento, which is also the name of a cultivar of *Capsicum annuum*, famous from the Southern United States appetizer pimento-cheese. It is therefore important not to confuse allspice with the heart-shaped mild cherry peppers that North Americans also call pimiento or pimento.

#### 4.1.1 The Botany, Origin, and Cultivation of Allspice

The allspice tree is a small mid-canopy tree or shrub with smooth, bay-like leaves and tiny white flowers. The berries turn dark purple if left to ripe, and the leaves and the bark are also aromatic (Riffle, 1998, p. 279). Belonging to the myrtle family (*Myrtaceae*), allspice is related to other aromatic trees, such as clove, eucalyptus, and the bay rum tree. Its binomial name is made up of *pimenta*, the Portuguese (or corrupted Spanish) equivalent of ‘pepper’, and *dioica* ‘of two houses’ (Greek *di-* from *dyo* ‘two’ and *oikos* ‘house’), indicating that the male and female flowers are found on different plants (Peter, 2012, vol. 2, p. 166).

Allspice is indigenous to the regions ranging from Southern Mexico to Central America and the Greater Antilles of the Caribbean, especially Jamaica (Czarra, 2009, p. 146). Where naturalized, it spreads by birds carrying the seeds. Allspice has been since introduced to a few neighboring places, such as Colombia, Venezuela, and Florida (POWO, 2022a, p. 146). In 1885 it was introduced from Jamaica to Hawaii and Kauai, and it even reached Tonga.

Allspice is cultivated as a crop in a few countries, notably in Jamaica, Mexico, and to a lesser extent in Honduras and Grenada. The primary producer and the source of the highest quality being Jamaica. Saplings are grown from seeds, then soon transplanted when still small. The trees need well-drained soil and humid conditions (van Wyk, 2014, p. 210). It is one of the only spices that no one managed to grow in the East, transplantation efforts were quickly abandoned, and its commercial cultivation is confined to the Americas (Duke, 2002, p. 21). Harvesting happens similarly to how black pepper is harvested; the still green, unripe fruits are picked by hand, and then dried under the sun.

The flavor of allspice mainly comes from the component eugenol, which is dominant both in the fruit and the leaves, but other compounds also add to the complexity of its aroma. Eugenol—also

<sup>1</sup>The Icelandic name is *altrahanda*, literally ‘of all hands’, meaning ‘for various purposes’; showing its multifaceted uses.

called clove oil, for it constitutes 80-90% of the essential oil from clove buds (Barnes et al., 2007, p. 166)—is widely used as a flavoring agent by the food industry and in pharmacology, and is also found in cinnamon, nutmeg, and bay leaves. It has antiseptic, antibacterial, anesthetic, and analgesic properties (Ulanowska & Olas, 2021). The leaves of a related plant called the West Indian Bay Tree (*Pimenta racemosa*) is used to produce bay rum, a popular essential oil used by the perfume industry for its spicy notes.

#### 4.1.2 The History of Allspice

There is not much we know about allspice before the arrival of the Europeans, except that the Aztecs used it to spice up their chocolate drink (Farrell, 1985, p. 27), although Dalby (2000, pp. 145, 177) doubts this was the case that early on. According to Duke (2002, p. 21), the Maya used allspice for embalming. We know that it reached Europe as a consequence of Christopher Columbus's voyages. Spanish colonizers must have encountered allspice in the West Indies sometime after Columbus and his crew explored the islands of Hispaniola, Cuba, and Jamaica, and the year 1494 is reported (Opara & Chohan, 2021, p. 12). Columbus himself did not find it. In fact, he did not recognize any spice he was so keen on finding—pepper, cloves, nutmeg, cinnamon—but kept himself and his patrons in the delusion that he will. In his first letter to Ferdinand and Isabella he writes: “On this island there are many spices and great mines of gold and other metals. [...] I believe that I have found rhubarb and cinnamon.” (Columbus, 1893, pp. 10–18) —in reality, he had none.<sup>2</sup>

He was adamant that the islands he *discovered* were full of spices and brought up excuse after excuse (out of season, etc.) after every voyage he returned with no spice (Dalby, 2000, p. 149). He also believed that he was in India or Cathay, on one of the outlying islands. Between apologies, Columbus also promised more gold, silver, cotton, mastic, and slaves. As Dalby (2000, p. 150) reports, what he recorded in his private journal is a bit more honest and realistic version of events: “I think that many trees and plants grow here which will be highly valued in Spain for dyes and medicinal spices. But I am sorry to say that I do not recognize them.” Columbus repeatedly regrets his ignorance in botany in his journal (see also Columbus, 1893/2010, p. 57).

Interestingly, authors love to claim that Columbus brought back allspice (together with vanilla and chili): “He returned with allspice from the West Indies, chilies from Mexico and vanilla from Central America.” (Craze, 1997, p. 17), and “Columbus brought it back to Europe thinking it was pepper.” (Czarra, 2009, p. 146), or “Though he did not find the Spice Islands, Columbus brought allspice, vanilla and red peppers from the West Indies back to his Spanish supporters.” (Parthasarathy et al., 2008, p. 1). This is not true, he most likely never even saw allspice, but it was reported him that it is there and can be cultivated, along with cinnamon, and mulberry for silk production (Colón, 1571/1959, p. 151). Columbus returned from his first voyage of 1492–93 with some gold nuggets and jewelry, pearls, a hammock, tobacco, the turkey, and a few poor captured Taínos, but no spices were presented to the Spanish monarchs Ferdinand and Isabella. He did bring back pineapple and cassava

<sup>2</sup>Columbus's first letter of his first voyage, sent on March 4, 1493 from Lisbon to the Spanish court (and its translation) is also available online at King's College London. Transcription: <http://www.ems.kcl.ac.uk/content/etext/eo21.html>, translation: <http://www.ems.kcl.ac.uk/content/etext/eo22.html>

(J. Turner, 2004, p. 11).

Diego Álvarez Chanca, the court appointed physician who accompanied Columbus on his second expedition in 1493 is often credited with bringing home both chili, and allspice (McCormick, n.d.), but in his 1494 letter describing the flora and fauna, he only mentions *agi*, also *axi*—modern Spanish *ají* from Taíno—(see Corominas, 1987, p. 34), and that the natives use it to season their food, with what we now know as *Capsicum annuum*: the chili pepper (Chanca, 1494/2003, p. 31).

In the following century the Spanish tried to turn Mexico into a spice plantation by transplanting eastern spices, an effort that mostly failed. Only after this did the colonizers start to pay proper attention to native spices (Machuca et al., 2020, p. 6).

Francisco Hernández de Toledo, King Philip II's court physician and naturalist spent 7 years in New Spain between 1571–1577, studying its species and conducting interviews with the natives. He was the first to formally describe allspice. He called it *Pipere Tavasci* ‘Tabasco pepper’ (today *Pimienta de Tabasco*, after the region of Tabasco, famous today for a brand of hot sauce. Hernández also recorded the Nahuatl name of allspice: *xocoxochitl* ‘sour flower’.<sup>3</sup> Hernández likens the flowers to pomegranates, and the aroma to that of orange blossoms, describing it to be very pleasant and attractive, with a sharp taste of the fruit. (Hernández, 1615, p. 2). In Machuca et al. (2020)’s translation:

“Xocoxochitl meaning sour flower, is a large tree, with leaves like those of the oranges, red flowers like a pomegranate, but with an aroma like the orange blossom, and in such a smooth and pleasant way, that even the leaves of the tree add to its attraction: the fruit is round, and hangs in clusters, which at first appear green, and then beige, and finally towards black: it is sharp and scathing to taste, and good-smelling”

According to Machuca et al. (2020), although allspice was known by the Spanish from early on “there are few historical records of its production and trade”, and only in the 18<sup>th</sup> century started they to consider American products to have economic potential.

Allspice berries are around 30% larger than peppercorns, and since their color and shape resembles black pepper, and it gave a spicy taste to food, it is no wonder that the Spanish called them *pimiento* ‘pepper’. The Portuguese version is *pimento*, and later the botanical name *Pimenta* was given to the genus of plants related to allspice (Farrell, 1985, p. 26). I disagree with the often repeated trope that the Spanish explorers mistook allspice berries for pepper and called them *pimiento* “by mistake”<sup>4</sup>, these people knew exactly what they were looking for, and that what they have found is not the mighty black pepper; but for them it was a kind of pepper. The crew showed samples of pepper and cinnamon to presumably confused Native Americans hoping for directions, and as Columbus wrote in his journal on the 4<sup>th</sup> of November, 1492, they indicated by sign language that there is a lot of it around (Duke, 2002, p. 21; Columbus, 1893/2010, p. 67). The Europeans, however, soon recognized the value of allspice, even if it was not the expensive black pepper, but still more pungent and exotic than some cheap Old World substitutes, the juniper and myrtle berries (which are very similar to allspice in appearance and usage) (Dalby, 2000, p. 150).

<sup>3</sup>cf. S. Wood, 2000–2022, xococ, xochitl.

<sup>4</sup>Britannica, 2022, allspice.

In short, allspice was introduced to Europe by the Spaniards in the 16<sup>th</sup> century, its import was first recorded in 1601, according to Britannica (n.d.) and Farrell (1985, p. 26). After 1655, when Jamaica became a British colony for nearly three centuries, the Brits developed a taste for allspice and started to use it to season meat dishes, sauces, and pickles (A. Green, 2006, p. 74). They were also responsible for its spread to some extent which is illustrated by the names of allspice in some languages, e.g., Polish *ziele angielskie* ‘English herb’.

#### 4.1.3 The Names of Allspice

Allspice is a fascinating case, because it gives us examples for a plethora of names that showcase us many of the motivations, mechanisms, and solutions people choose when naming spices. As I mentioned before, some people are puzzled if allspice is a spice blend or not. The names in some languages often just add to the confusion, for example French *quatre-épices* (lit. ‘four spices’) can have the sense ‘allspice’, but also ‘a kind of spice mix’ made up of four different spices.<sup>5</sup>

##### English

**Etymology 1.** English *allspice*, from *all* + *spice*; after the flavor profile that resembles the combined aroma of cloves, nutmeg, cinnamon, and black pepper, 1621<sup>a</sup>

<sup>a</sup>OUP (n.d., s.v. allspice)

**Note 4.1.3.** Introducing the *Etymology box*. This environment, as seen above in *Etymology 1*, offers a quick look at a words’ origins and development.

Since its introduction to the spice cabinet, allspice has been known by many names from which currently *allspice* seems to be prevailing. *Allspice* was formed by compounding *all* and *spice*, for its flavor was perceived to be a combination of four characteristic spices that the Europeans knew and sought after: black pepper, cinnamon, cloves, and nutmeg.<sup>6</sup> It was first recorded in 1621: “Amber-greese, nutmegs, and all spice.”<sup>7</sup>, and probably inspired the French *toute-épice* ‘all-spice’, attested in 1762.<sup>8</sup>

Sadly, the original word for allspice was lost with the demise of the native Taíno people of the Caribbean, nevertheless we got Taíno<sup>9</sup> words such as barbecue, *cassava*, *guava*, *hammock*, and *tobacco* (Rafinesque, 1836, p. 229). As we concluded before, it is assumed that it was the Spanish who first got in contact with the allspice berry, and that they simply called it *pimienta* ‘pepper’.

<sup>5</sup>TLFi, 2012, *quatre-épices*.

<sup>6</sup>OUP, n.d., *allspice*; Britannica, n.d.

<sup>7</sup>OUP, n.d., *allspice*.

<sup>8</sup>TLFi, 2012, *toute-épice*.

<sup>9</sup>Taíno is a now extinct Arawakan language.

**Etymology 2.** English *pimento* ‘allspice; sweet pepper’, ca. 1660 < partly Portuguese *pimenta* ‘allspice; sweet pepper; black pepper’ < and partly Spanish *pimiento* ‘hot and sweet pepper; formerly also black pepper; pepper plant of both kinds’, earlier *pimienta* ‘black pepper; peppercorn; ground pepper’ 13<sup>th</sup> c., 1495 < Medieval Latin *pigmenta* ‘plant juice; food seasoning; condiment; spices; perfumes’, plural of *pigmentum* < Latin *pigmentum* ‘colour, paint; ointment; drug; spiced wine’, from *pingō* ‘to paint’ + *-mentum* ‘instrument’<sup>a</sup>

<sup>a</sup>OUP (n.d., s.v. *pimento*); OUP (n.d., s.v. *pimento*); OUP (n.d., s.v. *pimiento*); Gómez de Silva (1985, p. 415) and Corominas (1987, p. 495); C. T. Lewis and Short (1879, s.v. *pigmentum*)

For a long time *pimento* (and to a much lesser extent *pimiento*)—the words for ‘pepper’ in Portuguese and Spanish, respectively—was commonly used in English to refer to allspice. This is still the case in Jamaican English for example, where the term *allspice* is not used. In North American English however, *pimento* now rather refers to a small, round variety of chili pepper (*Capsicum annuum*), commonly known as cherry pepper explained in Note 4.1.2.

The corruption and mix-up between the English words *pimento* and *pimiento* and their origins is as confusing as it gets. For the sake of a clear understanding, let us first consider the modern names for allspice in Spanish: *pimienta de Jamaica*, and Portuguese: *pimenta-da-jamaica*. In both cases, *pim(i)enta*, with a final *-a*, means ‘pepper’, referring to peppercorns of the usual black and white pepper (*Piper nigrum*). In Spanish and Portuguese, the words endings of *-o* and *-a* mark the grammatical gender, the significance of which dissipates in English. It is important to remember however, that the Spanish form *pimienta* emerged first from a Latin neuter plural suffix in the 13<sup>th</sup> century. Thus, perhaps a century or so later when the word *pimienta* was already embedded in Spanish, speakers perceived the word as a feminine noun, and a vacuum of a masculine counterpart emerged. This allowed for a practical differentiation by gender between the peppers of the Old World and the New World. Corominas (1987, p. 459) explains that *pimiento* derived from *pimienta*, and it was first applied in the Americas for the red fruits of the chili.

Gómez de Silva (1985, p. 415) makes the most compact distinction: “*pimienta* ‘(black) pepper; allspice’, *pimiento* ‘(hot and sweet) pepper’”. In contemporary Spanish, *pimiento* (the masculine form) refers to the fruits and plants of the *Capsicum* family, e.g., the numerous spicy chilies and mild bell peppers of red, green, and yellow, while *pimienta* (the feminine form) refers to the small round fruits of black and white pepper and its powdered forms. The distinction seems consistent, belonging to this latter group see for example *pimienta dulce* ‘sweet pepper’, and *pimienta gorda* ‘fat pepper’ both of which refers to allspice, not to be confused with *pimiento dulce*, which refers to sweet paprika powder.<sup>10</sup>

*Pimento* in English is a partly Portuguese, partly Spanish borrowing, while *pimiento* comes from Spanish. In fact, it is explained in the OED that in the ‘allspice’ sense of the word, *pimento*, from Portuguese *pimenta* (*daJamaica*), went through an alteration influenced by the Spanish word form, which is not attested in the ‘allspice’ sense. Ergo, Spanish *pimiento* maybe did not refer to allspice in

<sup>10</sup>Española, 2014, *pimiento*, -a.

Spanish at the time when the borrowing happened. And if so, *pimento* is a borrowing from Portuguese *pimenta* meaning ‘pepper’ and, as *pimenta da Jamaica*, ‘allspice’, influenced by Spanish *pimiento* ‘chili, sweet pepper’, also in the sense of the pepper plants of both kinds (chili and black). Spanish *pimiento* formerly had the sense of ‘black pepper, peppercorns, and ground pepper’ (before 1495), with an earlier form *pimienta* (13<sup>th</sup> century), now usually in sense ground pepper and peppercorns<sup>11</sup>. The Portuguese connection is only discussed by the OED, other dictionaries do not mention it. A direct Spanish borrowing is also plausible if we consider that it was the Spanish who most likely brought it back first, they probably called it *pimiento/-a*, and they were responsible for its subsequent diffusion in Europe. English spellings varied greatly of this Romance word, using forms such as *piemente* in the late 1600s.

The origin of these words is the classical Latin *pigmentum* ‘a material for coloring, a color, paint, pigment’, with a transferred meaning ‘the juice of plants’ in post-classical Latin.<sup>12</sup> The word *pigmentum* is made up of *pingō* ‘to paint’ and *-mentum*, a suffix denoting an ‘instrument, medium’, well recognizable from Romance languages and English (i.e., excitement). According to Corominas (1987, p. 459), Catalan *pimienta* is attested in the 13<sup>th</sup> century and it comes from the plural (*pigmenta*) of Latin *pigmentum* ‘coloring, paint’, which already meant ‘drug, ingredient’, and later, ‘condiment’ in Medieval Latin. Derived from this, in 1495 *pimiento* was applied to the plants bearing the pungent red fruits of the Americas. *Pigmentum* also entered English as *pigment* ‘paint, dye, ingredient in an ointment, drug’. According to the OED, Medieval Latin *pigmentum* also referred to spiced drinks (9<sup>th</sup> century), perfumes, and hence spice in general. Old French cognates support this, *pigment* had the sense of ‘balm, fragrant spice’ in the 12<sup>th</sup> century, Anglo-Norman *pigment/piment* meant ‘spice, spice wine’<sup>13</sup>, and Middle English *pihmentum* (12<sup>th</sup> century, later *piment*) had a sense of “a spiced drink, a remedy or concoction containing spices”,<sup>14</sup> “a sweetened, spiced wine used for refreshment and in medical recipes; a medicinal potion”.<sup>15</sup> *Piment* in French were later applied for chili, especially the cultivar of cayenne pepper. (The OED points to the sense ‘cayenne pepper’ in a “10<sup>th</sup> century French source”, which must be an error.)

Allspice is also known as *Jamaica pepper*, for it mainly grows on the island and the historical reasons described above. Many languages calqued *pimienta de Jamaica* from Spanish, or another transmitting language (e.g., Italian *pepe della Giamaica*). *Jamaica pepper* was first recorded in 1661: “A kind of Pepper, that tastes like Cloves, and very Aromatick (known by the name of Iamaica-Pepper)”.<sup>16</sup>

The name *myrtle pepper* echoes the similarities of the allspice tree with European myrtle (*Myrtus communis*), especially after the resemblance of their purple berries. Beyond the physical resemblance, myrtle berries are also edible, and are also dried to add to pepper mills as a spice. Furthermore, the European myrtle has aromatic leaves and wood as well, and it is used to grill and smoke meat in Southern Europe since Roman times, especially on Sardinia and Corsica; the same way the Caribbean

<sup>11</sup>OUP, n.d., *pimento*.

<sup>12</sup>C. T. Lewis and Short, 1879, *pigmentum*.

<sup>13</sup>OUP, n.d., *pigment*.

<sup>14</sup>Harper, n.d., *pigment*.

<sup>15</sup>R. E. Lewis et al., 1952–2001, *piment*.

<sup>16</sup>OUP, n.d., *Jamaica*.

people use allspice wood and leaves. The myrtle berry appears in Roman and Greek mythology as well (van Wyk, 2014, p. 186).

The name *clove pepper* has “chemical reasons”, namely that this name arises from the aroma of allspice that reminded people of clove. This is due to its eugenol content we discussed above. *Szegfűbors* lit. ‘clove-pepper’ is the most common name for allspice in Hungarian still, and it is used in sausage making.

One of the most interesting spice names we can come across in my opinion is *newspice*. The term is now archaic in English, but the idea still exists in a few European languages, such as Serbian and Macedonian *најгвирџ* *najgvirc* from German (*Neugewürz*), Czech and Slovak (*nové koření/korenie*), and Turkish *yenibahar* and Romanian *ienibahar* from Ottoman Turkish يېنى باھار *yeñibahar*; all the above literally meaning ‘new spice’.

The reason behind these names is that during the 17-18<sup>th</sup> centuries, allspice “suddenly” arrived to Central and Eastern Europe as a new (and possibly marketed as a trendy) spice. This happened a century after the red hot paprika took the world by storm (by 16<sup>th</sup> century it reached Hungary from the Ottoman Empire), and while the chili did not conquer northern Europe, allspice—to an extent—did. We could philosophize why the chili did not deserve the name ‘new spice’ when it first arrived, or why the Europeans—except on the south—were reluctant to assimilate it into their cuisines. Was the pungent chili too harsh for a Northern palate to consider? Is it the sophisticated chemical complexity of allspice that made it fashionable in Victorian England? All these questions are leading us to deep waters regarding the human palate and cultural attitudes toward spices and spiciness, as well as environmental and genetic factors deciding the heat of preference explored by interesting papers such as Spence (2018) and Törnwall et al. (2012).

We know that in the beginning allspice was overlooked by Europeans, and this is possibly the reason why allspice’s original name did not survive unlike the Nahuatl word *chilli*. Allspice was later sold and used in beverages and cookery, but its rising star never came close to that of chili. In Asia, where chilies were adopted early on and, eagerly transplanted, they transformed and revolutionized cuisine forever. It is unimaginable to think of Indian, Indonesian, or Chinese dishes without chilies today. Inversely, allspice is mostly unknown in East Asia, and the reasons behind it are just as botanical as historical: In the 16-17<sup>th</sup> century nobody knew how to grow allspice, while chili can be grown everywhere effortlessly. In addition, Europeans did not sail to Asia to sell spices, they went to take them.

As the 20<sup>th</sup> century came around, allspice—the only spice still exclusively imported from the Western hemisphere—quietly became one of the many, and its fervor faded a little. America was not new anymore, and the name *new spice* as well became obsolete. An English textbook for students of Italian narrates a letter from 1680 about this *Nuova Spezie* and the author’s opinion on it:

“I Am much obliged to you for the Drug you sent me inclosed in your last letter, about which I cannot tell you any thing but that it is called the New Spice, and it comes as it is said, or as it is guessed, from the West-Indies, and not from the East-Indies; and it is but six months that I had knowledge of it from Count Laurence Magalotti, who showed it me under the abovesaid name of New Spice. How many different tastes are found in it by

several honest folks ! that of the clove is the principal ; that of the nutmeg is the second in rank ; the cinnamon comes as it were the third in order ; next the citron ; then the smell of the musk and of the amber, and the most sweet taste of sugar. The truth is, in my opinion, that it is a pretty Drug. I am in Florence, and with for an occasion to do you service ; so command me with all freedom, and be certain that I will count it as good luck to have any power to serve you. I affectionately kiss your hands. Florence, 26th March 1680.” (Baretti, 1755, p. 5)

And so, we have established a few categories when it comes to the names of allspice: (1) names that are made up of *spice* as a headword and a modifying word, (2) names that use *pepper* as a headword with a modifier, and (3) names that are taken from Portuguese and Spanish. See Table 4.1 for a concise overview.

#	Species	Name	Source
1	<i>Pimenta dioica</i>	allspice	van Wyk (2014)
2	<i>Pimenta dioica</i>	clove pepper	Duke (2002)
3	<i>Pimenta dioica</i>	Jamaica pepper	van Wyk (2014)
4	<i>Pimenta dioica</i>	myrtle pepper	Peter (2012)
5	<i>Pimenta dioica</i>	newspice	Peter (2012)
6	<i>Pimenta dioica</i>	pepper cloves	James (2022)
7	<i>Pimenta dioica</i>	pimento	van Wyk (2014)
8	<i>Pimenta dioica</i>	pimento berry	OUP (n.d.)
9	<i>Pimenta dioica</i>	pimiento	OUP (n.d.)

Table 4.1 Various names for allspice in English.

## Arabic

**Etymology 3. Arabic** *fulfil ifranjī* ‘allspice’ [European pepper], literally ‘Frankish pepper’, named so because it was transmitted by Europeans, 1700?<sup>a</sup>

<sup>a</sup>Baalbaki (1995)

Arabic, similarly to English, boasts with a diverse set of names when it comes to allspice. First and foremost, it is known as *filfil ifranjī* ‘European pepper’. *Ifranjī* literally translates to ‘Frankish’, but it became the epithet of white Europeans, similarly to the term *farang*<sup>17</sup> in Southeast Asia. The rationale behind this name is evident: it was Europeans who introduced this spice to the Middle East and North Africa in the centuries following its debut.

Allspice’s Middle Eastern history is the topic I have found the least amount of information on, considering every other spice in this chapter. As it is an ingredient that have arrived long after the

<sup>17</sup>A word of Persian origin, applied for the Franks during the crusades (from Old French *franc*), and later by extension to any white merchant used from Persia to Thailand.

classical times, it is not discussed in the literature I have consulted, and modern articles only deal with it for its pharmaceutical and health benefits, not with its journey. The challenge to find further Arabic synonyms is also increased, because both English names *allspice* and *pimento* are ambiguous. I have found examples of wrongly glossed entries in both Arabic, and Chinese dictionaries. Be that as it may, I have managed to collect a few other Arabic names for allspice from contemporary dictionaries, these can be seen in Table 4.2.

Further common vernacular names are *fifil hulw* lit. ‘sweet pepper’, and *bahār hulw* lit. ‘sweet spice’, where *bahār* ‘spice’, is a loanword from Persian. Persian بَهَار *bahār* means spring (the season), it was borrowed into Arabic with a sense of blossoms and foliage, alluding to the leaves and flowers of plants as the source of many spices.<sup>18</sup> In the ‘spice, seasoning, condiment’ sense, the word spread regionally via Ottoman Turkish (loaned from Arabic). Similarly to the case of English, the word for spice was associated with the allspice berries, and consequently resulted in the already mentioned Turkish *yenibahar* [newspice] ‘allspice’, and μπαχάρι *bachári* ‘allspice’. Thus, just like English, Arabic propagates allspice names by using the words for ‘spice’ and ‘pepper’ with modifiers indicating qualities of taste, or who carried the spice.

#	Species	Name	Tr.	Gloss	Source
1	<i>Pimenta dioica</i>	بهار حلو	<i>bahār hulw</i>	sweet spice	Wiktionary ( <a href="#">n.d.-b</a> )
2	<i>Pimenta dioica</i>	فلفل البساتين	<i>fulful al-basātīn</i>	pepper of the gardens	Almaany ( <a href="#">n.d.</a> )
3	<i>Pimenta dioica</i>	فلفل إفرنجي	<i>fulful ifranjī</i>	European pepper	Baalbaki ( <a href="#">1995</a> )
4	<i>Pimenta dioica</i>	فلفل تابل	<i>fulful tābil</i>	spice pepper	Almaany ( <a href="#">n.d.</a> )
5	<i>Pimenta dioica</i>	فلفل حلو	<i>fulful hulw</i>	sweet pepper	Baalbaki ( <a href="#">1995</a> )

Table 4.2 Various names for allspice in Arabic.

## Chinese

**Etymology 4.** Mandarin Chinese 多香果 *duōxiāngguǒ* ‘allspice’ [many-spice-fruit], maybe a semantic translation<sup>a</sup>

<sup>a</sup>MDBG ([n.d.](#))

In Chinese, allspice goes by the name 多香果 *duōxiāngguǒ* [many-spice-fruit], supposedly a Chinese rendering of *allspice*. However, in China allspice is practically non-existent; it is not used in dishes, does not feature in TCM databases, and generally unknown besides Western specialty grocery shops. A search in Baidu Index yields no results as well. All the names except 甜胡椒 *tián hújiāo* ‘sweet (black) pepper’ shown in Table 4.3 are relatively modern semantic translations of presumably English sources. Just like in Arabic, it obviously does not show up in pre-modern corpora, and scarcely present in the modern corpus.

<sup>18</sup>Dozy, [1881](#), p. 121.

#	Species	Name	Tr.	Gloss	Source
1	<i>Pimenta dioica</i>	多香果	<i>duōxiāngguǒ</i>	many-spice-fruit	Kleeman and Yu (2010)
2	<i>Pimenta dioica</i>	全香子	<i>quánxiāngzǐ</i>	all-spice-seed	Spices Journey (2022)
3	<i>Pimenta dioica</i>	甜胡椒	<i>tiánhújiāo</i>	sweet-barbarian-pepper	Lau (n.d.)
4	<i>Pimenta dioica</i>	牙買加胡椒	<i>yámǎijiā hújiāo</i>	Jamaica-barbarian-pepper	MDBG (n.d.)
5	<i>Pimenta dioica</i>	眾香子	<i>zhòngxiāngzǐ</i>	many-spice-seed	MDBG (n.d.)

Table 4.3 Various names for allspice in Chinese.

## Summary

Table 4.4 shows all the names of allspice that can be found in dictionaries, in a trilingual setting.

#	Language	Term	Gloss	Loan	Source
1	English	<i>allspice</i>		no	OUP (n.d.)
2	English	<i>Jamaica pepper</i>		no	OUP (n.d.)
3	English	<i>pimento</i>		yes	OUP (n.d.)
4	English	<i>pimento berry</i>		no	OUP (n.d.)
5	English	<i>pimiento</i>		yes	OUP (n.d.)
1	Arabic	<i>fulful al-basātīn</i>	pepper of the gardens	no	Almaany (n.d.)
2	Arabic	<i>fulful ifranjī</i>	European pepper	no	Baalbaki (1995)
3	Arabic	<i>fulful tābil</i>	spice pepper	no	Almaany (n.d.)
4	Arabic	<i>fulful hulw</i>	sweet pepper	no	Baalbaki (1995)
1	Chinese	<i>duōxiāngguǒ</i>	many-spice-fruit	no	Kleeman and Yu (2010)
2	Chinese	<i>tiánhújiāo</i>	sweet-barbarian-pepper	no	Lau (n.d.)
3	Chinese	<i>yámǎijiā hújiāo</i>	Jamaica-barbarian-pepper	yes	MDBG (n.d.)
4	Chinese	<i>zhòngxiāngzǐ</i>	many-spice-seed	yes	MDBG (n.d.)

Table 4.4 Conventionalized names for allspice in English, Arabic, and Chinese, found in dictionaries.

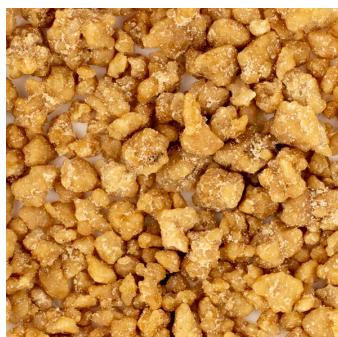
## 4.2 Asafoetida

### 2. ASAFOETIDA

POWO

English: *asafoetida*; *hing*; *devil's dung*. Arabic: حلبيت *hiltit*. Chinese: 阿魏 *āwèi*. Hungarian: *ördöggyökér* [devil's root]; *aszatgyanta* [asat resin]; *bűzös aszat* [stinking asat].

Plant species:	<i>Ferula foetida</i> (Bunge) Regel; <i>Ferula assa-foetida L.</i> ; <i>Ferula narthex</i> ; <i>et al.</i>
Family:	<i>Apiaceae</i>
part used:	gum-resin (latex)
Region of origin:	Iran; W. and C. Asia
Cultivated in:	Iran; Afghanistan
Color:	from pale yellow to brown



(a) gum-resin



(b) powder, colored with turmeric



(c) plant

Figure 4.4 Asafoetida in various forms, and one of its principal sources *Ferula assa-foetida* in the Kyzylkum Desert. Credit: (a) Glorian; (b) Aromatique; (c) Public Domain.

Asafoetida is the dried, golden brown oleoresin that forms after cutting the stems of various ferula plants of Central Asia. The material itself is a waxy gum-resin, and it is sold either in gum or powdered form. Asafoetida is an extremely pungent, strong-smelling substance; it is described having a “garlic-like” and “sulphurous odor” that is sometimes too strong in itself and must be diluted with other materials (van Wyk, 2014, p. 138). Asafoetida is a drug and spice, and was used for centuries in both Asia and Europe (Leung & Chen, 2019). It is still an integral part of Indian cuisine as an ingredient, while in Europe and East Asia it was mainly utilized as medicine.

Regarding the characteristics and uses of the plant asafoetida, there are parallels with the now extinct giant ferula plant, which is believed to be the source of the lost silphium or laserpitium of antiquity. Silphium was a drug used in ointments of traditional Greek medicine, and a coveted ingredient in Roman cuisine. It was and introduced from Libya in North Africa, and was once a commercially crucial product featured on Roman coins. We now believe that over-harvesting led to its demise (Dalby, 2000; Langenheim, 2003; Leung & Chen, 2019; van Wyk, 2014).

#### 4.2.1 The Botany, Origin, and Cultivation of Asafoetida

Asafoetida is obtained from species of the genus *Ferula* in the *Apiaceae* family, such as *Ferula assa-foetida*, *F. foetida*, and *F. narthex* (Mabberley, 2017). These plants are “robust perennial herbs” that can grow to 2 m high, and as umbelliferous plants surmounted by large yellow flowers (van Wyk, 2014, p. 138). The plants cope well in mountainous and dry, desert-like conditions of Iran (from Yazd to Lar), up to Southern Uzbekistan (Kyzylkum Desert), and the Qandahar region of Afghanistan where they grow wild (Leung & Chen, 2019). Asafoetida is wild-harvested the same way it has been for thousands of years. The plant is cut before flowering, at the base of the stalk just above the root, and left exposed. The exudate is then collected once it solidifies, and this process is repeated again and again for up to three months, until no more liquid can be tapped (van Wyk, 2014, p. 138).

#### 4.2.2 The History of Asafoetida

As ferula plants were not transplanted from Iran and Central Asia in the last couple thousands of years, its history and spread is connected with trade, especially overland.<sup>19</sup> A fantastic and recent chapter on the history of asafoetida already exists under the title *The Itinerary of Hing/Awei/Asafetida across Eurasia, 400–1800* by Leung and Chen (2019).

#### 4.2.3 The Names of Asafoetida

##### English

**Etymology 5.** English *asafoetida*, a. 1398 < Medieval Latin *asafoetida* [stinking asa] <<sup>?</sup> from Persian *āzā* ‘mastic’, in a Lanized form, *asa* + Latin *foetid* ‘ill-smelling, stinking’, (feminine of *fætidus*)<sup>a</sup>

<sup>a</sup>OUP (n.d., s.v. asafoetida); Laufer (1919, p. 353); Steingass (1892, p. 42)

*Asafoetida* (also spelled *asafetida*) is a term directly from Medieval Latin that found its way into the English lexicon via the early modern European medicinal and botanical literature. Often seen with archaic spellings, such as “*assafetida*”, the name is made up of the Latinized version of Persian آزا / *āzā*<sup>20</sup> ‘mastic’<sup>21</sup>, and Latin *foetida*, feminine of *foetidus* ‘stinking, ill-smelling, fetid’<sup>22</sup>.

The first detailed discussion about asafoetida’s name comes from (Laufer, 1919, pp. 353–362)’s *Sino-Iranica*, where he vehemently opposes the theories of Persian origin regarding *aza*, stating that its purported meaning, ‘mastic’ is “a product entirely different from what we understand by asafoetida”, and prefers the inferred theory first proposed by Garcia da Orta (1563/1913, p. 41) that *aza*—“mutilated

<sup>19</sup>According to news reports of last year, India, the biggest consumer of asafoetida only started experimenting with its cultivation in the last couple of years (Express News Service, 2021).

<sup>20</sup>Steingass, 1892, p. 42, [https://dsal.uchicago.edu/cgi-bin/app/steingass\\_query.py?page=42](https://dsal.uchicago.edu/cgi-bin/app/steingass_query.py?page=42).

<sup>21</sup>Mastic, also known as *tears of Chios* is, a resin exuded from the trees *Pistacia lentiscus*. The dried, yellowish and translucent brittle pieces of resin resemble teardrops, and turn white when chewed, behaving like nature’s (initially bitter) chewing gum. It is traditionally produced on the island of Chios, Greece.

<sup>22</sup>OUP, n.d., asafoetida.

by the druggists of the middle ages”—somehow derives from the *laser* or Pliny’s *laserpitium* (a synonym for silphium, an important spice, medicine, and aphrodisiac used in antiquity just mentioned above). None of the two explanations are supported with documentary evidence, and he is right in that “in no oriental language is there a word of the type *asa* or *aza* [...].” I am not sure why did Laufer immediately dismiss the connection between mastic and asafoetida; both are obtained from the dried oleo-resin of Western and Central Asian plants, and even his own descriptions of mastic and its uses are very similar to that of asafoetida (Laufer, 1919, p. 252). His reports from a 1610 Chinese source, using the transcribed Arabic name *mastaki* say that it is produced in Turkestan, used “as *jiao*” (Sichuan pepper), and that its odor is very strong, and beneficial for digestion. Laufer, an expert in East Asian languages expects *aza* to come up in other oriental languages, but it seems to me that the problem of *aza* starts with Latin and therefore should be searched within the medieval European scientific literature. If *aza*, a Persian term for a dried resinous substance (i.e., mastic) loaned by scribes of Latin existed, why does *asa foetida*, literally ‘stinking mastic’ for a foul smelling dried resinous gum sound so impossible? In fact, one of the Arabic names for asafoetida literally translates to ‘the mastic of the giant ferula’; but here ‘mastic’ is likely to simply mean ‘gum’.

Asafoetida was first attested in Middle English, indicating its arrival in Europe. Sometime before 1398, we can read: “Some stynkyng þinges beþ ydoon in medicyne, as..brymston and asa fetida.”<sup>23</sup>. This illustrious entrance of asafoetida immediately points out its stench, and to be paired here with brimstone—once a synonym for sulfur, now a term chiefly used in a Biblical context in the description of hell (cf. “fire and brimstone”)—is an apt premonition for the nickname *devil’s dung*. It is also worth noting that in English, the word first referred to the material, with the plant producing asafoetida sense only secondary; this is understandable, because no European have seen the ferula plants until the 17<sup>th</sup> century, and the origins of the drug were obscure.

**Etymology 6.** English *hing* ‘asafoetida’, 1599 < Hindi हिंग *hīṅg* ‘asafoetida’ < Sanskrit हिङ्गु *hiṅgu* ‘asafoetida’; cf. cognates Sogdian ’ynkw < Proto-Iranian \*aṅgu-ja-tu- ‘resin-gum’; cf. Tokharian B, Khotanese<sup>a</sup>

<sup>a</sup>OUP (n.d., s.v. *hing*); OUP (n.d., s.v. *hing*); Gharib (1995, p. 87); Adams (2013, p. 7)

India was always a big importer and consumer of asafoetida, and also played a role in exporting it to other part of the world. Bombay served as the key port in the 19<sup>th</sup> century, where the stinking gum would change hands (sometimes after a bit of manipulation and adulteration). Contrary to China and Europe, Indians also developed an affinity to use it in their cooking. Thus, when the British came in contact with asafoetida in India, they adopted the local name: *hing*<sup>24</sup>. *Hing* comes from Hindi हिंग *hīṅg*, through Sauraseni Prakrit *hirṅgu* from Sanskrit हिङ्गु *hiṅgu*<sup>25</sup>. The Sanskrit term is believed to have derived from an Iranian source reconstructed as Proto-Iranian \*aṅgu-ja-tu- where *ja-tu-*<sup>26</sup> is ‘gum’

<sup>23</sup>OUP, n.d., asafoetida.

<sup>24</sup>see Yule et al., 1903, p. 418,

<sup>25</sup>AHD, 2022, *hing*.

<sup>26</sup>Proto-Indo-European (PIE) \*gʷé-tu- ‘resin, gum’

(Modern Persian *زد zhad* ‘gum’) and other derivates are Tocharian B *ankwas(t)*, Khotanese *amguṣdā*, and Sogdian *\*angužat* (Adams, 2013, p. 7; Gharib, 1995, p. 87; R. L. Turner, 1962–1966, p. 281), also various Classical Persian forms, both inherited, e.g., آنگودان *angudān*, آنگوزه *ānguzah* and borrowed, e.g., آنگزاد *angužad* from Parthian (Tremblay, 2005, p. 438).

In English, *hing* is first attested in Hakluyt’s *Principle Navigations* (new ed.): “One hundred and fourescore boates laden with Salt, Opium, Hinge, Lead, Carpets [etc.]”.<sup>27</sup>, and soon identified as a substance identical to asafoetida, as an example from 1662 shows: “The Hingh, which our Drugsters and Apothecaries call Assa foetida, comes for the most part from Persia.”<sup>28</sup>

Among its many vernacular names in European languages, such as *devil’s dung* in English, there is often a hint to the devil, possibly due to the connection between the smell of sulfur and hell in the Biblical tradition (“fire and brimstone”). The name *devil’s dung* in its various glosses is popular among European languages (e.g., German *Teufelsdreck* lit. ‘devil’s filth’, Finnish *pirunpihka* lit. ‘devil’s resin’, or Turkish *şeytanboku* lit. ‘Satan’s shit’, which shows the strong aversion this material induces in European people, and why it never gained popularity in cookery. Other vernacular names in English include *devil’s dung*, *asant*, *stinking gum* (cf. George, 2012). On the far opposite, the phrase “food of the gods” on Wikipedia actually links to asafoetida, because in an Indian context asafoetida was and is a desirable ingredient. Garcia da Orta, a Portuguese Jewish herbalist and ethnobotanist pioneer who spent much time on Goa wrote in the 16<sup>th</sup> century:

“Well, you must know that the thing most used throughout India, and in all parts of it, is that Assa-fetida, as well for medicine as in cookery. A great quantity is used, for every Gentio who is able to get the means of buying it will buy it to flavour his food.” (Garcia da Orta, 1563/1913, p. 44)

But as a European, he also notes on the next page: “The nastiest smell in the world for me is Assa-fetida”.

#	Species	Name	Source
1	<i>Ferula assa-foetida</i> et al.	devil’s dung	van Wyk (2014)
2	<i>Ferula assa-foetida</i> et al.	hing	van Wyk (2014)
3	<i>Ferula assa-foetida</i> et al.	stinking gum	Peter (2012)
4	<i>Ferula spp.</i>	asafoetida	van Wyk (2014)

Table 4.5 Various names for asafoetida in English.

<sup>27</sup>Hakluyt, 1589, <http://www.perseus.tufts.edu/hopper/searchresults?target=en&inContent=true&q=hinge&doc=Perseus%3Atext%3A1999.03.0070>.

<sup>28</sup>OUP, n.d., hing, <https://www.oed.com/view/Entry/87092>.

## Arabic

**Etymology 7.** Arabic حلتیت *hiltīt* ‘asafoetida resin’; cf. cognates Hebrew חַלְתִּית *hiltīt* < Aramaic חַלְתִּיתא/סָלְבָּתָא *hiltītā* ‘id.’<sup>a</sup>

<sup>a</sup>Fraenkel (1886, p. 140); Löw (1881, p. 36) and Löw (1924, vol. 3, p. 452-455)

Arabic terms now make a difference between the material and the plant; asafoetida as a spice/medicine is called حلتیت *hiltīt*, while the plant is called انجدان *anjudān*. The word *hiltīt* comes from Aramaic חַלְתִּיתא/סָלְבָּתָא *hiltītā*, and also exists in a Hebrew cognate as حلتیت *hiltīt* (Fraenkel, 1886, p. 140; Löw, 1881, p. 36; Löw, 1924, Vol. 3, p. 452-455). It is first attested in Sibawayhi’s (ca. 760–796, a Persian native) *al-Kitab* [The Book], which is the earliest work on Arabic grammar and linguistics. *Hiltīt* appears in the first Arabic dictionary, the *Kitāb Al-‘Ayn* compiled by al-Farāhīdī (ca. 786), simply sending the reader to *al-anjudhān* ‘asafoetida’, which could mean that this word was more widely known than *hiltīt* at the time. *Anjudān* is first mentioned in its earlier form انجدان *anjudhān* in the *Kitab Al-‘ayn*, which also tells us that the source (*uṣūl*) of *anjudān* is a plant called *mahrūt*, which also appears in the poetry of Imru’ l-Qays, the most eloquent poet of pre-Islamic Arabia.<sup>29</sup> Arabic *anjudān* is a loanword from Persian, likely borrowed before the 6<sup>th</sup> century and it comes from the same Proto-Iranian \**angu-žatu-* as Sanskrit, and later English *hing*.

**Etymology 8.** Arabic انجدان *anjudān* < Persian انگدان *angudān* < Proto-Iranian \**angu-žatu-* ‘resin-gum’; cf. Tokharian B, Khotanese<sup>a</sup>

<sup>a</sup>Lane (1863, pp. 79–80); Steingass (1892, pp. 114, 106); Adams (2013, p. 7)

#	Species	Name	Tr.	Gloss	Source
1	<i>Ferula spp.</i>	أبو كبير	<i>abū kabīr</i>	big father	Wehr (1976)
2	<i>Ferula spp.</i>	أنجدان	<i>anjudān</i>		Baalbaki (1995)
3	<i>Ferula spp.</i>	صمع الأجدان	<i>samgh al-anjudān</i>	gum of anjudan	Baalbaki (1995)
4	<i>Ferula spp.</i>	صمع راتيناجي	<i>samgh rātīnājī</i>	rātīnājī gum	Baalbaki (1995)
5	<i>Ferula spp.</i>	حلتیت	<i>hiltīt</i>		Wehr (1976)

Table 4.6 Various names for asafoetida in Arabic.

<sup>29</sup>see Ibn Manzūr, 1290/1979, p. 819.

## Chinese

**Etymology 9.** Mandarin Chinese 阿魏 *āwèi* MC /?a ñuiH/ ‘asafoetida’ < Tokharian B *ankwas(t)* ‘asafoetida’ < Sogdian \**angužat* ‘asafoetida’ < Proto-Iranian \**aŋgu-čatu-* ‘resin-gum’<sup>a</sup>

<sup>a</sup>Leung and Chen (2019); Laufer (1919, p. 353); Tremblay (2005, p. 438)

As for Chinese, 阿魏 *awei* is the term that gained much prevalence in the 7<sup>th</sup> century (Leung & Chen, 2019). It seems likely that it was Kuchean traders from around the Tarim basin who first brought asafoetida to Chang'an, the Tang capital on the eastern terminus of the Silk Road. The consensus now among both Sinologists and experts on the languages of the Silk Road is that *awei* is a loan from Tokharian B *ankwas(t)*, originating from the same Proto-Iranian etymon as two of the above Arabic and English examples (Laufer, 1919, p. 353; Baxter & Sagart, 2014, p. 121).

**Etymology 10.** Mandarin Chinese 興蕖/興渠/興瞿 *xīngqú* MC /hiŋ giʌ/ ‘asafoetida’, phonetic transcription < Sanskrit हिङ्गु *hingu* ‘asafoetida’ < Proto-Iranian \**aŋgu-čatu-* ‘resin-gum’; cf. Tokharian B, Khotanese<sup>a</sup>

<sup>a</sup>Leung and Chen (2019); Laufer (1919, p. 353); Adams (2013, p. 7)

But, there was an earlier name for asafoetida in Chinese: 興蕖/瞿/渠 *xingqu*, doublet of 形虞 *xingyu*. These are direct transcriptions of the Sanskrit *hingu* we mentioned above, and were attested in 5<sup>th</sup>-century Buddhist sutras (Leung & Chen, 2019). It is also worth mentioning that in this case, the Chinese monks most likely had no idea what exactly *xingqu* is, just that it some plant resin, and as such, it exemplifies a rare case when the word precedes the thing it refers to. In the *Bencao Gangmu* (BCGM), besides the names above, other synonyms can also be found. These are 阿虞 *ayü*, from the transcription of Persian *anguza(d)*, and 哈昔尼 *haxini*, the transcription of Ghazni, a city in Afghanistan where asafoetida was exported from. In the *Taiping Guangji* (TPGJ) (citing the *Youyang Zazu* (YYZZ)), it is said that *awei* comes from the country of 伽闍那 MC /gazana/, which is likely a rendering of Ghazna, a variant of Ghazni.<sup>30</sup>

From all the names, the most successful was unquestionably *awei*, it enjoyed popularity for centuries, and further propagated into Sinoxenic words of Japanese 阿魏 *agi*, Korean 阿魏 Ⓜ 위 *awi*, and Vietnamese *ngui* (Leung & Chen, 2019).

I highly recommend both Laufer (1919)’s *Sino-Iranica*, and Leung and Chen (2019)’s “The Itinerary of Hing/Awei/Asafetida across Eurasia, 400–1800” for those who are interested in asafoetida’s journey and its names.

<sup>30</sup> CTP—<https://ctext.org/taiping-guangji/414/awei?searchu=%E9%98%BF%E9%AD%8F&searchmode=showall#result>

#	Species	Name	Tr.	Gloss	Source
1	<i>Ferula spp.</i>	阿虞	<i>ayü</i>		Leung and Chen (2019)
2	<i>Ferula spp.</i>	哈昔尼	<i>hāxīnǐ</i>		Leung and Chen (2019)
3	<i>Ferula spp.</i>	黑黎提提	<i>hēilítítí</i>		Rossabi (2013)
4	<i>Ferula spp.</i>	形虞	<i>xíngyú</i>		Leung and Chen (2019)
5	<i>Ferula spp.</i>	興蕖/興渠/興瞿	<i>xīngqú</i>		Leung and Chen (2019)
6	<i>Ferula spp.</i>	阿魏	<i>āwèi</i>		Leung and Chen (2019)

Table 4.7 Various names for asafoetida in Chinese.

### Summary

And so, what we see here is that all three languages under scrutiny—English, Arabic, and Chinese—have at least one word that goes back to the same Proto-Iranian etymon, from the geographic source of the material it signifies and from the native region of the plant it is harvested from. This is not a surprise, rather evidence showing that the words do follow the material, even with twists and turns, and that tracing their journey correlates with the trade routes thus marking the contact zones where information about the material was transmitted.

#	Language	Term	Gloss	Loan	Source
1	English	<i>devil's dung</i>		no	OUP (n.d.)
2	English	<i>hing</i>		yes	OUP (n.d.)
3	English	<i>asafoetida</i>		yes	OUP (n.d.)
1	Arabic	<i>abū kabīr</i>	big father	no	Wehr (1976)
2	Arabic	<i>anjudān</i>		yes	Baalbaki (1995)
3	Arabic	<i>samgh al-anjudān</i>	gum of anjudan	no	Baalbaki (1995)
4	Arabic	<i>samgh rātīnājī</i>	rātīnājī gum	no	Baalbaki (1995)
5	Arabic	<i>ḥiltīt</i>		yes	Wehr (1976)
1	Chinese	<i>āwèi</i>		yes	MDBG (n.d.)

Table 4.8 Conventionalized names for asafoetida in English, Arabic, and Chinese, found in dictionaries.

#### 4.2.4 The Diffusion of Asafoetida

Figure 4.5 shows the linguistic diffusion of some of the names of asafoetida into English, Arabic, and Chinese, according to available etymological data, marked with the approximate journey they took from a Proto-Iranian etymon.

## Etymological stages of names for asafoetida

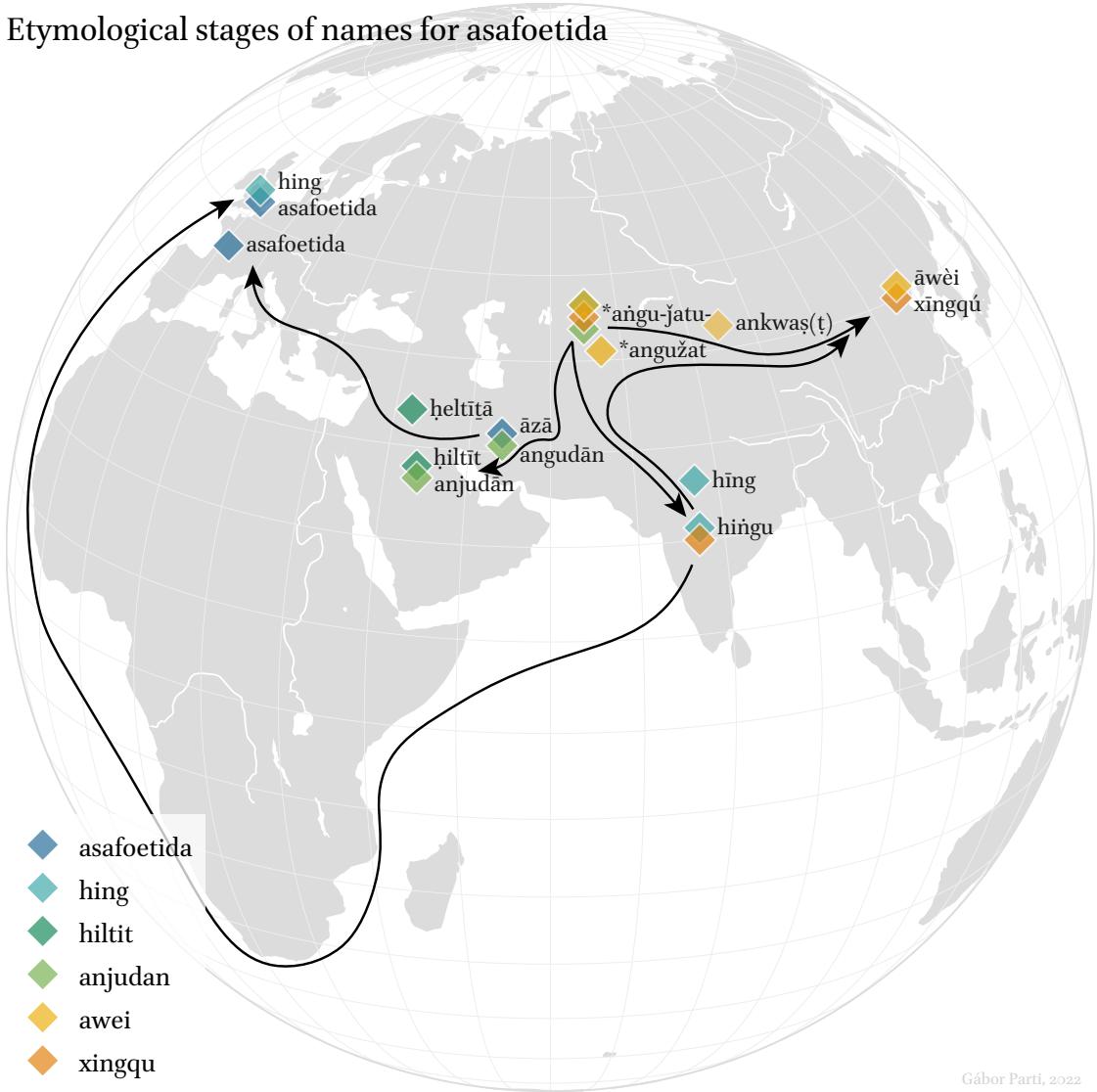


Figure 4.5 Diffusion of names for asafoetida, and their etymological stages in English, Arabic, and Chinese.

## 4.3 Cardamom

### 3. CARDAMOM

POWO

English: *cardamom*. Arabic: هال *hāl*; هييل *hayl*. Chinese: 豆蔻 *dòukòu* [bean-cardamom].

Hungarian: *kardamom*.

Plant species: *Elettaria cardamomum* (L.) Maton (syn. *Amomum cardamomum* L.)

Family: *Zingiberaceae*

part used: fruit (seed pods, capsules)

Region of origin: India

Cultivated in: Guatemala; India; Sri Lanka; Tanzania; Papua New Guinea

Color: green seed pods, brown seeds



Figure 4.6 Cardamom fruits cured, and powdered (*Elettaria cardamomum*). Credit: Aromatiques.

Cardamoms are the dried, ripe fruits of the cardamom plant *Elettaria cardamomum*. These fruits are sometimes called seeds, but they are in fact the seed pods, “three-valved capsules” (van Wyk, 2014, p. 132), containing several brown-colored small seeds, as it can be seen in Figure 4.6. The cardamom of commerce is widely used in Asia as medicine and spice, and is valued for its unique, minty and eucalyptus-like flavor. It is most prevalent in Indian cooking, but also known from the Arabic coffee tradition where it is sometimes added to the beverage. Indian restaurants often place a bowl of cardamoms at the entrance, so customers can take one as a masticatory on their way out, and chew on the refreshing capsules as they were nature’s breath mints. Native to the same region as the mighty black pepper in India, cardamom is sometimes referred to as the “queen of spices” (Ravindran & Madhusoodanan, 2002, p. 1). Cardamom was imported to Europe since the Roman era, and it is still used in meat dishes, sausages, Swedish meatballs, Danish pastries, ice-cream and liqueurs (Mabberley, 2017, p. 326). It is the third most expensive spice of our times, after saffron and vanilla (Business Insider, 2021).

Although *cardamom* usually refers to the fruits of *E. cardamom* from India—also sometimes known as green cardamom and true cardamom—there are numerous other cardamoms, similarly segmented capsule-like fruits used as spices and medicine in South, Southeast, and East Asia, and

even in Africa. Many of these belong to the *Amomum* genus of the ginger family (*Zingiberaceae*), such as the black cardamom from the Himalayas (*Amomum subulatum*), and the round cardamom from Java (*Amomum compactum*). See them in detail below in Section 4.3.3.

#### 4.3.1 The Botany, Origins, and Cultivation of Cardamom

The cardamom plant is a tall perennial herb from the ginger family (*Zingiberaceae*) with pink white flowers that grow at the base of the stem in clusters (van Wyk, 2014, p. 132). *Elettaria cardamomum* is indigenous to the Western Ghats region in South India, the same area that gave us black pepper and the center of its production and biodiversity (Ravindran & Madhusoodanan, 2002, p. 1). Together with black pepper and ginger, it has been wild-harvested since time immemorial, and formed the livelihood of many from the beginnings of the ancient spice trade around the 3<sup>rd</sup> century BC, until today (van Wyk, 2014, p. 132). Cardamom can only grow in a tropical climate, thriving in higher altitudes in the shade of trees, similarly to black pepper (which is a climbing vine) and thus modern cultivation does not differ much from traditional wild harvesting (van Wyk, 2014, p. 132). Cardamom is hand picked when ripe or near-ripe one by one—explaining its relatively high price—and then dried. It generally comes in light green, but one can also find them in white, which is a result of an extra step of steaming or bleaching before the drying process (van Wyk, 2014, p. 132). From the 1920s, Guatemala gradually became a major cardamom exporter, surpassing India in production. It is also grown in Tanzania and Papua New Guinea on a small scale.

#### 4.3.2 The History of Cardamom

It is difficult to trace the history of cardamoms with certainty because of the confusion in nomenclature (Cumo, 2013). However, the cardamom described in 4<sup>th</sup> century BC in Indian Ayurvedic literature is probably the green or true cardamom of today, called *elā*<sup>31</sup> in Sanskrit. Cardamom was also described by Theophrastus in the 4<sup>th</sup> century BC. He reports that *kardamomon* and *amomon* (cardamom and black cardamom) come from Media, or according to some, from India—just like spikenard and most other spices (Theophrastus, 1916, p. 249). Pliny connects amomum to North India, which is quite a punctual source for black cardamom. Cardamom was known to Dioscorides and Hippocrates, who have both written on its health benefits, e.g., aiding digestion. In Modern Greek, there is an informal way of saying ‘to strengthen, get strong’: *καρδαμών* *kardamónō*<sup>32</sup> deriving from the name of the spice.

Medieval Arab doctors wrote about cardamom in similar ways, and the geographer al-Idrīsī described ca. 1150 that it is brought to the port of Aden from Sindh, India and China, whereas in China, black cardamoms were important in the economy of the Song period (960–1279) (Prance & Nesbitt, 2005, pp. 158–159). Green cardamom reached China from Southeast Asia, in Hong Kong it is consumed primarily by the Indians and the Portuguese. It is cultivated in Guangdong, Guangxi, and Yunnan, rather used in medicine than cooking (S.-Y. Hu, 2005, pp. 325–326). For more on cardamom’s history, see Dalby (2000, pp. 102–106).

<sup>31</sup>Monier-Williams, 1899, p. 232.

<sup>32</sup>[https://www.greek-language.gr/greekLang/modern\\_greek/tools/lexica/triantafyllides/search.html?lq=%CE%BA%CE%81%CE%B4%CE%81%CE%BC%CF%8E%CE%BD%CF%89&dq=](https://www.greek-language.gr/greekLang/modern_greek/tools/lexica/triantafyllides/search.html?lq=%CE%BA%CE%81%CE%B4%CE%81%CE%BC%CF%8E%CE%BD%CF%89&dq=)

#### 4.3.3 A Crowd of Cardamoms: Identity and Confusion with Other Spices



Figure 4.7 False cardamoms: (a) Black cardamom from the Himalayas (*Amomum subulatum*), (b) Chinese black cardamom or *tsao-ko* from Yunnan, China (*Amomum tsao-ko*), and (c) round cardamom from Java (*Amomum compactum*). Credit: Aromatiques, NAI.

When it comes to cardamoms most of us are only familiar with one or two kinds, however, there is a multitude of plant species that are harvested for their fruit known by their common names as some kind of cardamom. All of these belong to *Zingiberaceae*. True cardamom—commercially the most important species—belongs to the genus *Elettaria*, a name derived from the Tamil root *elettari*, meaning cardamom seeds (Ravindran & Madhusoodanan, 2002, p. 1). Besides the genus *Elettaria*, “false” cardamoms are found in two other genera: *Amomum* and *Aframomum*. Following van Wyk (2014, pp. 290–308)’s checklist, these are listed in Table 4.9.

*Amomum*<sup>33</sup> is a genus home to a remarkable number of plants that yield pungent fruits and seeds, most known for *Amomum subulatum*. The *Amomum* genus contains of dozens of aromatic, spice-yielding and medicinal plant species primarily growing in India and China, and elsewhere in tropical and subtropical Asia, New Guinea, and North Queensland. Commonly called black cardamom or brown cardamom, but also referred to in various other names in English, such as Nepal cardamom, greater cardamom, Indian cardamom, Indian black cardamom, fake cardamom, Bengal cardamom, big cardamom, hill cardamon, and winged cardamom, the fruits of *A. subulatum* are larger than green cardamom, and it is native to the eastern Himalayan region; North India, Nepal, Bhutan, and Tibet. In Hindi it is called बड़ी इलाइची *baḍī ilāichī* ‘big cardamom’ or काली इलाइची *kālī ilāichī* ‘black cardamom’. In Chinese it is known as 香豆蔻 *xiāngdòukòu* ‘fragrant cardamom’, and S.-Y. Hu (2005, p. 327) also reports a local name in eastern Tibet for it: 嘎哥拉 *gágēlā* (ka-ko-la), which we will return to later. The dried fruits of this plant (see Figure 4.7) are used in savory dishes of northern India and Pakistan, and have a heavy smoky aroma and camphor-like taste. The brown color is a result of roasting and smoking on open fires (van Wyk, 2014, p. 132).

There are even larger (black) cardamoms, growing in the mountainous Vietnam-China borderlands, important in the cuisines of Vietnam, Yunnan, and Sichuan, such as *A. tsao-ko*<sup>34</sup> (recently

<sup>33</sup>GBIF Secretariat, 2021, *Amomum Roxb.*

<sup>34</sup><https://herbaltcm.sn.polyu.edu.hk/herbal/caoguo>

<i>Amomum aromaticum</i>	Bengal cardamom; Nepal card.; large card.	Bangl.; Nepal
<i>Amomum compactum</i> *	Indonesian cardamom	SE. Asia
<i>Amomum costatum</i> *	Chinese black cardamom	E. Asia
<i>Amomum globosum</i>	round Chinese cardamom	China
<i>Amomum kepulaga</i> *	round cardamom	Trop. Asia
<i>Amomum krervanh</i>	Cambodian cardamom; krervanh	Trop. Asia
<i>Amomum maximum</i>	Java cardamom	Trop. Asia
<i>Amomum subulatum</i>	brown cardamom; greater card.; Indian card.	Asia
<i>Amomum tsao-ko</i> *	tsao-ko cardamom; large cardamom	Asia
<i>Amomum villosum</i>	Malabar cardamom; Tavoy card.; wild Siamese card.	Asia
<i>Amomum xanthioides</i>	bastard Siamese cardamom; wild Siamese card.	Asia
<i>Aframomum alboviolaceum</i>	Cameroon cardamom	Trop. Africa
<i>Aframomum angustifolium</i>	Madagascar cardamom	Madagascar
<i>Aframomum daniellii</i>	bastard Melegueta; Cameroon cardamom	Trop. W. Af.
<i>Aframomum hanburyi</i>	Cameroon cardamom	Trop. W. Af.
<i>Aframomum corrorima</i>	Ethiopian cardamom; korarima	Trop. NE. Af.
<i>Aframomum macrospermum</i>	Guinea cardamom	W. Af.

Table 4.9 Spice plants with a common name that includes *cardamom* from the *Amomum* genus in Asia cultivated for their fruit & seed, and those from the *Aframomum* genus of Africa, cultivated for their seed (van Wyk, 2014). Items marked with asterisks are identified as botanical synonyms by me.

renamed as *Lanxangia tsao-ko* (Crevost & Lemarié) M.F.Newman & Skornick.), which S.-Y. Hu (2005, p. 326) calls Yunnan cardamom, and explains that in Yunnan, it goes into the chicken soup whole, as a flavoring agent. It is also used medicinally<sup>35</sup>, and the scientific species name comes from the transcribed Chinese name 草果 cǎoguǒ. In English it is called *tsao-ko cardamom*. S.-Y. Hu (2005, p. 326) distinguishes an *A. hongtsaoko* Liang et Fang (red cardamom), which appears to be a synonym for *A. tsao-ko* after consulting botanical databases. If one searches for “red cardamom” online, spice vendors’ advertisements would appear offering tsao-ko cardamom, also named “cao guo”. Putzel (2017) calls tsao-ko cardamom simply as black cardamom, and explores its cultivation and trade in Yunnan in great detail. He explains that in the last 50 years it has become a cash crop, and it is now the primary source of cardamom in Yunnan, together with *A. villosum*<sup>36</sup>, known as Tavoy cardamom, or 砂仁 shārén in Chinese (Putzel, 2017, p. 41).

Lastly, there are cardamoms that are round and white, indigenous to Southeast Asia. *Amomum krervanh* (newly reassigned as *Wurfbainia vera* (Blackw.) Skornick. & A.D.Poulsen) is Siam cardamom, Cambodian cardamom, or krervanh in English, and 白豆蔻 báidòukòu ‘white cardamom’ in Chinese. *A. compactum* (newly reassigned as *Wurfbainia compacta* (Sol. ex Maton) Skornick. & A.D.Poulsen) is known as round cardamom, Indonesian cardamom, or Java cardamom in English, and 爪哇白豆蔻 zhǎowā báidòukòu ‘Java white cardamom’ in Chinese, a spice used in TCM, and botanically very similar to *A. maximum*, which is 九翅豆蔻 jiǔchìdòukòu ‘nine-winged cardamom’ in Chinese. These are the first cardamoms that were imported to China from mainland Southeast Asia, together with nutmegs that

<sup>35</sup>FoC—[http://www.efloras.org/florataxon.aspx?flora\\_id=2&taxon\\_id=24000110](http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=24000110)

<sup>36</sup><https://herbaltcm.su.psu.edu.hk/herbal/villous-amomum-fruit>

caused an initial confusion we will shortly see. Cardamom in Indonesian is called *kapulaga* (Javanese kapulaga), primarily referring to *A. compactum* (more specifically *kapulaga jawa* ‘Javanese cardamom’, with an Old Javanese word<sup>37</sup> that people on the Wiktionary try to connect with Sanskrit कक्कोल *kakkola*<sup>38</sup>. Wyk’s *A. kepulaga* is a synonym for *A. compactum*.

Moving on to Africa, the genus *Aframomum*<sup>39</sup> contains around 50 species from the tropical regions of Africa, including Madagascar, Mauritius, and the Seychelles on the Indian ocean. The most important spice crop of this genus is *Aframomum melegueta* (grains of paradise, Melegueta pepper), and *A. exscapum* (alligator pepper), and staying on cardamoms: *A. corrorima*, commonly known as Ethiopian cardamom, or korarima. The latter is also often referred to as false cardamom, because the structure of the fruit imitates the true cardamom. One difference between the African and Asian cardamoms, is that in Africa, mostly the seeds are used, while in Asia, the whole seed pods are made use of (van Wyk, 2014).

What is common in all these different spice plants spanning from Asia to Africa? What connects them and makes us discuss them under cardamom? Their physical (and biochemical) properties. Not only are these plants related botanically, but the anatomy of their fruits are quite similar. Consequently, we can deduct that cardamom as a prototype has two features: (1) it is aromatic, (2) it is a capsule containing edible seeds. And just as cardamom is a prototypical object, *cardamom*—as a name—is a prototypical word that is used and reused as a headword to propagate spice names. There is also a certain dichotomy at play, the dynamics of adjectives that describe, distinguish, and evaluate a type of cardamom. Think of: green vs. black, Indian vs. Nepal, lesser vs. greater, true vs. false.

### Some Remarks on Common Names

When combing through the literature of cardamoms, there is small degree of conflict and overlap in the English common names that authors give to a plant and its spice. The vernacular names contend each other because authors come from different backgrounds, where one name might exist, but another does not, and—as mentioned in the introduction of this thesis—there are no rules governing this; it is up to each author. Scholars such as van Wyk from South Africa, Ravindran and Madhusoodanan from India, and S.-Y. Hu from China all bring a layer of diversity to the discussion of spices with their mentions and omissions of various common names of the plants/spices they so systematically try to present. This is expected, writers with a botanical focus pay attention to the strictly regulated scientific names in plant identification, so sometimes the included and excluded vernacular names are chosen on a whim, or depend on how much space is there left on the page. Some authors just note one common name, while some try to include as many as there are. A more interesting question would be: how do authorities on plant science go about the selection process? Where do they gather the vernacular names from?

Often, botanical and gastro writers have to make up what I call “speculative names”, where an author feels the need to devise/translate a common name for a plant that does not necessarily exist in

<sup>37</sup>Southeast Asian Languages Library (SEAlang)—<http://sealang.net/ojed/index.htm>

<sup>38</sup>Monier-Williams, 1899, 241.

<sup>39</sup>GBIF Secretariat, 2021, Aframomum K.Schum.

the target language they write. In this section, *red cardamom* is certainly a case on point. This is not a judgment, rather an observation; sometimes these inventions come to life and begin their journey as “real” plant/spice names that people will use if it fills a need. Further examples are found in Raghavan (2007, p. 64), who calls allspice *English spice* in English, which is an obvious translation from other languages that do in fact call it “English spice” (for the English fleet disseminated it from their colony of Jamaica).

#### 4.3.4 The Names of Cardamom

##### English

**Etymology 11.** English *cardamom* ‘cardamom’, (via post-classical Latin *cardimomum*, a. 1398), ?ca. 1425 < later also from Old French *cardemome* ‘cardamom’, ca. 1170; cf. modern French *cardamome* < Latin *cardamōnum* ‘cardamom’, 1<sup>st</sup> c. AD < Hellenistic Greek καρδάμωμον *kardámōmon* ‘cardamom’, haplological κάρδαμ- *kárdam-* ‘cress’ + ἀμωμον *ámōmon* ‘an Indian spice plant’, 3<sup>rd</sup> c. BC < Ancient Greek κάρδαμον *kárdamon* ‘garden cress *Lepidium sativum*’, perhaps a loanword (many plant names with *-amon* are clear loanwords; the suffix *-amon* is known from Pre-Greek; ultimately of uncertain origin), 4<sup>th</sup> c. BC; cf. cognates classical Latin *cardamum* <<sup>a</sup>

<sup>a</sup>OUP (n.d., s.v. *cardamom*); TLFi (2012, s.v. *cardamome*); C. T. Lewis and Short (1879, s.v. *cardamomum*); Liddell and Scott (1843/1940, s.v. καρδάμωμον); Liddell and Scott (1843/1940, s.v. κάρδαμον); Beekes and van Beek (2010, p. 644)

#	Species	Name	Source
1	<i>Elettaria cardamomum</i>	cardamom	van Wyk (2014)
2	<i>Elettaria cardamomum</i>	green cardamom	Ravindran and Madhusoodanan (2002)
3	<i>Elettaria cardamomum</i>	true cardamom	Ravindran and Madhusoodanan (2002)

Table 4.10 Various names for cardamom in English.

The word *cardamom* came from Latin *cardamōnum* via a Late Latin form attested in the late 14<sup>th</sup> century, and was later also influenced by French *cardamome*, which has the same Latin etymon. *Cardamōnum* is the Latinized form of Greek καρδάμωμον *kardámōmon*, a word that was formed by compounding the Ancient Greek κάρδαμον *kárdamon* ‘cress’, which is of unknown origin, and ἄμωμον *ámōmon* ‘amomum’, signifying an unidentified Indian spice plant, formed with haplology (\**kardamamōmom*).<sup>40</sup> The OED also lists many other European cognates of the English word, such as Spanish *cardamomo* (mid 13<sup>th</sup> c. or earlier), Italian *cardamomo* (late 13<sup>th</sup> c.), and Middle High German *kardamōm* (13<sup>th</sup> c., modern German *Kardamom*). In some cases, the form shows a dissimilation of the two final nasals, and so we can come across forms, such as *cardamon*.

<sup>40</sup>OUP, n.d., *cardamom*; AHD, 2022, *cardamom*.

Beekes and van Beek (2010, p. 644) does not speculate on the origin of *kárdamon*, but explains that plant names ending in *-amon* are clearly and frequently loanwords, and that the suffix *-anon* is a known pre-Greek element. He also mentions some doubtful attempts to explain the word by previous authors, and mentions that it has been connected with a Hittite word: *karšani* ‘an alcalic plant’. *Kárdamon* was identified with the word **𒂗𒀭𒉴 ka-da-mija<sup>41</sup>**, (*kardamia* as a feminine form of *kardamon*) appearing on Mycenaean tablets listing spices in Linear B, excavated in the “House of the Sphinxes” in 1950s, and dated to the 1200s BC (Bennett et al., 1958, p. 107). Meaning ‘garden cress’ (*Lepidium sativum*), of which the pungent seeds were consumed similarly to that of mustard and was popular in ancient Persia, it has been suggested that this is a Near Eastern *Wanderwort*, related to Middle Armenian **կոտեմ kotem** ‘garden cress’, and Classical Persian **کودیم kūdim** ‘a sort of plant (water-cress?)’, and Akkadian *kudimmu(m)* ‘a herb, perhaps cress’.<sup>42</sup>

**Etymology 12.** English *amomum* ‘any of several species of genus *Amomum*, family Zingiberaceae, including cardamom.’, An odoriferous plant. The *Amomum* of the ancients not being certainly identified, the word was used with uncertain denotation by earlier writers; a. 1398 < Latin *amomum* ‘amomum and a balm containing this spice’ < Ancient Greek ἄμωμον *ámōmon* ‘an Indian spice-plant, black cardamom (*Amomum subulatum*)’, an Oriental loanword, cf. κιννάμωμον < Semitic ‘id.’; cf. cognates Classical Syriac **ܚܾܻܰ h̄amāmā** → Arabic حمّام *hamāmā*; Akkadian *hamīmu<sup>a</sup>*

<sup>a</sup>OUP (n.d., s.v. *amomum*); C. T. Lewis and Short (1879); Liddell and Scott (1843/1940) and Beekes and van Beek (2010, p. 97); Löw (1881, p. 169), Lev and Amar (2008, p. 100), and Roth et al. (1968/2004, vol. 6, p. 66)

As for the identity of Greek *ámōmon* (Latin *amomum*)<sup>43</sup>, it is one of the more perplexing ancient spices. Although some consider it unidentified, the amomum of antiquity was probably what we call today as black cardamom. In the *Liddel-Scott-Jones: A Greek-English Lexicon* (LSJ) entry, it is defined as “an Indian spice plant, prob.”, but nevertheless recognized as *Amomum subulatum*, “Nepaul cardamom”.<sup>44</sup> Dalby (2000, p. 103) thinks that Linnaeus made a good guess about the identity of the spice plant when he aptly named the Asian genus *Amomum*, in which several other spice yielding plants we discussed above bear fruits known as “false cardamom” and “bastard cardamom”. The Greek word of *ámōmon* is a loan from Semitic languages whose further origin is uncertain, akin to and Akkadian *hamīmu*, Classical Syriac **ܚܾܻܰ h̄amāmā**, Arabic حمّام *hamāmā*<sup>45</sup>, and Hebrew **הַמָּם h̄amām**, which are not re-borrowings from Greek according to Löw (1881, p. 123). Denoting ‘a spice-plant’, these are probably from the Semitic root *h-m-m* ‘to be hot’ (Klein, 1987, p. 222). Thus, rendering the Greek word to be a loanword, just like in the case of *cinnamon*, which is clearly marked as an “oriental loanword” in Greek etymological dictionaries.

<sup>41</sup>Palaeolexicon—<http://www.palaeolexicon.com/Word>Show/16764>

<sup>42</sup>cf. Kouyoumdjian, 1970, p. 371; Asatrian, 2012; Black et al., 1999/2000, p. L14.

<sup>43</sup>C. T. Lewis and Short, 1879, *amomum*.

<sup>44</sup>Liddell and Scott, 1843/1940, ἄμωμον.

<sup>45</sup>cf. Roth et al., 1968/2004, vol. 6, p. 66; AHD, 2022, *cardamom*; Löw, 1881, p. 169; Lev and Amar, 2008, p. 100.

If most likely candidate for this “lost spice” is black cardamom, what happened to the name? One of the last reports on it comes from 1834, when Edmund Roberts traveling on a diplomatic mission sent by United States president Andrew Jackson listed items of Chinese trade lesser known in the West, and among them: *amomum*. He notes in his account that *amomum* is a seed, with “strong pungent taste, and a penetrating aromatic smell; [...] used to season sweet dishes” (Roberts, 1837, p. 135), which can easily describe any kind of cardamom people nowadays use. The term *amomum* is not used anymore; no prevailing spice, seed, or medicinal herb today is called the sort, however the Latin name for the genus *Amomum* from the ginger family (*Zingiberaceae*) carries on the name. The question of *amomum* will come up again in the discussion of *cinnamon*’s origins in Section 4.4.4. Cardamom is also referred to as the queen of spices, as it can be seen on the book title of Nair (2011), *Agronomy and Economy of Black Pepper and Cardamom: The “King” and “Queen” of Spices*, and we can come across green cardamoms advertised using its Hindi name spelled in English: *ilaichi/elaichi*, especially in the locales of the Indian diaspora.

And so, reflecting on Table 4.10 which shows all the names using the headword *cardamom*, we identified *cardamom* as a prototype word used in the propagation of other, related spice-names.

Arabic

**Etymology 13.** Arabic هال *hāl* ‘cardamom’ < Persian هیل *hil* ‘the lesser cardamoms’ < Sanskrit एला *elā* ‘cardamom’ < Proto-Dravidian \**ēla* ‘cardamom’; cf. Tamil *ēlam*<sup>a</sup>

<sup>a</sup>Wehr (1976, p. 1223); Steingass (1892, p. 1521); Dalby (2000, p. 104); Burrow and Emeneau (1984, p. 87)

In Arabic, cardamom is known by many different names varying from dialect to dialect, but the most common to come across in both modern and historical dictionaries is هال *hāl* or هييل *hayl*. *Hāl* is from Persian هييل *hil* ‘id.’ which goes back to a Sanskrit etymon, एला *elā*, which is ultimately a Dravidian loanword, reconstructed as \**ēla*. In modern Arabic dialects, an occasional /l/ to /n/ sound change can be observed, resulting in a version with a final /n/. Sometimes it is also prefixed by the word for ‘seed’, as in *habb al-hāl* [cardamom seed], referring to true cardamom, hence the contracted modern Egyptian Arabic *habbhān*. *Hāl* appears in Ibn Sīnā’s *Canon of Medicine* (1025), in a passage on how to prepare a concoction made with *hāl* (cardamom), *qāqulla* (black cardamom?), *qaranful* (clove), *dār filfil* (long pepper), using one *dirham* (~3 gr) each.<sup>46</sup>

**Etymology 14.** Arabic قاقلة *qāqulla* ‘cardamom; black cardamom’ < Classical Syriac qāqullā ‘cardamom’ < Akkadian (qa-qu-ul-lu.SAR) *qāqullu* ‘cardamom’ <? Sanskrit तक्कोल, कक्कोल *takkola, kakkola* ‘plant with aromatic berry; the perfume made from it’; cf. Pali *takkola*; Tibetan ལྕ.ଙ୍ଗ.ଲ୍ྔ *kakola*<sup>a</sup>

<sup>a</sup>Wehr (1976, p. 863); Löw (1924, vol. 1, p. 489); Zimmern (1915, p. 58); Monier-Williams (1899, pp. 431, 241)

46 SkF

Whether we consult dictionaries, explore the spice terminology of modern dialects, or read medieval travel writers, the word قاقلة *qāqulla* emerges often. This word is unmistakably a loanword, indicated by its distinct, alien form deviating from the usual Arabic word patterns. It is first attested in 8<sup>th</sup>-century medical literature.<sup>47</sup> In contemporary dictionaries it is usually glossed simply as ‘cardamom’. If we look at the origins of names for cardamom in modern languages, *qāqulla* is not a remarkably “successful” word; in terms of distribution, words originating in Greek surpass this and most others. However, if we dig deeper, we will find that *qāqulla* is likely a prominent ancient *Wanderwort*, possibly exhibiting a long journey in its history. Modern Turkish *kakule* is one of the few breadcrumbs to hint that we are dealing with a regional *Wanderwort*. According to the *Nişanyan Sözlük* (NS), *kakule* is attested in the 15<sup>th</sup> century, and comes from Arabic whose etymon is Aramaic *qāqūlā*, a word going back to Akkadian *qāqullu*, thus stretching our investigation to quite the time depth.<sup>48</sup> The *Chicago Assyrian Dictionary* (CAD)’s only information on it that it was a plant, growing in the garden of Merodach-Baladan II, a king of Babylon who ruled in the 8<sup>th</sup> century BC.<sup>49</sup> The Arabic word later entered the vocabulary of Latin, and survives today as the name for the genus *Cakile*.

Similarly to amomum, we are not entirely sure what Arabic *qāqulla* denoted in the past, but due to the fact that some medicinal recipes list both *hāl* and *qāqulla* as ingredients, we can be certain that they denoted different materials. Furthermore, it is likely that similarly to the word *cardamom*, *qaqulla* was an umbrella term. Consulting Ibn Sīna confirms this approach, he distinguishes a greater and a lesser kind of qaqulla, and describes their appearance, taste, and uses:

“Qāqulla. Its nature: There are big ones and there are small ones. The big ones are like small black walnuts [...] reminding the tongue of aromatic cubebs. The small ones are like cloves in shape, and also aromatic (Ibn Sīnā, 1025/1329).

In Amar and Lev (2017, pp. 66–68)’s work, the big qāqulla is identified as *Amomum melegueta* [sic] (grains of Paradise) with a question mark attached to it, while the small qāqulla is identified as true cardamom *E. cardamomum*. I would argue with the first. Both items appear in the book of Ibn Rushd (1126–1198), also known as Averroes.

#	Species	Name	Tr.	Gloss	Source
1	<i>Elettaria cardamomum</i>		هال <i>hāl</i>		Wehr (1976)
2	<i>Elettaria cardamomum</i>	خير بواء	<i>khayr buwwā'</i>	good-scent	Lane (1863)
3	<i>Elettaria cardamomum</i>	قاقلة صغيرة	<i>qāqulla saghīra</i>	small cardamom	Amar and Lev (2017)
4	<i>Elettaria cardamomum</i>	حب الـهـال	<i>habb al-hāl</i>	cardamom-seed	Baalbaki (1995)
5	<i>Elettaria cardamomum</i>	حبـهـان	<i>habhān</i>	cardamom-seed	Wehr (1976)

Table 4.11 Various names for cardamom in Arabic.

<sup>47</sup>SkE

<sup>48</sup>Nişanyan, 2022, *kakule*.

<sup>49</sup>Roth et al., 1968/2004, Vol. 13, p. 124.

## Chinese

**Etymology 15.** Mandarin Chinese 豆蔻 *dòukòu* MC /dəuH həuH/ ‘cardamom’ [bean-cardamom], compound of 豆 ‘bean(-like)’ + 蔻 ‘many; profusion’ (BCGM); or phono-semantic matching (also written using 荳 ; it was confused with nutmeg at first), ca. 863 <<sup>50</sup> Middle Chinese 多骨 *duōgǔ* MC /ta kuət/ ‘round cardamom’ <<sup>51</sup> Pali *takkola* ‘Bdellium, a perfume made from the berry of the kakkola plant’ <<sup>52</sup> Sanskrit तक्कोल, कक्कोल *takkola, kakkola* ‘plant with aromatic berry; the perfume made from it’; cf. Pali *takkola*; Tibetan ལྷଙ୍ଗྲ କାକୋଲ *kakola*; Chinese 嘎哥拉 *gágēlā*<sup>a</sup>

<sup>a</sup>Donkin (2003, p. 22); Duan (ca. 860, 18:55); Pali Text Society (1921–1925, p. 292); Monier-Williams (1899, pp. 431, 241)

In Chinese, the word equivalent to English *cardamom* is 豆蔻 *doukou* [bean-cardamom], sometimes with a variant of the first character meaning ‘bean’ containing the grass radical 艹. As Donkin (2003, p. 22) points out, cardamom and nutmeg were initially confused in classical Chinese literature. Probably on account of their similar appearance, and the fact that Chinese merchants imported both from somewhere around mainland Southeast Asia, more specifically, from the Malay Peninsula. Initially *doukou* referred to both spices (attested ca. 863), then in later sources, nutmeg was distinguished as 肉豆蔻 *roudoukou*, literally meaning ‘fleshy-cardamom’.

*Doukou* appears in 9 and 10<sup>th</sup>-century sources, such as the YYZZ and the TPGJ, as 白豆蔻 *baidoukou* [white-cardamom] reportedly called 多骨 (MC /ta kuət/) from the land of 伽古羅 *jiaguoluo* (Kakola?), describing the round cardamom sourced from either in Siam (*Amomum kravanh*) or Java (*Amomum compactum*).<sup>50</sup> This country refers to Kakola/Takola, a settlement on the western coast of the Malay Peninsula, where cardamoms were marketed together with nutmegs from the Moluccas (Donkin, 2003, p. 22). This word is said to be connected to Sanskrit तक्कोल *takkola* ‘a kind of perfume’, कक्कोल *kakkola* ‘a kind of aromatic plant; and a perfume made from its berries’<sup>51</sup>, a word that is the proposed etymon for others, such as Tibetan ལྷଙ୍ଗྲ କାକୋଲ *kakola*, referring to black cardamom, or Pali *takkola*. The Pali word is given as ‘a perfume made from an aromatic berry’, and also the name of a country.<sup>52</sup> 嘎哥拉 *gagela/kakola*, a local name for red cardamom mentioned by S.-Y. Hu (2005) also fits in here. Takola as a place name for a trading settlement on the Malay peninsula appears in Ptolemy’s *Geography*, better known as “Golden Chersonese” in antique writings. For more on the mystery of Kakola, see Wheatley (1961). It has not yet been established if *doukou* derives from a foreign name, such as the one reported in the YYZZ, or the phonological similarity is coincidental, but I hope an expert Sinologist will one day will help me find the connection. I think it is a plausible assumption for the following reasons: The character 蔻 *kou* does not appear in any other context or meaning, consulting the CTP, the first mention is a Tang dynasty poem about Jiangnan<sup>53</sup> cardamom. The *Nanfang Caomu*

<sup>50</sup>Duan, ca. 860, 18:55.

<sup>51</sup>Monier-Williams, 1899, pp. 431, 241.

<sup>52</sup>Pali Text Society, 1921–1925, p. 292; Trenckner, 1879, p. 59.

<sup>53</sup>Historical region of China south of the Yangtze river

*Zhuang* (NFCM), traditionally dated to the 4<sup>th</sup> century BC mentions cardamom but the authenticity and dating of this particular botanical treatise has been questioned over a hundred years before (Ma, 1978). Moreover, the character itself seems to have been utilized on purely phonetic grounds, and the attached grass/herb radical hinted on the new meaning (艸 cao ‘grass’ + 犭 kou ‘bandit’). I reckon that forms that supply both characters with the ‘grass’ radical are typically loanwords in the plant kingdom, and the variant 豆蔻 *doukou* seems to support this. And last but not least, a Shi (2000, p. 40)’s *Hanyu Wailaici* [Chinese Loanwords] directly tells us that it is an Arabic loanword, from “takur” [sic.]. Sadly, there is no Arabic word to the effect of *takur*, and I cannot guess what the author had in mind, but he also connected it with the place name, Takola. Besides this publication, I could not find it in other etymological dictionary. The BCGM interprets *doukou* as ‘bean’ + ‘many; profusion’ (which does not explain its use for nutmeg).

Based on Middle Chinese pronunciation, *doukou* cannot derive from Pali, and so it was suggested to me to look into a Southern Min variant. A brief correspondence with a professor familiar with Southern Min reconstructions did not exclude the possibility of a Minnan connection calling it “tempting” and stipulating that the Proto-Southern-Min reconstruction could be \**tau-khau*. But what would be the etymon of a Minnan word? Arabic “*takur*”? He also pointed out that “the impact from Proto-Min and its descendant Proto-Southern-Min to other Chinese dialects is very minor, taking into account the geographical isolation of Fujian (where Proto-Min was spoken) during the ancient time”, and hardly any common Chinese words originate from Min.<sup>54</sup> I hope to pursue the tracking of *doukou* in the future to offer a plausible hypothesis better than this.

#	Species	Name	Tr.	Gloss	Source
1	<i>Amomum spp.</i>	豆蔻	<i>dòukòu</i>	bean-cardamom	S.-Y. Hu (2005)
2	<i>Elettaria cardamomum</i>	綠豆蔻	<i>lǜdòukòu</i>	green-cardamom	Wikipedia (n.d.)
3	<i>Elettaria cardamomum</i>	青砂仁	<i>qīngshārénn</i>	green-gravel-kernel	Wikipedia (n.d.)
4	<i>Elettaria cardamomum</i>	小豆蔻	<i>xiǎodòukòu</i>	little-cardamom	DeFrancis (2003)

Table 4.12 Various names for cardamom in Chinese.

Zhang and Unschuld (2015, p. 729) identifies 豆蔻 with *Alpinia hainanensis* K.Schum. (syn. *Alpinia katsumadai* Hayata)<sup>55</sup>, a medicinal plant bearing round compact fruits, commonly referred to now as 草豆蔻 *caodoukou* [herb-cardamom]. In modern TCM, *doukou* is either *Amomum kravanh* or *Amomum compactum*<sup>56</sup>, while the green cardamoms of *Elettaria cardamomum* are designated as 小豆蔻 *xiaodoukou* [little cardamom]. Finally, the seeds of the greater galangal (*Alpinia galanga*)<sup>57</sup> are referred to in Chinese as 紅豆蔻 *hóngdòukòu* [red cardamom]. See Table 4.12 for an overview.

<sup>54</sup>Email exchange with Prof. Bit-Chee Kwok.

<sup>55</sup><https://herbaltcm.sn.polyu.edu.hk/herbal/katsumada-galangal-seed>

<sup>56</sup><https://herbaltcm.sn.polyu.edu.hk/herbal/round-cardamon-fruit>

<sup>57</sup><https://herbaltcm.sn.polyu.edu.hk/herbal/galangal-fruit>

## Summary

To summarize, I have presented the way of *cardamom* into English, and on the journey I was led astray by the spice amomum, its etymology and possible identity. I have then presented a multitude of spice names, propagated using the word *cardamom* as prototype. In Arabic, I have identified *hal/hayl* and *qaqulla* as important words in the history of cardamom(s) in a Middle Eastern context, the latter term possibly having an obscure but potentially incredible history. According to authors, such as Donkin (2003), Sanskrit seems to be the origin of *qaqulla* and its cognates in the Near East, and there is a possibility that Chinese *doukou* as well is a loanword from the same region: the Malay Peninsula from where the spice were sourced, and country called Kakola/Takola. Product names derived from toponyms are a well-known historical linguistic phenomenon (e.g.,cologne, hamburger), but here the connection between the Sanskrit plant name and the toponym Kakola is unclear and needs further investigation.

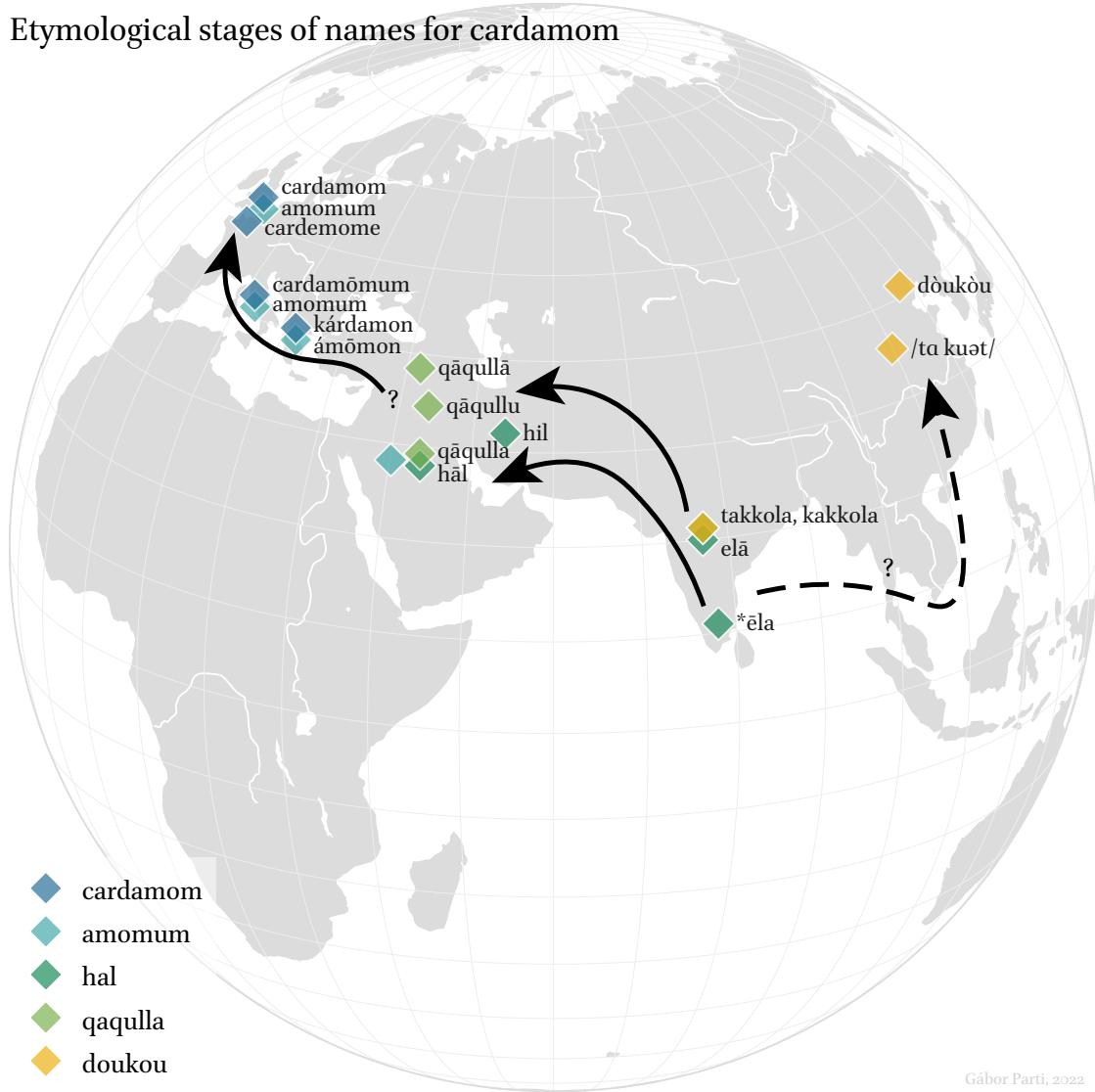
Spice names that are found in general dictionaries can be consulted in Table 4.13, and Figure 4.8 illustrates the journeys I discussed above.

#	Language	Term	Gloss	Loan	Source
1	English	<i>cardamom</i>		yes	OUP (n.d.)
1	Arabic	<i>hāl</i>		yes	Wehr (1976)
2	Arabic	<i>khayr buwwā'</i>	good-scent	yes	Lane (1863)
3	Arabic	<i>habb al-hāl</i>	cardamom-seed	no	Baalbaki (1995)
4	Arabic	<i>habhān</i>	cardamom-seed	no	Wehr (1976)
1	Chinese	<i>dòukòu</i>	bean-cardamom	maybe	DeFrancis (2003)
2	Chinese	<i>xiǎodòukòu</i>	little-cardamom	no	DeFrancis (2003)

Table 4.13 Conventionalized names for cardamom in English, Arabic, and Chinese, found in dictionaries.

### 4.3.5 The Diffusion of Cardamoms

### Etymological stages of names for cardamom



Gábor Parti, 2022

Figure 4.8 Diffusion of names for cardamom, and their etymological stages in English, Arabic, and Chinese.

## 4.4 Cinnamon & Cassia

### 4. CINNAMON

POWO

English: *cinnamon*. Arabic: قرفة *qirfa* [rind; bark]; دارصيني *dārsīnī*. Chinese: 錫蘭肉桂 *xīlánròuguì* [Ceylon-flesh-cinnamon]. Hungarian: *fahéj* [tree-bark].

Plant species:	<i>Cinnamomum verum</i> J.Presl. (syn. <i>Cinnamomum zeylanicum</i> Blume)
Family:	<i>Lauraceae</i>
part used:	bark; leaf
Region of origin:	Sri Lanka; SW. India
Cultivated in:	Sri Lanka; Seychelles; Madagascar; India
Color:	warm yellowish-brown, cinnamon ■



(a) quills



(b) quills



(c) leaves

Figure 4.9 Cinnamon quills, powder, and leaves from *Cinnamomum verum*.

Cinnamon is well-known around the world for its sweet aroma and flavor, and as one of the oldest spices of commerce. It was a sought-after substance in rituals and traditional medicine systems of different cultures, and today it is an essential spice of several cuisines—both Eastern and Western. Cinnamon has maintained its level of demand ever since humans first traded it, and even in contemporary times it is the second most important spice in the markets of Europe and the United States (including cassia cinnamon), falling only behind black pepper (Ravindran et al., 2004).

Cinnamon comes from the inner bark (cortex) of the tropical tree *Cinnamomum verum* J.Presl (syn. *C. zeylanicum* Blume)<sup>58</sup>, which are stripped and rolled into quills of several tightly packed layers

<sup>58</sup>It is difficult to navigate between the hundreds of species and subspecies of cinnamon and their overlapping botanical taxons and binomial synonyms, *C. verum* for example has 51 scientific synonyms, mainly a result of botanical history and competing naturalists. In plant taxonomy, species often have dozens of scientific names called “synonyms”. If there is consensus on the name within the scientific community, that binomial name (appended with the abbreviated name of the person who coined it) will be marked as “accepted”, while the status of the other names will be “synonym”, or “unresolved”. This is the product of the efforts of the last couple hundred years, when botanists tried to collect, describe, name, and categorize plant life around the world. As the consensus changes with time, competing names can appear in the literature. Botanical databases, such as the WFO and POWO, or specialized plant name checklists usually list all synonyms of a species to help us orientate in the jungle of plant nomenclature. Synonyms (abbreviated as syn.) are only given if a plant is known by multiple names in non-specialist literature, such as the case above.

by skilled peelers of (mostly) Sri Lanka, where the plant is native. In a rare example, the literal translations of the binomial names *C. verum* meaning ‘true cinnamon’, and *C. zeylanicum* meaning ‘Ceylon cinnamon’<sup>59</sup> are used as common names for cinnamon in several languages.

## 5. CASSIA

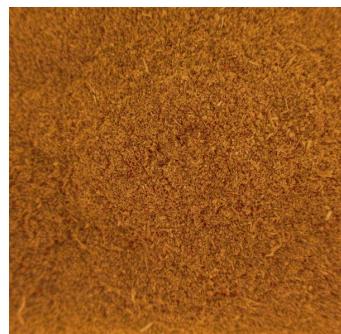
POWO

**English:** cassia. **Arabic:** سليخة *salīkha* [peel; bark]. **Chinese:** 肉桂 *ròugui* [flesh-cinnamon]. **Hungarian:** *kasszia(fahéj)* [cassia (tree-bark)].

Plant species:	<i>Cinnamomum cassia</i> (L.) J.Presl. (syn. <i>Cinnamomum aromaticum</i> Nees); <i>et al.</i>
Family:	<i>Lauraceae</i>
part used:	bark; fruit
Region of origin:	nan
Cultivated in:	Indonesia; China; Vietnam; Timor-Leste; etc.
Color:	reddish brown



(a) stick



(b) powder



(c) buds (dried unripe fruits)

Figure 4.10 Cassia sticks and “buds” from *Cinnamomum cassia*.

The phrase *true cinnamon* implies that there is a false cinnamon as well, and that would be cassia. Cassia, also known as Chinese cinnamon, Chinese cassia, cassia cinnamon, and—somewhat harshly—bastard cinnamon, is obtained similarly from the aromatic inner barks of closely related species, especially *Cinnamomum cassia* (L.) J.Presl. (syn. *C. aromaticum* Nees), which is produced in Southeast China and Vietnam. Although seemingly very similar to the uninitiated eye, the two spices are different in many ways. Cassia is more hard and coarse, it is made up of a single layer of thicker rind that have curled up in the heat of the day after harvesting, in the shape of a scroll. This is the cinnamon stick that most of us are familiar with, and it is capable of damaging a home grinder. It is also a bit more darker reddish brown in color, and more pungent in flavor. Ceylon cinnamon on the other hand is more fragile, slightly pale in color, and supposedly more delicate in taste because it offers a combination of different essential oils besides cinnamaldehyde (the principal component responsible for its aroma and flavor). Both are marketed in powdered form as well, and as such they are

<sup>59</sup>Ceylon is the former name of Sri Lanka

indistinguishable; creating room for adulteration. Since the Europeans took over the cinnamon trade of Sri Lanka and tapping the source of “true cinnamon” (first by the Portuguese, who got a foothold in the city of Colombo in 1518 together with trading concessions), there is a still ongoing notion that cassia is an inferior product (Chennault, 2006). And this belief eventually became reflected on the plant’s Linnaean name. A few cuisines also make use of the leaves (usually from *C. verum*), and the dried, immature fruits called cinnamon buds (usually from *C. cassia*).

There are a handful of other species that are cultivated as a source of commercial cassia, such as *C. burmannii* (Indonesian cassia/cinnamon, Padang cassia, Batavia cassia, Korintje (cassia)), *C. loureiroi* (Vietnamese cassia/cinnamon, Saigon cinnamon), and *C. tamala* (Indian cassia (lignea), Indian bark, Malabathri bark), which is more known for its leaf as Indian bay leaf, malabathrum, or tejpat. As reported in Ravindran et al. (2004, p. 10), *C. loureiroi* is extremely rare, and in actuality most of what is known as Vietnamese cassia or Saigon cinnamon is in fact *C. cassia*, contrary to what is claimed in most of the literature. This is supported by reports from botanists of French Indochina who insisted that Saigon cinnamon is brought from the north by Chinese and Annamese merchants (S.-Y. Hu, 2005, p. 400). S.-Y. Hu (2005) recounts us a personal experience from the 1960s, regarding a professor of pharmacy asking assistance in the identification of a cassia shipment from Hong Kong to the United States, stopped at maritime customs. If the cinnamon specimens are from *C. cassia*, it must be sent back. If it is *C. loureiroi*, it will be accepted. With no certain indicator or characteristics on the species, Dr. Hu’s team made a decision “for humanitarian reasons” and opted for *C. loureiroi*. It is fascinating to see behind the curtain and see how difficult it is sometimes to actually know the identity of plant products circulating in global trade, and what decisions plant taxonomists must make. This is also a good anecdote to demonstrate that for the average consumer, the primary difference between these *Cinnamomum* species are purely geographic. The reason behind the hesitation to accept cassia was presumably due to its high coumarin content, a compound that is toxic in large quantities, and therefore cassia has often been portrayed as the less healthy option (Dinesh et al., 2015).

**Note 4.4.1.** In this dissertation the word *cinnamon* usually refers to all products from the species mentioned above—both cinnamon and cassia—following the everyday common usage in language. However, where a distinction is made between *cinnamon* and *cassia*, *cinnamon* only refers to that of *C. verum*, the “true cinnamon” of Sri Lanka, and *cassia* refers to cassia of any source (China, Indonesia, Vietnam, etc.).

#### 4.4.1 The Botany, Origin, and Cultivation of Cinnamon and Cassia

The plant itself, (*C. verum*) is a medium-sized, evergreen tree in the laurel family (*Lauraceae*), with glossy leaves, small white flowers, and oblong, acorn-like fruits (van Wyk, 2014, p. 104). New trees are propagated both from seeds and cuttings, and are often multi-stemmed due to practice of *coppicing*: the chopping of younger shoots to ground level to stimulate growth. Cinnamon is indigenous to Sri Lanka. Cultivation of high-quality true cinnamon is historically important on the island of Sri Lanka, who is the main producer and exporter until this day. It is followed by Madagascar and the Seychelles with minute

amounts. Cassia (*C. cassia*) is believed to be native to the borderlands between northern Vietnam and southern China, south of the Nanling mountain range where the ethnic people used its bark as medicine and spice from “time immemorial” (S.-Y. Hu, 2005, p. 400). Some sources also mention Myanmar, but others refute this (see Haw, 2017). Cassia of various kinds is widely cultivated now in many countries and regions, including India, Indonesia, Laos, Malaysia, Taiwan, Thailand, Vietnam, and tropical and subtropical provinces on the south of China: Guangdong, Guangxi, Guizhou, and Yunnan, where it is indigenous, and Fujian, Hainan where it has been introduced to (Chennault, 2006; Ford et al., 2019). It is hard to find detailed statistics on production, because most indexes such as the *UN Food and Agriculture Organization Statistical Database (FAOSTAT)* do not differentiate between true cinnamon and cassia varieties. In any case, most of the world’s “cinnamon” is actually cassia grown on a large scale in Indonesia, Mainland China, and Vietnam. I believe that it is impossible to discuss cinnamon without including cassia as well, since the two are often interchanged—not only in discourse, but also in the shelves of stores and in kitchens around the world. Popular spice compendiums often blend information of cassia and cinnamon, or just ignore it altogether.

#### 4.4.2 The Identity of Cinnamon and Cassia

*Cinnamon* is often used as an umbrella term and includes both the true cinnamon of Sri Lanka, and cassia varieties of different origins. *Cassia* or *cassia cinnamon* is used as hypernym to refer to any cassia (sometimes explained as a lesser quality cinnamon), unless there is a need to specify the exact variety (e.g.: *Indonesian cassia*). There is a degree of perplexity between the two terms, and the material cinnamon was, and still is often confused with cassia. Evidently, the two products have a high degree of resemblance and their methods of procurement are almost identical; and so they are essentially the two main varieties of a spice product made from aromatic tree bark. Confusion in terminology also arises from the fact that while most of the European market differentiates between culinary cinnamon and cassia, North America does not. In Europe, Australia, New Zealand, and Mexico, where the higher quality—and definitely more expensive—true cinnamon is desired and preferred, sellers must indicate if the product is cinnamon or cassia. Meanwhile, United States laws (or rather the lack of certain regulations) allow for cassia to be labeled and marketed as “cinnamon”; distributors are not legally required to label their product accurately. Consequently, most of cinnamon sold in the United States is in fact cassia (Czarra, 2009, p. 124). Cassia is the main product of choice not only in the United States and Canada, but in South East Asia, and China as well, where it is a native spice (van Wyk, 2014, p. 104).

Different disciplines use varying levels of rigidity when it comes to the choice of names *cinnamon* and *cassia*. Wijesekera and Chichester (1978) consistently refers to *C. verum* as *cinnamon*, and to *C. cassia* as *cassia*, only discussing the cinnamon grown in Sri Lanka in their historical overview of the cinnamon industry, calling it “genuine” as opposed to cassia, a “substitute for cinnamon” which was flooding to London in large quantities starting from the second half of the 19<sup>th</sup> century, drastically lowering the prices for cinnamon from Ceylon (Wijesekera & Chichester, 1978). The practice of distinguishing the two as such is still commonly used and preferred among spice sellers, however

one can find studies where researchers use the name “cinnamon” as an umbrella term for several species (see Rao & Gan, 2014), and it is not uncommon in everyday language use to confound the two, especially when referring to cassia with the word *cinnamon*, as I mentioned above. The *Handbook of Herbs and Spices* (Peter, 2012) discusses cassia (and other similarly used *Cinnamomum* species under the chapter titled “Cinnamon”), indicating that even for industry professional circles, *cinnamon* is the bigger set, usually referring to all species of the genus, even if there is no botanical hierarchy between cinnamon and cassia. In short, it is customary to use the term *cinnamon* as a collective term, and only make a distinction between different kinds of cinnamon, when it is necessary.

The notion of Ceylon cinnamon being “real” and “genuine”, is apparent and could not be more obvious than in the botanical name *C. verum*, ‘true cinnamon’ in Latin, already explained. Dinesh et al. (2015) outright call cassia “the fake cinnamon” and an “avatar” of true cinnamon (which is a truly creative witticism in an Indian journal), clearly elevating cinnamon on a pedestal and treating cassia as a counterfeit version of the former. Other articles with titles, such as *Bastard Spice or Champagne of Cinnamon?* question the value of specific products and reflect our bias and tolerance toward a spice, which would be a great discussion for marketing experts (see Derkx et al., 2020). This conveniently leads us to the topic of adulteration, which I will briefly mention. Numerous academic articles explore methods to identify the botanical species from cinnamon samples, in order to verify origin and authenticate the quality of *Cinnamomum spp.* products, via analyzing chemical compounds. This unique set of methods rose from the need to expose substances (cinnamon powder, bark oil, leaf oil, etc.) in the spice industry, that are adulterated with other, cheaper, lower quality species purely for financial gain, representing an interesting interpolation of chemistry and geobotany into the spice business (see Ford et al., 2019). Even more interesting is that the confusion in terminology is evidently a problem in pharmacological experiments, as indicated by Oketch-Rabah et al. (2018).

The species prevalent in human consumption today can be seen in Table 4.14 (Kawatra & Rajagopalan, 2015), with a minor source from additional species, such as *C. tamala*. According to Ulbricht et al. (2011), true cinnamon (*C. verum*) and cassia cinnamon (*C. cassia*) are the only two species of the genus that are approved medicinal herbs. The existence of an unrelated genus named *Cassia* in the pea family (*Fabaceae*) should be noted as well to avoid confusion. This genus used to be a wastebasket taxon, now containing many ornamental flowering plants, e.g., *Cassia fistula*, commonly known as “golden shower”.

For a comprehensive account on cinnamon, cassia, and other economically important products from the genus *Cinnamomum* such as camphor, please refer to the book by Ravindran et al. (2004).

#### 4.4.3 The History of Cinnamon and Cassia

During its several thousand years history of human use across various civilizations, knowledge and understanding regarding the origins of this once highly priced product often pertained to confusion and mystery, and the uncertainty between cinnamon and cassia is just one of the reasons. While our contemporary knowledge on the various cinnamon products and their sources are quite clear, the identity of cinnamon and cassia used and described in antiquity is quite puzzling. Cinnamon has

#	taxon	common name(s)	native habitat
1	<i>C. verum</i>	cinnamon; true cinnamon; Ceylon cinnamon	Sri Lanka
2	<i>C. cassia</i>	cassia; cassia cinnamon; Chinese cinnamon	S. China
3	<i>C. burmannii</i>	Indonesian cinnamon; Batavia cinnamon; korintje	Sumatra; Java
4	<i>C. loureiroi</i>   <i>C. cassia</i>	Vietnamese cinnamon; Saigon cinnamon	Vietnam

Table 4.14 *Cinnamomum spp.* cultivated for commercial cinnamon and cassia, their common names and native regions.

been claimed to be found in pharaonic tombs of ancient Egypt (see Meyerhof and Sobhy in al-Għafikī, 1932, pp. 471, 475), and was mentioned by early Western authors, such as Herodotus, Theophrastus, Dioscorides, Strabo, and Pliny (Laufer, 1919, p. 541), and the poet Sappho. Haw (2017) suggests that the assumption that the ancient and modern products are identical is problematic, and that the cinnamon and cassia described by early Europeans were sourced from different species of aromatic barks from Africa, and—as a plant taxonomist and historian himself—gives a hint on a probable candidate. “There is no good reason to believe that cinnamon and cassia were traded to the western Indian Ocean and the Mediterranean region at any very early date.”—he writes, even if others claim the opposite, such as “The much-discussed identification of the biblical *kinnamom* as *Cinnamomum* has been clarified and confirmed by various scholars.” (M. Zohary, 1982, p. 202). In any case, cinnamon is one of the oldest of spices, its history reaches back millennia. It is mentioned in the Bible in the Old Testament, in Sanskrit texts, and early Chinese *materia medica*.

It is said that the Chinese used it as early as the 3<sup>rd</sup> millennium BC, and it reached the West in the 2<sup>nd</sup> millennium BC (Dietrich, 2004b), with evidence of Chinese poetry from the 2<sup>nd</sup> century BC (Dalby, 2000, p. 38). Archaeological discoveries from 2013 found 3000-year old cinnamaldehyde residue inside elegant flasks in a Phoenician site at Tel Dor, modern day Israel. The researchers stipulate that cinnamon was used to flavor wine, and that this could be evidence for early trade in aromatics from Southeast Asia (Namdar et al., 2013). Besides its traditional usage as a stomachic and carminative medicine, aiding digestion and promoting appetite (still popular as such), it is a popular culinary spice today (Ulbricht et al., 2011). However, this was not always the case; for example, in European antiquity cinnamon was not used in food preparation, it was rather burned like incense as an offering to the gods, sprinkled in the air as perfume, and mixed in healing decoctions and spiced wines. It has been reported by Pliny that after the death of Poppaea in 65 AD, (by the hands of?) her husband, emperor Nero, burned a year’s worth of supply of Rome’s cinnamon on his young wife’s funeral (Counts, 1996). The earliest mentions of cinnamon come from around the Mediterranean in 6<sup>th</sup> century BC. The *Exodus*, the second book of the Bible traditionally attributed to Moses, contains the following paragraph:

<sup>22</sup> The LORD spoke to Moses, <sup>23</sup> “Take the finest spices: of liquid myrrh five hundred shekels, and of sweet-smelling cinnamon half as much, that is, two hundred fifty, and two hundred fifty of aromatic cane, <sup>24</sup> and five hundred of cassia—measured by the sanctuary shekel—and a hin of olive oil, <sup>25</sup> and you shall make of these a sacred anointing

oil blended as by the perfumer; it shall be a holy anointing oil. <sup>26</sup> With it you shall anoint the tent of meeting and the ark of the covenant <sup>27</sup> and the table and all its utensils and the lampstand and its utensils and the altar of incense <sup>28</sup> and the altar of burnt offering with all its utensils and the basin with its stand; <sup>29</sup> you shall consecrate them, so that they may be most holy; whatever touches them will become holy.” (Exodus 30:22-29)<sup>60</sup>

This is a good demonstration of how important perfume and ointments were in early Judaistic rituals; while God is leading the Jews out of Egypt after the ten plagues, he methodically describes the expected sacrifices and rituals. If rightly prepared, these aromatics have the power to turn the things they touch sacred, and holy. Cassia appears in more mundane parts of the Bible as well, in the *Book of Ezekiel* the Hebrew prophet, who is attributed with the authorship of the chapter around the 6<sup>th</sup> century BC, gives his observations on the spice trade in Tyre (today on the coast of South Lebanon).

<sup>18</sup> Damascus traded with you for your abundant goods—because of your great wealth of every kind—wine of Helbon and wool of Zahar. <sup>19</sup> Vedan and Javan from Uzal[a] entered into trade for your wares; wrought iron, cassia, and sweet cane were bartered for your merchandise. (Ezekiel 27:18-20)<sup>61</sup>

In the chants of an unknown poet on a wedding addressing a royal bride, cinnamon is accompanied with myrrh and aloes(wood): “Your robes are all fragrant with myrrh and aloes and cassia [...]” (Psalm 45:8)<sup>62</sup>. This is similar to a poem about adultery showing that it was used as perfume, sprinkled on clothes and linen, emanating beauty and attracting love seekers.

<sup>17</sup> I have perfumed my bed with myrrh,  
aloes, and cinnamon.

<sup>18</sup> Come, let us take our fill of love until morning;  
let us delight ourselves with love.

<sup>19</sup> For my husband is not at home;  
he has gone on a long journey.  
(Proverbs 7:17)<sup>63</sup>

<sup>17</sup> I have perfumed my bed with myrrh,  
aloes, and cinnamon.

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he has gone on a long journey.  
(Proverbs 7:17)<sup>64</sup>

<sup>60</sup><https://www.biblegateway.com/passage/?search=Exodus+30&version=NRSVUE>

<sup>61</sup><https://www.biblegateway.com/passage/?search=Ezekiel%2027%3A18%2D20&version=NRSVUE>

<sup>62</sup><https://www.biblegateway.com/passage/?search=Psalm%2045%3A8&version=NRSVUE>

<sup>63</sup><https://www.biblegateway.com/passage/?search=Proverbs%207%3A17&version=NRSVUE>

<sup>64</sup><https://www.biblegateway.com/passage/?search=Proverbs%207%3A17&version=NRSVUE>

The Bible mentions cinnamon four times, three in the Old Testament and one in the New Testament, and cassia four times, three in the Old Testament and one in the Apocrypha. Besides the Bible, our most important source is Sappho (d. c. 570 BC), a Greek poet from Lesbos. On an imaginary Troyan wedding she writes: “[...] and everywhere through the streets... wine bowls and goblets... myrrh, cassia, and frankincense mixed together.” (Rayor & Lardinois, 2014, p. 49). Cinnamon appears in *The Histories* of Herodotus, his 430 BC magnum opus about the Persian wars, which is considered the founding work of Western historiography.

“As for cinnamon, they gather it in an even stranger way. Where it comes from and what land produces it they cannot say, except that it is reported, reasonably enough, to grow in the places where Dionysus was reared. There are great birds, it is said, that take these dry sticks which we have learned from the Phoenicians to call cinnamon and carry them off to nests stuck with mud to precipitous cliffs, where man has no means of approach. The Arabian solution to this is to cut dead oxen and asses and other beasts of burden into the largest possible pieces, then to set these near the eyries and withdraw far off. The birds then fly down (it is said) and carry the pieces of the beasts up to their nests, while these, not being able to bear the weight, break and fall down the mountain side, and then the Arabians come and gather them up. Thus is cinnamon said to be gathered, and so to come from Arabia to other lands.” (Herodotus, 430 B.C.E./1921, p. 139)<sup>65</sup>

Besides the fabulous tales regarding the procurement of cinnamon, Herodotus explains that the Greeks learned the name from the Phoenicians, and that the source of the product is from Arabia.<sup>66</sup> Theophrastus (d. c. 287 BC) mentions cinnamon but remains vague about the origins (Arabia, Syria, or India). In his *Enquiry into Plants* he included accounts of plants found outside of Greece, such as the cotton-plant, banyan, pepper, cinnamon, myrrh, and frankincense based on reports of Alexander’s followers (Theophrastus, 1916, pp. xix, 323).

Arabia was the source of cinnamon not only in ancient times, but throughout the Middle Ages as well. The Arabs used the tubular sticks as spice, as well as its leaves and unripe berries. They were familiar with its medicinal values to “strengthen the stomach, liver and spleen”, and thought it to be effective against scorpion venom (Dietrich, 2004b). Whenever the “real” cinnamon arrived to the ports of the Red Sea, it was most likely at Aden (Dietrich, 2004b), one of the most important ports after the 11<sup>th</sup> century, but already important in the trade with India in the 1<sup>st</sup> century AD in the time of the *Periplus*. Western authors doubtful of Sri Lanka’s early cinnamon enterprise often give very later dates for its export: 14<sup>th</sup> century (Dietrich, 2004b), 1770s (Alam, 1994/2011, referring to William Dymock), but we have Arabic eyewitnesses for the opposite. Buzurg ibn Shahriyār (ca. 900–953/1908, p. 126) mentioned *al-qirfat al-sahilāniya* “Sinhalese bark” on his travels. A native of Ramhormoz, north of the port of Siraf (today Iran), Buzurg ibn Shahriyār was a Persian ship captain; his *Kitāb ‘ajāib al-Hind* [*The Book of the Marvels of India*] is one of our most important sources we have on 10<sup>th</sup>-century

<sup>65</sup>Hdt. 3.11—<http://www.perseus.tufts.edu/hopper/text?doc=Hdt.+3.11&fromdoc=Perseus%3Atext%3A1999.01.0126>

<sup>66</sup>These mythical birds in Arabia are called “cinnamon gatherers” κινναμωμο-φόρος *kinnamōno-fóros* after Strabo and κινναμο-λόγος *kinnamo-lógos* after Pliny, or just simply κιννάμωμον *kinnámōmon* after Aristoteles.

Indian Ocean trade, his travels and stories also inspired the tales of Sindbad. A century before, (Ibn Khurdādhbih, ca. 870) also talks about cinnamon (*dārṣīnī*) as one of the economic products sold on the Indian Ocean route. For the Europeans, the source of cinnamon remained a mystery until the 16<sup>th</sup> century, and they had to buy it via Arab middlemen in Alexandria or elsewhere. In colonial times, the cinnamon export was so important in Sri Lanka that in the Dutch period (1602–1796), the colony's coat of arms featured three cinnamon bales, and an elephant holding a cinnamon branch (Hartemink, 1995).

For further details on the history of cinnamon, I recommend Dalby (2000)'s *Dangerous Tastes*.

#### 4.4.4 The Names of Cinnamon and Cassia

English

<sup>a</sup>OUP (n.d., s.v. *cinnamon*); TLFi (2012); C. T. Lewis and Short (1879); Beekes and van Beek (2010, p. 701); Klein (1987, p. 585); Rosól (2018)

*Cinnamom*, or more accurately one its countless Middle English spelling variants among *sinamome* or *cynamom*, were first attested in the 15<sup>th</sup> century (ca. 1430), and became relatively more frequent in the following 16<sup>th</sup> century.<sup>67</sup> It can be traced back to Ancient Greek and Hebrew with certainty, but not further. According to the OED, the English term was loaned from French *cinnamome* (attested in the 13<sup>th</sup> century as *cynnamome*)<sup>68</sup>, which comes from Latin *cinnamōmum*. The Latin word is a direct borrowing from the Greek κιννάμωμον *kinnámōmon* (since 5<sup>th</sup> century BC), which is in turn a Semitic loanword. According to Beekes and van Beek (2010, p. 701), (who is citing Herodotus), the Greek word comes from Phoenician. Herodotus wrote in the 3<sup>rd</sup> century BC that the word *kinnámōmon* was “taught” to the Greeks by the Phoenicians (Herodotus, 430 B.C.E./1921, p. 139)<sup>69</sup>, a Canaanite Semitic speaking seafaring people, originally from the Eastern Mediterranean, roughly around today’s Lebanon. According to Klein (1987, p. 585) however, the Greek is a loanword from Hebrew, and he observes that this word seems to be “of foreign origin”. Indeed, the Semitic root system does not support this type of native word form, but we have no further attestation to the origins of this word. Besides Biblical Hebrew קִנְמֹן *qinnāmōn*, Semitic cognates are also attested in Judeo-Aramaic *qnmn/qnmwn* Samaritan Aramaic *qynmwn* and Syriac *qūnnāmā* (Rosol, 2018). The alteration of the

<sup>67</sup>OUP, n.d., s.v. cinnamon.

<sup>68</sup> *Trésor de la Langue Francaise informatisé (TLFi)*—<https://www.cnrtl.fr/etymologie/cinnamome>

<sup>69</sup> Hdt. 3.111—<http://www.perseus.tufts.edu/hopper/text?doc=Hdt.+3.111&fromdoc=Perseus%3Atext%3A1999.01.0126>

Greek word ending (*kinnámōnon* > *kinnámōmon*) is probably due to folk-etymology, modelled after the phytonym ἄμωμον *ámōmon* ‘a spice plant’ (Beekes & van Beek, 2010; Klein, 1987).

*Amomum* is an spice of uncertain identity, featured in the writings of European antiquity but cannot be positively matched today. I have briefly introduced amomum in Section 4.3, explaining that it most probably refers to black cardamom. Appearing in Pliny’s *Natural History*, it is “an aromatic shrub, from which the Romans prepared a costly, fragrant balsam”<sup>70</sup> and for the Greeks it denoted an Indian spice-plant: “Nepaul cardamom”.<sup>71</sup> This brings us is one of the popular theories one may find when searching for the origins and explanations of the word *cinnamon*, that it is made up of the combination of Κίνα *Kína* ‘China’ + ἄμωμον *ámōmon* ‘amomum’, as in ‘Chinese amomum’. This is somewhat analogous with the plant’s Persian name *dârcin* ‘cinnamon’ (lit. ‘Chinese tree’), which is a *Wanderwort* that have spread far and wide from South and Central Asia to the Balkans.

Another—seemingly rather far-fetched—theory is the presumed relatedness to Malay *kayu manis* ‘cinnamon’, (lit. ‘sweet wood’). Even a Google search for the etymology of cinnamon powered by Oxford Languages data does return Malay as possible etymon. This speculation (probably on the account of a similar consonant sequence) seemed to gain some traction with a reference work of Biblical Hebrew and Aramaic titled *A Hebrew and English Lexicon of the Old Testament*, commonly known as the Brown–Driver–Briggs (see Brown et al., 1906/1939, p. 890)<sup>72</sup>. “Prob. foreign wd., coming with the thing from remote E[ast]; cp. with Malay *kainamanis* by Röd, *kāyū mān̄s* Lewi [...]”—says the old dictionary guiding the reader further down the rabbit hole. As I mentioned above, cinnamon is attested in the Old Testament in three places<sup>73</sup>, among other spices, incense, and perfumes. I think the logic of the authors lay in that cinnamon was thought to be imported to the Middle East at the earliest of times from East Asia, and that if anyone could afford exotic spices coming through the hands of early Babylonian and Malay traders, King Solomon—who is considered to be the author of several Biblical books—must be one. To sum up, we have no way of knowing *cinnamon*’s origins for certain prior to Hebrew, only speculations.

Besides *kinnámōmon*, there is also κίνναμον *kínnamon* in Greek, a later, more rare form of the former, appearing first in the writings of Pliny. The current English form is in part derived from the Latin versions *cinnamum/cinnamon* refashioned after this.<sup>74</sup>.

**Etymology 17.** English *cassia*, ca. 1000 < Latin *casia* ‘id.’, 1<sup>st</sup> c. AD < Ancient Greek κασία *kasía* ‘id.’, 6<sup>th</sup> c. BC < Ancient Hebrew קָשֵׁשׁ *qəš̄š* ‘a bark resembling cinnamon, but less aromatic, so called from being stripped off’, from *qaš̄* ‘to cut off, strip off bark’ (hapax legomenon in the Bible; Ps. 45:9)<sup>75</sup>

<sup>70</sup>OUP (n.d., s.v. *cassia*); Rosól (2018); Beekes and van Beek (2010, p. 653); Klein (1987, p. 589)

<sup>71</sup>C. T. Lewis and Short, 1879, *amomum*.

<sup>72</sup>Liddell and Scott, 1843/1940, ἄμωμον.

<sup>73</sup>BDB—<https://mg.alhatorah.org/Dictionary/7076>

<sup>74</sup>Exodus 30:23; Proverbs 7:17; Song of Songs 4:14—<https://www.biblegateway.com/quicksearch/?quicksearch=cinnamon&version=NRSVUE>

<sup>75</sup>Hoad, 2003, *cinnamon*.

The English word *cassia*, similarly to *cinnamon*, goes back to Latin. *Casia* (rarely *cassia*) is a direct borrowing from Greek κασία *kasía*, occasionally with double sigma: κασσία *kassía*.<sup>75</sup> The Greek word, appearing first in Herodotus's writings, once again is “an oriental loanword” and often explained as ‘wild cinnamon’, comparable to Hebrew קָשֵׁׂׂא *qəšî̄â* and “Assyrian” *kasîa* (Beekes & van Beek, 2010, p. 653). Although Beekes and van Beek (2010) indicates that the word originally is Austro-Asiatic, there is no further elaboration there, and according to Welles (1934, p. 342) it is a Semitic loan-word. This conforms with the current popular theory that the source of the Greek term is the Hebrew word *qəšî̄â*, literally meaning ‘peel’ i.e., “the peel of the plant, which is scraped off the tree” (Klein, 1987, p. 589). *Qəšî̄â* derives from the root *q-s-*, this Semitic root means “to cut, cut off; to scrape”, which clearly refers to the procurement of this spice, the peeling off the tree bark (Klein, 1987).<sup>76</sup> Not everyone subscribes to this inherited Semitic word theory, and there were wild speculations that the Biblical Hebrew word is a loan from Chinese 桂枝 *guìzhī* or 桂子 *guìzǐ* (which were not attested until the 11<sup>th</sup> and 14<sup>th</sup> centuries (Noonan, 2019, p. 197)). This words is a hapax legomenon in the Hebrew Bible, it occurs only once<sup>77</sup> in the plural form (*qəšî̄ōt*), mentioned in connection with myrrh and aloes, being used to perfume garments. It was probably prepared from the peeled bark of some cassia-like plant, as the Hebrew word suggests. (Noonan, 2019, p. 196) is sure that the cassia in the Bible is a spice from Arabia or Ethiopia, and not the cassia of today, trusting classical authors and citing that it appears with other Red Sea products such as myrrh, ivory, and the port of Ophir. He also thinks, that this word has to be a loanword from a language in this region. Although a hapax legomenon according to Klein (1987), *qəšî̄â* also appears in Job 42:14 as a feminine proper name rendered usually as Keziah in English, who is the second daughter of Job (probably named after the fragrant spice tree). If we search English translations of the Bible, we can find three occurrences of ‘cassia’ as an aromatic substance —in agreement with The Septuagint (Greek Old Testament)—however, two of these (Ex. 30:24; Ezek. 27:19) are translated from the word קִדְדָּה *qidddah*, “of uncertain origin; prob. a foreign word”—writes Klein<sup>78</sup>. In the *Encyclopedia Judaica* (EJ), the tree kinds of cinnamon are identified in the Bible and Talmudic literature, according to the followings: (1) Cinnamon, Ceylonese; *Cinnamomum zeylanicum* [sic]; קִדְדָּה aromatic tropical spice tree; Ex. 30:23; Prov. 7:17, et al. (2) Cinnamon, Chinese; *Cinnamomum cassia* [sic]; קִדְדָּה aromatic tropical spice tree; Ex. 30:24; Ezek. 27:19. (3) Cinnamon, Indo-Chinese; *Cinnamomum laurei* [sic]; קִדְדָּה aromatic tropical spice tree; Ps. 45:9 (Feliks, 2007, vol. 16, p. 221).

Both words spread in Europe significantly via Latin, and especially with the spread of Christianity, through Medieval Latin. Words for cinnamon and cassia (cf. Musselman, 2012, p. 38) might be one of the few spice names that have spread to places where the spice itself have not reached yet. For example, *cassia* is attested in Old English and Middle English, but was not naturalized until the 16<sup>th</sup>

<sup>75</sup>OUP, n.d., s.v. *cassia*.

<sup>76</sup>Cognates are Aramaic קִטְּרָה *qtî̄*, and Arabic قَطْرَة *qaṭra'*

<sup>77</sup>Ps. 45:8—<https://www.biblegateway.com/passage/?search=Psalm%2045%3A8&version=NRSVUE>

<sup>78</sup>In Easton's Bible Dictionary: “*qidddah*’, i.e., ‘split’. One of the principal spices of the holy anointing oil (Ex. 30:24), and an article of commerce (Ezek. 27:19). It is the inner bark of a tree resembling the cinnamon (q.v.), the *Cinnamomum cassia* of botanists, and was probably imported from India.”—<https://www.blueletterbible.org/search/dictionary/viewtopic.cfm?topic=EToooo734>

century.<sup>79</sup>.

English names are concerned with two things regarding cinnamon: place of origin, and genuineness. Sometimes the *semantics* of these two overlap, especially if one is familiar with the qualities and grades associated with the source of the cinnamon. For those who know what these epithets actually mean, *Chinese cinnamon* should signify the same thing as *bastard cinnamon*, and *Ceylon cinnamon* is the same as *true cinnamon*. For the rest, all these names would just fall in the category of culinary cinnamon, and they can only infer further information from the meaning of the distinguishing words (*true*, *Ceylon*, *bastard*, *Chinese*, etc.). The phrase *bastard cinnamon* is not in frequent daily use anymore, but at some point it was important enough to explain it in dictionaries.<sup>80</sup> Attested in 1678, it was inspired by French <sup>†</sup>*cannelle bastarde*<sup>81</sup>, and was born during an English translation of a travelogue.

“After the Dutch had disposses’d the Portugals of whatever they had in Ceylan, they cast their eyes upon Cochin, in the Territories whereof grows the Bastard Cinnamon, which hinder’d the utterance<sup>82</sup> of Ceylan Cinnamon.” (Tavernier, 1678, p. 88)

As the quote shows, the phrase *bastard cinnamon*’s sole role is to stand opposed to *Ceylon/true cinnamon*, and if we think about the European maritime powers vying for power at this time, this dysphemism could be regarded as a negative marketing strategy as well; whoever owned Ceylon and the trade in *real* cinnamon, did not want others to have an attractive alternative supply from around the corner.

#	Species	Name	Source
1	<i>Cinnamomum burmannii</i>	Batavia cassia	van Wyk (2014)
2	<i>Cinnamomum burmannii</i>	Indonesian cassia	van Wyk (2014)
3	<i>Cinnamomum burmannii</i>	Korintje cassia	van Wyk (2014)
4	<i>Cinnamomum burmannii</i>	Padang cassia	van Wyk (2014)
5	<i>Cinnamomum cassia</i>	bastard cinnamon	OUP (n.d.)
6	<i>Cinnamomum cassia</i>	cassia	van Wyk (2014)
7	<i>Cinnamomum cassia</i>	Cassia cinnamon	Peter (2012)
8	<i>Cinnamomum cassia</i>	Chinese cassia	van Wyk (2014)
9	<i>Cinnamomum cassia</i>	Chinese cinnamon	van Wyk (2014)
10	<i>Cinnamomum loureiroi</i> ; <i>C. cassia</i>	Saigon cinnamon	van Wyk (2014)
11	<i>Cinnamomum loureiroi</i> ; <i>C. cassia</i>	Vietnamese cassia	van Wyk (2014)
12	<i>Cinnamomum tamala</i>	Indian bark	van Wyk (2014)
13	<i>Cinnamomum tamala</i>	Indian cassia	Peter (2012)
14	<i>Cinnamomum verum</i>	Ceylon cinnamon	van Wyk (2014)
15	<i>Cinnamomum verum</i>	cinnamon	van Wyk (2014)
16	<i>Cinnamomum verum</i>	true cinnamon	van Wyk (2014)

Table 4.15 Various names for cinnamon in English.

<sup>79</sup>Hoad, 2003, cassia.

<sup>80</sup>cf. OUP, n.d., bastard cinnamon.

<sup>81</sup>Coined in 1605 or before; now *cannelle bâtarde*

<sup>82</sup>The word *utterance*’s now obsolete meaning was: “the disposal of goods, commodities, etc., by sale or barter”

Arabic

**Etymology 18.** Arabic *qirfa* ‘cinnamon’ [bark, rind], from *qarafa* ‘to peel, bark, derind’; Semitic root q-r-f (related to root q-l-f); cf. Amharic *kerefe*<sup>a</sup>

<sup>a</sup>Wehr (1976, p. 888) and Leslau (1991, p. 427)

In Modern Standard Arabic, cinnamon is known as قرفة *qirfa*, literally ‘rind, bark’.<sup>83</sup> *Qirfa* is not a modern word though, thanks to literary Arabic’s rigid resistance to change, we can easily recognize cognates from the times of Classical Arabic and even before; e.g., Classical Syriac ܩܠܦܬ *qlāptā* ‘bark, peel, Hebrew קָלִיפָה *qalippā* ‘id.’, and many others (see Leslau, 1991, p. 427). When Herodotus mentioned cinnamon in his story with the giant cinnamon gatherer birds of Arabia (<http://www.perseus.tufts.edu/hopper/text?doc=Hdt.+3.111&fromdoc=Perseus%3Atext%3A1999.01.0126>), he used the word κάρφος *kárphos* ‘dry stalk, dry sticks of cinnamon; twigs that birds use to build a nest’.<sup>84</sup> There is some speculation that this Greek word is a Semitic loan as well, but this is unfounded, and Beekes and van Beek (2010) stays silent on the matter; the related *kárō* ‘to dry’ seems to be of Pre-Greek origin. The wildest fantasies I came across tried to connect this word with a Dravidian etymon, musing that this Semitic word might be a loanword from Tamil கருவா *karuvā* ‘cinnamon’. But, the fact that the early Semitic root related to the concept of peeling is attested in several languages strongly goes against any idea of borrowing in this case. In the *Lisān al-‘Arab*, *al-qirfa* is defined as *dawā ma‘rūf* ‘a well-known drug/medicine’.<sup>85</sup>

**Etymology 19.** Arabic *dārṣinī* ‘cinnamon’ < Persian *dārčīnī* ‘cinnamon’ [Chinese wood], from Persian *dār* ‘wood’ + *cīn* ‘China’; cf. cognates Sanskrit *dāru* (PIE \*dóru) < Pahlavi \*dār ī čēnīg \**dār i čēnīq* ‘cinnamon’, (cf. Armenian *daričenik*)<sup>a</sup>

<sup>a</sup>Wehr (1976, p. 311); Dietrich (2004b); Alam (1994/2011)

In Classical Arabic literature however, one can find another names for cinnamon, and the most important of those is دارصيني *dārṣīnī* or دارچين *dār ṣīnī*, a loanword from Persian *dārčīnī*, (or دارچين *dār-i chīn*), literally meaning ‘Chinese wood’, seemingly referring to Chinese cinnamon. In Persian, *dār* is ‘tree; wood’<sup>86</sup>, while *chīn* is ‘China’—arriving via Middle Persian *chīn*, via Sanskrit چीن *cīna*, likely originating from Old Chinese 秦 /*\*zin/*, after the Qin dynasty of ancient China. The latter half or *dārčīnī* went through Arabicization, rendering it *sīn* in Arabic.<sup>87</sup> The *-ī* suffix makes the

<sup>83</sup>From *qarafa* ‘to peel, bark, derind’ (Wehr, 1976, s.v. *qarafa*); doublet of *qilf* and *qulāfa* ‘bark, rind’, from *qalafa* ‘to strip the bark of a tree’.

<sup>84</sup>Liddell and Scott, 1843/1940, s.v. κάρφεα.

<sup>85</sup>Ibn Manzūr, 1200/1079, 3500.

TDI Manžú

<sup>87</sup>There is no /tʃ/ sound in Standard Arabic.

adjective: ‘Chinese’.

As a loanword in Arabic, the word *dārṣīnī* must have been confusing for some people, and less confusing for others. After the eastward expansion of the Abbasid Caliphate consolidated, it was not uncommon for native Persian scholars to work and write in Arabic. One Persian bureaucrat and postmaster, Ibn Khurdādhbih (ca. 870, p. 71), writing in the 9<sup>th</sup> century in his *Kitāb Al-Masālik Wa l-Mamālik*, mentions *dārṣīnī*, as one of the many products that are shipped to *al-Sīlā* [Korea] from other parts of East Asia.<sup>88</sup> He does not give any explanation on the name, in fact *dārṣīnī* is one of the least confusing ones, which might indicate that for a Persian speaker, the meaning was trivial. On the other hand, Abū Ḥanīfah al-Dīnawarī (d. 895), a Persian polymath also writing in Arabic mentions *dārṣīnī* in his *Book of Plants*, but he is quite confused about the term *ṣīnī*, and associates with another (unidentified) drug called *ṣīnīn* (ad-Dīnawarī, 1974, p. 210). According to the EI2 Ishāk b. Sulaymān al-Isrā'īlī (d. 955), a scholar from Egypt was the first to acknowledge that *dārṣīnī* comes from China.

**Etymology 20.** Arabic سليخة *salīkhā* ‘cinnamon bark; cassia bark’ [peeled off, stripped off], from *salakha* ‘to pull off, strip off; skin, flay’; Semitic root *s-l-kh*; cf. cognates \*<sup>a</sup>

<sup>a</sup>Wehr (1976, p. 491)

Medieval Arabic pharmacognostic literature always makes a distinction between *dārṣīnī* and another substance, سليخة *salīkhā*<sup>89</sup>, a term that has been associated with cassia (*C. cassia*) from early texts until today.

If *dārṣīnī* and *salīkhā* are not identical, *dārṣīnī* must be a cinnamon from another source. Could it be the cinnamon from Sri Lanka? Documents from the Cairo Geniza show that Arab traders have purchased cinnamon from Ceylon in rather large quantities (sixty bags, each bag 100 pounds) in around 1140, calling it *qirfa sīlī* ‘Ceylon(?) cinnamon’ (Goitein & Friedman, 2008, p. 375) and we can presume it was the local product. I agree with Dietrich (2004b)’s opinion that the identity of the plant source “cannot be established with certainty”. Lev and Amar (2008, pp. 143–144) suggested that the three terms were used interchangeably, but in general *dārṣīnī* referred to both Ceylon cinnamon and Chinese cassia, whereas *qirfa* was Ceylon cinnamon, and *salīkhā* was Chinese cassia. This could be close to the truth, but I would like to entertain Haw (2017)’s theory as well, who is convinced that “*salīkhā* really refers to the genus *Cassia*”, and to the Chinese cassia, and that Herodotus, Theophrastus and Pliny were right when writing about ancient “cinnamon” coming from Africa, which Haw identifies with *Cassia abbreviata*, a tree native to East and South Africa.

The other problem is that according to our current understanding, Ceylon cinnamon was not exported from the island until a quite late date, “hardly before the 14<sup>th</sup> century” (Dietrich, 2004b), which agrees with the problems raised by Haw (2017). This sheds a cloud of uncertainty on every claim that ancient cinnamon mentioned by Greeks, Romans, and Arabs is the same as the cinnamon from

<sup>88</sup>Also transcribed as Ibn Khordadbeh, he is the first Western author that mentioned Korea.

<sup>89</sup>From *salakha* ‘to pull off, strip off; skin, flay’, after the method of peeling off a tree’s skin; <http://www.semiticroots.net/index.php?r=root/view&id=387>

Ceylon, and that what the Arabs knew and used early on were cinnamon from Asia or something else.

In the writings of Dioscorides from the 1<sup>st</sup> century AD, both classes of κινάμωμον *kinámōmon* and κασ(σ)ία *kas(s)ía* rind are listed, but he fails to mention their source (A'lām, 1994/2011). Muslim writers translating the Greek works from the 9<sup>th</sup> century rendered the classes as *dārṣīnī* and *salīkha* (A'lām, 1994/2011). Figure 4.11 shows a folio from a Greco-Islamic pharmacopoeia, where the heading right under the red stroke says: قينامامون وهو الدارصيني *qīnāmāmūn wa-huwa l-dārṣīnī* ‘*Kīnāmāmon*, which is cinnamon’, shows that Arabic translators transcribed the Greek names for herbal remedies, even when they had their own terminology. The Islamicate scholarly world of scholars were closely familiar with the Greek works, *dārṣīnī* seems to have indicated the same category as Greek *kinnámōmon*, and they knew a “whole range of kinds” of it.<sup>90</sup> Ibn al-Bayṭār (d. 1248), an Andalusian Arab physician, pharmacist, and botanist heavily relying on the writings of Dioscorides and Galen, listed the different kinds of cinnamon known under the category of *dārṣīnī* in his *Mufradāt*, citing Ishaq b. Sulaymān (Ibn al-Bayṭār, ca. 1248/1874, vol. I/2, p. 83, *dārṣīnī*). Dietrich (2004b) introduces these products listed by Ibn al-Bayṭār: Chinese cinnamon *dārṣīnī al-ṣīn* lit. ‘Chinese wood of China’, an inferior kind called *dārṣīs*, the “real cinnamon rind” *al-qirfa* ‘*alā l-haqīqa*, the “clove-rind” *qirfat al-qurunful* [sic], the “pungent cinnamon” *al-hadd al-madhāq* lit. ‘the sharp of taste’, etc. The term *dārṣīnī* still exists in the Arabic scientific name for the genus *Cinnamomum*, and as a colloquial term without an emphatic /s/; *dārṣīn* (دارسين) in some Khalījī (Gulf) Arabic dialects, where the Persian influence was always strong.

According to (A'lām, 1994/2011), some modern scholars have implied that ancient societies sourced their cinnamon from China overland, due to the interpretation of the name, but citing Laufer (1919)'s *Sino-Iranica*, there is no Sinological evidence to support this. I agree with the author here that if cinnamon came from Asia, it must have arrived via the sea trade with South India and Lanka. Yūḥannā bin Māsūya (d. 955), a contemporary of al-Isrā'ili, mentioned three kinds of *qirfa*: *qirfat al-qarunful*, the best; *qirfa* that smelled like camphor; and *qirfa* that smelled like *dārṣīnī* (A'lām, 1994/2011).

Arabic names shown in Table 4.16, similarly to English, focus geographical origin and genuineness, but also quality and grade. This shows us two things. First, people who were part of the spice trade and had some knowledge on it were also concerned about the source of the *real* cinnamon, not only the Europeans were actively trying to *go* and find it some centuries later. Second, there must have been several sources of “cinnamon”. It is not a secret that Arabia and neighboring East Africa had aromatic trees and shrubs, just think of myrrh and frankincense. It is not an impossible idea that words such as *qirfa* and *salīkha*—which literally meant ‘rind’ or ‘bark’ were sourced locally/regionally, and these terms were also applied to similar products arriving from Southeast Asia. As for *dārṣīnī*, it is without a doubt an eastern product. Terms, such as *dārṣīnī al-ṣīn* [*dārṣīnī* of China/Chinese *dārṣīnī*] also indicate that it was a category, rather than a specific kind of product.

## Chinese

The Chinese language does not have two different words for cinnamon and cassia, the term 肉桂 *ròuguì* [flesh-cinnamon] is used, referring to the ‘cassia bark’ of *C. cassia*, often just called “Chinese

<sup>90</sup>For more on the Arabic transmission of Dioscorides's *Materia medica*, see Gutas (2012)

#	Species	Name	Tr.	Gloss	Source
1	<i>Cinnamomum cassia</i>	دارصيني الدون	<i>dārṣīnī al-dūn</i>	inferior cinnamon	
2	<i>Cinnamomum cassia</i>	قرفة صينية	<i>qirfa ṣīnīyya</i>	Chinese bark	Wikipedia (n.d.)
3	<i>Cinnamomum cassia</i>	سليخة	<i>salīkhā</i>	peel, strip	Wehr (1976)
4	<i>Cinnamomum spp.</i>	الحاد المذاق	<i>al-hādd al-madhāq</i>	the sharp taste	Dietrich (2004b)
5	<i>Cinnamomum spp.</i>	دارصيني	<i>dārṣīnī</i>	Chinese wood	Dietrich (2004b)
6	<i>Cinnamomum spp.</i>	دارصيني الصين	<i>dārṣīnī al-ṣīn</i>	Chinese wood of China	Dietrich (2004b)
7	<i>Cinnamomum spp.</i>	قرفة	<i>qirfa</i>	bark, rind	Wehr (1976)
8	<i>Cinnamomum spp.</i>	قرفة القرنفل	<i>qirfat al-qurunful</i>	the bark of clove	Dietrich (2004b)
9	<i>Cinnamomum verum</i>	الدارصيني على الحقيقة	<i>al-dārṣīnī ‘alā l-ḥaqīqa</i>	the real darsini	Dietrich (2004b)
10	<i>Cinnamomum verum</i>	القرفة على الحقيقة	<i>al-qirfa ‘alā l-ḥaqīqa</i>	the real bark	Dietrich (2004b)
11	<i>Cinnamomum verum</i>	القرفة الأصلية	<i>al-qirfat al-aṣliyya</i>	the original bark	Wikipedia (n.d.)
12	<i>Cinnamomum verum</i>	القرفة السهيلانية	<i>al-qirfat al-sihilāniyya</i>	Sinhalese bark	A'lām (1994/2011)

Table 4.16 Various names for cinnamon in Arabic.

cinnamon” in English. Furthermore, one can come across 桂皮 *guǐpí* [cinnamon-skin] ‘id.’, and S.-Y. Hu (2005, p. 399) also lists 官桂 *guānguì* [official-cinnamon] ‘id.’. The latter makes sense if we imagine the resemblance of the curled barks of cinnamon to the written scrolls of the officials (see Zhang & Unschuld, 2015, p. 732). 桂心 *guǐxīn* [cinnamon-heart] ‘id.’ refers to the inner bark specifically.<sup>91</sup> Hu calls all these products—native to the mountainous regions of Vietnam and China borderlands—*cassia*, and she reiterates the notion introduced by (Ravindran et al., 2004), that Vietnamese and Chinese *cassia* is the same, explaining that those that are exported from Saigon are called *Saigon cinnamon* in English, while the others transported to the south to Guangzhou and Hong Kong “have the trade name *cassia*” (S.-Y. Hu, 2005, p. 400). There is also 桂枝 *guǐzhī* [cassia-branches] ‘cassia twigs’, which is a particular kind of cinnamon product unique to TCM, made up of the chopped up young branches of the cassia tree, and 桂子 *guǐzǐ* [cassia-seeds] ‘cassia buds’ referring to the fruits. As for the other cinnamon products found outside of China, medicinal products from *C. burmannii* (root, bark, leaf), are called 隅香 *yīnxīāng* [yin-spice]<sup>92</sup> (S.-y. Hu, 1980/1999, p. 179). If Sri Lankan cinnamon must be expressed, 锡蘭肉桂 *xīlánròugui* ‘Ceylon cinnamon’ is applicable,

In historical texts the character 桂 *guǐ*<sup>93</sup> referred to cinnamon/cassia. The Sinogram of *guǐ*, *Old Chinese* (OC) /\*kʷe:s/, is a phono-semantic compound made up of semantic 木 ‘tree’ + phonetic 圭 OC /\*kʷe:/-. The first instance we are able to find in the corpus available in the CTP of *guǐ* is in the *Liji*, from the Warring States period (5<sup>th</sup> c.–221 BC):

曾子曰：「喪有疾，食肉飲酒，必有草木之滋焉。以為姜桂之謂也。」

<sup>91</sup>In case of some cassia varieties, the outer barks could be used as well.

<sup>92</sup>From the feminine, dark, “negative” half of the yin and yang concept.

<sup>93</sup>Sturgeon, 2021, s.v. 桂.

Zeng-zi said, ‘When one during his mourning rites falls ill, and has to eat meat and drink spirits, there must be added the strengthening flavours from vegetables and trees;’ meaning thereby ginger and cinnamon.<sup>94</sup>

Here too, we must be careful when identifying plants and plant products, because *guì* can also be the sweet-scented osmanthus. In the past, *guì* marked both cinnamon species from the laurel family (*Lauraceae*), and sweet osmanthus (from Greek *osme* ‘fragrant’ and *anthos*, ‘flower’), a fragrant flowering bush with tiny white flowers common all around East and mainland Southeast Asia, frequently found in city parks. *Osmannthus fragrans* Lour.)—also called “sweet olive” and “tea olive” in English—is a species in the olive family *Oleaceae* (Pearlstine, 2022, p. 191), and today it is referred to as 桂花 *guìhuā* [osmanthus-flower] to make a distinction. The synonym 木犀 *mùxi* is said to come from the similarity of the bark’s striations and the rhinoceros’s horn (Chennault, 2006); another name is 九里香 *jǐlǐxiāng*, lit. ‘fragrant-for-nine-li’<sup>95</sup>. Chennault (2006) uses reasoning along botanical lines, to find out if a line is about cinnamon or osmanthus. For example, if the *guì*-wood is used for temple-building, it must be cinnamon (osmanthus is a shrub, less suitable for construction); if the verse talks about the scent of white or red flowers, it is likely to concern osmanthus (only the bark and leaves are aromatic in case of cinnamon, and cinnamon flowers are always white as opposed to osmanthus, where some varieties have orange/reddish flowers). *Osmannthus* is used to season tea and it is an ingredient in pastries. An alcoholic beverage called *guìhua* liquor also uses osmanthus tincture to flavor rice gin (S.-Y. Hu, 2005, p. 627). *Osmannthus* flower is important in Chinese culture—from legends, in poetry, and as a Buddhist symbol—and it is associated with the Mid-autumn Festival. Chennault (2006)’s essay on the identity of *guì* explores the use of *guì* in traditional—especially Buddhist—poetry, and clears the confusion between cinnamon and osmanthus in a Chinese literary context. The character 桂 *guì* appears in the *Shuowen Jiezi* and *Kangxi Zidian* dictionaries, as well as the *BCGM*, where it has been identified as *Cinnamomum cassia* (Zhang & Unschuld, 2015, p. 732).

Chinese names are concerned with plant parts first and foremost. Even the modern Chinese distinction between the two basic meanings of *guì* (cinnamon/cassia and osmanthus) happens with the addition of other Chinese characters referring to the *guì*’s meat or flesh (also used for fruit pulp) if it is cinnamon, or its flower if it is osmanthus. As a native spice of China, we will not find loanwords for cinnamon.

## Summary

To summarize, the two English quintessential names that cannot be broken down into further parts in English—*cinnamon* and *cassia*—are both loanwords arriving on similar pathways, and also *Wanderwörter*. From the three Arabic words that play an important role here, two—*qirfa* and *salikha*—are native Semitic words, while *dārṣīnī* is a borrowing from Persian, which is the source language for many languages borrowing the name for cinnamon. As for Chinese, *guì* is the original Sinogram for cinnamon, and all further words are compounded with this character. In Table 4.18, I listed the names

<sup>94</sup> CTP—<https://ctext.org/pre-qin-and-han?searchu=%E6%A1%82>; translations from James Legge

<sup>95</sup> *Li* is an ancient measure of length, approximately equal to 500 meters.

#	Species	Name	Tr.	Gloss	Source
1	<i>Cinnamomum cassia</i>	桂	guì	cassia	DeFrancis (2003)
2	<i>Cinnamomum cassia</i>	桂皮	guìpí	cassia-skin	DeFrancis (2003)
3	<i>Cinnamomum cassia</i>	桂心	guìxīn	cassia-heart	S.-Y. Hu (2005)
4	<i>Cinnamomum cassia</i>	桂枝	guìzhī	cassia-branches	S.-Y. Hu (2005)
5	<i>Cinnamomum cassia</i>	桂子	guìzǐ	cassia-seeds	DeFrancis (2003)
6	<i>Cinnamomum cassia</i>	官桂	guānguì	official-cassia	S.-Y. Hu (2005)
7	<i>Cinnamomum cassia</i>	肉桂	ròuguì	flesh-cassia	S.-Y. Hu (2005)
8	<i>Cinnamomum verum</i>	錫蘭肉桂	xīlán ròuguì	Ceylon-flesh-cinnamon	Wikipedia (n.d.)

Table 4.17 Various names for cinnamon in Chinese.

#	Language	Term	Gloss	Loan	Source
1	English	<i>bastard cinnamon</i>		yes	OUP (n.d.)
2	English	<i>cassia</i>		yes	OUP (n.d.)
3	English	<i>cinnamon</i>		yes	OUP (n.d.)
1	Arabic	<i>salīkha</i>	peel, strip	no	Wehr (1976)
2	Arabic	<i>dārṣīnī</i>	Chinese wood	yes	Wehr (1976)
3	Arabic	<i>qirfa</i>	bark, rind	no	Wehr (1976)
1	Chinese	guì	cassia	no	DeFrancis (2003)
2	Chinese	guìpí	cassia-skin	no	DeFrancis (2003)
3	Chinese	guìzhī	cassia-branches	no	DeFrancis (2003)
4	Chinese	guìzǐ	cassia-seeds	no	DeFrancis (2003)
5	Chinese	ròuguì	flesh-cassia	no	DeFrancis (2003)

Table 4.18 Conventionalized names for cinnamon in English, Arabic, and Chinese, found in dictionaries.

that appear in modern dictionaries. One thing to notice here is that the further we are to the source of cinnamon and cassia geographically, the more likely it is for the name to be a loanword.

#### 4.4.5 The Contemporary Distribution of Spice Terms: The Case of Cinnamon

This section aims to give an overview on the terminology used by various languages when referring to cinnamon. These words are connected to the spread of material culture, and a (not-so) specific plant product used and coveted for its aroma, used as spice and medicine. Known by humans for millennia, cinnamon is now present essentially on a global scale, and by exploring its names in multiple languages, we can reconstruct its linguistic genealogy. These results also tell a story; they tell us an account on the linguistic history of *cinnamonic* words, their origins, diffusion, and ultimately, the story of cinnamon. We can infer information on the trade routes and the peoples who transmitted it, and identify the cultures that used and diffused knowledge on it.

To those of us who interested in the spread of words, especially *Wanderwörter* and their underlying cultural, historical, and geo-political significance, the map of tea might come to mind. This is a map

that shows the journey of words for tea (either from Sinitic *cha* or Minnan *te*), and their distribution in a sample of the world's languages. The point of this map is that it clearly shows if the name for tea arrived by overland trade or via a sea route. This peculiar phenomenon is a feature on its own (138A) in [WALS](#), and have been described in a chapter by Dahl (2013).<sup>96</sup> Discussions and maps of the land vs. sea distribution of tea terminology have since made it into popular science magazines and articles, made rounds on Twitter, and hence relatively well known.<sup>97</sup> On a more scientific note, the distribution of tea words are discussed in detail by (Mair & Hoh, 2009, pp. 261–270) in an appendix titled *A Genealogy of Words for Tea*, with including a discussion on historical phonology.

Cinnamon as a spice is relatively common around the world, and the history of its diffusion goes back to thousands of years, with words attested as early as the Bible itself, as it was discussed in Section 4.4. This is in contrast with the story of tea, in the sense that the international spread of tea is a relatively recent process in the economic history of plant products and colonial powers, and so we have a much clearer picture on the exact ways it was transmitted. Although tea-drinking in its homeland was practiced from time immemorial, and trade allowed it to spread regionally on networks, such as the Tea Horse Road, its present global domination is a result of 17<sup>th</sup>-century European fascination and large scale shipping. While the tea map illustrates the long haul trade connections of the time, such as those between Europe and the Far East, the map of cinnamon shows traces of an older, more gradual spread that happened in stages, outlining a more geographically contiguous development, and incremental trade networks. The propagation of cinnamonic [Wanderwörter](#) mirrors the historical processes, and just as the story of cinnamon, the words' origins are sometimes obscured by the sheer time-depth that is covered.

## Methods

Informative geospatial visualizations such as Figure 4.12 above are a powerful tool in conveying the information about spread and distribution of words, and they can also help us to notice patterns and connections faster and easier than studying long tables of words, especially when the distributions are more complex than the somewhat neat duality of tea. In this case study, I will attempt a classification for the words for cinnamon by looking at clusters and categorizing them according to their source, to see what the distribution of names today can tell us about the spread and history of cinnamon.

Because words for cinnamon or other spices are not included as features in balanced typological datasets, such as [WALS](#) (tea is an exceptional feature in this database), I have attempted a manual collection of words for cinnamon based on dictionary entries. As a starting point, I have crawled data from the Wiktionary (<https://en.wiktionary.org>), which is the closest resource we currently have to an open- and crowd-sourced multilingual dictionary. Similarly to the Wikipedia, the Wiktionary is edited and reviewed by the community, which has both advantages and disadvantages. On one hand, information on the Wiktionary is free, broad in scope, it usually represents the public consensus,

<sup>96</sup>The accompanying map is available online at <https://wals.info/feature/138A#2/25.5/143.6>

<sup>97</sup>See for example Sonnad (2018) in Quartz: <https://qz.com/1176962/map-how-the-word-tea-spread-over-land-and-sea-to-conquer-the-world/> or Netchev and Macquarie (2022) in the World History Encyclopedia: <https://www.worldhistory.org/image/14112/movement-of-tea--cha-around-the-globe/>

and often well cited. On the other hand, it is not always complete, the available languages do not represent a balanced sample from a typological point of view, and the information can sometimes be ill-informed or deprecated. In any case it is a rich resource to start with.

For cinnamon, first I scraped the translations for the word *cinnamon* in the sense ‘spice’ (Wiktionary, n.d.-a), and cleaned the data using regular expressions. After this, I have performed a round of manual checking where I fixed obvious mistakes in word forms and transliterations by consulting other dictionaries and reference works, in the languages and scripts I felt competent to do so. I proceeded to add a few missing translations with the help of other lexicographical resources and the Google Neural Machine Translation engine’s Python API (Y. Wu et al., 2016).<sup>98</sup> Then, I analyzed each word in terms of etymological origin, and assigned them to categories. For example, words derived from Greek *kinnámōmon*, such as Lithuanian *cinamonas* or English *cinnamon* constitute one category, and words derived from Persian *dârcin*, such as Turkish *tarçın* or Hindi *dālcīnī*, make up another. I continued this categorization for all instances, and created a new category for every group that has at least three attested members. Instances that do not belong to any group or undetermined were assigned to “other”. Finally, I merged this dataset with language data obtained from the databases of both WALS (Dryer & Haspelmath, 2013) and Glottolog (Hammarström et al., 2022) to prepare for geospatial plotting. The datasets were handled using the pandas library in Python, and the visualizations were created using the plotly Python library (McKinney, 2011; Plotly Technologies Inc., 2015).

## Results

Figure 4.13 shows the results of the analysis above, on a geographical scatter plot. As it can be seen, there are six groups in total: canela, kinnamom, korica, qirfa, darchin, and gui, with a seventh one—other—containing those that do not belong to any of these. It is also noticeable that the groups that were manually identified form geographical clusters, for example, the gui group appears in East Asia, while the canela group is mainly found in Europe. Lastly, I would like to draw attention that the “other” group has a high number of members in regions where cinnamon (or cassia) is native. The canela group represent words that derived from Latin, the kinnamom group contains words going back to Greek, and the korica group represent mostly Slavic languages. Qirfa words are derived from Arabic, darchin gathers terms from the Persianate world, and gui embraces some terms from the Sinosphere. Let us now look at these categories one by one.

**Note 4.4.2.** The interactive plot can be rotated, zoomed in and out, and the groups of data points can be isolated with a double-click on the group name/icon. Hovering over a data point will bring forward further information on the term, its transliteration, associated language and language family.

<sup>98</sup><https://pypi.org/project/googletrans/>

The canela group

The distribution of this group is overwhelming in Europe, which seems to echo the strong influence of Latin vocabulary, especially in the developing Romance languages. One example would be Old French *canele* (modern *cannelle*), which was formed within French from *canne* ‘cane’, and first attested in the first half of the 12<sup>th</sup> century from an epic poem describing a fictional expedition of Charlemagne to Jerusalem<sup>102</sup>, and the local vendors selling cinnamon, pepper, and “other fine spices”.<sup>103</sup> The TLFi explains that this word exists in most romance languages and it is impossible to determine its progress, and also notes that the medieval Latin is not attested in the ‘cinnamon’ sense. Either French or Italian was the usual donor for other European languages, take for example Dutch *kaneel*, or Finnish *kaneli* through Swedish *kanel*. Spanish *canela* is attested around 1250, from “Italian” (Medieval Latin) *cannella* (Corominas, 1987, p. 125; Gómez de Silva, 1985, p. 98). Due to later colonization by European powers, many of these terms spread elsewhere, e.g.: Tagalog *kanel*a from Spanish, or Haitian Creole *kannèl*.

<sup>†</sup>*Cannel*, also earlier as *canel* had entered English usage in the 13<sup>th</sup> century from French, but is now obsolete. It existed in Early Modern English up until the 18<sup>th</sup> century, and was gradually replaced by *cinnamon* (also arriving through French), which was first attested in the first half of the 15<sup>th</sup> century (see Etymology 16). Neo Latin *canella* also appeared for a brief time, but its meaning as ‘cinnamon’ waned, and now it is used in botany to refer to a plant genus.

In many other languages of Europe the opposite happened, and an existing word from Greek was replaced by the Latin term. Even Modern Greek uses *kanéla*, re(?)-borrowed from Italian *cannella*, instead of the Ancient Greek *kinnámōmon*.

The kinnamon group

This group centers around Ancient Greek *kinnámōmon*, most possibly a loanword from a Semitic language as I discussed in Section 4.4.4. *Kinnámōmon* is the source of words for cinnamon in many

<sup>99</sup>OUP, n.d., cannel.

<sup>100</sup><https://cal.huc.edu/oneentry.php?lemma=qnh+N&cts=all>

https://doi.org/10.1093/oed/odaa001

<sup>102</sup> *Le Pèlerinage de Charlemagne* [The Pilgrimage of Charlemagne], or *Voyage de Charlemagne à Jérusalem et à Constantinople* [Charlemagne's Voyage to Jerusalem and Constantinople], (c. 1140).

<sup>103</sup>Tl F1 2013 cannelle

European languages (e.g.: German *Zimt*, Lithuanian *cinamonas*, and English *cinnamon*), prominently in Central Europe and the Middle East. In most cases, these words represent an area where words derived from Latin *cannella* (or one of its descendants) did not replace the earlier word derived of *kinnámōmon*. This group also contains South Slavic languages in the Balkan linguistic area (e.g., Slovenian *cimet*, Serbian цимет *cimet*) where it arrived via the earlier German term *Zimmet* (now *Zimt*), and therefore it diverges from West and East Slavic branches for this lexical item. It reached Southeast Europe in the 16<sup>th</sup> century (Snoj, 1997, *cimet*)<sup>104</sup>, from which we can assume that cinnamon started to arrive here from the West during this turbulent time in the Balkans, in the middle of the Ottoman Empire's European expansion.

### The korica group

The korica group contains languages that use words derived from the inherited Slavic lexicon, in this case the East and West Slavic branches. Proto-Slavic \**korica* 'bark' is a derivative of \**korà* 'bark',<sup>105</sup><sup>106</sup> the suffix *-ica* is diminutive. Old Church Slavic *koricę* meant 'cinnamon', and further cognates are Russian *korica* 'id.', Ukrainian кориця *korýčja* 'id.' (East Slavic), Czech *skořice* 'id.' (West Slavic). In other cases, words derived from \**korica* can mean 'bark, crust' (e.g., Serb-Croatian) or 'cover (of a book), binding' (e.g., Bulgarian) (DerkSEN, 2008, p. 235). Due to the influence of Russian during Soviet times, some Central Asian Turkic languages ended up with foreign words in their vocabularies, e.g., Kirghiz корица *korica*.

### The qirfa group

The qirfa group contains languages from Africa and the Middle East, whose words for cinnamon were borrowed from Arabic *qirfa*, for example Hausa *kirfa* (Newman, 2007, p. 114) and Amharic ቀራፍ *qäräfā* (Leslau, 1996, p. 74).

### The darchin group

Names for cinnamon in this category originate from Persian, as it was explained in Section 4.4.4. According to the data this cluster has the largest geographical extent, and by number of instances constitutes the largest group, almost head to head with the group of canela. Darchin represents the earliest stage of cinnamon's westward spread from South, Southeast, or East Asia, depending which cinnamon or cassia we think became the first cinnamon of commerce. Consulting the plot we can witness the huge influence Persian had in this step of transmission to the Middle East and Central Asia. We can also see that central and north Indian languages use a loanword from Persian, which can be explained by the Persianate<sup>107</sup> societies that resulted from the Islamic conquest of India, starting from the 13<sup>th</sup> century. The first sultan to ravage the land, Mahmud of Ghazni was a Persianized *mamluk* Turk, who laid the foundations with his raids in the 11<sup>th</sup> century for a series of Muslim dynasties on

<sup>104</sup>Fran—<https://fran.si/193/marko-snoj-slovenski-etimoloski-slovar/4285437/cimet?View=1&Query=cimet>

<sup>105</sup>PIE \*(s)*kor-* 'to cut'

<sup>106</sup>DerkSEN, 2008.

<sup>107</sup>For a discussion on this term, see N. Green (2019).

the Indian subcontinent, culminating in the Mughal Empire (1526–1857) and what we define today as Indo-Persian culture (Eaton, 2019, p. 33).

### The gui group

The gui group contains terms from the Sinosphere, words that borrowed the Sinogram 桂 *gui* (see Section 4.4.4), such as Japanese 桂 *kei* ‘cinnamon or cassia tree’, synonym with 肉桂 (肉桂) *nikkei*, Korean 계 *gye* as 계피 (桂皮) *gyepi* and 육계 (肉桂) and the Sino-Vietnamese *quế*. This shows that the Chinese transmitted their cassia to their immediate neighbors East and Southwest, together with the word and character for it. However, there is little evidence for trade in cinnamon between China and Southeast Asia in early history, G. Wang (1958) does not give any information on it in his “The Nanhai Trade: A Study of the Early History of Chinese Trade in the South China Sea.” (G. Wang, 1958) This makes sense if we remember that all regions active in the South China Sea maritime trade—from Guangdong to Sumatra to Lanka—had their own source of cinnamon, and traders would only transport it westwards.

### Others

We can see that the category of “other” is prevalent in areas where cinnamon of various kinds is native and therefore these languages often have native words to refer to it. Many words from these group are derived from the meaning of ‘tree bark, skin, peel’ Malay/Indonesian *kulit kayu manis* [bark-wood-sweet] ‘sweet wood bark’, where *kulit* ‘skin, bark’ is often omitted, or Dhivehi *fonithoshi* [sweet-bark]. Hungarian *fahéj* [tree-bark] is made by compounding and was attested in ca. 1395 (Zaicz, 2006, *fahéj*), Romanian *scortișoară*<sup>108</sup>, is perhaps modeled after Slavic *\*korica*.

### Conclusion

So what does this tell us exactly? It shows that the modern state of spice terms’ distribution is neatly arranged according to the influential languages that spread the name for particular material, pointing to certain civilizations who used, traded, and carried it, and had great influence over their neighbors. In the future, I hope to extend this approach to other spices, as it would be fascinating to compare the data of many different items and their distribution patterns.

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<sup>108</sup> Diminutive of *scoartă* ‘bark’, from Latin *scortum* ‘hide, skin’, PIE \*(s)ker- ‘to cut’.



Figure 4.11 Cinnamon tree in a 10<sup>th</sup>-century Arabic translation of Dioscorides's *De Materia Medica*, a manuscript at the Oriental Collection of the University Library of Leiden (Shelfmark: Or. 289). This copy is from Samarkand, and dates to 1083, the time of the Karakhanids (Dioscorides, 1083, f. 9a)

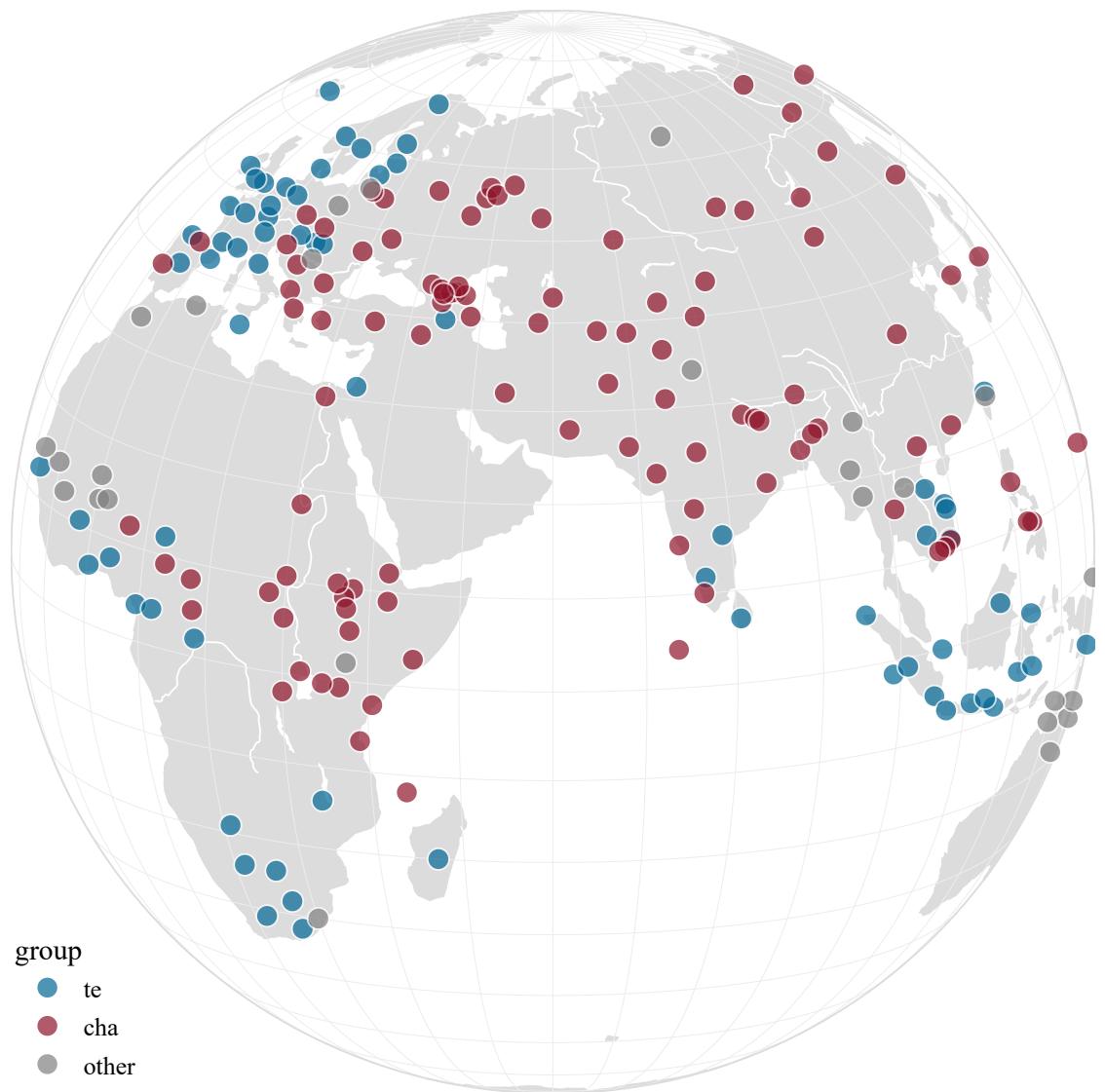


Figure 4.12 Distribution of words for tea from Sinitic *cha* and Minnan *te*, based on the data around the globe, from the [WALS](#) dataset.

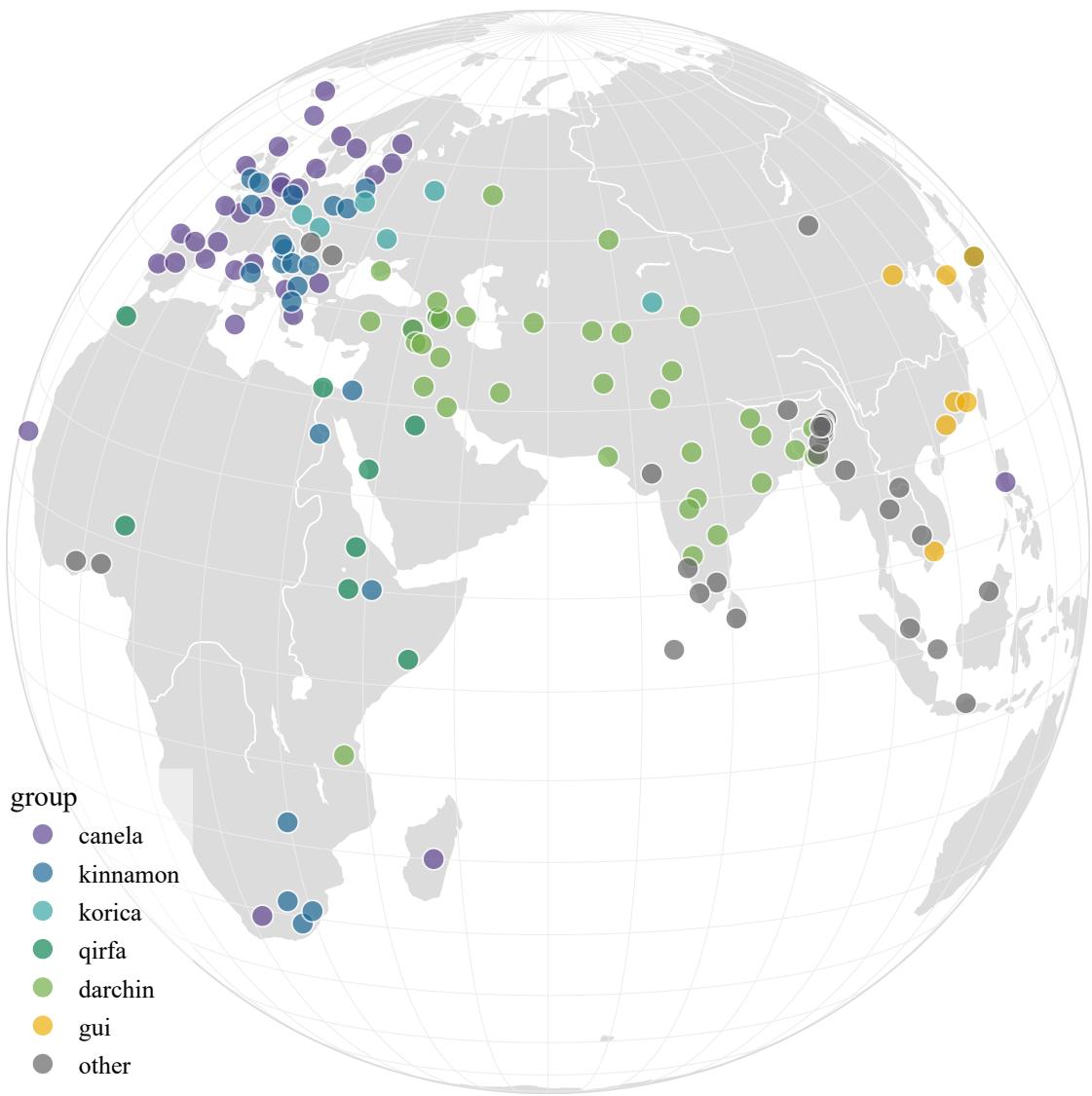


Figure 4.13 Distribution of words for cinnamon in a few languages around the globe. For a full, interactive and explorable version of the plot, please visit the following link: [http://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/distribution\\_cinnamon.html](http://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/distribution_cinnamon.html)

## 4.5 Black Pepper & Long Pepper

### 6. PEPPER

POWO

English: *pepper*; *black pepper*. Arabic: فلفل أسود *fulfil, fulful aswad* [black pepper]. Chinese: 胡椒 *hújiāo* [barbarian-pepper]; 黑胡椒 *hēihújiāo* [black-barbarian-pepper]. Hungarian: *bors* [pepper]; *fekete bors* [black pepper].

Plant species:	<i>Piper nigrum</i> L.
Family:	<i>Piperaceae</i>
part used:	fruit
Region of origin:	Malabar coast (South India)
Cultivated in:	Vietnam; Brazil; Indonesia; India; Sri Lanka; etc.
Color:	black; white; green



Figure 4.14 Black pepper from the Malabar coast in India, white pepper from the Penja Valley in Cameroon, and green peppercorns. *Piper nigrum*. Credits: Aromatiques.

Black pepper is the dried fruit (drupe)<sup>109</sup> of the species *Piper nigrum*. Pepper fruits are often called peppercorns, and they come in black, white, green, and even red. However, black pepper, white pepper, green and “true” red peppercorns are not different varieties, they are the fruits of the same plant. Their difference merely lies in the harvesting and drying process. All of them have a unique, pungent taste and a fresh, spicy aroma that they release when being crushed or ground.

Black pepper is the most important, most popular, and most consumed spice in the world (Maberley, 2017, p. 721). Valued for its pungency and flavor, pepper has been used since ancient times in traditional medicine and gastronomy from East to West, and it is the most influential spice that shaped human history. It is found and used virtually everywhere around the globe (Hill, 2004, p. 253), and most of us are familiar with the biting sensation it causes on the tongue and in the nose. Black pepper was one of the first aromatic substances used medicinally in India, and one of the first products of global commerce to be traded, alongside long pepper, and ginger. It was transplanted to other tropical

<sup>109</sup>A type of fleshy fruit with thin skin and a single, central pit containing the seed, also known as a “stone-fruit” (e.g.: plum, cherry, peach, nutmeg, olive, mango). It is a term used to denote the contrast to a botanical “berry”, which contains many seeds (e.g.: blueberry, grape).

regions of Asia early on, and cultivated extensively. Black pepper's early diffusion is remarkably interesting, it is the prototype spice for many of us. Also referred to simply as *pepper* from here on, it was among the first oriental spices to reach the Occident (Peter, 2012, vol. 1, p. 86). Pepper was known to the ancient Egyptians, Greeks, and Romans in the West, and have changed medieval Europe. It was even used as currency in small amounts. Today it accounts for more than a third of all spices traded in the world, making it the most traded spice as well (Ravindran, 2017b). Its importance is well demonstrated by the many books and monographs about its history (see Shaffer, 2013; Wernick, 2014), agronomy (see Nair, 2020; Ravindran, 2000), and appeal (see Barth, 2019; De Kerros, 2016).

**Note 4.5.1.** Throughout this dissertation—unless stated otherwise—the term *pepper* alone always denotes the pepper(s) of *Piper nigrum*, of the genus *Piper*, from the pepper family (*Piperaceae*) originating in India (i.e., black pepper, white pepper, etc.). This is to make an arbitrary distinction with the various kinds of hot chile, or chili peppers of the genus *Capsicum* in the nightshade family (*Solanaceae*), native to the Americas. A partial objective of this dissertation is to untangle the messy nomenclature around these plant and spice names, which is evident if we take into account all the different items we can refer to with the words *pepper* in English, *jiāo* in Chinese, and *fīlīl* in Arabic; a situation true to many other languages as well.

## Uses

Black pepper had and has various uses in multiple areas. Nowadays, we mainly consider its importance in the culinary arts—from seasoning food in the kitchen to the dining table—but it is extensively used in the food industry as well for flavoring and preserving processed foods (Peter, 2012, vol. 1, p. 86). Often called the “king of spices”, black pepper is so ubiquitous and well-known in cooking that it is essentially pointless to list cuisines and dishes that feature it. It is present in practically all savoury dishes, sauces, marinades, and pickles. It is used whole, crushed, or ground, and its role in Western gastronomy is well marked by the fact that virtually all restaurant table host a pair of salt and pepper mills or shakers. On the other hand, white pepper is a key ingredient in French and Chinese cuisine, where it is much more popular than black pepper, while green pepper is popular in Thai and South Indian cooking. But besides just a seasoning, pepper also has roles in perfumery and beauty care, not to mention its use as a home remedy (Ravindran, 2000, p. 467). In fact, as it is true for most spices, pepper in the past was considered primarily a medicine. Black pepper is well known in the traditional herbal systems, whether Ancient Greek, Ayurvedic, or Traditional Chinese Medicine, as well as contemporary pharmacology and phytotherapy (a modern name for chemistry-assisted herbalism). Reviews and updates on the research of *Piper nigrum*, its active components, and their effects on human physiology are being published at a steady pace (see Butt et al., 2013; Haq et al., 2021; Meghwal & Goswami, 2013; Srinivasan, 2007). Recent scientific research shows that piperine displays numerous pharmacological effects, such as antimicrobial and antioxidant (Haq et al., 2021). It is therefore not surprising that health benefits of black pepper have been recorded in pharmacopoeias since ancient times, and that it has been used for the treating of various illnesses: ranging from

stomach pains and digestive problems to fever, cold, and even food poisoning (Quattrocchi, 2014, p. 2952).

#### 4.5.1 Long Pepper and other False Peppers

There are other aromatic, spice yielding plants (other kinds of peppers, if you like) in the *Piperaceae* family, constituting to different species, such as cubebs, tailed peppers, or Java peppers (*Piper cubeba*), (Indian) long peppers (*P. longum*; *P. retrofactum*), “piper chilies” (*P. chaba*), Ashanti/Benin pepper (*P. guineense*), etc., and they will be referred to using these common names throughout. Cubeb, and long pepper especially, were more common in ancient times but virtually disappeared from the global spice trade in the modern age. Long pepper is the most important relative of the black pepper, and as a commercial product it comes from two sources: the Indian long pepper (*Piper longum*), and Javanese long pepper (*Piper retrofactum*). The latter is sometimes also called Balinese long pepper or Indonesian long pepper Peter (551 2012, vol. 2). Other, less common spices unrelated to the *Piper* genus, such as pink peppercorns from South America (*Schinus molle*; *S. terebinthifolia*), Sichuan peppers from East Asia (*Zanthoxylum spp.*), and alligator peppers (*Aframomum danielli*) from Africa are sometimes referred to as “false peppers”. These will always be referred to with their usual full vernacular names to avoid confusion.

##### 7. LONG PEPPER

POWO

English: *long pepper*. Arabic: دارفلل *dārfilfil*. Chinese: 薑撥 *bībō*. Hungarian: *hosszú bors* [long-pepper].

Plant species:	<i>Piper longum</i> L.; <i>P. retrofactum</i> Vahl
Family:	<i>Piperaceae</i>
part used:	fruit
Region of origin:	E. Himalaya to S. China; Indo-China
Cultivated in:	India; Indonesia; Thailand
Color:	green to red when ripe, dark brown when dried

#### 4.5.2 The Botany of Black Pepper

Pepper is native to the Malabar region in South India where the Western Ghats, a mountain range parallel to the coastline, traps the monsoon rains. This results in the most humid region in India, making it one of the plant biodiversity hot-spots on Earth (Ravindran, 2000, p. 1). Often called the “king of spices”, pepper originates here in the evergreen tropical forests of Kerala, which is the origin and center of plant diversity for the “queen of spices” as well: cardamom (Ravindran, 2000, p. 1). Wild populations of pepper and closely related species grow in the moist, shady forests, up to 1200 m above sea level (Ravindran, 2017b). Pepper is cultivated for thousands of years in these areas, and once South India was the only place that produced it. Due to the human desire for this valuable spice, the crop was



Figure 4.15 Various “false peppers”: long pepper (*Piper longum*), cubeb pepper (*Piper cubeba*), and pink peppercorns (*Schinus terebinthifolius*). Credits: Aromatiques.

slowly transplanted from here to other tropical zones, mainly in the Asia-Pacific: Sri Lanka, Malaysia, Indonesia; but also to the West as far as Madagascar and Brazil. Today it is cultivated in 26 countries (Ravindran, 2000). The top five producers in 2020 were Vietnam, Brazil, Indonesia, India, and Sri Lanka.<sup>110</sup> Pepper grows on a perennial vine, blooming a cluster of small flowers on hanging spikes that bring young, round fruits that are first green, turning to bright red as they ripen; resembling berries. Pepper plants in their native habitats spread on the forest floor, or climb over rocks, shrubs, and trees. Pepper prefers the hot tropics with high humidity, and optimal temperatures of around 20-30°C. Open cultivation is possible in places where rainfall is well distributed (e.g.: Thailand, Vietnam, Malaysia), whereas in India shade is required because of the 6 months of drought between monsoon seasons (Ravindran, 2017b). Wild pepper species are dioecious<sup>111</sup>, having male and female individuals, while the domesticated pepper populations became monoecious:<sup>112</sup> one plant is both male and female. This is probably due to thousands of years of selective multiplication and it leads to greater quantities in production: bisexual flowers mean high fruit yields (Ravindran, 2000, p. 38). Pepper lianes are propagated from cuttings, and being climbers, they are usually grown around trees for live support, or with the use artificial poles (van Wyk, 2014, p. 216).

When it comes to harvesting, the techniques are different depending on the intended end product. In the case of black pepper, the near-ripe (still green) fruits are hand-picked and sun-dried in the course of several days up to two weeks. Oxidization leads to the darkening of the pericarp<sup>113</sup> (the outside skin and flesh of the fruit) to a hue ranging from deep brown to jet black, while also attaining the signature wrinkles and dimples (Hill, 2004, p. 254). The drying process can be sped up by boiling the pepper fruits in hot water for a short time. Chemical changes induced by the heat hasten the subsequent oxidization process, which causes the outer layer to gradually shrivel and blacken while getting dried (van Wyk, 2014, p. 216). White pepper is obtained by letting moisture and micro-organism dissolve

<sup>110</sup>In order of production quantity, from highest to lowest. All production data is from FAOSTAT (Food and agriculture data of the Statistics Division, Food and Agriculture Organization of the United Nations): <https://www.fao.org/faostat/en/#home>; license: CC BY-NC-SA 3.0 IGO.

<sup>111</sup>Bot.: the male and female reproductive organs are found in separate individuals.

<sup>112</sup>Bot.: having both the male and female reproductive organs in the same individual; hermaphrodite.

<sup>113</sup>Bot.: In fruit anatomy, pericarp is the collective name for the outer layers around the seed of a fleshy fruit or drupe: the endocarp (innermost covering of the seed; the pit), the mesocarp (flesh), and the exocarp (skin).

the cellular tissue of the fully ripe red fruits, basically letting them rot in a technique called retting<sup>114</sup>. The fruits' decomposed skin and flesh are easily removed by hand or machine after soaking and gentle washing, and the remaining pale seed is then dried on the sun, or bleached (van Wyk, 2014, p. 216). Green peppercorns are a result of traditional pickling, or in modern times rapid freeze-drying of the unripe fruits as a way to prevent fermentation. This process results in a product with a light weight and seemingly higher price. Occasionally the ripe, red fruits are sold as well to be used fresh, but the "true" red peppercorns—as Hill (2004) calls them—are rare and mostly found in producing areas: they lose their vigour within days of harvest and so must be used fresh unless preserved in vinegar or brine. As it is a hallmark of spices, the two varieties that are dried (black pepper and white pepper) are much more known worldwide, their dry quality allows them to be transported on longer journeys. If we think of white pepper as de facto decorticated black pepper, we would rightly guess that the flavor of white pepper is weaker than black pepper, as the outer peel of black pepper contains much of the spicy compounds responsible for the heat. Green peppercorns have an even milder taste and a much shorter shelf-life. Indigenous to the Malabar coast, a well-known and popular variant is the Malabar pepper or Malabar black, a commodity sought-after by traders since Roman times (De Romanis, 2020). Another famous name on the market is the Tellicherry black, which according to spice traders is not a regional designation, but rather a requirement of size. If a peppercorn is larger than 4.25 mm pinhead, it is classified as Tellicherry (Eirinberg, 2021). Other famous and/or protected pepper variants with Geographical Indication (GI) certificates are Kampot pepper from Cambodia, the Muntok white and Sarawak white from Indonesia and Malaysia respectively, and the Penja pepper from Cameroon. A relatively recent publication by pepper grower and merchant De Kerros (2016) accompanied by remarkable photographs aims to present all the dozens of pepper varieties around the world that are available to those with an adventurous taste. Pepper owes its punch to the alkaloid piperine, while the wrinkly pericarp supplies the complex spicy aroma and flavor thanks to a high number of chemical compounds in the form of volatile oils (Ravindran, 2000, p. 467). The most powerful one of which is rotundone, a highly potent compound also found in Shiraz wines (C. Wood et al., 2008). For more on details on the botany, chemistry, cultivation, agronomy, and other aspects of black pepper, please refer to Nair (2011), Parthasarathy et al. (2008), and Ravindran (2000).

According to Mabberley (2017, p. 695), the following common names refer to the species *Piper nigrum*: pepper, black pepper, Madagascar pepper, and white pepper. Except the green peppercorns mentioned above, other spices, such as the Sichuan peppers from China, pink peppercorns from Brazil, and Guinea peppers (*Aframomum melegueta*) from tropical West Africa are different, often botanically unrelated species. Only connected by their names and similar uses, looks, or flavor profiles.

#### 4.5.3 The History of Black Pepper

The history of pepper accompanies the history of mankind from the earliest times of contact and exchange between civilizations. The story of pepper is global and must travel to Ancient Egypt to begin. According to a popular anecdote in books and articles about pepper, peppercorns were used in

<sup>114</sup>

the embalming process of mummies (Ravindran, 2000), and they were found in the nostrils of Ramses II (J. Turner, 2004, p. 168). I have read this on many occasions, and I have spent way too much time to find out if this is true or not. In short, there is no definitive answer, but that the alleged peppercorns were only “seen” through X-ray, and that the original reports are dubious at best, as reported by Bucaille (1990, p. 206). Ramses II died in 1213 BC, and even if these specific are problematic, it is said that peppercorns and cinnamon were imported “from Southeast Asia and the East Indies” and thus available to wealthy citizens of Egypt as early as New Kingdom era (16<sup>th</sup> c. BC–11<sup>th</sup> c. BC) (Salima, 2001/2005, p. 394).

Pāṇini, the famous Sanskrit grammarian (ca. 4–6<sup>th</sup> c. BC) recorded the use of pepper in spiced wine, and pepper appears in early Indian medical texts of Suśruta as well (Ravindran, 2000). In the 4<sup>th</sup> century, Theophrastus recorded and described both black pepper and long pepper, and by the 1<sup>st</sup> century AD its source was accurately described by Pliny the Elder; stating that black pepper is from south, long pepper is from north India. Rome conquered Egypt in 30 BC, and with that the pepper trade as well, which was a key enterprise in Rome’s later financial success. From here onwards, the history of pepper within the Indo-Roman trade is well studied and documented, for further details please see De Romanis (2020), Miller (1969), and Sidebotham (2011).

During the late Middle Ages, pepper also brought great riches to Europe, the former wealth of Venice was due to its trade. After the crusades, European sea powers tried to get ahold on the monopoly of the spice trade, and Vasco de Gama’s landing near Calicut in 1498 in the Venetian, Portuguese, Spanish, Dutch, and English vied with each other for centuries up to the modern era. The story of pepper is very well explored in the Age of Exploration as well, there is no need for me to delve into it deeper. I recommend Shaffer (2013) for those interested in the big picture, but the sections about pepper in Dalby (2000) and J. Turner (2004) are also well researched.

#### 4.5.4 The Names of Black Pepper

##### English

**Etymology 21.** English *pepper* <? West Germanic \**pipor* ‘id.’ < Latin *piper* ‘black pepper, long pepper’ < Ancient Greek πέπερι *péperi* ‘id.’ < Middle Indo-Aryan पिप्परि *pipparī* ‘long pepper’ < Sanskrit पिप्पलि *pippali* ‘long pepper *Piper longum* (plant and berry); a berry’<sup>a</sup>

<sup>a</sup>Bosworth and Toller (1898/2014), R. E. Lewis et al. (1952–2001), and OUP (n.d.); Harper (n.d.); C. T. Lewis and Short (1870); Liddell and Scott (1843/1940); Sheth (1923–1928, p. 599); Monier-Williams (1890, p. 626)

The word *pepper* arrived to modern English via Middle English *peper* and Old English *pipor*, *piper*, from an early, Proto-West Germanic borrowing of Latin *piper*.<sup>115</sup> The Latin word comes from Greek πέπερι *péperi*, a word “of oriental origin”<sup>116</sup> or “Indic origin”.<sup>117</sup> The source is most probably from

<sup>115</sup>OUP, n.d., pepper.

<sup>116</sup>Hoad, 2003, pepper.

<sup>117</sup>AHD, 2022, pepper.

a Middle Indo-Aryan language, akin to Prakrit *pippari*<sup>118</sup>, probably via Pahlavi (Middle Persian)<sup>119</sup>, ultimately from Sanskrit *pippali* or *pippalī*.<sup>120</sup>

As for the meaning, we know that in Latin the word *piper* was used for both black pepper and long pepper, and this is true for the Greek word as well. As long pepper gradually disappeared and was completely replaced by black pepper in the Middle Ages, so varied the sense of the word. The original word's meaning however was exclusively long pepper, *pippali* did not refer to black pepper. In Monier-Williams (1899), *pippali* is 'long pepper', while *pippalī* refers to 'a berry; Piper longum (both plant and berry)'. The Sanskrit word for 'black pepper' was मरिच *marica*<sup>121</sup>, attested in the Suśrutasamhitā, the foundational text of Ayurveda. Hindi-Urdu मिर्च/mirch is the most obvious descendant of the Sanskrit word, and it is similar in meanings to the word *pepper* in English today: by itself it rather refers to chili, while with a distinguishing word, it refers to black pepper (i.e., *kālī mirī* [black pepper]). The use of both black and long pepper in India can be dated to ancient times, as Ayurvedic texts compiled in Sanskrit, such as the Suśrutasamhitā testify. Together with ginger (*śṛṅgavera* in Sanskrit), these three spices are a base combination in traditional Indian medicine, the name for which is त्रिकटु *trikatū* 'three spices'.

The ancestors of English speakers adopted the word during the Anglo-Saxon period, before they arrived to England, and so its cognates are found in other West Germanic languages as well.<sup>122</sup> As for the term *peppercorn* attested in early old English, it is a compound of *pepper* and *corn* in its previous sense 'grain', and it is used to refer to a single piece of the pepper fruits. Many other names of black pepper actually refer to varieties and cultivars, e.g., *Malabar pepper*, *Kampot pepper*, and the above-mentioned Tellicherry black.

#	Species	Name	Source
1	<i>Piper nigrum</i>	black pepper	van Wyk (2014)
2	<i>Piper nigrum</i>	green pepper	OUP (n.d.)
3	<b><i>Piper nigrum</i></b>	<b>pepper</b>	van Wyk (2014)
4	<i>Piper nigrum</i>	peppercorn	OUP (n.d.)
5	<i>Piper nigrum</i>	white pepper	OUP (n.d.)

Table 4.19 Various names for pepper in English.

<sup>118</sup>Sheth, 1923–1928, p. 599.

<sup>119</sup>Harper, n.d., pepper.

<sup>120</sup>Monier-Williams, 1899, 628.

<sup>121</sup>Monier-Williams, 1899, p. 790.

<sup>122</sup>Cresswell, 2021, pepper.

**Etymology 22.** English *long pepper* ‘long pepper’, eOE; cf. cognates Anglo-Norman as poivre lorc (13th cent.; Middle French, French poivre long) and also Middle Dutch lanc peper (Dutch lange peper), Middle Low German lanc pēper, lancpēper, Old High German langpfeffar (Middle High German langer pheffer, German langer Pfeffer), Old Swedish langa pipar (Swedish långpeppar) < Latin *piper longus* ‘long pepper’ [pepper-long]<sup>a</sup>

<sup>a</sup>OUP (n.d., long pepper)

In English, *long pepper* is a calque after the modelling the Latin *piper longus*, and first appear in the early Old English Medicinal text known as *Bald’s Leechbook*<sup>123</sup>. The plant’s binomial name was also derived from this term, using the neuter form *Piper longum*. The OED points out that it was supposed to refer to flowers or unripe fruits of the (black) pepper plant in earlier times. This notion must arise from the fact that the long pepper fruits do somewhat look resemble the unripe black pepper clusters looking like catkins, and some Romans must have assumed that long pepper is just the unripe version of small black pepper clumps. Nevertheless, I am certain that the Romans did not see young unripe black peppers still on the vine very often, so we can forgive them this time. The gloss of *long pepper* from Latin is not unique to English, many European languages went down the same route.<sup>124</sup>

In the East, however, where there was no Latin to distinguish between black (*nigrum*) and long (*longum*), simply the Sanskrit name *pippali* was borrowed by the languages whose speakers got familiar with long pepper and its sisters directly from speakers of Indic languages, compare Malayalam *tippali*, Telugu *pippali*, or Tibetan *pi pi ling*. Modern Hindi *pippali* is most probably a *tatsama*<sup>125</sup> word, a learned loan from Sanskrit. The name of the sacred fig (*Ficus religiosa*) – otherwise known as the bodhi tree, under which the Buddha gained enlightenment and rendered *peepul* in English from Hindustani *pīpal* – has Sanskrit *pippala* ‘berry, especially the fruit of the sacred fig’ as an etymon. The sacred fig was a kind of “spiritual import”, we know about two instances when the Indian king gifted bodhi trees to the Chinese emperor in 641 and 647 from Magadha, the homeland of these trees (Schafer, 1985, p. 122).

<sup>123</sup>OUP, n.d., longpepper.

<sup>124</sup>Compare Anglo-Norman *poivre lorc* (13th cent.; Middle French, French *poivre long*), Middle Dutch *lanc peper* (Dutch *lange peper*), Middle Low German *lanc pēper*, *lancpēper*, Old High German *langpfeffar* (Middle High German *langer pheffer*, German *langer Pfeffer*), Old Swedish *langa pipar* (Swedish *långpeppar*), according to the OED; as well as Italian *pepe lungo*, Spanish *pimienta larga*, Portuguese *pimenta-longa*, Finnish *pitkäpippuri*, Polish *pieprz dług*, etc.

<sup>125</sup>*Tatsama* refers to a group of vocabulary consisting of learned loanwords from Sanskrit into modern languages of India, including both Indo-Aryan and Dravidian languages. It is comparable to the usage of Greek and Latin words in modern European languages, as they belong to a higher register. E.g.: the choice to use *curriculum* over *courses*. It is accompanied with *tadbhava*, which is the class of words that evolved.

#	Species	Name	Source
1	<i>Piper longum</i>	Indian long pepper	van Wyk (2014)
2	<i>Piper longum</i>	long pepper	van Wyk (2014)
3	<i>Piper longum</i>	pippali	van Wyk (2014)
4	<i>Piper longum</i>	thippali	
5	<i>Piper retrofactum</i>	Balinese long pepper	van Wyk (2014)
6	<i>Piper retrofactum</i>	Javanese long pepper	van Wyk (2014)

Table 4.20 Various names for long pepper in English.

## Arabic

**Etymology 23.** Arabic **فلفل** *filfil, fulful* ‘pepper’ < Persian پلپل *pilpil* ‘id.’; cf. cognates Old Armenian պղպեղ *płpət*, Old Georgian პილპილი *pilpili* <<sup>?</sup> Middle Indo-Aryan ? ‘long pepper’ < Sanskrit पिप्पलि *pippali* ‘long pepper *Piper longum* (plant and berry); a berry’<sup>a</sup>

<sup>a</sup>Lane (1863, p. 2434); Sultan Qaboos University (1985)

Arabic *fulful*<sup>126</sup> comes via Persian from essentially the same Indic etymon as English pepper: Sanskrit *pippali*. The word is first attested Arabic spice term in this set (AD 6<sup>th</sup> century). Similarly to almost all other languages, the word can be appended by the adjectives for black and white. And, as *fulful* is a “collective” term, we can refer to a singular peppercorn by adding the singular feminine marker *-a* (*tā marbūta*) suffix.

#	Species	Name	Tr.	Gloss	Source
1	<i>Piper nigrum</i>	فلفل	<i>fulful</i>		Wehr (1976)
2	<i>Piper nigrum</i>	فلفل أبيض	<i>fulful abyad</i>	white pepper	Baalbaki (1995)
3	<i>Piper nigrum</i>	فلفل أسود	<i>fulful aswad</i>	black pepper	Baalbaki (1995)
4	<i>Piper nigrum</i>	فلفلة	<i>fulfula</i>		Wehr (1976)

Table 4.21 Various names for pepper in Arabic.

**Etymology 24.** Arabic **دارفلفل** *dārfilfil* ‘long pepper’, compound of two Persian words < Persian دار پلپل *dār pilpil* ‘long pepper’, formed within Persian from *dār* ‘wood’ + *pilpil* ‘pepper’ (both words are Sanskrit loanwords) < ultimately from Sanskrit *dāru* + *pippali* ‘long pepper’<sup>a</sup>

<sup>a</sup>Lane (1863, p. 2435);

<sup>126</sup>“also pronounced *filfil* but the vulgar pronounce it [thus] with *kesr*—name of the /i/—and the pronouncing it with *kesr* is said to be not allowable [...], as reported by Lane (1863, p. 2434)

#	Species	Name	Tr.	Gloss	Source
1	<i>Piper chaba</i> ; et al.	دارفلل	dārfilfil		Wehr (1976)

Table 4.22 Various names for long pepper in Arabic.

### Chinese

**Etymology 25.** Mandarin Chinese 胡椒 *hújiāo* ‘black pepper’ [barbarian-pepper], from 胡 *hú* ‘Western barbarians, steppe nomads’ + 椒 *jiāo* ‘pepper, spice’ (*jiāo* was the prototype spice in China, originally referring to the local “Sichuan pepper” which is now called 花椒 *huājiāo* [flower-pepper]), [Northern and Southern] 420-445<sup>a</sup>

<sup>a</sup>Schuessler (2007)

There is no surprise in the anatomy of pepper terms in Chinese neither, except that there we have an extra layer of modifiers, namely *hu* ‘Western barbarians, steppe nomads’. This indicates two things. One, black pepper must have arrived China from the west, transmitted by the nomadic peoples of the steppe outside of Chinese territories. Two, *jiao*, the term now denoting all kinds of ‘peppers’ existed before *Piper nigrum* was known, and it refers to the prototype spice item for Chinese speakers. With some background knowledge, we know that this prototype spice in China were the fruits of *Zanthoxylum* species, otherwise known as Sichuan peppers. *Hujiao* ‘black pepper’ first appeared in the *Hou Hanshu* ca. AD 450.

#	Species	Name	Tr.	Gloss	Source
1	<i>Piper nigrum</i>	白胡椒	báihújiāo	white-barbarian-pepper	MDBG (n.d.)
2	<i>Piper nigrum</i>	胡椒	hújiāo	barbarian-pepper	S.-Y. Hu (2005)
3	<i>Piper nigrum</i>	黑胡椒	hēihújiāo	black-barbarian-pepper	MDBG (n.d.)
4	<i>Piper nigrum</i>	綠胡椒	lǜhújiāo	green-barbarian-pepper	Regency Spices (2022)
5	<i>Piper nigrum</i>	青胡椒	qīnghújiāo	green-barbarian-pepper	Regency Spices (2022)

Table 4.23 Various names for pepper in Chinese.

**Etymology 26.** Mandarin Chinese 蕃拔 *bibá* MC /piŋ<sup>t</sup> buat/ ‘long pepper’, a phonetic loan < Sanskrit पिप्पलि *pippali* ‘long pepper *Piper longum* (plant and berry); a berry’<sup>a</sup>

<sup>a</sup>Monier-Williams (1899, p. 626)

Long pepper in Chinese is 蕃芨 *bibō*, as it appears on TCM databases<sup>127</sup>, or 蕃拔 *bibá*, with some other historical character variations. A local Hong Kong spice vendor is marketing it as 長胡椒/蕃撥 *zhǎng hújiāo/bibō*, the first of which is a obvious rendering of the English *long* [*black*] pepper,

<sup>127</sup>

while the second is using the second character 撥 *bō*, the same that is used the first time in historical documents. The first mention is in 通典 *Tongdian*<sup>128</sup> “Comprehensive statutes” written by Du You, a late 8<sup>th</sup>-century encyclopedia and administrative history covering ancient times up to 756, including the Battle of Talas and other important events in Tang history. Long pepper appears in the last part of the book about “Frontier defense”, under the section 波斯 *Bosi* [Persia], in a listing all the products that are supposed to be found there.<sup>129</sup> Long pepper also appears in the 酉陽雜俎 *Youyang Zazu*<sup>130</sup> “Miscellaneous Morsels from Youyang”, a 9<sup>th</sup> century Tang miscellany on various topics by Duan Chengsi. It contains fantastic stories from ghosts to strange animals, “legends and hearsay, reports on natural phenomena, short anecdotes, and tales of the wondrous and mundane, as well as notes on such topics as medicinal herbs, perfume, tattoo and language” – to quote Reed (1995, p. 1). Book<sup>131</sup> eighteen contains 24 entries of exotic plants that have been imported to China or brought as tribute from places such as Syria, Persia, Malaysia, and Silla [Korea]. The author usually gives the foreign names of these products and tries to compare them to a plant more familiar to the Chinese readership. The plants featured here include cardamom, galbanum, acacia, jackfruit, Balm of Gilead, Narcissus, and jasmine (Reed, 1995, p. 68). Entry 56 is on long pepper (葷撥 *bibō*), where Duan tells us that it comes from Magadha, and pronounced as 葷撥梨 \*bit-bat-li<sup>132</sup>. Magadha refers to a culturally important historic region of India roughly on the eastern Ganges-plain. He also tells us the purported Fulin [Roman] name for it, and then proceeds to describes the appearance of the plant, likening the fruit to mulberries, which bear a close enough similarity of long pepper fruits. This is clear evidence that the Chinese used the Sanskrit word referring to long pepper, and Schafer (1985, p. 151) mentions that it was commonly shortened to *pippal* and mispronounced as *pitpat* or *pippat*.

葷撥，出摩伽陀國，呼為葷撥梨，拂林國呼為阿梨訶他。苗長三四尺，莖細如箸。葉似戢葉。子似桑椹，八月採。（YYZZ 18:56）<sup>133</sup>

It is now a good time to remind the reader that it is this long pepper that gave us the word *pepper* in English and many other languages around the world, as it was shown in 21.

I mentioned “sisters” earlier, because long pepper is not alone here, there are other species, such as *Piper retrofractum*, also known as *Javanese long pepper* or sometimes as *Balinese long pepper*. At this point it will make sense to use the name *Indian long pepper* when referring to *Piper longum* to avoid confusion. These two plants and their fruits are very similar, and they are often lumped together in discussions. It is enough to remember that Indian long pepper is important in India and mainland Southeast Asia, while Javanese long pepper is more relevant to insular Southeast Asia, but both were exported to medieval China and most likely there was no distinction made between the two. Javanese long pepper is more pungent than both black and long pepper, and is used in medicine, pickling,

<sup>128</sup><http://www.chinaknowledge.de/Literature/Science/tongdian.html>

<sup>129</sup><https://ctext.org/dictionary.pl?if=en&id=565096>

<sup>130</sup><http://www.chinaknowledge.de/Literature/Novels/youyangzazu.html>

<sup>131</sup>The original term is 卷 *juan*, meaning ‘scroll, book’, or ‘volume, chapter’.

<sup>132</sup>Reconstructed Tang pronunciation

<sup>133</sup>The same page also has an entry on black pepper. <https://ctext.org/library.pl?if=en&file=85088&page=282>

and curries, and much is exported to China—wrote Burkill (1935). Long pepper also spread through southern Asia before black pepper (Burkill, 1935, pp. 1746–1751).

We know that long pepper was popular in Rome during Pliny's time, and that it was more expensive than black pepper. And if we look at the fact that the name borrowed to Greek from Sanskrit was *pippali* and not *marica*, we can readily assume that it was introduced to Europe before black pepper.

These plants hold the key to one of the questions I asked at the beginning of this project, that is: Why was the Indonesian word *cabai* so resistant, and why Indonesian did not loan words of 'pepper' or 'chili'?

They bear very similar fruits, turning bright red when ripe, reaching upwards.

#	Species	Name	Tr.	Gloss	Source
1	<i>Piper longum</i>	鼙芨	<i>bibá</i>		DeFrancis (2003)
2	<i>Piper longum</i>	畢勃	<i>bibó</i>		
3	<i>Piper longum</i>	鼙撥	<i>bibō</i>		S.-Y. Hu (2005)

Table 4.24 Various names for long pepper in Chinese.

## Summary

#	Language	Term	Gloss	Loan	Source
1	English	<i>black pepper</i>		maybe	OUP (n.d.)
2	English	<i>pepper</i>		yes	OUP (n.d.)
3	English	<i>white pepper</i>		maybe	OUP (n.d.)
1	Arabic	<i>fulful</i>		yes	Wehr (1976)
2	Arabic	<i>fulful abyad</i>	white pepper	no	Baalbaki (1995)
3	Arabic	<i>fulful aswad</i>	black pepper	no	Baalbaki (1995)
4	Arabic	<i>fulfula</i>		no	Wehr (1976)
1	Chinese	<i>báihújiāo</i>	white-barbarian-pepper	no	MDBG (n.d.)
2	Chinese	<i>hújiāo</i>	barbarian-pepper	no	DeFrancis (2003)
3	Chinese	<i>hēihújiāo</i>	black-barbarian-pepper	no	MDBG (n.d.)

Table 4.25 Conventionalized names for pepper in English, Arabic, and Chinese, found in dictionaries.

### 4.5.5 The Diffusion of Pepper

The names of pepper on the above map demonstrate indirect evidence for the trails the material have left, and show the extent of trade networks at certain times. They reveal the cultures and civilizations located at the heartland of the product and the crossroads of its exchange. The distribution of clusters of words belonging to the same categories in this plot also indicate the possible ways of diffusion. This can be then studied from a historical linguistic point of view through investigating language

#	Language	Term	Gloss	Loan	Source
1	English	<i>long pepper</i>		yes	OUP (n.d.)
1	Arabic	<i>dārfilfīl</i>		yes	Wehr (1976)
1	Chinese	<i>bibá</i>		yes	DeFrancis (2003)
2	Chinese	<i>bībō</i>		yes	S.-Y. Hu (2005)

Table 4.26 Conventionalized names for long pepper in English, Arabic, and Chinese, found in dictionaries.

contact and loanwords, reinforced with historical awareness, and supported by botanical information. Domain knowledge of spices is also crucial, if we want to answer specific questions about the spread of spices and spice terminology. For example, one of the reasons pepper (and its name) was so successful on reaching faraway places so early on is due to the fact that pepper does not spoil. Or at least, not fast compared to other agricultural products; it keeps its aroma and pungency longer than many other spices. Krondl (2007, p. 59) writes that “pepper, in particular, is remarkably stable and can be stored up to a decade as long as it’s kept reasonably dry.” This is one of the key features of spices, that allowed them to be shipped and carried thousands of miles away, during the course of several months if not years. Moreover, as dried plant matter, spices are also light, resulting in an extremely high price-to-weight ratio compared to, say, wheat, which made trading in pepper so lucrative in the past, and defined the fate (and face) of cities, such as Venice.

Turning our attention back to vocabulary, the most fascinating part of this phenomenon is that the word *pepper* originates so distant from English; both in time and space. Thanks to the hard work of historical linguists and philologists, we have a decent reconstruction of *pepper*’s journey, and we know that Germanic tribes must have loaned the term on mainland Europe, some time before their migration to England around the 5<sup>th</sup> century. Early Old English *pīpor* comes from Latin, which originates in the Sanskrit word *pippali* by way of an Indo-Aryan transmission (see 21). The spatial and temporal trajectories of this word are remarkable, and follow the path of the material. Indian pepper (black and long) was known and coveted in Arabia and Rome long before the Anglo-Saxons got to taste it. Still, much of the story of pepper and its worldwide diffusion goes back to prehistoric times. Tracing its itinerary on Eurasian pathways is difficult at this time depth, yet we have breadcrumbs: its names. *Pippali* and its derivatives mark the way the spice have spread, even where written documentation and archaeological finds are missing.

Now, homing in on our scope of English, Arabic, and Chinese, we can look at the etymological stages of the words for pepper in these languages. In Figure 4.16, I tried to illustrate the origins of the words for pepper in the languages under inspection. We see that the branch that leads to English is on the same trajectory as Arabic, both going back to the Sanskrit etymon. They also formed their words for long pepper with the prototype words *pepper* & *filfil*: English modeled it after Latin, while Arabic loaned a Persian term that compounded ‘wood’ and ‘pepper’ (*dar pilpil*), the reasons behind which we can only speculate. Either it reminded the Persians to a piece of stick, or there was maybe

## Etymological stages of names for pepper

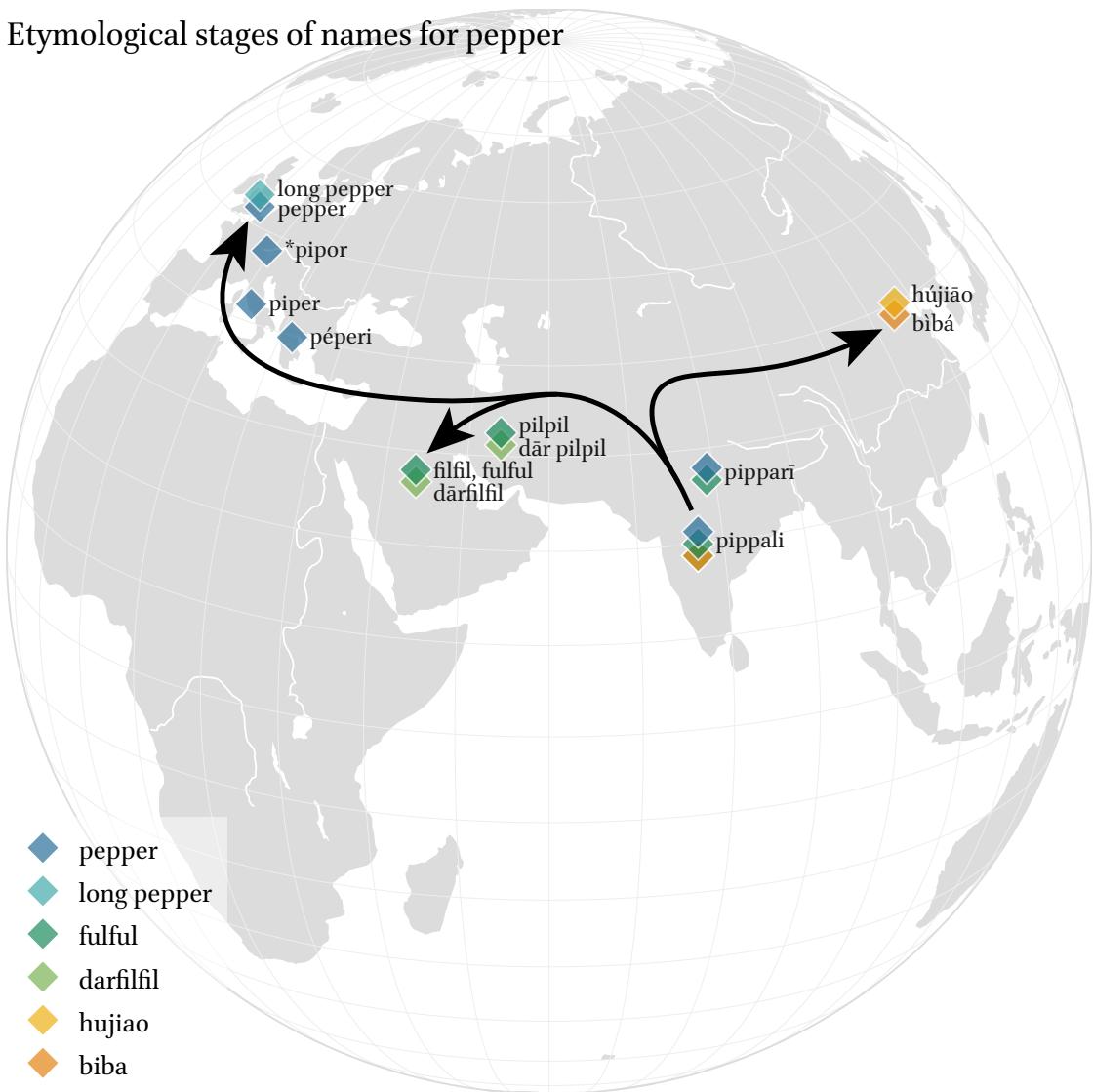


Figure 4.16 Diffusion of names for black pepper and long pepper, and their etymological stages in English, Arabic, and Chinese.

some type of analogy with the name of cinnamon: *dar chini*. Unmistakably, the Chinese did not loan a word for black pepper, they formed their own name by compounding their prototype word, *jiao*, appending it with *hu*, referring to foreigners, Western barbarians. Notwithstanding, Sanskrit *pippali* also survives in Chinese, in the form of *biba*, strictly referring to long pepper, known probably before Tang times (attested in the *Tongdian*) and still used in TCM. The questions begs to be asked: Why was one pepper adopted with a native word and designation, and why was the other loaned? I can think of two reasons. First, black peppercorns are very similar to the indigenous Sichuan peppers—in their shape, size, taste, and function—therefore it seems obvious to apply the term that already exist and conceptually very close to the new material. By way of their similarity, a metaphoric way of expression extended the set of referents for this word, *jiao*. Second, long pepper was a new item not incredibly similar to already existing Chinese products, it would place itself further away from Sichuan pepper in

the semantic space. They do not match in color, shape, size, and even in its use long pepper was (and still is) rather a medicine than culinary spice. It was alien enough to be adorned with a loanword.

## 4.6 Turmeric

### 8. TURMERIC

POWO

English: turmeric. Arabic: كركم kurkum. Chinese: 薑黃 jiānghuáng [ginger-yellow]; 黃薑 huángjiāng [yellow-ginger]. Hungarian: kurkuma.

Plant species:	<i>Curcuma longa</i> L. (syn. <i>Curcuma domestica</i> Valeton)
Family:	Zingiberaceae
part used:	rhizome
Region of origin:	India
Cultivated in:	China; Honduras; India; Indonesia; Jamaica
Color:	orange-yellow



Figure 4.17 Turmeric rhizome, slices, and powder *Curcuma longa*. Credit: Aromatiques.

Turmeric is a spice obtained from the dried rhizomes of *Curcuma longa*, an aromatic plant closely related, and very similar to ginger. Commercial turmeric can be found in the shape of finger-like knobs, slices, and most commonly, powder. It can be seen on Figure 4.17. Turmeric is an important ancient spice, medicine, dye, social and ritual substance, and it turns everything it touches yellow. It has a distinct smell and taste—it is slightly bitter and somewhat pungent—and it is used to color food, textiles, and even as a protection from evil spirits.<sup>134</sup> Turmeric, “the golden spice”, is well known for its importance in South and Southeast Asian culinary traditions, (curries), traditional and modern medicine (Ayurveda, see Prasad and Aggarwal (2011)), and religious traditions (e.g., *haldi* ceremony before Hindu weddings; as blessing or *prasad* ‘a benedictory material’, see Nair (2019)). Turmeric’s color comes from curcumin, which is a coloring agent and common and approved food additive marked by the code E100 on regulated food products.

<sup>134</sup>I have personally witnessed the practice of sprinkling turmeric on the doorstep of houses of the Indian community in Penang, Malaysia.

#### 4.6.1 The Botany, Origins, and Cultivation of Turmeric

*Curcuma longa* is a perennial herbaceous plant with large oblong leaves, short stem, and attractive white and yellow flowers that grow in clusters, from the ginger family *Zingiberaceae* (van Wyk, 2014, p. 128). The plant is rhizomatous, meaning that the stems are subterranean, sending roots downwards, and shoots upwards. It is this rhizome that makes turmeric valuable as a spice, turning deeper and richer in color when dried.

Similarly to ginger, turmeric is an ancient sterile *cultigen*, not found in the wild (van Wyk, 2014, p. 128). It does not produce seeds; it is propagated by splitting the rhizome. Therefore, as Kikusawa and Reid (2007) points out, “its distribution in the Pacific area is considered to obviously be the result of human introduction [...]” Again, the origins of turmeric are not certain (and disputed), but it is believed to have been domesticated either in India (Nair, 2019; POWO, 2022b; van Wyk, 2014), or Southeast Asia (Kikusawa & Reid, 2007; Mabberley, 2017). Turmeric needs a tropical climate to grow, it requires high temperatures and rainfall. Harvesting means digging up the mature rhizomes that are then dried, sliced, and powdered (van Wyk, 2014, p. 128). The top producer of turmeric is India, but neighboring and Southeast Asian countries also cultivate and market turmeric as well.

Similarly used and botanically close plants include the paler yellow mango ginger (*C. amada*), the Indonesian mango ginger (*C. mangga*), wild turmeric (*C. aromatica*, also a dye), and zedoary (*C. zedoaria*), an alternative source for turmeric, especially in China (van Wyk, 2014, p. 128).

#### 4.6.2 The History of Turmeric

Turmeric is widely used in South and Southeast Asia as a spice, medicine, cosmetic, and in rituals. In India, the use of turmeric dates back to Vedic period (c. 1500–c. 500 BC). It is featured in the *Suśrutasamhitā*, the foundational text of traditional Indian medicine as an ingredient in a ointment for poisoned food (Prasad & Aggarwal, 2011). The use of turmeric is most salient in the various island cultures of the Pacific, where it has spread with the Austronesian expansion around starting around 5000 BP, reaching as far as Polynesia and Fiji, and used as a dye and ceremonial substance (McClatchey, 1993; Prance & Nesbitt, 2005; Sopher, 1964). For the early history of turmeric, I recommend the book chapter titled *Proto Who Utilized Turmeric, and How?* by Kikusawa and Reid (2007), which deals with the spread and uses of turmeric pre-European contact. It reached Tahiti, Hawaii, and the Easter Islands before the Europeans. Because of its role in Hindu rites, turmeric probably also spread to Southeast Asia at later stages as well, with the expansion of Hindu kingdoms in the region (Prance & Nesbitt, 2005, p. 170).

Turmeric, similarly to ginger, seems to have been known in Europe at early dates, but even if the modern identifications are correct, it was not a widespread substance before the 7<sup>th</sup> century. “There is no evidence of its use in the Levant and the Mediterranean Basin before the Islamic conquests.”—writes Amar and Lev (2017, p. 108). In the 1<sup>st</sup> century, Dioscorides noted in the *De Materia Medica*: “It is reported that there is also another kind of galangale that grows in India. It resembles ginger, it is saffron-colored and bitter when chewed, and it is a fast-acting depilatory when smeared on.” (Dioscorides, ca. 50–70/2005). Despite both Dioscorides and Pliny mentioning it, medieval Arabic authors considered

it a novel spice not identified by the classic Greek authors (Amar & Lev, 2017, p. 108).

According to Nair (2019, p. 2), its maritime dispersion from India intensified in the Middle Ages, reaching the coast of China in the 7<sup>th</sup> century AD, and East Africa a century later, West Africa by 1200, and Jamaica in the 18<sup>th</sup> century. In Chinese medicinal literature turmeric first appears in the *Xinxiu Bencao*, and the *Bencao Gangmu* treats it as well (Feng et al., 2011).

From its initial diffusion up to Vasco da Gama's journey and landing in Kozhikode, it was Arab traders who were instrumental in the westward spread of turmeric, similarly to pepper and other spices of the time. It is said that in 1280, Marco Polo described turmeric in the China leg of his travels, but his vague description might agree with bastard saffron (safflower, *Carthamus tinctorius*)<sup>135</sup>, or a species of *Gardenia* that were used as yellow dye in East Asia at the time (Polo & Rusticano, 1903/2004, p. 226).

“There is also a vegetable which has all the properties of the true saffron, as well the smell as the colour, and yet it is not reall saffron. It is held in great estimation, and being an ingredient in all their dishes, it bears, on that account, a high price.” (Polo, 1926, pp. 251–252)

#### 4.6.3 The Names of Turmeric

##### English

**Etymology 27.** English *turmeric* ‘turmeric’, obscure origin (by alteration of earlier forms), 1545 <<sup>?</sup> akin to French *terre mérите* ‘saffron’ [worthy earth] <<sup>?</sup> and Medieval Latin *terra merita* ‘turmeric’ [deserved earth] <<sup>?</sup> Arabic *kurkum* ‘turmeric; saffron’, maybe a folk-etymological corruption<sup>a</sup>

<sup>a</sup>OUP (n.d., s.v. turmeric); Harper (n.d., s.v. turmeric); Guthrie (2009); Klein (1971, p. 789)

According to most etymological dictionaries, the origins of *turmeric* are obscure and uncertain.<sup>136</sup> However, they compare Medieval Latin *terra merita*, and French *terre mérите* meaning *meritorious earth*, which according to Nair (2019, p. 2) are the source, and refers to “the color of ground turmeric, resembling a mineral pigment”—I consider this pure speculation.

Truthfully, the English name of turmeric is probably the most obscure out of all English spice names. Dictionaries or authorities are only guessing, and even the immediate French and Latin etymons (*terre mérите*; *terra merita*) are speculative in terms of directionality. According to my readings, the latest attempt to explain the origins of the word *turmeric* was published in an article by Guthrie (2009), who tried to tie the European word form to the trade languages of Northern India, for example Pashto *tzer merich* [yellow pepper] (cf. Persian *zard* ‘yellow’, and Sanskrit *marica* ‘[black] pepper’), but because of the lack of attestation in other languages or a continuous trail of linguistic evidence, I do

<sup>135</sup>A plant introduced to China in the 2<sup>nd</sup> c. BC from Western Asia (Polo & Rusticano, 1903/2004, p. 226).

<sup>136</sup>OUP, n.d., turmeric; Harper, n.d., turmeric; AHD, 2022, turmeric.

not find this explanation convincing. Nevertheless, the author does a good job circumscribing the problematics of *turmeric* and the previous attempts on solving it.

The term *Indian saffron* tells us that Europeans who came into contact with turmeric first (most likely in Asia, as Nair (2019) proposes mentioning Marco Polo) were reminded of saffron due to its similar use and coloring properties, and so this name was devised by compounding the geographic origin of the novel item with a prototype spice name based on their similarity in function. Arabic also uses a similar term as we will shortly see.

It is worth pointing out that outside the United Kingdom, the whole of continental Europe uses derivations of (scientific) Latin *curcuma*, or some other name not reminiscent of *turmeric*. *Curcuma*, besides being a botanical name for the genus is not used for turmeric in English, but it is connected to the Latin name of saffron, *crocus*, which shows that the early confusion of the two names survives to this day in their binomial names. Both words go back to the Arabic etymon of *kurkum*, which originally meant ‘saffron’.

#	Species	Name	Source
1	<i>Curcuma longa</i>	curcuma	OUP (n.d.)
2	<i>Curcuma longa</i>	Indian saffron	Nair (2019)
3	<i>Curcuma longa</i>	turmeric	van Wyk (2014)

Table 4.27 Various names for turmeric in English.

## Arabic

**Etymology 28. Arabic** كركوم *kurkum* ‘turmeric; saffron’; cf. cognates Hebrew כרכום *karkom*; Aramaic kurkmā; Akkadian kurkanū <? Sanskrit कुर्कुम *kuṇkuma* ‘saffron’<sup>a</sup>

<sup>a</sup>Kaufman et al. (1987, s.v. *kwrkm*); Guthrie (2009)

The Arabic word for turmeric is *kurkum*, which originally meant ‘saffron’. The word *kurkum* has a Hebrew cognate *karkom*, and it appears in the Bible once,<sup>137</sup> together with other perfumes of ancient times, where it was identified as saffron. It is also generally accepted that this Semitic words is the etymon in the name of the saffron crocus, via the Greek word χρόκος *krókos*, found now in the Latin binomial name of saffron (*Crocus sativus*).

Arabic *kurkum* has other Semitic (Aramaic, Akkadian), and regional cognates of Southwest Asia, such as Armenian պղում *k'rk'um* (a loan from Syriac), Middle Persian *kwlkwm*, and it was suggested that this word originates in Sankrit, with an etymon of *kuṇkuma* ‘saffron; saffron powder used as *tilak*, a bright red dye used for marking forehead’.<sup>138</sup> However, it might be the case that since these words

<sup>137</sup>Song of Songs 4:14 <https://www.biblegateway.com/passage/?search=Song%20of%20Songs%204%3A14&version=NRSV>

<sup>138</sup>R. L. Turner, 1962–1966, 164.

originally mark saffron, native of the Eastern Mediterranean, it is actually the Sanskrit term that is ultimately derived from the Semitic, as claimed by Greppin (1987). According to Amar and Lev (2017, p. 108), turmeric received the Semitic name (*kurkum/karkom*) from saffron due to the close similarities of their main role: a yellow dye. They also say that this must have happened after the Islamic conquest of Arabia, which facilitated the introduction and diffusion of turmeric into the region.

Just as in English, medieval Arabic literature called turmeric *za'farān hindī* ‘Indian saffron’, and just as in Europe, turmeric in Arabia served as a cheap substitute for the extremely expensive saffron (Amar & Lev, 2017).

Further Arabic names include *hurd* (in and around the Gulf, e.g., Yemen), via Persian *hard*, most probably derived from the Sanskrit name of turmeric: हरिद्रा *haridrā* (cf. Hindi हल्दी *haldī*) (Laufer, 1919).

#	Species	Name	Tr.	Gloss	Source
1	<i>Curcuma longa</i>	أصابع صفر	<i>asābi' ṣufr</i>	yellow fingers	Wikipedia (n.d.)
2	<i>Curcuma longa</i>	هرد	<i>hurd</i>		Amar and Lev (2017)
3	<i>Curcuma longa</i>	كركم	<i>kurkum</i>		Amar and Lev (2017)
4	<i>Curcuma longa</i>	شجرة الخطايف	<i>shajarat al-khaṭāif</i>	tree of hooks	Amar and Lev (2017)
5	<i>Curcuma longa</i>	زعفران هندي	<i>za'farān hindī</i>	Indian saffron	Amar and Lev (2017)
6	<i>Curcuma longa</i>	عقدة صفراء	<i>uqda ṣafrā'</i>	yellow knob	Baalbaki (1995)
7	<i>Curcuma longa</i>	عروق صفر	<i>'urūq ṣufr</i>	yellow roots	Amar and Lev (2017)

Table 4.28 Various names for turmeric in Arabic.

## Chinese

**Etymology 29.** Mandarin Chinese 薑黃 *jiānghuáng* ‘turmeric’, *jiang* ‘ginger’ + *huang* ‘yellow’<sup>a</sup>

<sup>a</sup>Kleeman and Yu (2010, p. 856)

In Chinese, turmeric today is known as *jianghuang* [ginger-yellow], or less frequently as *huangjiang* [yellow-ginger]. A historic name appearing in the *Bencao Gangmu* and reported by Laufer (1919, pp. 312–313) is used for both saffron and turmeric. More precisely, the *yujin* [yü-gold] aromatic (香 *xiāng*) where the flowers are used (saffron), and the *yujin* of the roots (turmeric, or some other *Curcuma* species used similarly).

#	Species	Name	Tr.	Gloss	Source
1	<i>Curcuma longa</i>	黃薑	<i>huángjiāng</i>	yellow-ginger	DeFrancis (2003)
2	<i>Curcuma longa</i>	薑黃	<i>jiānghuáng</i>	ginger-yellow	Kleeman and Yu (2010)
3	<i>Curcuma longa</i>	鬱金	<i>yùjīn</i>	yü-gold	Schafer (1985)

Table 4.29 Various names for turmeric in Chinese.

## Summary

Table 4.30 shows the names of turmeric that occur in modern dictionaries.

#	Language	Term	Gloss	Loan	Source
1	English	<i>curcuma</i>		yes	OUP (n.d.)
2	English	<i>Indian saffron</i>		no	OUP (n.d.)
3	English	<i>turmeric</i>		yes	OUP (n.d.)
1	Arabic	<i>hurd</i>		yes	Lane (1863)
2	Arabic	<i>kurkum</i>		yes	Wehr (1976)
3	Arabic	‘uqda ṣafrā’	yellow knob	no	Baalbaki (1995)
1	Chinese	<i>huángjiāng</i>	yellow-ginger	no	DeFrancis (2003)
2	Chinese	<i>jiānghuáng</i>	ginger-yellow	no	Kleeman and Yu (2010)

Table 4.30 Conventionalized names for turmeric in English, Arabic, and Chinese, found in dictionaries.



# The Diffusion of Spices

In this chapter, I will present the findings on the diffusion of spices, by looking at the distribution of spice plants and their primary names. First, an overview about the spices' geographical distribution will be presented. Then, a discussion on their spread and *spreadability* will ensue, and lastly, I will present my findings on the diffusion of wandering spice names along spatial and temporal trajectories, and how they relate to the botanical reality. The aim of this chapter is to have an understanding of how spices spread around the globe as informed by their names and etymologies, but at the same time supported by the evidences and current state of their physical diffusion.

## 5.1 The Geographic Distribution of Spices

In general, it is true that spices come from the hot and humid tropical regions, especially Asia. However, there are number of aromatic plants that originate from more temperate regions, here we should think about the umbelliferous plants of West and Central Asia: asafoetida, fennel, cumin, caraway, and others, and we must not forget the three American spices: chile, vanilla, and allspice. Figure 5.1 shows the macroareas where the 24 spices originate.

Botanical databases, such as [POWO](#), often show distribution and give us the regions where a plant is *native* to, and where it has been *introduced*. “Introduced” means that the plant is not native in the area, but now grows wild due to human intervention—whether the plant escaped cultivation, or became naturalized after accidental introduction—or due to natural spreading. Looking at this information reflects on the plants’ ability to adapt and grow in new places, but also hints on how human usage and transmission affected and created habitats. I have collected this information and used it to compare the spices in question. I have simply counted the native and introduced regions, and added them up. In Figure 5.2, you can see the spices ranked by the total number of the regions they grow in, including both native and where the plants were consequently introduced. I would like to highlight that the highest ranks are occupied by aromatic plants that are also herbs, both in the botanical and in the culinary definition. This makes sense, since these plants—e.g., fennel, coriander, dill, fenugreek, etc.—are not only cultivated for their seeds, but the fresh leafy green parts are made use of as well, so it is without question that the whole plant “travels” to new places, not only its dried product. Chili peppers are also available fresh in many places today. People transplant their

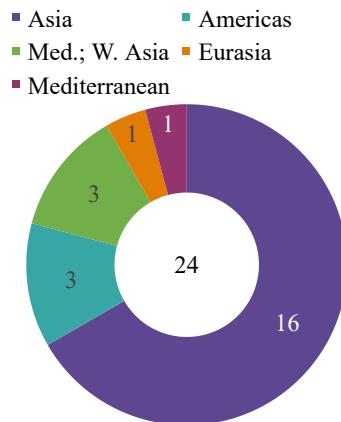
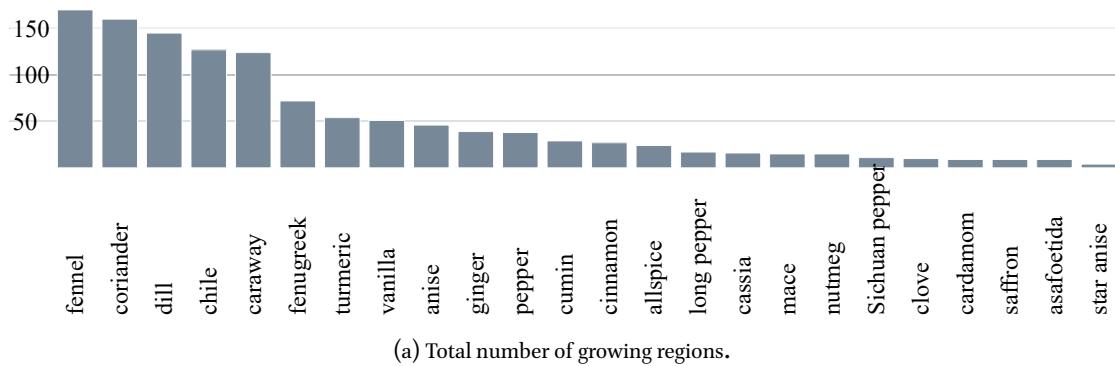
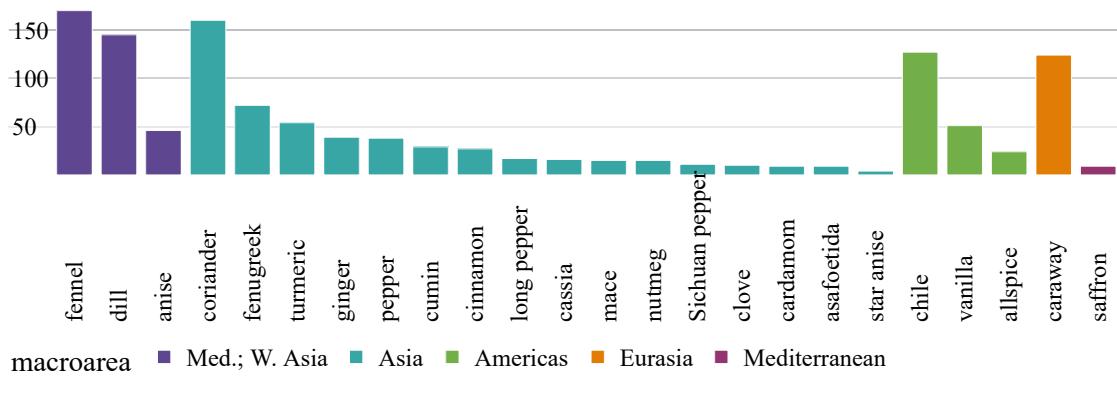


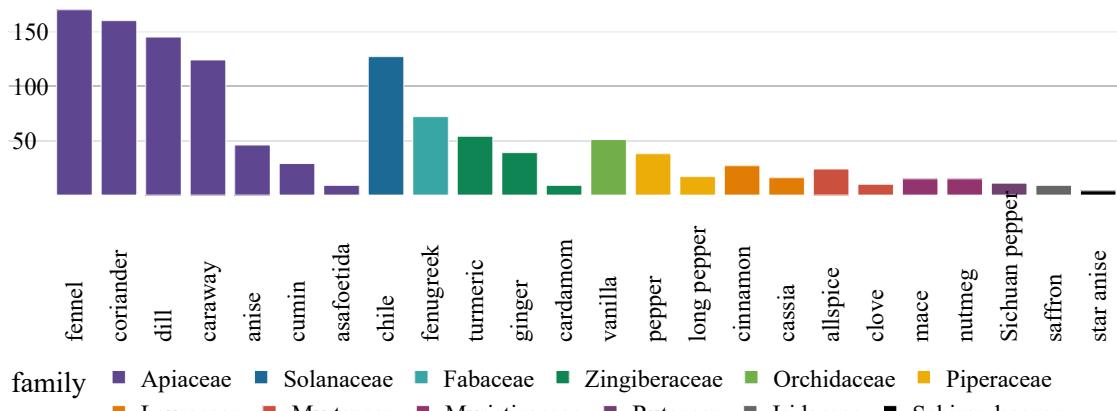
Figure 5.1 Distribution of spice plants by the macroarea of their native habitat.



(a) Total number of growing regions.



(b) Spices by total number of growing regions, grouped by macroarea.



(c) Spices by total number of growing regions, grouped by family.

Figure 5.2 Spices ranked according to the total number of regions they grow in, both native and introduced.

ingredients whenever they can, unless the primary goal of cultivation is purely profit.<sup>1</sup>

The far side of the rankings show the spices that do not grow extensively across many regions, regardless of how valuable or popular they are: star anise, asafoetida, saffron, cardamom, cloves. Of course, behind this, are the complex issues of plant biology, ecology and the many factors that decide

<sup>1</sup>The Dutch for example actively destroyed plant habitats, and wiped out whole islands—including the population—in the Spice Islands of Indonesia to generate scarcity and ramp up value during their monopol rule in the 17<sup>th</sup> century.

a plant's resistance to transplantation and if it can grow in new, alien environments. However, there is another point to notice here: labor. The lower ranks feature spices that are highly labor intensive to cultivate and harvest, including star anise, cardamom, and saffron, but the collection of asafoetida is cumbersome as well, and this also effects prices. This seems to indicate that the harder it is to cultivate a spice plant, the less likely it is that it will spread to new places. Interestingly—and of course, closely related what was just said—all of these are products that are very specific plant parts, the pericarps (star anise, Sichuan pepper), dried oleo-gum-resin, (asafoetida), stigmas (saffron), and dried flower buds (cloves). Figure 5.2 also shows a grouping by macroarea and by plant family as well.

### 5.1.1 The Spreadability of Spices

When it comes to spices of commerce, there is a factor that greatly weighs in on their diffusion: their ability to spread. I have noticed that while some spices were very expensive at some point in time (or still are) others, with the same levels of demand, were never particularly costly. Related to the ideas of supply and demand, the answer to this question was scarcity; or in this case, the lack thereof. To put it simply, a spice was expensive if it was rare or its supply was tightly controlled, not unlike diamonds today. Spices that could be easily grown anywhere were transplanted early on and were therefore not considered for their lavish returns, however venerated and influential they were. The two best examples for this are ginger and chili.

If you have ever left a knob of fresh ginger on your kitchen counter for weeks or even months, you might have noticed that it does not rot, it will eventually sprout and start growing a plant (similarly to an onion or a potato). And if you want more ginger root later, you should put it into a pot of soil. This was the secret of gingers' prehistoric success, which is most known in connection with the Austronesian expansion that began around 5000 years ago, populated the Pacific, and generally believed to have unfurled out of Taiwan (Mirabal et al., 2013). The early Austronesians carried ginger everywhere on their migrations into Maritime Southeast Asia and the Pacific on their outrigger boats (a native Austronesian invention that enabled people to reach as far as Hawaii and Madagascar), as it was a valuable source of nutrition with added medicinal value (see Dalby, 2000, pp. 21–25). Ginger with its numerous health benefits strengthens the immune system, and was therefore an invaluable crop to carry on long ocean voyages and was a constant feature onboard ships of maritime Asia (compare the “discovery” of lemon’s effectiveness against scurvy by British naval doctor James Lind in 1747 (Allan, 2021)). Accordingly, there is a reconstructed Proto-Oceanic term for ginger, \**laqia* (Bellwood et al., 2006, p. 52), and a Malagasy term for ginger seems to correspond to a Sanskrit etymon: *sakarivo < śṛṅgavera* (Adelaar, 1994, p. 41). More recent genetic and archaeobotanical studies support the Austronesian expansion theory, which in the past two centuries was solely standing on linguistic grounds. The names of ginger are among the linguistic clues that helped anthropologists, ethnographers, and linguists to reconstructs and establish a chronology. But there is a botanical clue as well that this is a very ancient spice and a long-term product of trade: it is not found in the wild anymore (Ravindran & Nirmal Babu, 2005). Although it is naturalized in India, it is believed to originate in Southeast Asia (Ravindran & Nirmal Babu, 2005). The ease of ginger rhizomes’ transportation over

long distances means that it have spread to other tropical and subtropical regions at a very early time, making the primary center of domestication hard to locate. It was hence called the most widely cultivated spice (Lawrence, 1984), which I am almost certain today would be the chili pepper. Dalby (2000) also points out that because humans propagate ginger for millennia by splitting the rhizome, it has lost its ability to be grown from seeds.

Chili on the other hand can reproduce from seeds, and is easy to grow in temperate areas as well. So much so that the American spice became an integral part of many European, African, and Asian cuisines in less then a hundred years since its introduction by the Portuguese, and many often forget that it in fact came from the New World. The red peppers were introduced to Hungary by the Ottomans soon after their conquest marked by the Battle of Mohács in 1526, hence the initial name *törökbors* [turkish-pepper (of *Piper nigrum*)], and Hungarian *paprika*—referring to the fine red powder made from dried chilies (attested in 1748, a borrowing from *Serbian-Croatian-Bosnian* (SCB))<sup>2</sup>—soon came to be an integral part of Hungarian cuisine and identity. Chilies reached Asia soon as well, Dott (2020) in his well researched book about the cultural history of the chile in China writes that an 1614 Korean encyclopedia noted “Now it is grown everywhere [in Korea]”, which means it has been introduced to Korea before, and even in 1621, some Chinese *bencao* author believed it to come from Sichuan! “It comes from central Shu [Sichuan]. Now it is found everywhere.”—reports the *Shiwu Bencao* (Dott, 2020, pp. 24, 28).

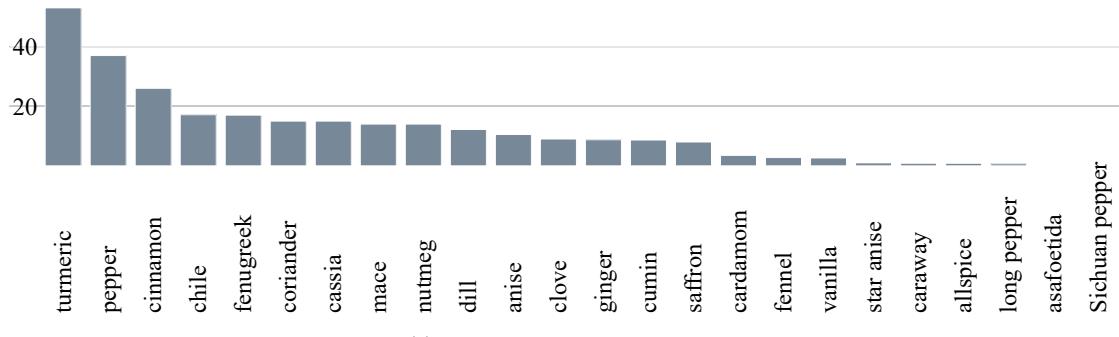
And so, it is clear that some spices spread more easily than others, affecting trade patterns, prices, and the diffusion of names. But how to compare this? How to measure it? To have a basic understanding of what effect spices’ ease or difficulty to spread can have on their diffusion, value, and global popularity, I created a rudimentary metric based on geographical-botanical data from POWO (POWO, 2022b). I will call this *spreadability*. I have simply divided the sum of the introduced regions with the sum of the native regions to serve as a crude indicator of how *well* a spice plant have spread. Intuitively, this index is about spice plants’ ability and “ecological willingness” to spread to new regions, whether it is a result of human hands (by trade and transplantation) or nature (self-seeding, spread by birds, etc.) into neighboring areas.

$$\frac{\sum \text{region}_{\text{introduced}}}{\sum \text{region}_{\text{native}}} = \text{spreadability index}$$

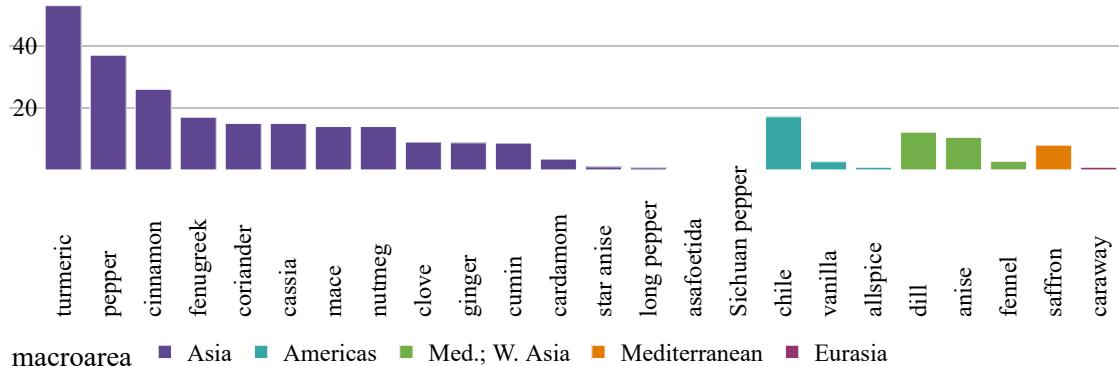
This metric accounts for the initial difference between if a spice was minimally distributed (i.e., only found in one or two regions), or well distributed before being introduced to either a few, or many new places. Figure 5.3 shows the spices ranked by their spreadability index. The figure shows for example tumeric, originally from “one region” (India), is now found in 53 other regions, resulting in the highest score of 53. On the far side of the plot, we can find Sichuan pepper, whose main source, *Zanthoxylum bungeanum* is indigenous to 10 geographical zones in China, but only have been introduced to one region (Uzbekistan), getting a low score of 0.10.

The results of this graph—like any other—greatly depend on the data we feed to it, and like any other quantitative analysis, has its limitations. Although the regions in the POWO database

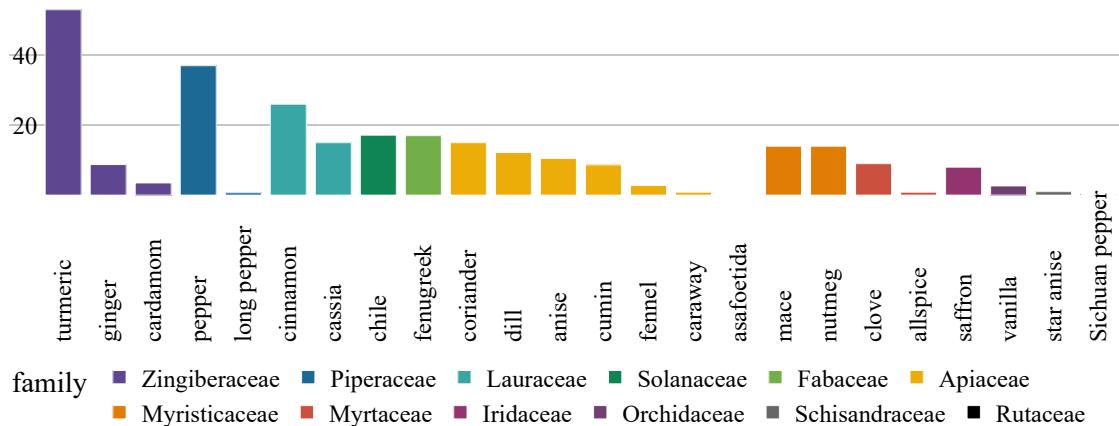
<sup>2</sup>Zaicz, 2006, paprika.



(a) Spices ranked by spreadability.



(b) Spices ranked by spreadability, grouped by macroarea.



(c) Spices ranked by spreadability, grouped by family.

Figure 5.3 Spices ranked by their spreadability index, showing which spice plants spread to more regions, taking into account the initial state of their distribution.

are uniform, they are not clear-cut ecological zones, but rather based on administrative divisions of countries, and it is not perfect. While some large countries are divided to broad areas that represent different biodiversity zones, the borders are arbitrary. For example, the United States, Australia, Russia, and China are divided by states, provinces, or greater geographical areas (e.g., New South Wales, Central European Russia, China South-Central) India is just one unit, explaining the very high

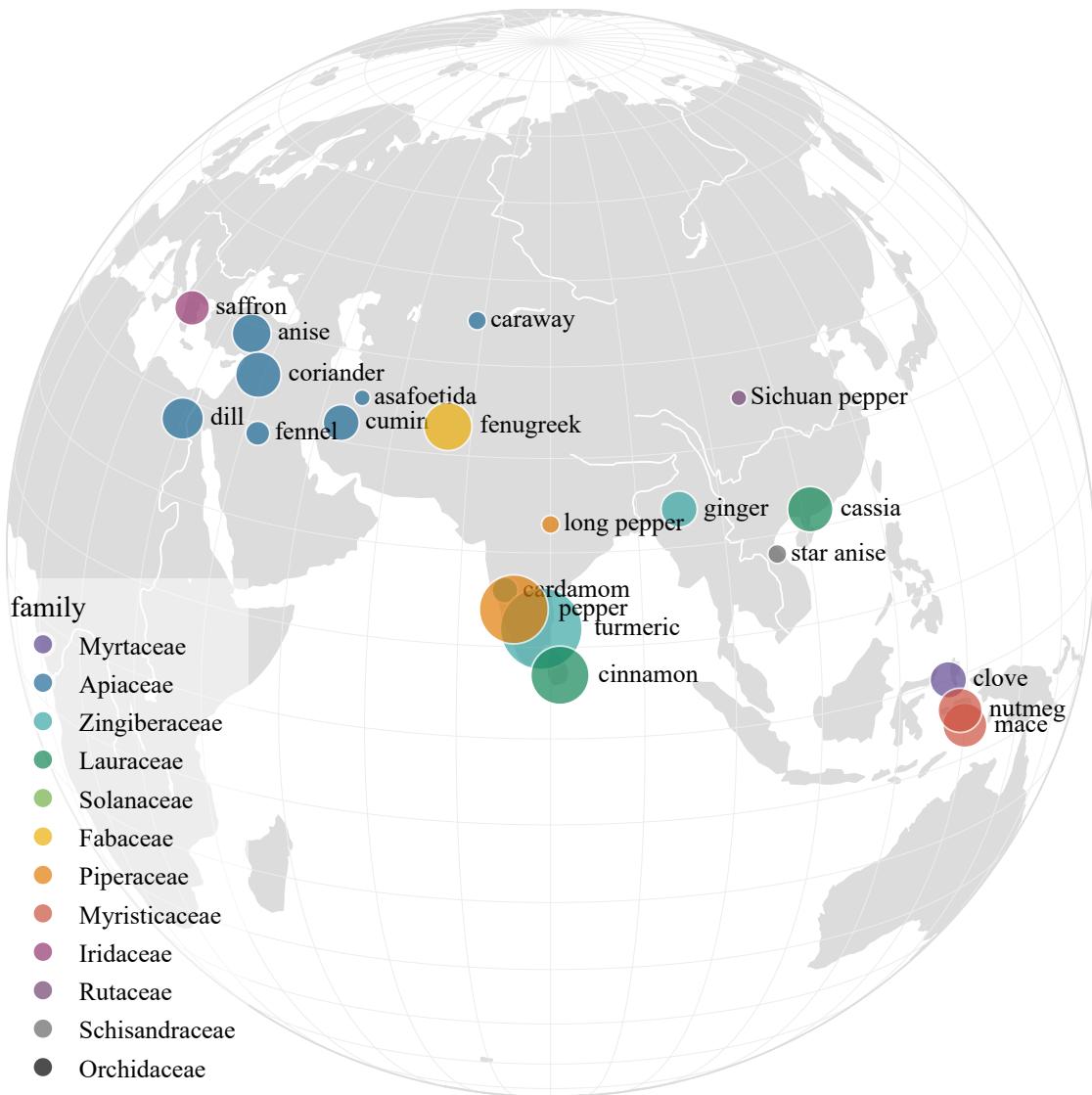


Figure 5.4 The approximate geographical origins of the spices in this thesis; size represents their spreadability index. For a full, interactive version, please visit [https://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/spices\\_map.html](https://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/spices_map.html)

score of turmeric.<sup>3</sup> Nonetheless, in terms of general usefulness the index has some merit. If we look at the distribution map of turmeric,<sup>4</sup> we will see that it did indeed spread far and wide, from Southeast Asia through West Africa to the Caribbean, and compared with Sichuan pepper<sup>5</sup>—which is still mostly limited to China—is much more popular globally. Figure 5.3 (b) and (c) show the spices ranked by their spreadability index as well, but broken down by macroarea and plant family. I have included the plant family groupings because it can be very interesting to those with affinity to the plant sciences, but truthfully, this particular grouping would be much more exciting when including more plants in

<sup>3</sup>Another limitation might be the age of this database as we find zones named Yugoslavia, or Czechoslovakia, but I doubt the biodiversity changed as much as political borders.

<sup>4</sup>*Curcuma longa* on POWO: <https://powo.science.kew.org/taxon/796451-1#/distribution-map>

<sup>5</sup>*Zanthoxylum bungeanum* on POWO: <https://powo.science.kew.org/taxon/775625-1#/distribution-map>

these analyses.

Based on my readings and data from the botanical databases, I have tried to approximate the geographical origins of each spice in the thesis. Figure 5.4 shows this attempt, plotted onto the globe. In cases, where a spice's supposed native area includes a large number of expansive regions, I have opted for a geospatial mid-point as a compromise. Therefore, you can see caraway placed in the middle of Eurasia, because I used the coordinates for Eurasia, as it is marked native everywhere in Eurasia in the database. Most spice plants *fortunately* do not have so extensive native areas, and in many cases the exact origins can be pinpointed. For example, see the case of nutmeg and cloves neatly situated on tiny islands of the Moluccas in present day Indonesia. The size of the data-points correspond to the their spreadability values, and they indicate very clearly that South Asian spices had a tremendous "success" in terms of global diffusion. This also conforms to historical facts; during the centuries old maritime trade between East and West whose two main end points were the entrepôts of Arabia and the port cities of South China, India was the halfway point. Because of its central location of the Maritime Silk Road, it was on the shores of South India where Arabs, Persians, Southeast Asians, Chinese, and later Europeans exchanged goods with each other, and therefore this region was a key point in the spread of spices as well.

What we can know about the diffusion of spices beyond the botanical and historical evidence, is in their names. In most cases, the spice names spread with the materials, and have left a trace. Moreover, these linguistic traces—together with the close study of their respective materials—can help us match or reconstruct the exact routes the materials took, accounting for communities and cultures that have played important roles in their dissemination. The following section will focus on this phenomenon.

## 5.2 The Linguistic Diffusion of Spices

At last, turning towards the language element of spice diffusion, I will now illustrate the linguistic diffusion through the investigation of spice terminology and their spread on spatial and temporal dimensions by tracing loanwords and analyzing attestation timelines. Before introducing the etymological findings, I must touch upon the terms' borrowed status, which I have previously introduced briefly in Section 3.2.2. Accordingly, this chapter focuses on the borrowed elements of spice terminology.

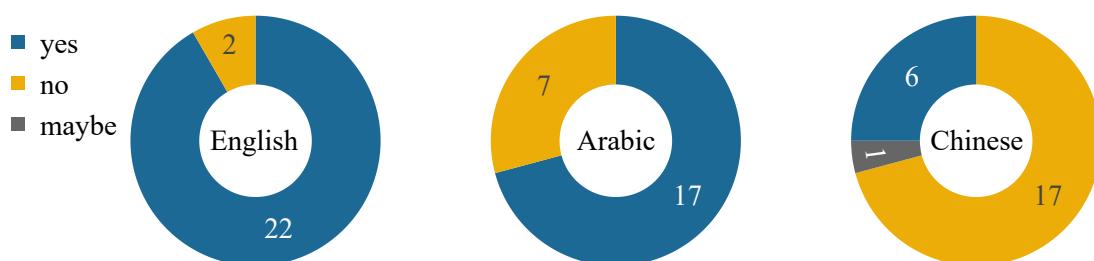


Figure 5.5 Ratio of borrowed terms in the spice nomenclature across the three languages, based on Table 5.1.

#	English	Borrowed	Arabic	Borrowed	Chinese	Borrowed
1	allspice	-	fulful ifranjī	-	duōxiāngguǒ	-
2	anise	+	anīsūn	+	huíqín	-
3	asafoetida	+	ḥiltīt	+	āwèi	+
4	caraway	+	karāwiyā	+	gělǚzi	+
5	cardamom	+	hāl	+	dòukòu	?
6	cassia	+	salīkha	-	ròuguì	-
7	chili	+	fulful hārr	-	làjiāo	-
8	cinnamon	+	qirfa	-	xīlánròuguì	-
9	clove	+	qaranful	+	dīngxiāng	-
10	coriander	+	kuzbara	+	yánsuī	-
11	cumin	+	kammūn	+	zīrán	+
12	dill	+	shibithth	+	shíluó	+
13	fennel	+	shamar	+	huíxiāng	-
14	fenugreek	+	ḥulba	-	húlubā	+
15	ginger	+	zanjabīl	+	jiāng	-
16	long pepper	+	dārfilfil	+	bìbō	+
17	mace	+	basbās	+	ròudòukòugānpí	-
18	nutmeg	+	jawz al-ṭib	+	ròudòukòu	-
19	pepper	+	fulful	+	hújiāo	-
20	saffron	+	za'farān	+	fānhónghuā	-
21	Sichuan pepper	+	fulful sītshuwān	-	huájiāo	-
22	star anise	-	yānsūn najmī	-	bājiāohuíxiāng	-
23	turmeric	+	kurkum	+	jiānghuáng	-
24	vanilla	+	fānīliyā	+	xiāngcǎo	-

Table 5.1 Spice nomenclature, showing if the terms are borrowed (+), not borrowed (-), or maybe borrowed (?).

### 5.2.1 Borrowings: Loanwords and *Wanderwörter*

In order to accurately compare the itineraries of loanwords and *Wanderwörter* in a trilingual setting, I had to determine which spice names are in fact borrowed, and which are native derivations/inventions. In most instances, it is rather obvious if a word is a borrowing or not, while in others, it was not so easy to determine. For example, I initially assumed that *Sichuan pepper* (which does not occur in English dictionaries) is an English construction and therefore not a borrowing, but after trying to find its source, I learned that it is a calque (loan translation) from Chinese 川椒 *chuānjiao* [Sichuan pepper]<sup>6</sup>, devised in the field of herbal medicine (Hooper, 1929, p. 140). In short, I analyzed the names based on their borrowed status to find loanwords. The result of this analysis on the default names of the 24 spices can be seen in Table 5.1.

The most important finding is that English has by far the most loaned terms in the spice domain—according to our modest sample of spices—followed by Arabic, and finally Chinese. Out of the 24

<sup>6</sup>Which uses the prototype spice word in Chinese, prefixed with the second character of Sichuan province (originally meaning ‘river’).

default names, there are 21 borrowings in English, 17 in Arabic, and 8 in Chinese. Figure 5.5 show the ratio of borrowings concisely. Of course, this figure alone can be misleading, since the difference in ratio between the languages is not representative only of the spice domain; the English lexicon has a large number of loanwords in general. Dictionaries especially have a high amount of loanwords, but everyday communication features them greatly as well. For example, out of the top 1000 most frequent words in the *British National Corpus* (BNC), more than half are borrowed (usually from French and Latin) (Durkin, 2014, p. 38). We should always approach the percentage of loanwords in a language with caution and I will not cite numbers, but from my studies I know that the percentage of loanwords in English is certainly higher than it is in Arabic, and Chinese, which prefer to coin words using native elements.

Word formation in Arabic most often happens internally by utilizing the possibilities of the highly productive root system, but it seems that in the spice domain, loanwords entered the Arabic vocabulary at high rates as well. Thankfully, the semitic root system and the rules of Arabic word patterns make it easy to spot loanwords. For example, if we take the words *zanjabil* ‘ginger’, *zaṣarān* ‘saffron’, or *qaranful* ‘cloves’, we can be sure that these are loanwords for the following reasons: There are no native quinqueliteral (five letter/consonant) roots in Arabic, the few existing ones are borrowings. Furthermore, there are no true “broken plural”, or related verbal forms for these words. Interestingly, a large amount of Persian (and other) loanwords in the domain of plants, fruits, and vegetables have five-consonant roots, including eggplant, cauliflower, parsley, and oranges.

My knowledge on Chinese word formation is rather limited, but I would like to point out a few phenomena. Firstly, it is well known that while Classical Chinese operated with monosyllabic, single-character words, modern Chinese has a strong tendency to prefer disyllabic words, mainly to disambiguate homophones. Therefore, only the most ancient spices would have a monosyllabic ancestor, Sinograms that convey the meaning of the spice on their own (e.g., *jiao* ‘pepper’, *jiang* ‘ginger’, *gui* ‘cassia’). In modern Chinese, ginger is the only one that still can stand alone, pepper and cassia are always affixed with modifiers to distinguish them from other items, and to fit the disyllabic trend. Loanwords will also often conform to this trend and become disyllabic in Chinese when integrated (e.g., *awei* ‘asafoetida’, *bibo* ‘long pepper’, *ziran* ‘cumin’). Tri-syllabic loanwords are often historical in this domain and not a common feature in day-to-day usage; they are not an integral part of the conventionalized vocabulary (e.g., *zafulan* ‘saffron’ *huluba*, ‘fenugreek’, *geluzi* ‘caraway’). Secondly, I want to highlight the curiosity of phono-semantic matching. In Chinese, loaned elements are sometimes incorporated by words that are phonetically similar and semantically related, thus hiding the word’s or morpheme’s borrowed quality. For example, *husui*, a name for coriander literally meaning ‘barbarian coriander’ is supposed to be a phono-semantic matching of an Iranian term (\**koswi*, \**košwi*, \**gošwi*), according to Laufer (1919). I will discuss the naming of newly introduced items in more detail in the next chapter.

The fact that English has many loanwords in the spice domain is not surprising if we consider that all of these aromatic products are *exotic*, they are not from anywhere near England, or the Saxon homeland. As for Arabic, we know from the history of the spice trade that virtually all materials from Asia passed through the Arabian Peninsula, and the names of many spices with origins in West Asia

predate the Arabic expansion of the 7<sup>th</sup> century and therefore in Arabic, many are loanwords from other Semitic languages. Loanwords in Chinese in the spice domain are much fewer in number, with most of the historic words being Silk Road terms, or contemporary creations for those introduced in modern times.

### 5.2.2 Spatial Trajectories: Tracing Spice Terms Around the Globe

In order to present the findings in a convenient, reader friendly, and interesting way, I turned to geospatial mapping. The plots seen in this section are made possible by utilizing the etymological data on spice terminology, collected and introduced for each spice in Chapter 4, and justified in Section 3.2.3. When creating these visualizations, I have included relevant historic names beyond the 24 default terms such as *amomum*, *dārṣīnī* ‘cinnamon’, or *xīngqū* ‘asafoetida’, and I have also left out terms that are not borrowings. Therefore, you will not find words on the plots such as *allspice*, *qīrfā* ‘cinnamon’, or *hūjiāo* ‘black pepper’.

**Note 5.2.1.** The geospatial plots in this section (fig. 5.6, 5.7, and 5.8) are a static version of interactive graphs available online via clicking the links given in the captions. I highly recommend examining these visualizations, as they supply further details on the words’ histories, and most importantly, the traces can be isolated by double clicking on an item in the legend, allowing for a clearer view and comparisons. The color palette in these plots does not have any significance, their sole purpose is to visually separate the traces of the terms.

#### Spices Flow Into Europe: The Case of English

Figure 5.6 shows the diffusion of spice names viewed from the progression of the words’ etymological stages into English. Words that were coined in English (i.e., not loanwords), are not present. What we see here, is a very clear trend in the dispersion of English spice terminology to have an East-to-West directionality. Besides the few spices that came from the Americas, all via Spanish (*chili*, *pimento*, *vanilla*, where *chili* is represented by the single line crossing the Atlantic Ocean pointing to a Nahuatl etymon) after the 15<sup>th</sup> century, the majority of spice terms are oriental in origin, and have long histories reaching into times of antiquity and beyond.

As far as space and distance goes (and probably time as well), the most remote *Wanderwort* seems to be *ginger*, whose source can be traced back to a Dravidian language of South India, but even that form has been identified as a loanword from an unknown Southeast Asian language<sup>7</sup> (cf. Etymology 30). Based on the cognates in surrounding unrelated languages (Khasi, Thai, Old Chinese), we can assume that ginger in a very early *Wanderwort* of the region going back to a Proto-Tibeto-Burman reconstructed form, /\*kjaŋ/ (Matisoff, 2003, p. 302). Even more exciting is the fact that besides English, the Arabic and Chinese words for ginger originate in the same etymon as well. I recommend using the link to explore the interactive visualization and isolating the trace for ginger, or any other

<sup>7</sup>OUP, n.d., ginger.

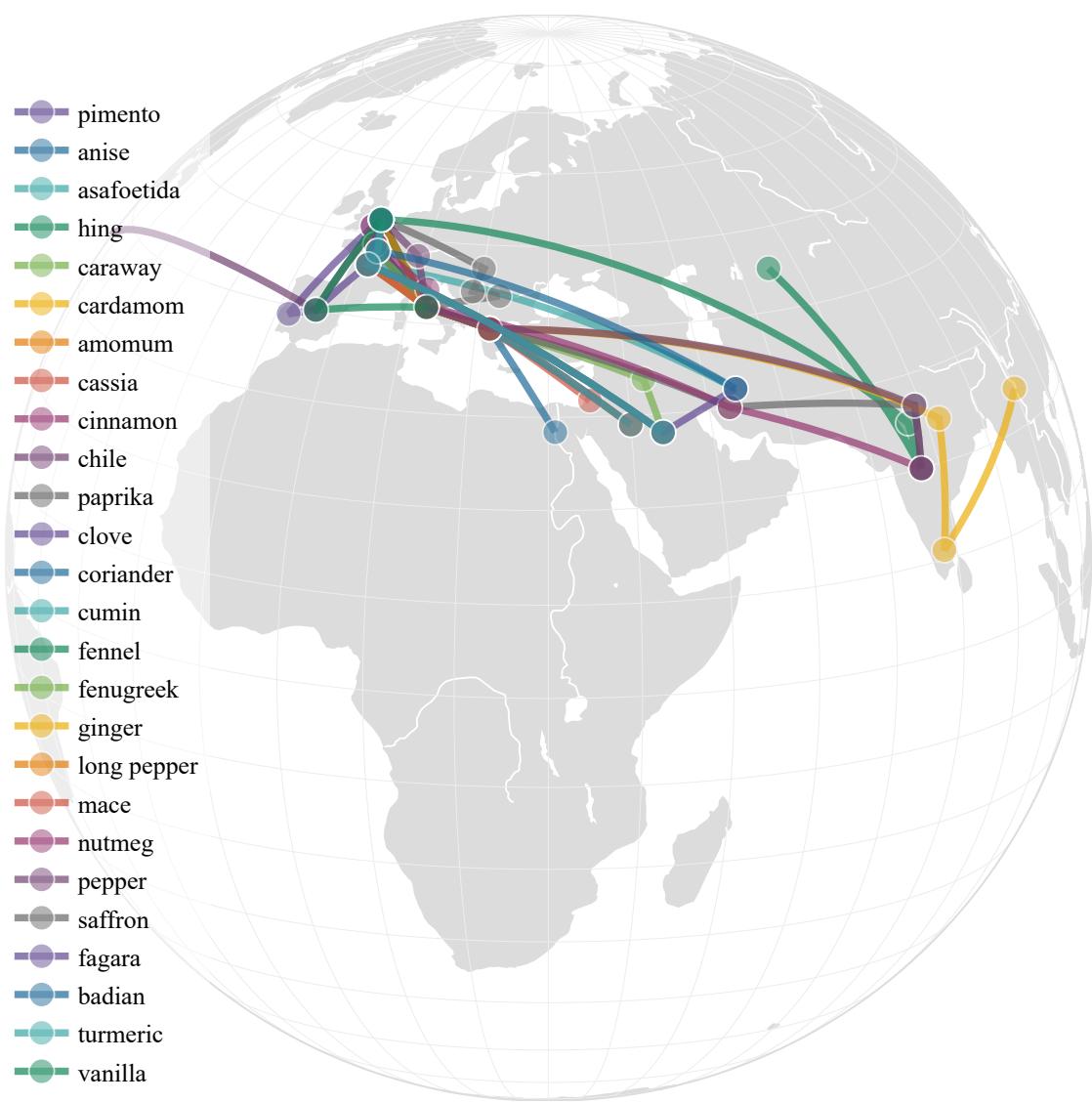


Figure 5.6 The diffusion of spice terminology in English, focusing on loanwords and *Wanderwörter*. For a full interactive version, please visit [https://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/diffusion\\_en.html](https://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/diffusion_en.html)

spice, as it is much more clear to inspect a single item as opposed to a crowd.

**Etymology 30.** English *ginger*, ca. 925 < reinforced by Old French *gingivere*, *gingibre* ‘ginger’ < Medieval Latin *gingiber* ‘ginger’ < Latin *zingiber* ‘ginger’ < Ancient Greek ζιγγίβερις *ziggiberis* ‘ginger’ < Pali *singivera* ‘ginger’; cf. cognates Sanskrit शृङ्गावेरं *śṛṅgavera* < Dravidian \**cinki-wēr* ‘ginger’, South dravidian nominal compound from the etyma of Tamil and Malayalam *iñci* (both with regular loss of an initial sibilant) + *wēr* (Proto-Dravidian *wēr*); the base of \**cinki* is a loanword < **unknown language?** ‘ginger’, unidentified Southeast Asian language; cf. cognates Khasi *sying* /s?inj/, Thai *khang*, Vietnamese *giảng*, Chinese *jiāng* <? **Proto-Sino-Tibetan** \**kjan* ‘ginger’<sup>a</sup>

<sup>a</sup>OUP (n.d.) and Ross (1952); Krishnamurti (2003, p. 5);

Besides the extreme case of *ginger*, we should take note that words from India (e.g., *pepper*) have passed through Persia, Arabia, and Greece, and in the final stages, almost every loanword have arrived via French and/or Latin. By parsing through the etyma of English spice terms, it is impossible not to acknowledge the role of the Arab traders, the Greek city states, and most crucial for the rest of Europe, the importance of the Roman Empire.

### Spices Travel Through Arabia: The Case of Arabic

Arabic loanwords in the spice domain reflect where the Arab merchants sourced their spices from; either overland via Persia or by sea from India (e.g., *fulful* ‘pepper’, *dārṣīnī* ‘cinnamon’, *dārfīlī* ‘long pepper’, etc.). Regional Semitic borrowings are also present, these include spices that originate relatively close to Arabia and the peoples of the region who knew and used them; e.g., *kammūn*, *shibitt* ‘dill’, *shamar* ‘fennel’, all three traced back to Akkadian. Arabia represents a bridge in the spice trade between Europe and Asia, connecting the Orient and Occident during the peak of the spice trade starting from the 6<sup>th</sup> century. In fact, the rise of Mecca, “the cradle of Islam” is known to have become prosperous due to the trade that lead ships to moor around the coast of Arabia, and turned caravans towards its flourishings trading posts with the ultimate goal of exchanging products for money with the merchants of the Mediterranean. The Arabs were so skilled traders that soon they managed the coastal trade in Indian ports as well, that represented the midway in the Indian Ocean trade network (Parti, 2017).

### Spices in the Middle Kingdom: The Case of Chinese

Loanwords of the spice domain in Chinese mostly testify to the early—indirect—relationships with India and Central Asia through the Silk Roads and its peoples (see *bibo* and *xingqu* from Sanskrit, and *awei*, *husui*, and *shiluo* via various iranian languages). *Huluba* ‘fenugreek’ is unquestionably a rendering of Arabic *hulba*, most likely to arribe via Persian. More recent borrowings include *duoxianggio* ‘allspice’, a semantic translation of the English term, and *geluzi* ‘caraway’, that I traced to be a loan from Japanese who learned and coined this form from Western medicinal herbals. *Ziran* is also a recent loanword from Uyghur.

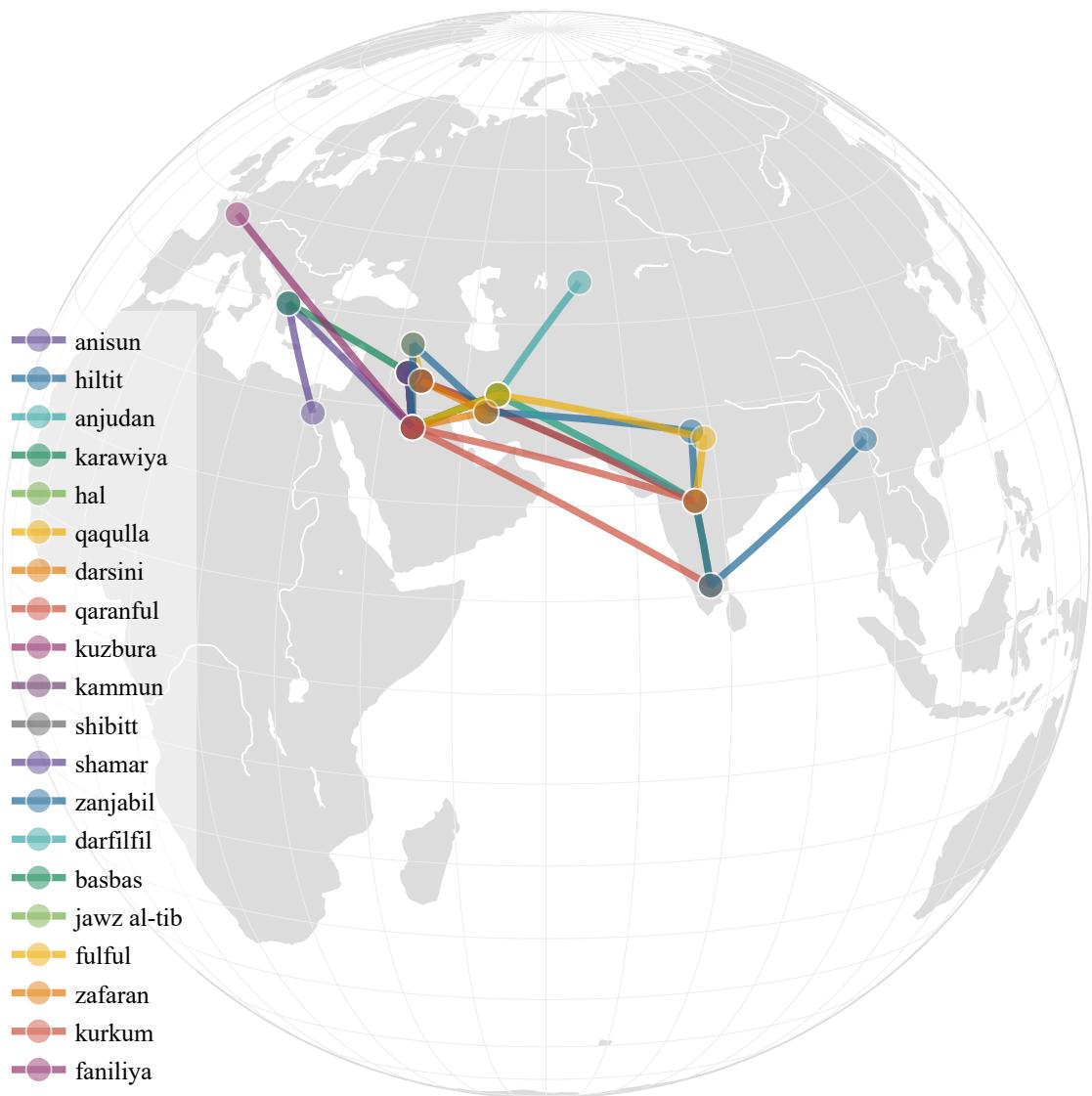


Figure 5.7 The diffusion of spice terminology in Arabic, focusing on loanwords and Wanderwörter. For a full interactive version, please visit [https://htmlpreview.github.io/?https://github.com/partigaborg/phd-thesis-viz/blob/main/diffusion\\_ar.html](https://htmlpreview.github.io/?https://github.com/partigaborg/phd-thesis-viz/blob/main/diffusion_ar.html)

It seems that Chinese loanwords represent spices that have arrived from a distance, India, Indo-China, and West Asia, and the Southeast Asian spices, such as nutmeg and cloves did receive Chinese names. A doubtful case is *doukou* ‘cardamom’, because it might represent an early Southeast Asian loan hidden by a partial phono-semantic matching, as it was discussed in Section 4.3.

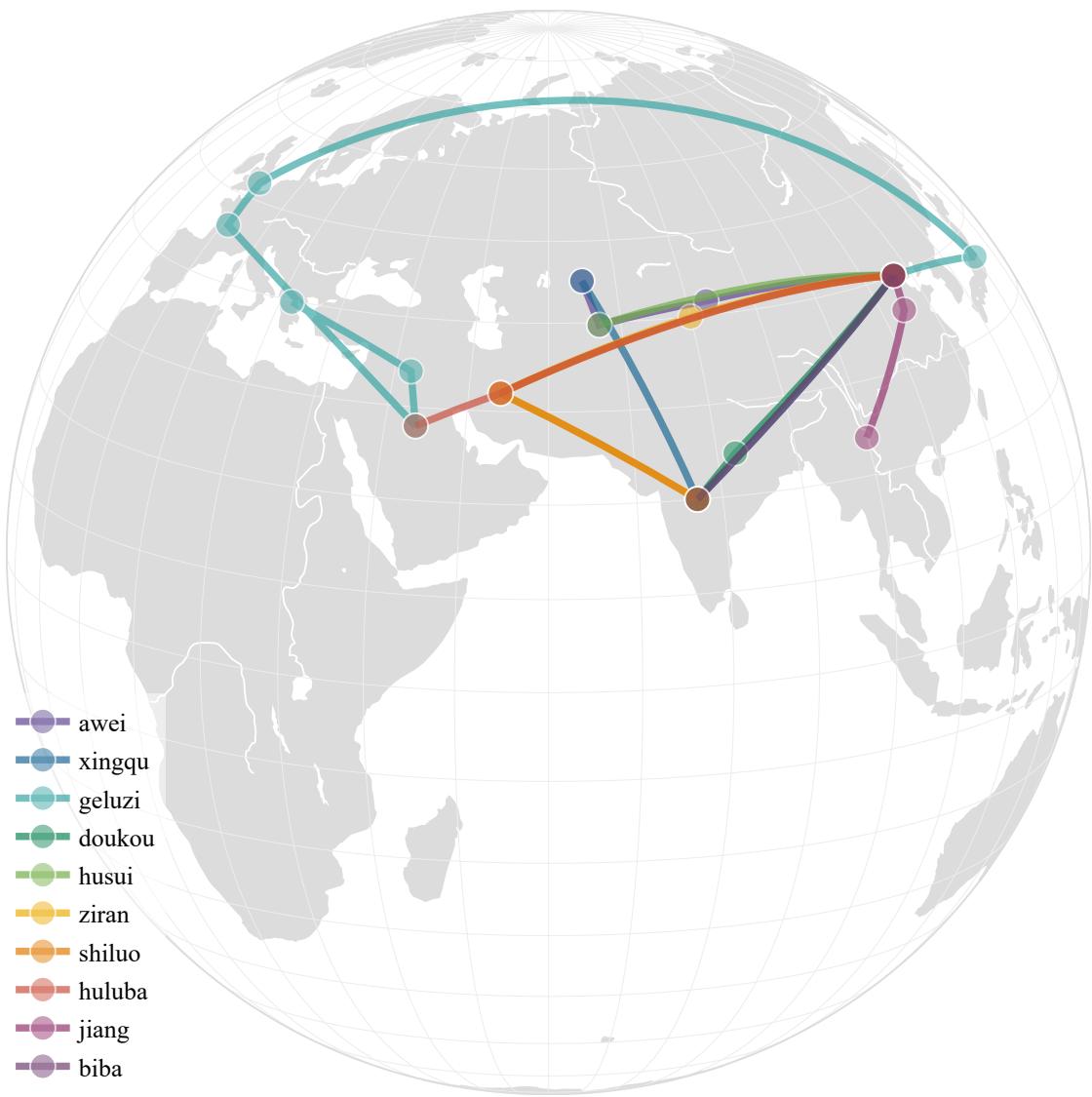


Figure 5.8 The diffusion of spice terminology in Chinese, focusing on loanwords and Wanderwörter. For a full interactive version, please visit [https://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/diffusion\\_zh.html](https://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/diffusion_zh.html)

### 5.2.3 Temporal Trajectories: The Attestation of Spice Words

After the investigation of how spice names reached English, Arabic, and Chinese on spatial trajectories, let us now look at how they have spread across time. One of the most exciting part of this thesis is the data that was collected regarding dates of attestation. In other words, I tried to find the earliest possible mentions for each spice, and then combine this information in a way that enables us to see the diffusion of spices span throughout the history of a language and culture. This information is a valuable indicator, as it shows the approximate times of the earliest contact and introduction of the materials. In essence, we can grasp the history of the spice trade in the words: when they arrived, which spices were the earliest to be recorded, and which ones make the latest additions to our vocabularies and spice cabinets. Here as well, from the nearly 360 names, I have used the selected few that—for lack of a better word—I marked with “default”. To make the attestation visualizations easy to read, I only used the default terms, and a small number of historic terms that precede the contemporary default ones. This allows for a less packed and cleaner plot and offers a way to compare the attestations in the three languages.

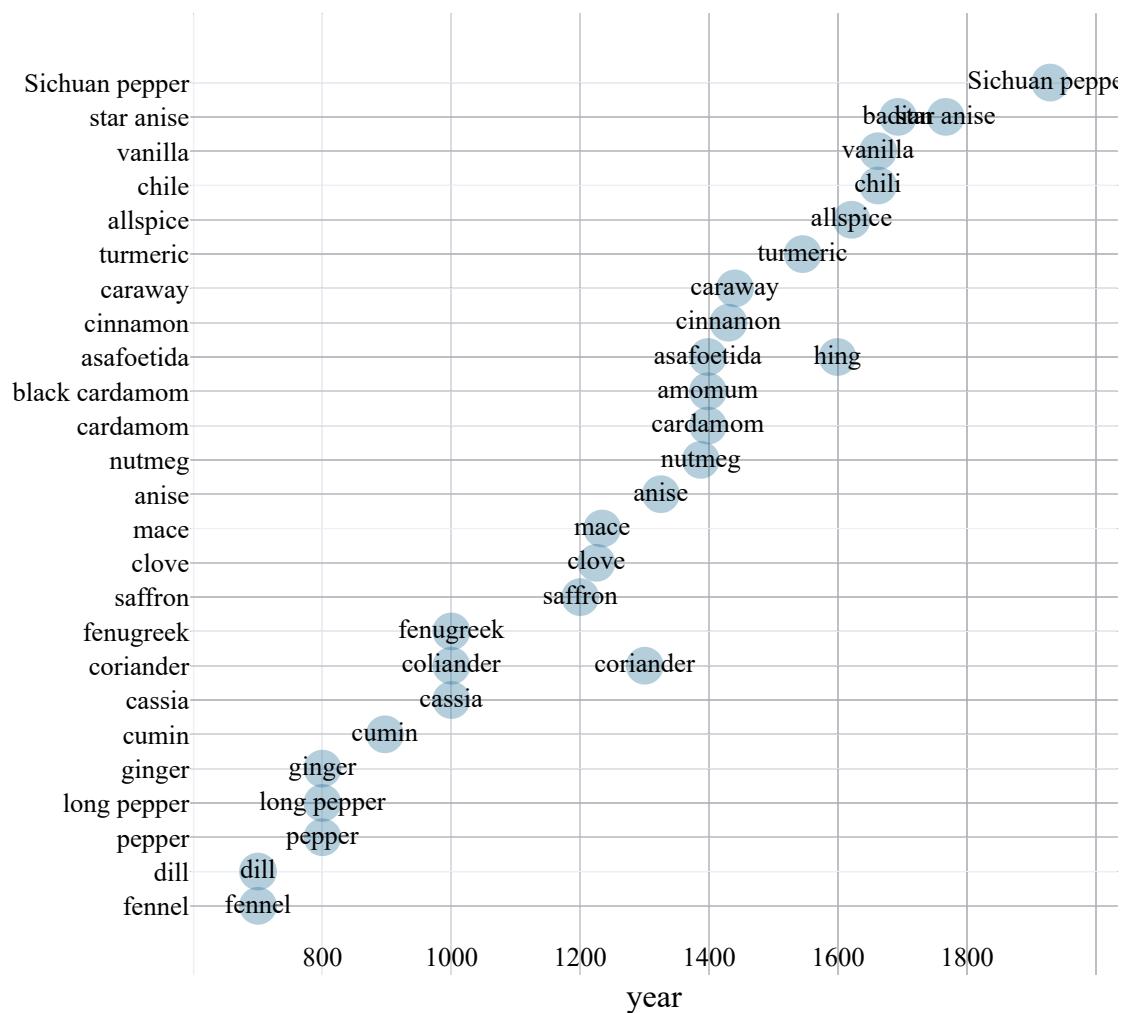


Figure 5.9 Attestation timeline for spice terms in English.

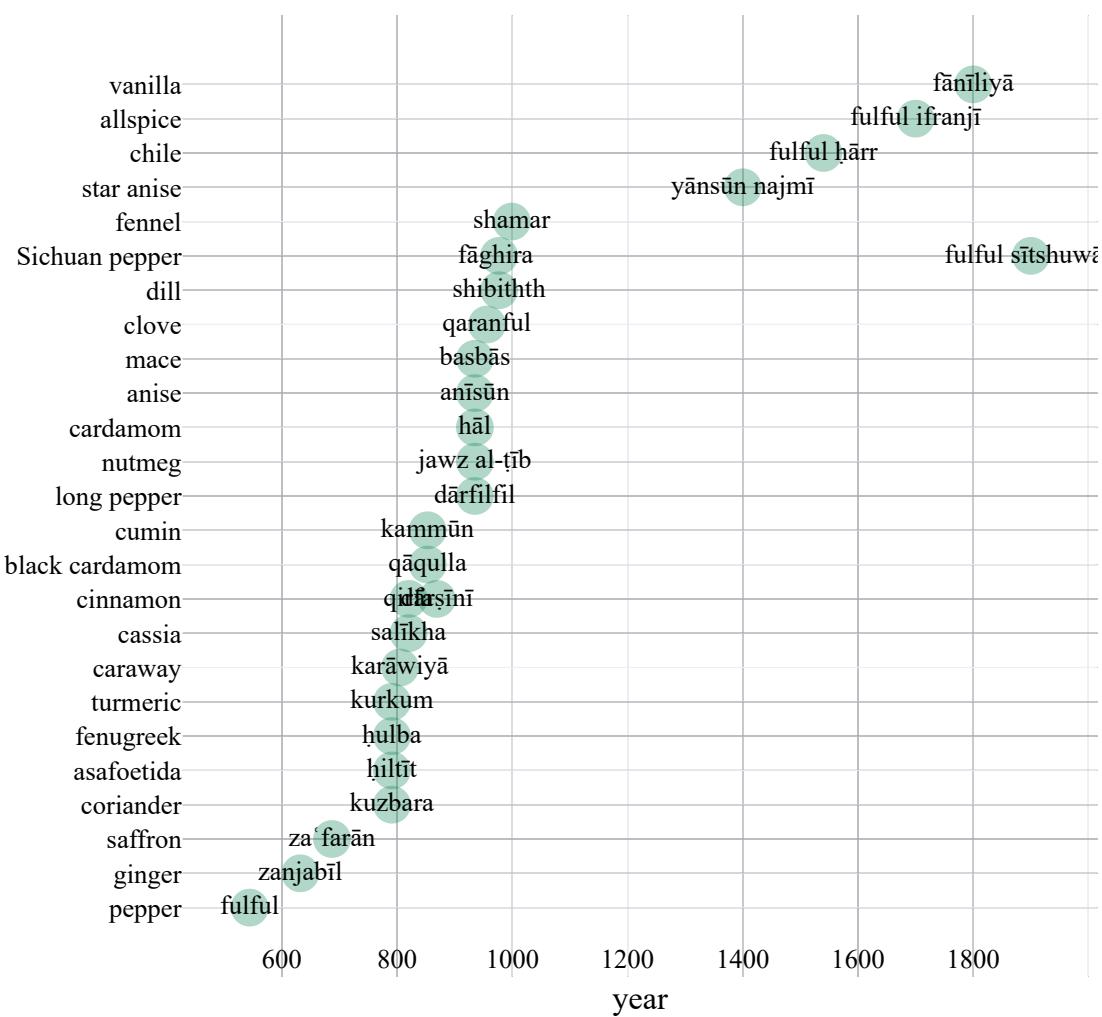


Figure 5.10 Attestation timeline for spice terms in Arabic.

The following figures should give a bird's eye view of the history of the spice domain, and its mark on vocabulary. In Figures 5.9 to 5.11, you can see the timeline of the spice nomenclature language by language. Not surprisingly, these figures will show that the native spices that are to be found the closest to the homeland of the ancestors of English, Arabic, and Chinese speakers, have been recorded first. See dill and fennel in English, saffron and fenugreek in Arabic, and Sichuan pepper and cassia in Chinese. If we reflect back to the geographical origins of the spices (Figure 5.4) the figures also show which are the earliest products of transnational trade, those that spread first despite their origins were distant and unknown to the early recipients. Primarily, these include pepper and ginger, which we already discussed were ideal candidates because of their resistance to long-haul transportation and high scores of (biological) spreadability.

In the final trilingual plot in Figure 5.12 I have produced a compact version of the same data, arranged by language. There is a chance to compare the main attestation periods for these items, and I added an accompanying histogram to better see which periods have seen the emergence of new spice words, indicating both flourishing periods of literature and trade.

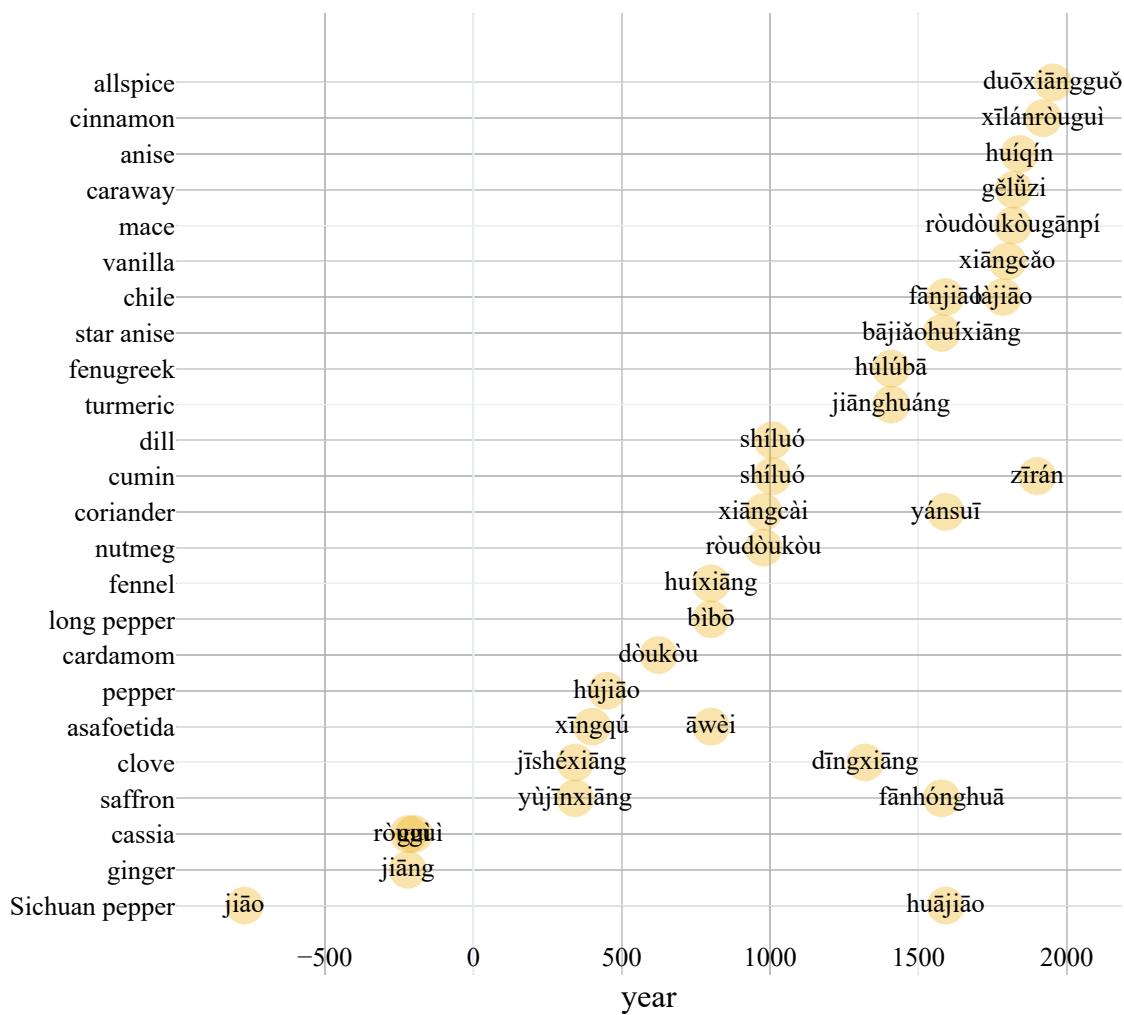


Figure 5.11 Attestation timeline for spice terms in Chinese.

Looking at Figure 5.12, we can observe a few trends off glance. First of all, it is clear that Chinese—the language with the longest literary tradition out of the three languages—has the earliest attested spice words, primarily *jiao* ‘pepper’, originally referring to the indigenous Sichuan pepper, but now also used to denote the black pepper and chili pepper especially. In this sense, *jiao* is the equivalent of English *pepper*, and Arabic *fulful*. *Jiao* is followed in time by *gui* and *rougui*, referring to the spice we know and use as cinnamon (but actually cassia), a tree native to the South of China, in the immediate proximity of the ancient Chinese heartland. As for *jiang* ‘ginger’—also attested at a very early date—I have already mentioned the reasons for its early diffusion and consequent inclusion into the medicinal and culinary traditions of ancient people *worldwide*. The attestation dates of other spices distribute evenly starting from the 4<sup>th</sup>-5 century, which marks the introduction of Buddhism into China from Central Asia along the Silk Roads, entering through the Gansu corridor. Besides monks carrying saffron, and asafoetida, we must not forget the many nomads and traveling traders, who likely introduced pepper as well (literally (nomadic) barbarian-pepper in Chinese), before the emergence of the Sogdians responsible for the introduction of many articles of trade during the Tang

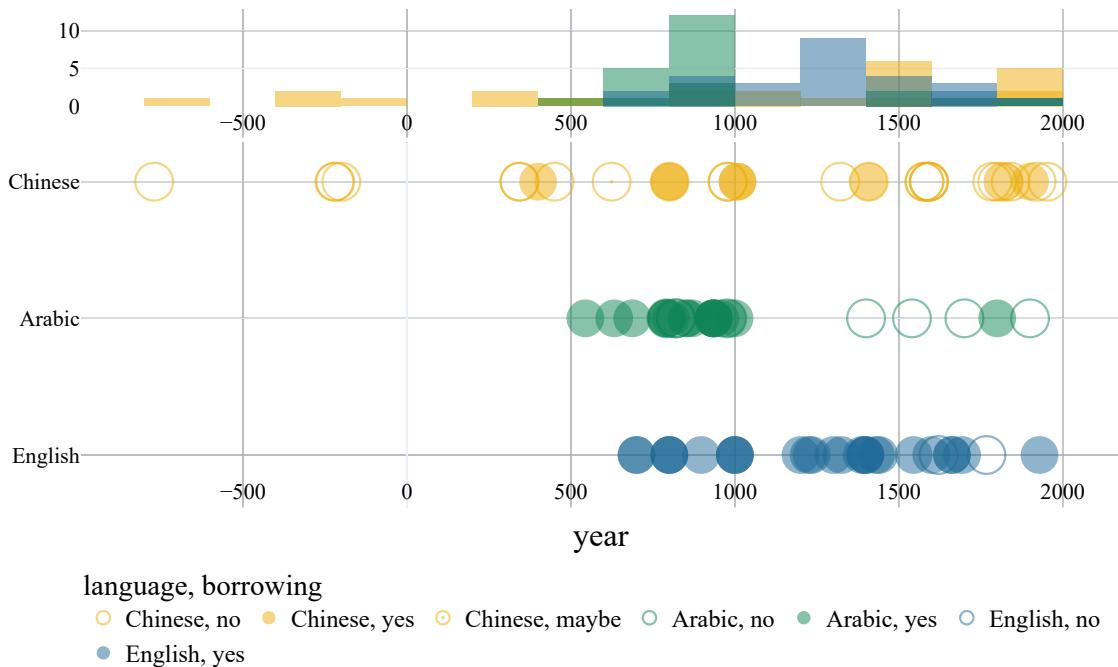


Figure 5.12 Comparative timelines for attested spice terms in English, Arabic, and Chinese, indicating borrowings. For a full interactive version, please visit [https://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/attestation\\_and\\_borrowing\\_compact.html](https://htmlpreview.github.io/?https://github.com/partigabor/phd-thesis-viz/blob/main/attestation_and_borrowing_compact.html)

dynasty. The attestation of many spice names in the modern period is worth noting, these include spices that were known before but not distinguished (caraway seeds were not considered a separate spice from cumin, but were surely known in the Western Regions), or spices that were (are?) not used traditionally (allspice, anise, Ceylon cinnamon).

Secondly, there is an obvious jump in the attested Arabic terms in the 8<sup>th</sup> century, which is considered the start of the Islamic Golden Age. During this time, science and literature flourished under the Abbasid caliph Harun al-Rashid, and the “House of Wisdom”<sup>8</sup> in Baghdad, the largest city in the world at the time (Gutas, 1998). It is worth noting that many of these terms became part of the Arabic vocabulary certainly much earlier than the attestation dates, but since the Arabic literary tradition begins with the compilation of the Quran (shortly after the death of Prophet Muhammad ﷺ in 632), we have little early documentary evidence. The earliest example would be from the *Jahiliyya*<sup>9</sup> era poet Imru’ l-Qays, whose poetry features the word *fulful/filfil* ‘pepper’.

Thirdly, English features a set of spices that were attested in Old English, many known to the Romans since Biblical times, such as... But we can also see the time when Europe bacame aquantied with further oriental spices after the Crusades, when the westerners who have acquired a taste for

<sup>8</sup>The House of Wisdom (Arabic: *Bayt al-Hikmah*) refers to a large library and/or academy famous for the voluminous translation work that produced an output of scientific literature from all sources and traditions including Greek, Roman, Persian, Indian, and the Arabic literature that built on and advanced the various sciences. Recently it has been suggested that the House of Wisdom was not an actual library but rather a metaphor referring to the active scientific community as a whole during early Abbasid dynasty. The library—if it existed—perished during the total destruction of Baghdad in 1258 by the hands of Hülegü and the Ilkhanid Mongols, thus little archeological evidence remains.

<sup>9</sup>Literally meaning ‘ignorance’, this term refers to the pre-Islamic period of Arabia.

lavish Eastern flavors started to bring them home.

The next trivial step is to add the feature of borrowings to the plot, to see chronologically which terms were borrowed, and which are native inventions.

#### 5.2.4 The Donor Languages

So who loaned these words? Which languages and civilizations are responsible for transmitting, transmuting, and disseminating the terms of the spice domain? From the etymological dataset, I have extracted the *participating* languages. In order of their frequency, they are: Latin, Sanskrit, Persian, Ancient Greek, Aramaic, French, Akkadian, Old French, Arabic, Proto-Iranian\*, Unknown, Middle Indo-Aryan\*, Semitic\*, Dravidian\*, Iranian\*, Anglo-Norman, Hungarian, Spanish, English, Pali, Egyptian (Ancient), Proto-Dravidian\*, Uyghur, Turkic\*, West Germanic\*, Romance\*, Proto-Sino-Tibetan\*, Old Chinese, Old Tamil, Sauraseni Prakrit, Late Latin, Old English, Middle Chinese, Hindi, Tokharian B, Sogdian, Slavic\*, Serbian-Croatian-Bosnian, Japanese, Classical Nahuatl, Hellenistic Greek, Ancient Hebrew, and Mandarin Chinese. Language families/branches, and proto languages are marked by an asterisk.

To give this batch of information some meaning, I have broken down this data according to our three reference languages, English, Arabic, and Chinese. You can consult this in Figure 5.13. This bar chart shows the top 5 languages that have played a role in *carrying* loanwords of the spice domain, at any given stage, whether being the source, or a transmitting language. Speaking of source, Figure 5.14 shows the top 5 source languages of the loanwords of the spice domain.



Figure 5.13 Top donor languages of English, Arabic, and Chinese loanwords in the spice domain.

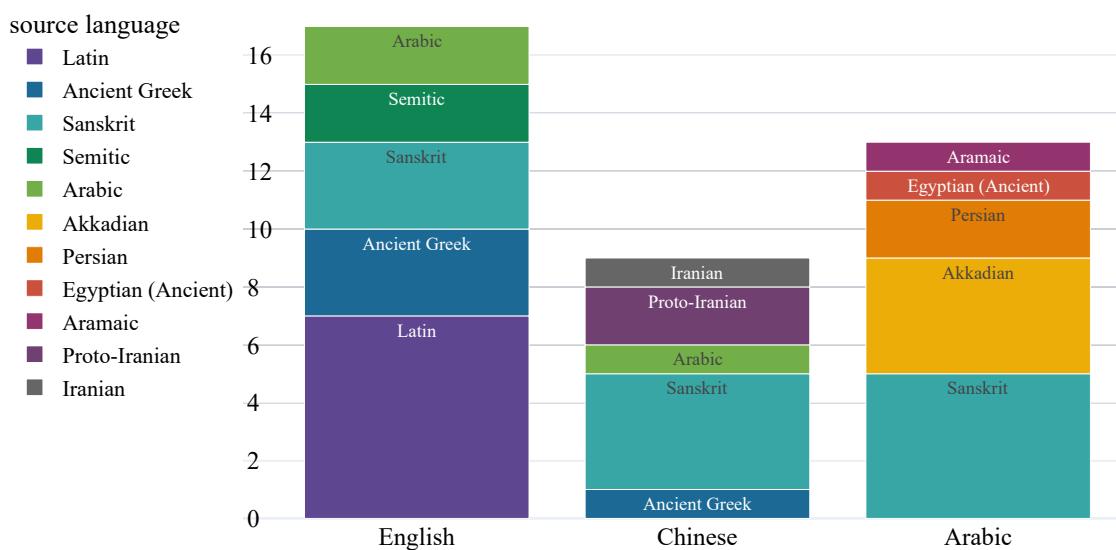


Figure 5.14 Top source languages of English, Arabic, and Chinese loanwords in the spice domain.

# The Language of Spices

**N**ow that the detailed explanation of the diffusion of spices is complete, let us examine spice names. Throughout this chapter, I will look at the terminology comparatively, using three sets of names representing spice nomenclature in English, Arabic, and Chinese. This chapter constitutes the results and findings of the analysis on the terms of the spice domain, from linguistic-cognitive perspectives.

I will start with an overview of the data and the results in numbers, and then I will thematically introduce certain aspects of the terminology, guiding the reader from a general questions of analyzability and structure, towards more nuanced probes that will shed light on the composition, rationale, and motivations behind spice names. The aim of this section is to have an understanding of how spice names are formed, what are the components of typical spice names, and why languages use these elements. At the end of this chapter, a close look into the names of one specific spice will show how can we apply the findings.

## 6.1 Overview: Spice Names in Numbers

As a result of the data collection set forth in Chapter 4, the spice name dataset now contains 360 spice names. Of these, 154 are in English, 86 are in Arabic, and 120 are in Chinese; Figure 6.1 shows this distribution. The total number is the result of the lengthy process of carefully compiling the nomenclature for the set of spices as defined at the beginning of the thesis, which consists of 24 different spices. The data collection methods were detailed in Section 3.2. Combing through dictionaries and the literature, it quickly became clear that the accumulation of spice names—and therefore this project is essentially endless—there is no feasible way to compile the infinite aromatic plant products of the world, and certainly not their many names. This can spark both stress and joy; on the one hand I am relieved that I chose only two dozen relatively well-known spices and not more, while on the other I am excited to see that there is room to grow: there are more aromatics to include, more names to examine, and more things to learn.

On average, a spice in my dataset has 14 names, where the max is 44 (chile), and the min is 4 (fenugreek and mace). Figure 6.2 shows the top ten and the bottom ten spices that have the most and least number of names, including all three languages. The legitimacy of this figure might raise some eyebrows, but in fact it is a very good indicator of which spices are more complicated in their nomenclature overall, and therefore which are the most *problematic* to untangle. As we can see, spice plants that boast with many names include the chili pepper, Sichuan pepper, cassia and false

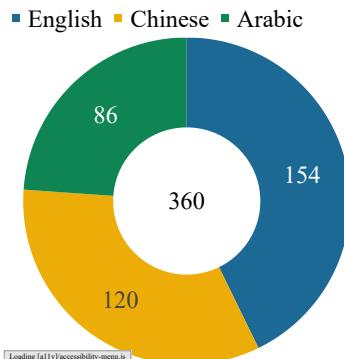


Figure 6.1 The distribution of spice names across the three languages.

cardamoms, which represent spices that are rich in variety. On the other hand there is also allspice, which has no variety at all but a confusing and unclear set of names across the three languages. These are—not incidentally—the very items that I have dedicated substantially more pages to than some of their peer spices, due to issues about their identity or the complexity and richness of their nomenclature. This seems to go hand in hand with matters of biodiversity: chile has countless varieties that have spread to faraway corners of the earth, and now it is a hobby in its own right to cultivate, breed, and crossbreed hot chile cultivars. As we saw, Sichuan pepper species are used across vast regions in East Asia (mainly in China), and it can cause headache to pin them down exactly, their “boundaries” and varieties are not that well-defined—especially to those outside East Asia—and it does need some explanation to untangle and isolate the various sources of cassia types as well.

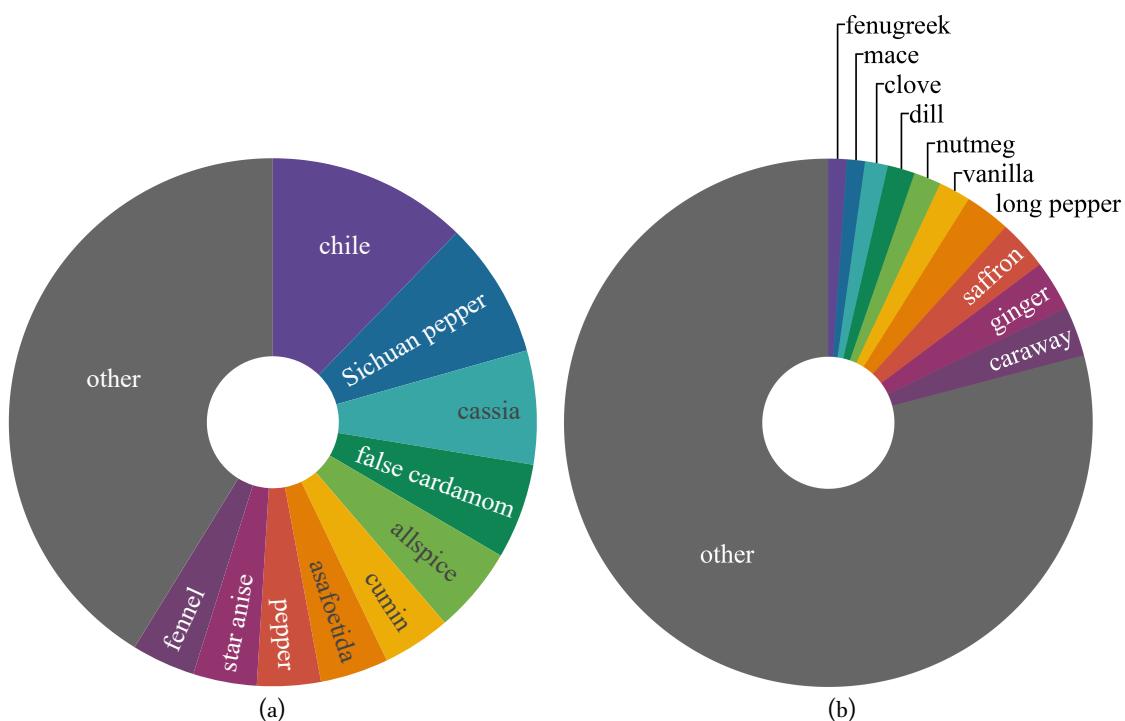


Figure 6.2 Top 10 spices with the most number of names (a), and bottom 10 spices with the least number of names (b).

On the other hand, spices with the lowest number of names are presumably the most straightforward items, take for example cloves, or vanilla. But what makes a spice “straightforward”, or in other words, simple? In my opinion, it is their uniqueness and recognizability. Indeed, if we reflect on our investigation on vanilla in the last section of the data chapter, we have already established that it is a rather special item: there is no other spice that is made from the fruits of an orchid, no other spice that is obtained from crystals of long dark brown beans, and no other spice that is sold in liquid form—it is unique. Or, if we think of cloves, they are unmistakable in their shape and in many languages they are known by their shape. These two items are also very well circumscribed in terms of their geographic origins. Although now cultivated in multiple tropical regions, vanilla is known to be

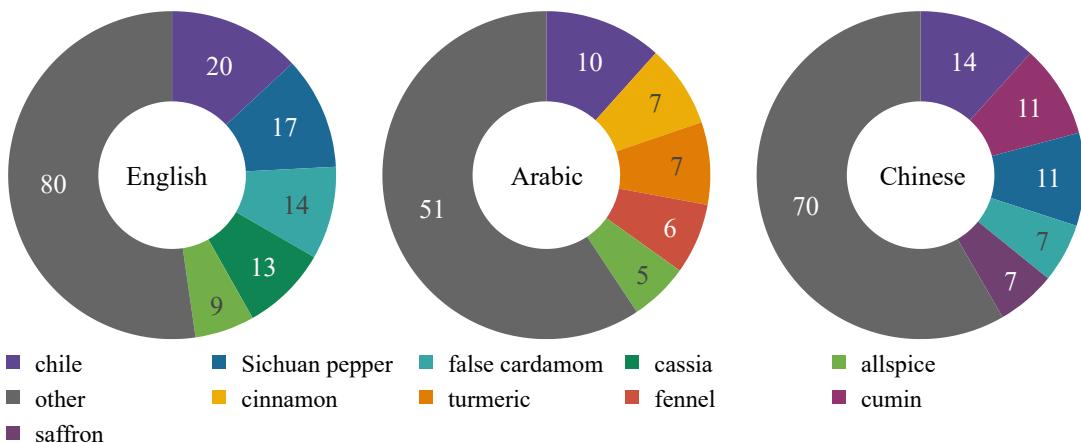


Figure 6.3 Top 5 spices with the most number of names, by language.

from the jungles of Central America and Brazil, there is no doubt about its origins. The native habitat of cloves is even more narrow, as it is only indigenous only to North Maluku and the “spice islands” of Makian, Ternate, and Tidore. We see nutmeg and mace as well among the bottom five items with the least amount of names, and we should notice that nutmeg and its mace are also from this region, they were exclusively found on the Banda islands of Maluku, and nowhere else until the second half of the 18<sup>th</sup> century. Now, it makes a bit more sense to look at these same charts deconstructed by language, this can be seen on Figure 6.3. The most conspicuous feature of these pie charts is that chili has the most names, across every language.

## 6.2 The Analysis of Spice Nomenclature

This section will now present the analysis on spice names trying to answer the main question: How do people name spices, and specifically, new spices that they came into contact with? Immediately, we can think of two ways: languages either borrow, or conceive a name. We saw the borrowed element in the previous chapter, and now we will dive into how the naming process exactly works. What are the structural requirements and salient features that influence the creation of a name? How languages invent and generate new names for novel materials and substances? In an attempt to give answers to these questions, I took a bottom-up approach and looked at all 360 names of the 24 spices from the data I collected to arrive to some conclusions.

So what kind of spice names there are? How does a typical spice name looks like? Intuitively, we can identify two core types of names instantaneously along the lines of their structure: *basic*, *modified*. *Basic* would be a monomorphemic or a derived word that refers to a prototype spice, without any distinguishing word, e.g., *cardamom*. *Modified* could refer to compounds and noun phrases that use a spice name as a headword, but also have a modifier for purposes of identification and disambiguation, e.g., *green cardamom*, *black cardamom*, *true cardamom*, *false cardamom*, *Nepal cardamom*, *Ethiopian cardamom*, *round cardamom*, *lesser cardamom*, *greater cardamom*, *hill cardamom*, etc. We can also discern the wide range of categories of the modifiers referring to color, shape, size, geographic origin,

#	analyzability	English	Arabic	Chinese
0	analyzable	111	50	99
1	unanalyzable	39	32	20
2	semi-analyzable	3	4	1

Table 6.1 Analyzability of words in the spice name dataset.

and even positive and negative evaluations of perceived authenticity. A spice term can also have a modifying word to specify the plant part as well, this can be observed most commonly for spices that are known also as plants, or other parts of the plant are used as well, or the same part is used in other form (i.e., ground or powdered). In English this is usually attached after the headword, similarly to a regular suffix. Examples include: *cumin seed*, *coriander-seed*, *aniseed*, *ginger root*, etc. After consulting intuition, let us consider a more formal analysis.

### 6.2.1 Analyzability and Structure

Analyzability of words is originally an idea from the 20<sup>th</sup>-century philological movement and method *Wörter und Sachen* (words and things in German), which had a big influence on linguistics and ethnography. Outlined by Hugo Schuchardt and based on the titular journal *Wörter und Sachen* started by Indo-Europeanist Rudolf Meringer in 1909, it proposed the close study of the etymology of words together with the artifacts/concepts (Ortutay, 1977–1982). Meringer wrote in 1906: “Ohne Sachwissenschaft keine Sprachwissenschaft mehr!” (There is no more linguistics without the study of material culture!). Practically speaking, analyzability meant that the more opaque a name is in terms of morphological analysis, the longer it is assumed to be present in the language. A basic example would be *York* (monomorphemic) vs. *New York* (analyzable), which provides a potential chronology for the concepts the words signify. This approach was incorporated into historical linguistic research and philology, often studied in parallel with findings in archeology (Ortutay, 1977–1982).

Haspelmath and Tadmor (2009a, p. 12) also used the term “analyzability” in the creation of their loanword database (*The World Loanword Database (WOLD)*) as a first step to assess a word’s loanword status, although in a purely linguistic way. I have applied a simplified version of this annotation, and indicated if a word was (1) unanalyzable, (2) semi-analyzable, (3) or analyzable. Items are semi-analyzable if the situation is morphosyntactically complex. For example in case of “cranberry words” such as *fenugreek*, where an English speaker could decipher the element *Greek*, but would be left in the dark with *fenu-*, or the Arabicized loanwords from Persian, *dāršīnū* ‘cinnamon’ or *dārfīlī* ‘long pepper’, where both *shīnū* ‘Chinese’ and *fīlī* ‘pepper’ would be understood, but Arabic speakers would not know what to do with *dār* (which coincidentally means ‘house’ in Arabic, but it is from Persian ‘wood’). A Chinese example could be *huluba* ‘fenugreek’, where *hu* ‘barbarian’ is the same character that is found in *hujiao* ‘black pepper’, pointing to its foreign origins, but the whole word itself would be difficult to decode since it is in part a phono-semantic matching or Arabic *hulba* ‘fenugreek’. Sometimes the Chinese term uses the first character 胡, which is a phono-semantic compound of *hu* ‘barbarian’ (after its sound value) and *cao* ‘herb’ for its meaning, making the loanword origin more obvious.

Analyzability of words greatly interlinks with their structure, which can be simple or monomorphemic (e.g., *hing*), compound (e.g., *stinking gum*), or phrasal (e.g., *devil's dung*). *Asafoetida* would be considered a compound to those only who are familiar with either Latin, or the history and meaning of this word. Even if we are, *asa* is a cranberry morpheme, and *foetida* ‘fetid’ might not be immediately obvious, so it is a semi-analyzable compound.

Importantly, compounds that are coined within a language are not considered loanwords, even if they contain borrowed elements. Thus, while *chili* is considered a loanword, *chili pepper* is not. Of course, there are always ambiguous cases: is *black pepper* a loanword? It depends on if it is a learned loan/semantic translation from Latin *piper nigrum*, or a genuine English invention; and for this we have to dig deep into the history of words. To sum up, we could say that if a word is morphosyntactically complex, “it was almost certain that it was created by speakers of the language rather than borrowed from some other language” (Haspelmath & Tadmor, 2009a, p. 12).

Words that are analyzable are most often compound in their structure, but there are a few derived names as well. As English is an isolating language, it is less common to find derived words. Derived terms do occur in Arabic, where a handful of spice names come from verbal roots originally referring to the method of acquisition, such as *qirfa* ‘cinnamon’ from *qarafa* ‘to peel, derind’, or *salikha* ‘cassia’ from *salakha* ‘to pull off, strip off; skin, flay’. Other methods of word formation for generating spice names in Arabic include the diminutive pattern, cf. the form *fulayfila* from *fulūl* ‘pepper’, equivalent to ‘capsicum’. Or, the pattern to form an active participle in the feminine as it has been proposed in case of *fāghira* ‘Sichuan pepper’ from *faghara* ‘to open’, alluding to the half open, mouth-like pericarps of *Zanthozylum* species. There a few examples of phrasal names as well, such as the above-mentioned *devil's dung*, but most often these tend to be titles of praise rather than actual names, for example *king of spices* ‘black pepper’, *queen of spices* ‘cardamom’, *red gold* ‘saffron’, etc. Table 6.1 and Figure 6.4 show the trilingual distribution on the analyzability of words. Closely related to analyzability, is the question if a term is borrowed or not, which I have already covered in the previous chapter on the diffusion of spice words.

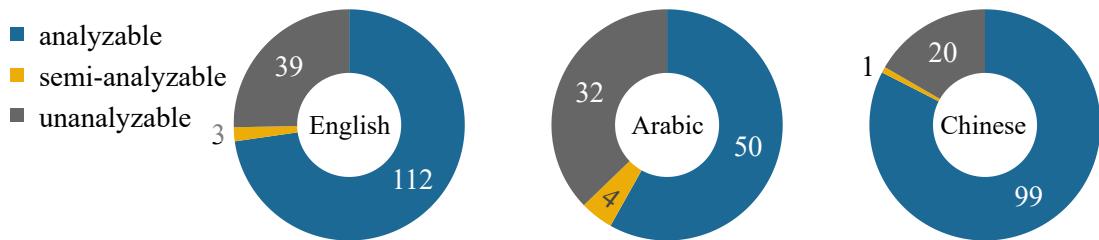


Figure 6.4 The ratios of the analyzable words in the spice name dataset.

### 6.2.2 Spice Term Anatomy: Prototypes and Distinguishing Words

I already mentioned that the vast majority of analyzable spice terms are compounds, and so let us look at the anatomy of these compounds. By far, most compounds are made up of two elements, sometimes three, but even more is possible. Based on the principle of analyzability explained above

we could rightfully assume that the more elements a compound name has, the more culturally *distant* it is, the more unfamiliar its referent is to the speakers of the language. We saw in Chapter 5 that the earliest attested words are indeed *short* and monomorphemic in their form, such as *dill*, *fulful* ‘pepper’ and *gui* ‘cassia’. And in support of this theory we also saw that recently attested words are likely to be polymorphemic compounds, such as *Sichuan pepper*, *fulful ifranjī* ‘allspice’, and *xilanrougui* ‘cinnamon’. In short, there is an obvious tendency from simple towards the complex.

Every compound element has a headword, and one (or more) modifier(s). Take for instance *sweet cumin* referring to ‘anise’, where the headword is *cumin*, and the modifier is *sweet*. The use of *cumin* can be explained by the prototype theory; to the person(s) who coined this term, cumin was an already known, ideal prototype for anise, on account of their similarity in their appearance (indeed, the two kinds of seeds look very similar, and they are related plants from roughly similar geographical origins to an English speaker). And so here, we can determine that the rationale for use of the headword is ‘prototype similarity’ with the basis of physical appearance. In most cases, the motivation behind the creation of spice names is simply identification and disambiguation.<sup>1</sup> Thus, a distinguishing word is needed to differentiate from the *original cumin*, and this word here is *sweet*. The distinguishing words or modifiers often arise from the most salient quality of the materials when compared to the prototype item: in this case, the sweetness of anise.

The final thing to point out in this example is that *sweet cumin* is not merely an alternative name of anise, it is an *alias*. Under “alias”, I am referring to the misleading quality of this name, and I would like to emphasize that the prototype words could be used in two ways: matching or not matching. For example: in the compound *white pepper*, the headword *pepper* is used a matching prototype because the referent of the prototype matches the referent of the whole compound (i.e., white pepper is really pepper). Hence, white pepper is an alternative name which has the role of narrowing, specifying the subtype of pepper in certain situations. Contrastingly, *Jamaica pepper* is an alias, because in the real world the referent of the prototype and the referent of the compound do not match. In these cases, the prototype is used as a headword on account of its similarity—whether physical, chemical, or other.

This difference in how prototypes fill in the role of the headword (matching or not) can have serious real world implications, and it is the one single feature of spice names that can cause the biggest confusion. If I may share a personal anecdote. One of my very close friends is working in the family business of importing and exporting various nuts and oil seeds. When a customer ordered a large shipment of black cumin, her boss—her sister—mistakenly ordered cumin. Now, if my friend’s sister had glanced on the report my friend made, she would have noticed immediately that black cumin (also known as *nigella*, *Nigella sativa*) and cumin (*Cuminum cyminum*) are two different spices, from different families. The mistake cost a lot to the company, and a lesson was learned, but we can safely assume that this kind of mixup happens regularly. To be clear, I do not want to “fix” the usage of common names in this thesis, I am simply trying to explore and explain why there is confusion between certain materials, so that I can organize and present it in a way that it one day might be useful

<sup>1</sup>Another interesting type of motivation is promotion/advertisement, as in the case of *grains of paradise*, where the creation of the name was intended to make the spice more desirable for European buyers. Cf. *xiangcao* ‘fragrant-grass/herb’

as a trustworthy checklist or master list of spice names. Right now, I still believe that botanical names are the safest way avoid accidents like this.

By the way, to make things much worse, there are more than one spices that can be called *black cumin* besides nigella, *Bunium bulbocastanum* (a.k.a. great pignut), and especially *Elwendia persica* (*black seed*, *black cumin*, *black caraway*) is often confused with the black seeds of nigella. It is not uncommon for a name to be used for the products of different aromatic plants, and this is a source of confusion.

## Headwords and Prototypes

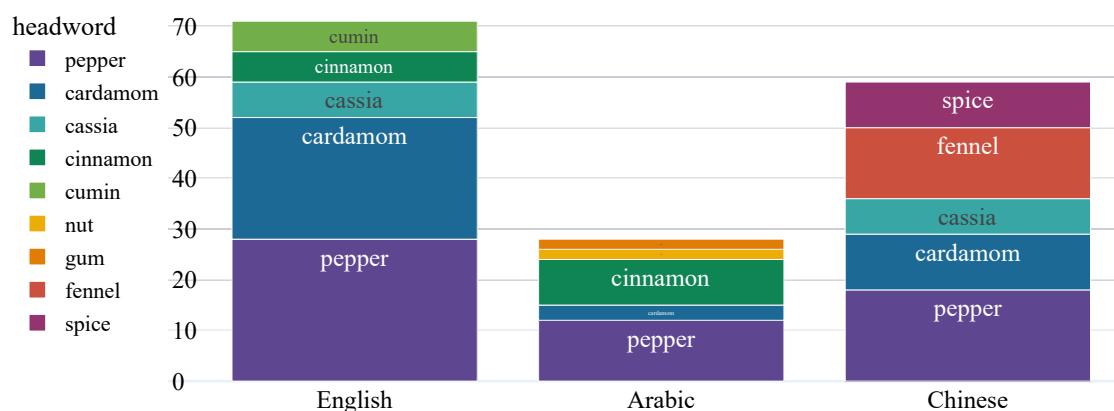


Figure 6.5 Top 5 headwords appearing in spice names, by language.

When it comes to frequent headwords, we will most often find spice name prototypes—both matching and not matching the referent of the whole compound—for example, the prototype words for pepper, cardamom, cinnamon, and fennel occur in high numbers. The top most frequent headwords can be seen on Figure 6.5. There are also headwords that do not refer to spices, but rather signify other plant parts and products, such as Arabic *jawz* ‘nut’ (with the primary sense of ‘walnut’ but by extension any nut) as in *jawz al-ṭib* [nut-of.fragrance] ‘nutmeg’. Arguably the most salient feature of the nutmeg is its nut-like appearance, and English also testifies to this. Another example could be the words for gum, referring to the useful part of the ferula plant, asafoetida. Headwords that allude to the function, role, and usage of the substances are also present, consider the *spice* in *allspice*, *bahār* ‘spice’ in *bahār hubw* [sweet-spice] ‘allspice’, or *huixiang* [Muslim-spice] ‘fennel’ or *dingxiang* [nail-spice] ‘clove’.

To have an outlook on the full extent of how headwords operate, I have tried to categorize them. According to the usage, most headwords are prototype words used because they are similar to the item that bears the name, followed by cases when the prototypes used in a “matching” way. The rest are a few cases that utilize words of plant parts, function, taste, shape, and color in their headwords as most salient elements.

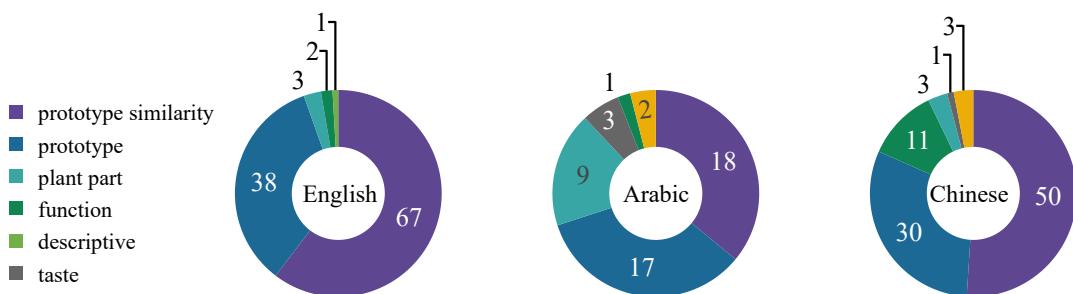


Figure 6.6 Top 5 headword types in spice names, by language.

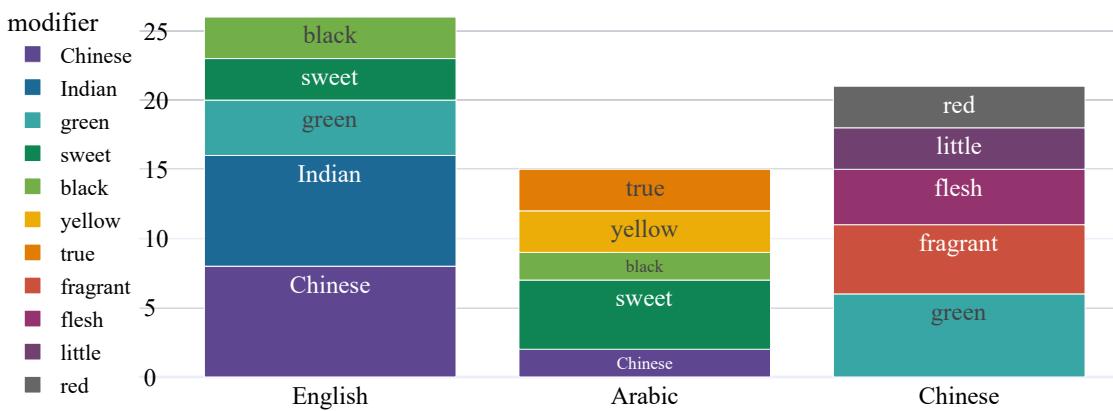


Figure 6.7 Top 5 modifiers appearing in spice names, by language.

### Modifiers and Distinguishing Words

When it comes to modifiers, we can see that the most prominent distinguishing words are adjectives of color, taste, size, shape, but unmistakably, modifiers pointing to geographical origins. Names of countries, regions, cities, perceived or real sources of spices are the most prevalent category here. Figure 6.7 show the top five modifiers across the three languages.

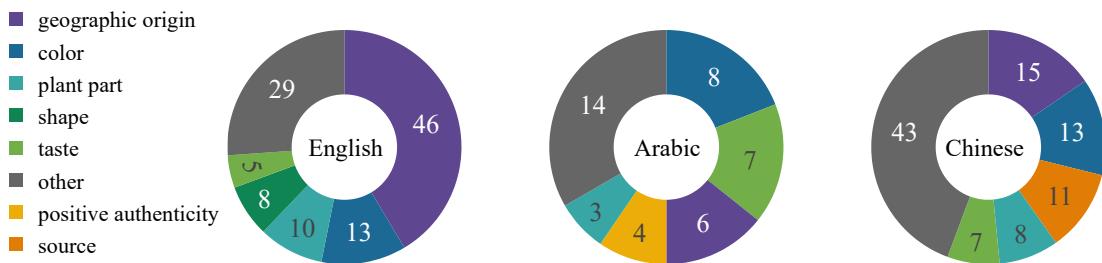


Figure 6.8 Top 5 modifier types in spice names, by language.

## Sensory Words

Due to the highly stimulating nature of spices, sensory words often frequent the modifiers. In fact, after distinguishing spices by their geographic origin, the second most common types of modifiers are words of color. What are other salient qualities of perception when it comes to spices? It must taste and smell, right? In my analysis, I have identified and categorized sensory words according to the sensory modalities they operate in, and the results can be seen in Figure 6.9. It is clear that vision—generally accepted as being part of the “higher senses” along with hearing—takes the highest ranks, and the “lower senses” follow suit: words from the gustatory, olfactory, tactile, and thermal sensory domains.

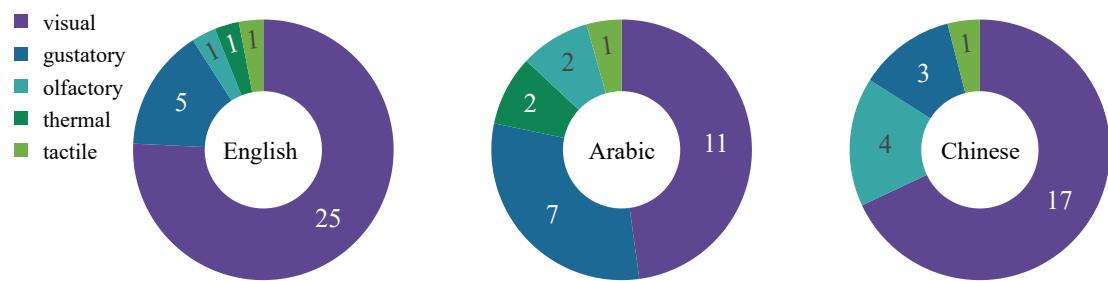


Figure 6.9 Proportion of the sensory modalities in among the modifier words that belong to a sensory domain.

## Summary

The final question offers itself: What is the most common blueprint for a spice name? According to the statistics of the dataset, the most common combination is *prototype similarity + geographical origin*. Therefore, names such as *Indian cardamom*, *Ceylon cinnamon*, and *Chinese anise* are the most typical examples for naming a spice, where the headwords point to a different item of significant similarity. Therefore, *Jamaica pepper*, the first example we mentioned many pages ago in the introduction, is a fairly regular spice name.

## 6.3 Spice Name Analysis: The Example of Star Anise

Let us consider the nomenclature of star anise in the three languages. In English, there is the default term *star anise*, which is a native invention, obviously after the fruit’s unmistakable appearance. On a rare occasion, we have information on the exact time of star anise’s arrival to England, which is dated to 1588.<sup>2</sup> The same inspiration for the name is found in most European languages, either influenced by 16-17<sup>th</sup>-century spice dealer terminology, or devised on their own conviction, looking at its recognizable shape. I used the word “native”, even though the phrase is obviously mixed from an etymological point of view: *anise* is a loanword ultimately from Greek. However, when faced with this

<sup>2</sup>OUP, n.d., star anise.

type of phrases, I consider that at the time of the contact situation, *anise* was already part of the English lexicon—as well as *star*—therefore, this phrase was coined within English, and is deemed as a native creation. This practice is consistent with the approach took by the team of Haspelmath and Tadmor (2009b) at WOLD. English also has the term *Chinese anise*, which is a phrase consisting of *anise*, again, and *Chinese*, referring to star anise’s geographical location and the origin of its procurement for the English. The motivation behind this term could be due to the need to differentiate between Chinese and Japanese star anise, two very similar items. Both phrases utilize the term *anise*, which refers to the small anise seeds of the Mediterranean, used as a spice, and flavoring for liqueurs and confectionary. Why is there a connection to anise? The two plants could not be more different, they are geographically distant, and they are botanically unrelated. The only thing that connects them is their highly similar flavor profile, dominated by the volatile oil anethole; the same nauseating and sweet chemical compound that is found in fennel and licorice. And so, for the Europeans who were familiar with anise and its taste, the novel product reminded them of anise’s aroma. Hence, the names are in part inspired by taste/plant chemistry, defining anise as a prototype spice and prototype term. To avoid confusion, (the existence of which will be clear to anyone who tries to do a brief search about anise or star anise), distinguishing words are used for the new material. These modifiers are attached to the headword, and in one case inspired by the spice’s shape, on the other hand referring to its geographical origin. The existence of a name of *Chinese star anise* could be explained by the fact that there is a Japanese star anise as well, a similar looking but poisonous fruit and tree, *Illicium anisatum*, as mentioned above. In short, the two phrases have different ways to identify this spice. English also has an archaic form referring to star anise: *badian* from French, which arrived via a land route through Persian, that might be a phonetic loan from Chinese, but there is no documentary evidence for this.<sup>3</sup>

Arabic *yansūn najmī* [star anise] was devised along similar lines, using a native Arabic word for ‘star’, the prototype word is anise, and the more interesting instances are to be found in neighboring Persian. *Bādyān khatā’ī* or *khatāyī* [star anise] is star anise, while *bādyān rūmī* [Roman anise] is anise.<sup>4</sup> *Bādyān* alone could also refer to fennel.<sup>5</sup> This shows, that in Persian, the prototype word was *bādyān*.

As for Chinese, we do not find any loanword among the terms used to refer to star anise, all names are local “inventions”. The modern “proper name” for star anise is *bājiǎohuíxiāng* [eight-horn-hui-spice], where [eight-horn] means ‘octagonal’, and [hui-spice] is fennel, therefore it can be translated as ‘octagonal fennel’, or ‘eight-horned fennel’. Another name, *dàhuíxiāng* ‘big-fennel’ strengthens the assumption that in Chinese, *huíxiāng* ‘fennel’ is the prototype. Again, the flavor profiles of fennel and anise are basically identical, hence the connection (and confusion). The formal Chinese names of star anise are not attested in historical corpora, and I assume that the vernacular name of *bājiǎo* [eight-horn] was first applied to star anise, and the formal name was modelled later driven by the plant sciences. In modern dialects star anise is also referred to as *huíxiāng* ‘hui-spice’ (historically ‘fennel’) and *dàxiāng* ‘big-spice’. In modern TCM, fennel is referred to as *xiǎohuíxiāng* ‘little-hui-spice’,

<sup>3</sup>OUP, n.d., *badian*.

<sup>4</sup>Hayyim, 1934–1936, Vol. 1, p. 197.

<sup>5</sup>Steingass, 1892, p. 140.

contrasting the two spices that are confounded due to their taste, using size. In fact, the Chinese 大/小 *dà/xiǎ* ‘greater/lesser’ contrast is not necessarily a marker of size, but a semantic tool to convey unmarked-marked, or proper/imitator.

To summarize the points I intended to make above: First, I determined if the words and phrases are analyzable (morphologically, syntactically, semantically), then I examined those names further, while also stating why a specific item is unanalyzable. E.g., *badian* as a loanword does not carry any useful information for an English speaker that is not familiar with the word, it cannot be dissected or interpreted alone. Next, I looked at the borrowed status of the names to determine if the word or phrase is borrowed, or devised locally. E.g., the Chinese names are native lexical creations, while English and Arabic use a non-native headword (*anise/yansūn*) and a native distinguishing word (*star/najmī*). Finally, I have looked at the inspirations behind these lexical inventions, and identified the rationale and motivation behind them. For phrases and compound words, we can separate a headword (usually a prototype noun), and a modifier or distinguishing word (usually an adjective). In each case, we can discern the reasons why that prototype word was used, what feature of the prototype item (the referent) is the most salient. The same is true for the distinguishing word(s). For example, *star anise* is named so after (1) similarity in taste + (2) shape; and *Chinese star anise* is named so after (1) similarity in taste + (2) shape + (3) geographic origin. In Table 6.2, you can see a concise overview of the analysis of star anise terminology.

Term	Gloss	Analyzability	Borrowed	Prototype	Modifier
star anise		analyzable	native	similarity in taste	shape
badian		unanalyzable	borrowed		
Chinese anise		analyzable	native	similarity in taste	origin
Chinese star anise		analyzable	native	similarity in taste	shape + origin
<i>yansūn najmī</i>	star anise	analyzable	native	similarity in taste	shape
<i>bājiǎo</i>	octagonal	analyzable	native	shape	
<i>bājiǎohuíxiāng</i>	octagonal-fennel	analyzable	native	similarity in taste	shape
<i>bóhuíxiāng</i>	ship-fennel	analyzable	native	similarity in taste	shape
<i>dàhuíxiāng</i>	big-fennel	analyzable	native	similarity in taste	size*
<i>dàliào</i>	big-ingredient	analyzable	native	function	size*

Table 6.2 Comparative analysis of the names of star anise in English, Arabic, and Chinese.

In this sense, the space names are layered. Intuitively, the more layers a spice name has, the more distant the item was culturally. And on the converse, the less components there is to a term, more familiarity with the substance is presumed (e.g., *anise* vs. *star anise* in English), this reflects back nicely to the idea of the analyzability of words we introduced before. Therefore, spice names’ modifiers can be categorized according to what salient feature contributed to the naming the most, and in this specific case, it is star anise’s distinct shape. As we will later see, shape is just one of many properties that can distinguish/identify a spice, for others, different properties are salient, including color, taste, smell, and the geographical origin we mentioned. Furthermore, these names reflect on

the materials' physical qualities, and the perception and importance of a spice for various sensory modalities in the human experience: vision, gustation, olfaction, etc.

# Conclusion

ENDING my dissertation, I will now summarize the work that was done, reflect on the findings and their implications. Then, I will try to answer the research questions, revisit the aims stated in the beginning, and mention some of the limitations and future plans.

To summarize what I did, I should start with mentioning the datasets. I have collected data in three stages, (1) on a set of spices, (2) on their names, and (3) on their related etymologies. I have done so, because from the literature it was obvious that there is a gap regarding research of spice terminology and nomenclature, which leads to chaos and confusion in the secondary sources. I hope that this dissertation is a step forward towards a future database of spice names that can be useful for both academics and the public. The datasets are unique in the sense that they incorporate botanical information, rich in philological considerations regarding sources, attestation dates, and etymological stages, and accommodate three major world languages: English, Arabic, and Chinese. I have introduced six of the 24 spices in greater detail, discussing their significance, uses, botany, history, and names (Chapter 4), with the aim of us having an deeper understanding of these specific items from a comparative perspective.

Then, the collected terms allowed for an analysis on the linguistic diffusion of spices, which I discussed in parallel with the physical diffusion of the plants and materials. I have illustrated the spatial spread of English, Arabic, and Chinese loanwords and *Wanderwörter* of the spice domain using interactive geospatial visualizations (Chapter 5). For the temporal dimension, I have illustrated the attestation dates on timelines, comparing clusters of attestation dates and borrowings across the three languages.

My findings show that besides the interest and demand, or the volume of trade at certain times, one of the most important factors in a spice's—and its name's—successful diffusion is in their ability to *survive* in new environments, alive or dead. By successful I mean widespread and long-lasting. Whether it is the enduring rhizomes of ginger and turmeric waiting to sprout on the decks of outrigger boats on the Pacific, the dried fruits of pepper capable of withstanding spoilage for years in Roman warehouses, or the easy-to-grow, ever-thriving American chile that Asians everywhere so quickly learned to cultivate, it is the “ecological willingness” to adapt and last which was crucial in the widespread diffusion of these plants and materials. I tried to this with a rudimentary measure I called a spreadability index. The

Lastly, I have looked into the various spice names, and underlying mechanisms of spice name propagation to explain how novel substances are named in this domain. I have compared the three languages by the terms' analyzability, borrowed status, and word formation strategies, and I conducted analysis on the headwords and modifiers of compound spice terms. This yielded some insights into the motivations and strategies behind the invention and derivation of spice names, and also let me see the influence of these substances highly sensory nature, marked by words of color, taste, smell, shape and form (Chapter 6).

The findings of this chapter was that on one hand the headword is usually a prototype spice, an item already known to the speakers of the language and similar in some way to the novel item to be named after it. A prototype spice word can have two roles, first on account of its similarity denoting a mismatching spice (i.e., Chinese parsley is not parsley), or with a specifying modifier a matching spice (i.e., true cardamom is cardamom). Prototype similarity can be based on any salient qualities of the substance: whether it is the chemical constituents resulting in a similar flavor (anise → star anise), the function/use as a pungent culinary spice (pepper → chili pepper; long pepper), or physical similarity (pepper → Jamaica pepper). Of course, these qualities are never exclusive. On the other hand, we learned that the modifiers are most likely distinguishing words that point to a source or geographic origin (e.g., Chinese, Indian, foreign), and sensory words of color, smell, or taste that disambiguate, specify, and identify different products (e.g., black, red, green, sweet, fragrant, hot, etc.). We learned that statistically, the most typical spice name is one with a blueprint of *prototype similarity headword + geographic origin modifier*, e.g., *Jamaica pepper*, *Indian saffron*, *Ethiopian cardamom*. We might call these regular spice terms, and it is interesting to notice that at the same time, these are aliases, hiding spices with different identities behind better known prototype items. Is this the reason many of us are confused by spice names?

## Answers

In Section 2.2.2, I have asked some initial research question that expected to find answers to. Q1 was “Does the propagation of *Wanderwörter* within the domain of the spice trade follow the diffusion of the materials?” The answer to this question is overwhelmingly yes, however, we found some exceptions. Notably, a few terms actually have outpaced their respective referent materials, and reached a language before the speakers were familiar with the material itself. According to my dataset of the 24 spices, this always happened via the dispersion of religious texts. In the West, the best examples are *cassia* and *cinnamon*, words that appear in the Bible, and with the wind of Christianity these words reached places far beyond the Eastern Mediterranean before the actual materials. In the East, our only certain example for this phenomenon is Chinese *xingyu/xingqu* ‘hing’ (asafoetida), which spread with Buddhist texts from the Silk Roads of Central Asia before Chinese monks have ever seen the gum-resin. When the product arrived a century later, it came with a new name *awei* which was loaned from a Kuchean word. This is the name by which it is known today.

Q2 was “Is there any underlying pattern behind the mechanisms of spice diffusion, considering both the materials and the nomenclature?”, and the answer was explained just above, with the findings about the diffusion of spices discussed in Chapter 5: The diffusion of the words strongly correlates with the diffusion of the materials—which is not surprising, but expected—and the patterns we see the etymological stages reflect the powers of trade that were situated on the crossroads between the source of the materials, and major communities with an urge for them. The findings also showed that besides the human factor, the ecology of the plants, and the materials’ resistance to long-haul trade have also played a great role.

Regarding Q3: “Is there any influence on the naming spices, in terms of sensory words and

synesthetic properties?”, I have found that the sensory nature of spices plays a role in their names in two ways. One, compound spice names usually contain a headword that is a previously known prototype spice, on account of their physical (appearance, color, shape, form), and chemical (taste, aroma, heat, pungency) similarity; and two, distinguishing words are also frequently sensory words of vision, gustation, or olfaction as we saw in Chapter 6. However, despite the rich sensory nature of spices, the names are most typically modified with a geographic place name. This suggests, that even if spices are colorful and aromatic, often the most salient feature is their exoticism.

### Aims Revisited

Overall, the aims stated in the [Introduction](#) were achieved. First of all, there is a framework and a database that—although far from perfect—can be a basis for future endeavors in the research of the terminology of aromatic materials that can be interesting for philologists, linguists, historians, or culinary professionals. I would like to highlight again that this dataset is machine-readable, and after further expansion can accommodate various statistical analytics regarding the spices, and various aspects of their names. The dataset also facilitates the detailed treatise of other spices, beyond the six that were introduced in the data chapter ([The Spices](#)), many of which have yet to be published on from a humanities’ perspective.

Our second aim was “to map the diffusion of the terms of the spice domain”, and I hope the interactive visualizations under Figures 5.6 to 5.8<sup>1</sup> are adequate to illustrate the significance of these wandering words. The visualizations are based on the etymological data collected and explained in the thesis, and openly available on the same repository.<sup>2</sup>

The third goal was to shed light on how spice names are “born”, and what are the motivations and mechanisms for spice name propagation. I feel that the findings of Chapter 6 achieves this goal, as we now know how the three languages borrow words, and how they devise new names based on existing words, and what are the typical components in this process.

### Significance and Contribution

In the very beginning of this thesis I talked about a tree and its spice which has different names in various languages and turned out to be allspice. I hope that the motivation and reasons behind its many names—*allspice*, *newspice*, *clove pepper*, *Jamaica pepper*—is not a mystery anymore. Furthermore, I hope that the next time the reader is faced with the name of a novel spice term, they can analyze it, ponder on its origins, and look up its history. I think that if we go about with open eyes and noses, we will sense the surrounding variety every day, embodied in the aromas. And the next time my grandmother is making sausage in Hungary, I can tell her that the “clove pepper” she is using is from the Caribbean, and even if Columbus never found it, it eventually arrived to this side of the planet; only to be confused with every other spice under the sun by the many confusing ways we named it.

The significance of this study lies in the topic; spices are ubiquitous part of our cuisine and

<sup>1</sup>Hosted on <https://github.com/partigabor/phd-thesis-viz>

<sup>2</sup>Hosted on <https://github.com/partigabor/phd-thesis-viz/data>.

culture. Everyone who ever had a dinner party at home—including the cooking—in a multicultural, multilingual setting knows that the nomenclature of spices and seasonings are confusing, interesting, and carry the history of the spice. My contribution is an attempt to collect, introduce, and analyze them in a way that was not done before.

## 7.1 Limitations

This project has a number of limitations. First, it was not possible to include more spices in this short time. I firmly believe that the more aromatic items we add into the fold, the more firm the results would be in terms of claiming something universal about the terms of the spice domain. The present study encompasses 24 spices and 360 names, and it feels it is just enough to start suggesting generalization about the diffusion and especially the naming of various aromatic substances.

I also maintain that there are some general truths that I can now claim, especially regarding the globally important and well-known items that were popular from Asia to Europe, and between the two endpoints of the Maritime Silk Road. Among these are the overwhelming East-to-West directionality, which is supported by the botanical reality (most of these spices are from tropical Asia), the historical evidence (the spice trade since antiquity, the Age of Discovery), and the linguistic trail (cf. the source and donor languages). My opinion, based on the data here, is that the more aromatics we add into the investigation, the proportion of the major donor languages will be similar. Words from Latin, Greek, Arabic, Persian, Akkadian, Sanskrit, Chinese, etc. and other influential languages of high culture since premodern times will “overpower” smaller regional languages from the source or path of the materials. There are always exceptions, of course, but the influence of languages of empires and civilizations with long-lasting influence is almost unquestionable.

Further limitations of my study arise from the fact that I tried to delimit my scope by focusing on words that arrived to English, Arabic, and Chinese, and disregarding other interesting and related cases. Although in the etymologies I ventured beyond the trilingual setting, but I now I believe that this kind of study should be aware of any language of contact, and especially influential languages of source words, e.g., Sanskrit. In any case, I believe that the trio of English, Arabic, and Chinese made for an interesting comparison for glimpse into the spice domain.

I introduced the research gap in the beginning of the thesis (Section 2.2), and now I believe it is impossible to fill it with one dissertation. On one hand, it is not possible to be competent in every related language, and second, it is not feasible to introduce every known spice accurately here. Maybe later, in the form of a book? I am convinced, that this project could be valuable and interesting with a team of experts that can help with the curation of relevant information.

## 7.2 Future Studies

In terms of future work, I am full of ideas. For future studies, I think one valuable way to dive into the diffusion of spices, incense, perfume, and other aromatics is to focus on a specific cultural area, for example the Mediterranean, or Southeast Asia. I have plans for a paper that tracks wandering food

items—and their names—of East and Southeast Asia.

On a slightly different take diving into lexical semantics and cognitive linguistics relying on corpora and corpus linguistic tools. I have extracted words from dictionaries that derive from spice terms, and analyzed their dates of coinage and grouped them by grammatical category. Doing so, I wish to prove that the more familiar is a culture with an item, the more productive the item's name is in the languages. This study will focus on the spices' role in daily language, how spice words entered the lexicon and what is their role in metaphors and idiomatic expressions. And most importantly, how do we conceptualize spicy words, a topic that was recently touched by Bagli (2021) in English, and Dong et al. (2018) and Zhong et al. (2021) in Chinese. The goal of this is to look at to what degree spice terminology is used in a language, which is proposed to be a gauge of a spice's embeddedness in a culture, and see how significant they are in the everyday human experience.

I also hope to extend on the attempt to collect the names for a specific spice in every significant language and plot their distributions grouped by etymon as it can be seen on Section 4.4.5. In a more typological take, hopefully I can compare more spices similarly to find patterns and correlations. The problem with this is that while some products represent common and easy-to-collect word lists from existing databases (i.e., *pepper*), more rare items would be much more difficult to gather.

However, the most crucial task is to make this project alive and breathing. During the revision phase, I have built a website to host a spice database currently named *Spice and Spice Terminology Database 1.0*, accessible at <https://partigabor.github.io/spice/>. I hope in the future this can be a useful portal for people to access information about spices and spice names. I will host the datasets and visualizations, which people can query, and learn about the nomenclature, etymologies, and diffusion of spice terms on the web. I plan to make this website as a sort of philologically focused spice directory, that is free and open-access. Hopefully this platform makes way to gradually update, correct, and expand on the existing data, and I also expect valuable input from other researchers in the same area, not mention the tips and guidance of people who are expert in a certain language or substance that I am not. I definitely plan to work on this topic in the long term, and I hope I can eventually collaborate with other scholars including linguists, botanists, historians, and even culinary experts to build a rich and useful database that supplies precise information.



# Primary Sources

- al-Qānūn fī l-Tibb [The Canon of Medicine] by Ibn Sīnā, 1025. 19
- Bencao Gangmu 本草綱目 [Compendium of Materia Medica] by Li Shizhen, 1578 18
- De Materia Medica [On Medical Materials] by Pedanius Dioscorides, 1<sup>st</sup> c. AD 7
- Hou Hanshu 後漢書 [Book of the Later Han] 5<sup>th</sup> c. AD 16
- Kangxi Zidian 康熙字典 [Kangxi Dictionary] 1716 91
- Kitāb Al-‘Ayn [The Source] by al-Khalil b. Ahmad al-Farāhīdī, ca. 786 58
- Liji 禮記 [The Book of Rites] Warring States period, 475–221 BC 90
- Lisān al-‘Arab [Tongue of the Arabs] 1290 36
- Periplus Maris Erythraei [Periplus of the Erythraean Sea] 1<sup>st</sup> c. AD 36
- Quan Tangshi 全唐詩 [Complete Tang Poems] poetry collection, 1705 38
- Shennong Bencaojing 神農本草經 [Shennong's Classic Herbal] ca. 200 AD 18
- Shiwu Bencao 食物本草 [Materia Medica of Food] Ming, 1621 126
- Shuowen Jiezi 說文解字 [Discussing Writing and Explaining Characters] 100 AD 36
- Suśrutasamhitā সুশ্রূতসংহিতা [Suśruta's Compendium] ca. 600 AD 107
- Tongdian 通典 [Comprehensive Statutes] by Du You, Tang, 801 114
- Xinxiu Bencao 新修本草 [Newly Revised Materia Medica] Tang, 659 118
- Youyang Zazu 西陽雜俎 [Miscellaneous Morsels from Youyang] by Duan Chengsi, 9<sup>th</sup> c. 36



# Bibliography

- Academia Sinica. (1993–2008). *Scripta Sinica*. <https://hanchi.ihp.sinica.edu.tw/ihp/hanji.htm> (Cited on p. 38).
- Adams, D. Q. (2013). *A Dictionary of Tocharian B: Revised and Greatly Enlarged*. Rodopi. (Cited on pp. 56–59).
- ad-Dīnawarī, A. H. (1974). *The Book of Plants* (L. Bernhard, Ed.). Franz Steiner Verlag. (Cited on p. 88).
- Adelaar, K. A. (1994). Malay and Javanese Loanwords in Malagasy, Tagalog and Siraya (Formosa). *Bijdragen Tot de Taal-, Land- En Volkenkunde [Contributions to Linguistics, Geography and Ethnology]*, 150(1), 50–65 (Cited on p. 125).
- AHD, E. O. T. (Ed.). (2022). *The American Heritage Dictionary of the English Language* (5th ed.). HarperCollins Publishers. <https://www.ahdictionary.com/> (Cited on pp. 5, 56, 67, 68, 106, 118).
- al-Farāhīdī, K. b. A. [ca. 786]. *Kitāb Al-'Ayn [The Source]*. <http://arabiclexicon.hawramani.com/al-khalil-b-ahmad-al-farahidi-kitab-al-ain/> (Cited on p. 58).
- al-Ghāfiķī, A. J. A. i. M. (1932). *The Abridged Version of "The Book of Simple Drugs" of Ahmad Ibn Muhammad al-Ghāfiqī*. (Cited on p. 80).
- Allan, P. K. (2021). Finding the Cure for Scurvy. *Naval History Magazine*, 35(1). Retrieved August 11, 2022, from <https://www.usni.org/magazines/naval-history-magazine/2021/february/finding-cure-scurvy> (Cited on p. 125).
- Allen, G. (2012). *Herbs: A Global History*. Reaktion Books. (Cited on p. 6).
- Allen, L. H., Prentice, A., & Caballero, B. (Eds.). (2013). *Encyclopedia of Human Nutrition*. Elsevier Science. (Cited on p. 1).
- Almaany. (n.d.). *Almaany*. Retrieved July 13, 2022, from <https://www.almaany.com/en/dict/ar-en/> (Cited on pp. 52, 53).
- Alrabiah, M., Al-Salman, A., & Atwell, E. S. (2013). The Design and Construction of the 50 Million Words KSUCCA. *Proceedings of WACL' 2 Second Workshop on Arabic Corpus Linguistics*, 5–8. <https://doi.org/http://eprints.whiterose.ac.uk/81860/> (Cited on p. 38).
- Alrabiah, M., Alhelewh, N., Al-Salman, A., & Atwell, E. S. (2014). An Empirical Study on the Holy Quran Based on a Large Classical Arabic Corpus. *International Journal of Computational Linguistics (IJCL)*, 5(1), 1–13. <http://eprints.whiterose.ac.uk/81839/> (Cited on p. 38).
- Amar, Z., & Lev, E. (2017). *Arabian Drugs in Early Medieval Mediterranean Medicine*. Edinburgh University Press. <https://edinburghuniversitypress.com/book-arabian-drugs-in-early-medieval-mediterranean-medicine.html> (Cited on pp. 17, 70, 117, 118, 120).
- OCLC: ocng68918144.

- Apicius, M. G. (1977). *Apicius, Cookery and Dining in Imperial Rome: A Bibliography, Critical Review and Translation of the Ancient Book Known as 'Apicius de Re Coquinaria'* (J. D. Vehling, Ed.). Dover Publications. (Cited on p. 36).
- Asatrian, G. (2012). Marginal Remarks on the History of Some Persian Words. *Iran and the Caucasus*, 16(1), 105–116. <https://doi.org/10.1163/160984912X13309560274172> (Cited on p. 68).
- Ash, A. (2020, November 10). *Why Frankincense and Myrrh Are so Expensive*. Business Insider. Retrieved August 5, 2022, from <https://www.businessinsider.com/why-frankincense-and-myrrh-are-so-expensive-2020-10> (Cited on p. 19).
- Austin, D. F., & Felger, R. S. (2008). Sichuan Peppers and the Etymology of Fagara (Rutaceae). *Economic Botany*, 62(4), 567–573 (Cited on pp. 15, 22).
- A'lam, H. (2011). Dārčīnī. In *Encyclopaedia Iranica*. Retrieved June 6, 2022, from <https://iranicaonline.org> (Original work published 1994). (Cited on pp. 82, 87, 89, 90)
- Baalbaki, R. (1995). *Al-Mawrid: A Modern Arabic-English Dictionary* (7th ed.). Dar el-Ilm lil-Malayin. (Cited on pp. 51–53, 58, 60, 70, 73, 109, 112, 120, 121).
- Bagli, M. (2021). *Tastes We Live by: The Linguistic Conceptualisation of Taste in English*. De Gruyter Mouton. (Cited on pp. 20, 159).
- Baker, I., Chohan, M., & Opara, E. I. (2013). Impact of Cooking and Digestion, in Vitro, on the Antioxidant Capacity and Anti-inflammatory Activity of Cinnamon, Clove and Nutmeg. *Plant Foods for Human Nutrition*, 68(4), 364–369. <https://doi.org/10.1007/s11130-013-0379-4> (Cited on p. 17).
- Baretti, G. (1755). *An Introduction to The Italian Language: Containing Specimens Both of Prose and Verse*. A. Millar. (Cited on p. 51).
- Barnes, J., Anderson, L. A., & Phillipson, J. D. (2007). *Herbal Medicines* (3rd ed.). Pharmaceutical Press. (Cited on p. 45).
- Barth, J. (2019). *Pepper: A Guide to the World's Favorite Spice*. Rowman & Littlefield. (Cited on p. 102).
- Baxter, W. H., & Sagart, L. (2014). *Old Chinese: A New Reconstruction*. Oxford University Press. (Cited on p. 59).
- Bearman, P. J., Bianquis, T., Bosworth, C. E., van Donzel, E., & Heinrichs, W. P. (Eds.). (1960–2005). *The Encyclopaedia of Islam* (2nd ed.). E. J. Brill. <https://referenceworks.brillonline.com/browse/encyclopaedia-of-islam-2> (Cited on p. 36).
- Beekes, R. S. P., & van Beek, L. (2010). *Etymological Dictionary of Greek*. Brill. (Cited on pp. 36, 67, 68, 83–85, 87, 95).
- Beers, S.-J. (2012). *Jamu: The Ancient Indonesian Art of Herbal Healing*. Tuttle. <http://site.ebrary.com/id/10595159> (Cited on p. 19).
- Bellwood, P. S., Fox, J. J., & Tryon, D. T. (Eds.). (2006). *The Austronesians: Historical and Comparative Perspectives*. Dept. of Anthropology as part of the Comparative Austronesian Project, Research School of Pacific and Asian Studies, Australian National University. (Cited on p. 125).
- Bennett, E. L., Wace, A. J. B., Wace, E. B., & Chadwick, J. (1958). The Mycenaean Tablets II. *Transactions of the American Philosophical Society*, 48(1), 1–122 (Cited on p. 68).

- Billing, J., & Sherman, P. W. (1998). Antimicrobial Functions of Spices: Why Some Like It Hot. *The Quarterly Review of Biology*, 73(1), 3–49. <https://doi.org/10.1086/420058> (Cited on p. 18).
- Black, J., George, A., & Postgate, N. (Eds.). (2000). *A Concise Dictionary of Akkadian* (2nd ed.). Harrassowitz Verlag. (Original work published 1999). (Cited on p. 68)
- Blažek, V. (2006). Etymology. In K. Versteegh (Ed.), *Encyclopedia of Arabic Language and Linguistics* (pp. 65–69, Vol. 2). Brill. <https://referenceworks.brillonline.com/browse/encyclopedia-of-arabic-language-and-linguistics> (Cited on p. 36).
- Bosworth, J., & Toller, T. N. (Eds.). (2014). *An Anglo-Saxon Dictionary, Based on the Manuscript Collections of the Late Joseph Bosworth*. Faculty of Arts, Charles University. <https://bosworthtoller.com> (Original work published 1898). (Cited on p. 106).
- Original place: Oxford
- Boy, H. I. A., Rutilla, A. J. H., Santos, K. A., Ty, A. M. T., Yu, A. I., Mahboob, T., Tangpoong, J., & Nissapatorn, V. (2018). Recommended Medicinal Plants as Source of Natural Products: A Review. *Digital Chinese Medicine*, 1(2), 131–142. [https://doi.org/10.1016/s2589-3777\(19\)30018-7](https://doi.org/10.1016/s2589-3777(19)30018-7) (Cited on p. 17).
- Britannica, T. E. o. E. (2022). Spice and Herb. In *Encyclopædia Britannica*. <https://www.britannica.com/topic/spice-food> (Cited on pp. 6, 46).
- Britannica, T. E. o. E. (Ed.). (n.d.). Allspice. In *Encyclopædia Britannica*. Encyclopædia Britannica, Inc. Retrieved March 24, 2022, from <https://www.britannica.com/plant/allspice> (Cited on p. 47).
- Brown, F., Driver, S. R., & Briggs, C. A. (1939). *A Hebrew and English Lexicon of the Old Testament: With an Appendix Containing the Biblical Aramaic* (E. Robinson, Trans.). Oxford University Press. (Original work published 1906). (Cited on p. 84)
- Bucaille, M. (1990). *Mummies of the Pharaohs: Modern Medical Investigations* (A. D. Pannell & M. Bucaille, Trans.). St. Martin's Press. (Cited on p. 106).
- Burkill, I. H. (1935). *A Dictionary of the Economic Products of the Malay Peninsula*. Published on behalf of the Governments of the Straits Settlements and Federated Malay States by the Crown Agents for the Colonies. (Cited on pp. 16, 112).
- Burnet, I. (2011). *Spice Islands*. Rosenberg Pub. (Cited on p. 16).
- Burrow, T., & Emeneau, M. B. (1984). *A Dravidian Etymological Dictionary* (2nd ed.). Oxford University Press. (Cited on p. 69).
- Business Insider. (2021, November 21). *Why Mastic Tree Resin Is So Expensive* [Video]. YouTube. Retrieved June 3, 2022, from <https://www.youtube.com/watch?v=F95jAZtVmFE> (Cited on p. 62).
- Butt, M. S., Pasha, I., Sultan, M. T., Randhawa, M. A., Saeed, F., & Ahmed, W. (2013). Black Pepper and Health Claims: A Comprehensive Treatise. *Critical Reviews in Food Science and Nutrition*, 53(9), 875–886. <https://doi.org/10.1080/10408398.2011.571799> (Cited on p. 102).
- Buzurg ibn Shahriyār. (1908). *Kitāb ‘ajāib al-Hind* [The Book of the Marvels of India]. At the expense of bookseller Mustafa Fahmy, at al-Saada Press, together with the Governorate of Egypt.

- <http://remacle.org/bloodwolf/arabe/anonyme/inde.htm> (Original work published ca. 900–953). (Cited on p. 82)
- Carstens, E., Carstens, M. I., Dessirier, J.-M., O’Mahony, M., Simons, C. T., Sudo, M., & Sudo, S. (2002). It Hurts so Good: Oral Irritation by Spices and Carbonated Drinks and the Underlying Neural Mechanisms. *Food Quality and Preference*, 13(7-8), 431–443 (Cited on p. 18).
- Casson, L. (1989). *The Periplus Maris Erythraei: Text With Introduction, Translation, and Commentary*. Princeton University Press. (Cited on p. 36).
- Chanca, D. Á. (2003). American Journeys Collection: Letter of Dr. Chanca on the Second Voyage of Columbus. (Cited on p. 46).
- Chang, K.-C. (1977). *Food in Chinese Culture: Anthropological and Historical Perspectives*. Yale University Press. (Cited on p. 15).
- Ch’en, K. K. S. (1964). *Buddhism in China: A Historical Survey*. Princeton University Press. (Cited on p. 38).
- Chen, Z. (2019). Toward a Global Network Revolution: Zheng He’s Maritime Voyages and Tribute-Trade Relations between China and the Indian Ocean World. *China and Asia*, 1(1), 3–49. <https://doi.org/10.1163/2589465X-o00101002> (Cited on p. 16).
- Chennault, C. L. (2006). The Reclusive Gui–Cinnamon or Osmanthus? *Early Medieval China*, 2006(1), 151–181. <https://doi.org/10.1179/152991006788126177> (Cited on pp. 77, 78, 91).
- Cobb, M. A. (2019). *The Indian Ocean Trade in Antiquity: Political, Cultural and Economic Impacts*. Routledge. (Cited on p. 16).
- Colón, F. (1959). *The Life of the Admiral Christopher Columbus by His Son Ferdinand* (B. Keen, Trans.). Rutgers University Press. (Original work published 1571). (Cited on p. 45)
- Columbus, C. (1893). *The Spanish Letter of Columbus: Written by Him on Feb. 15, 1493 to Announce the Discovery of America* (Bernard Quaritch, Trans.; Facsimile with Translation). Bernard Quaritch. (Cited on p. 45).
- Columbus, C. (2010). *Journal of Christopher Columbus (During His First Voyage, 1492-93) and Documents Relating to the Voyages of John Cabot and Gaspar Corte Real* (C. R. Markham, Ed.). Ashgate. (Original work published 1893). (Cited on pp. 45, 46)
- Corn, C. (1998). *The Scents of Eden: A Narrative of the Spice Trade*. Kodansha International. (Cited on p. 16).
- Corominas, J. (1987). *Breve Diccionario Etimológico De La Lengua Castellana [Brief Etymological Dictionary of the Castilian Language]* (3rd ed.). Editorial Gredos. (Cited on pp. 46, 48, 49, 95).
- Counts, D. B. (1996). Regum Externorum Consuetudine: The Nature and Function of Embalming in Rome. *Classical Antiquity*, 15(2), 189–202. <https://doi.org/10.2307/25011039> (Cited on p. 80).
- Crane, G. R. (Ed.). (n.d.). *Perseus Digital Library*. Tufts University. <http://www.perseus.tufts.edu/hopper/> (Cited on p. 36).
- note: Web portal.
- Craze, R. (1997). *The Spice Companion: The Culinary, Cosmetic, and Medicinal Uses of Spices*. People’s Medical Society. (Cited on pp. 14, 45).

- Cresswell, J. (Ed.). (2021). *Oxford Dictionary of Word Origins* (3rd ed.). Oxford University Press. <https://global.oup.com/academic/product/oxford-dictionary-of-word-origins-9780198868750?cc=hk&lang=en&> (Cited on p. 107).
- Cumo, C. (Ed.). (2013). *Encyclopedia of Cultivated Plants: From Acacia to Zinnia*. (Cited on p. 63).
- Czarra, F. (2009). *Spices: A Global History*. Reaktion Books. <https://press.uchicago.edu/ucp/books/book/distributed/S/bo6899739.html> (Cited on pp. 5, 7, 14, 21, 44, 45, 78).
- Dahl, Ö. (2013). Tea. In M. S. Dryer & M. Haspelmath (Eds.), *The World Atlas of Language Structures Online*. Max Planck Institute for Evolutionary Anthropology. <https://wals.info/chapter/138> (Cited on p. 93).
- Dalby, A. (1996). *Siren Feasts: A History of Food and Gastronomy in Greece*. Routledge. (Cited on p. 15).
- Dalby, A. (2000). *Dangerous Tastes: The Story of Spices*. University of California Press. <https://www.worldcat.org/title/44979585> (Cited on pp. 7, 14, 45, 46, 54, 63, 68, 69, 80, 83, 106, 125, 126).
- Dalby, A. (2001). Christopher Columbus, Gonzalo Pizarro, and the Search for Cinnamon. *Gastronomica*, 1(2), 40–49. <https://doi.org/10.1525/gfc.2001.1.2.40> (Cited on p. 14).
- Dalby, A. (2003). *Food in the Ancient World, from A to Z*. Routledge. (Cited on p. 15).
- Dalby, A. (2010). *Tastes of Byzantium: The Cuisine of a Legendary Empire*. Tauris. (Cited on p. 15).
- Dalby, A., & Grainger, S. (1996). *The Classical Cookbook*. J. Paul Getty Museum. (Cited on p. 15).
- Davidson, A. (2014). *The Oxford Companion to Food* (3rd ed.). Oxford University Press. <https://doi.org/10.1093/acref/9780199677337.001.0001> (Cited on p. 15).
- De Kerros, E. (2016). *Pepper*. Editions de La Martinière. (Cited on pp. 102, 105).
- Notes: Terre Exotique.
- De Romanis, F. (2020). *Indo-Roman Trade and the Muziris Papyrus*. Oxford University Press. (Cited on pp. 105, 106).
- DeFrancis, J. (2003). *ABC Chinese-English Comprehensive Dictionary: Alphabetically Based Computerized*. University of Hawai'i Press. (Cited on pp. 72, 73, 92, 112, 113, 120, 121).
- de Goeje, M. J. (Ed.). (1870). *Bibliotheca Geographorum Arabicorum*. E. J. Brill. <https://brill.com/view/serial/BGA> (Cited on p. 36).
- Depner, S. C.-y. (2019). Chinese Language and Fruits. In C.-R. Huang, Z. Jing-Schmidt, & B. Meisterernst (Eds.), *The Routledge Handbook of Chinese Applied Linguistics* (pp. 92–104). Routledge. (Cited on p. 20).
- Derks, A., Turner, S., & Thúy Hạnh, N. (2020). Bastard Spice or Champagne of Cinnamon? Conflicting Value Creations along Cinnamon Commodity Chains in Northern Vietnam. *Development and Change*, 51(3), 895–920. <https://doi.org/10.1111/dech.12582> (Cited on p. 79).
- Derkzen, R. (2008). *Etymological Dictionary of the Slavic Inherited Lexicon*. Brill. (Cited on p. 96).
- Detienne, M. (1994). *The Gardens of Adonis: Spices in Greek Mythology* (J. Lloyd, Trans.). Princeton University Press. (Cited on p. 14).

- Dietrich, A. (2004a). *Afāwīh*. In P. J. Bearman, T. Bianquis, C. E. Bosworth, E. van Donzel, & W. P. Heinrichs (Eds.), *The Encyclopaedia of Islam* (2nd ed., pp. 42–43, Vol. 12). E. J. Brill. <https://referenceworks.brillonline.com/browse/encyclopaedia-of-islam-2> (Cited on p. 15).
- Dietrich, A. (2004b). *Dār Ṣīnī*. In P. J. Bearman, T. Bianquis, C. E. Bosworth, E. van Donzel, & W. P. Heinrichs (Eds.), *The Encyclopaedia of Islam* (2nd ed., pp. 197–198, Vol. 12). E. J. Brill. <https://referenceworks.brillonline.com/browse/encyclopaedia-of-islam-2> (Cited on pp. 80, 82, 87–90).
- Dinesh, R., Leela, N. K., Zachariah, T. J., & Anandaraj, M. (2015). Controversies Surrounding Coumarin in Cassia: The Good, the Bad and the Not so Ugly. *Current Science*, 108(4), 482–484. <https://doi.org/10.2307/24216590> (Cited on pp. 77, 79).
- Dioscorides, P. (1083). *Kitāb Al-Ḥašā'iṣ Fī Hāyūlā al-‘ilāg al-Ṭibbī* [The Book of Herbs among Substances of Medical Treatment] (H. b. I. al-Nāṭīlī & Stephanus b. Bāsīl, Trans.). <http://hdl.handle.net/1887.1/item:1578364> (Cited on p. 98).
- Dioscorides, P. (2005). *De Materia Medica* (L. Y. Beck, Trans.). Olms-Weidmann. (Original work published ca. 50–70). (Cited on pp. 36, 117)
- Dong, S., Zhong, Y., & Huang, C.-R. (2018). A Corpus-based Study on Chinese People's Perception of Spicy and Numbing Food. *Information and Computation*, 858–865 (Cited on p. 159).
- Donkin, R. A. (2003). *Between East and West: The Moluccas and the Traffic in Spices Up to the Arrival of Europeans*. American Philosophical Society. (Cited on pp. 16, 71, 73).
- Dott, B. R. (2020). *The Chile Pepper in China: A Cultural Biography*. Columbia University Press. <http://cup.columbia.edu/book/the-chile-pepper-in-china/9780231195324> (Cited on pp. 15, 126).
- Dozy, R. P. A. (1881). *Supplément aux Dictionnaires Arabes*. E. J. Brill. (Cited on p. 52).
- Dryer, M. S., & Haspelmath, M. (Eds.). (2013). *WALS Online*. Max Planck Institute for Evolutionary Anthropology. <https://wals.info/> (Cited on pp. 35, 94).
- Duan, C. [ca. 860]. *Youyang Zazu* [Miscellaneous Morsels from Youyang]. (Cited on pp. 36, 71).
- Duke, J. A. (2002). *CRC Handbook of Medicinal Spices*. CRC press. (Cited on pp. 18, 44–46, 51).
- Duke, J. A., Duke, P.-A. K., & DuCellier, J. L. (2008). *Duke's Handbook of Medicinal Plants of the Bible*. CRC Press. (Cited on p. 17).
- Durkin, P. (2014). *Borrowed Words: A History of Loanwords in English*. Oxford University Press. (Cited on p. 131).
- Eaton, R. M. (2019). *India in the Persianate Age: 1000–1765*. Allen Lane. (Cited on p. 97).
- Eirinberg, S. (2021, March 1). *Tellicherry Peppercorns vs. Regular Malabar Black Pepper – What's the Difference?* The Reluctant Blogger/The Reluctant Trading Experiment. Retrieved March 8, 2022, from <https://reluctanttrading.com/blogs/the-reluctant-blogger/18993899-tellicherry-peppercorns-vs-regular-malabar-black-pepper-whats-the-difference> (Cited on p. 105).
- Engelhardt, U. (2001). Dietetics in Tang China and the First Extant Works of Materia Dietetica. In E. Hsu (Ed.), *Innovation in Chinese Medicine* (pp. 173–191). Cambridge University Press. (Cited on p. 19).

- Española, A. d. A. d. l. L. (2014). *Diccionario de La Lengua Española* (23rd ed.). Real Academia Española. <https://dle.rae.es> (Cited on p. 48).
- versión 23.4 en línea.
- Express News Service. (2021, June 3). *Taking Roots in High Hills of Himachal, the First Hing Plants*. The Indian Express. Retrieved August 26, 2022, from <https://indianexpress.com/article/cities/shimla/taking-roots-in-high-hills-of-himachal-the-first-hing-plants-7341792/> (Cited on p. 55).
- Farrell, K. T. (1985). *Spices, Condiments, and Seasonings* (2nd ed.). AVI Pub. Co. (Cited on pp. 14, 45–47).
- Farrimond, S. (2018). *The Science of Spice: Understand Flavour Connections and Revolutionize Your Cooking*. Penguin Random House. <https://www.overdrive.com/search?q=1A704FA2-E323-4FD5-95F9-12EDE5F93DDB> (Cited on p. 17).
- Feliks, J. (2007). Plants. In F. Skolnik & M. Berenbaum (Eds.), *Encyclopaedia Judaica* (2nd ed., Vol. 16, pp. 219–225, Vols. 22, Vol. 16). Thomson Gale in Association with Keter Publishing House. (Cited on p. 85).
- Fellbaum, C. (1998). *WordNet: An Electronic Lexical Database*. MIT Press. <https://ieeexplore.ieee.org/servlet/opac?bknumber=6267389> (Cited on p. 29).
- Feng, Y., Wang, N., Cheung, F., Zhu, M., Li, H., & Feng, Y. (2011). Molecular and Cellular Mechanism Studies on Anticancer Effects of Chinese Medicine. *Biomedical Engineering, Trends, Research and Technologies*, 331–362 (Cited on p. 118).
- Ford, P. W., Harmon, A. D., Tucker, A. O., Sasser, M., Jackoway, G., Albornoz, G., Grypa, R. D., Pratt, J. L., & Cardellina, J. H. (2019). Cinnamon – Differentiation of Four Species by Linking Classical Botany to an Automated Chromatographic Authentication System. *Journal of AOAC International*, 102(2), 363–368. <https://doi.org/10.5740/jaoacint.18-0343> (Cited on pp. 28, 78, 79).
- Foundation, E. I., & Yarshater, E. (Eds.). (1996–present). *Encyclopaedia Iranica* (Online). Retrieved August 7, 2022, from <https://iranicaonline.org> (Cited on p. 36).
- Fraenkel, S. (1886). *Die Aramäischen Fremdwörter Im Arabischen [The Aramaic Loanwords in Arabic]*. E. J. Brill. (Cited on p. 58).
- Freedman, P. (2008). *Out of the East: Spices and the Medieval Imagination*. Yale University Press. (Cited on p. 14).
- Freedman, P. (2015). Health, Wellness and the Allure of Spices in the Middle Ages. *Journal of Ethnopharmacology*, 167, 47–53. <https://doi.org/10.1016/j.jep.2014.10.065> (Cited on p. 19).
- Garcia da Orta. (1913). *Colóquios dos simples e drogas da India* [Colloquies on the Simples and Drugs of India] (C. Markham, Trans.; Lisbon, 1895, New). Henry Sotheran and Co. (Original work published 1563). (Cited on pp. 55, 57)
- GBIF Secretariat. (2021). *GBIF Backbone Taxonomy*. Global Biodiversity Information Facility. <https://doi.org/10.15468/39omei> (Cited on pp. 64, 66).
- George, C. K. (2012). Asafoetida. In K. V. Peter (Ed.), *Handbook of Herbs and Spices* (2nd ed., pp. 151–165, Vols. 3, Vol. 2). Woodhead Publishing Limited. <http://www.sciencedirect.com/science/book/9780857090409> (Cited on p. 57).

- Gharib, B. (1995). *Sogdian Dictionary: Sogdian-Persian-English* (S. Fotouhi, Ed.). Farhangan Publications. (Cited on pp. 56, 57).
- Glare, P. G. W. (2012). *Oxford Latin Dictionary* (2nd ed.). Oxford University Press. (Original work published 1982). (Cited on p. 7)
- Goitein, S. D., & Friedman, M. A. (2008). *India Traders of the Middle Ages: Documents from the Cairo Geniza: India Book*. Brill. (Cited on p. 88).
- Gómez de Silva, G. (1985). *Elsevier's Concise Spanish Etymological Dictionary*. Elsevier. (Cited on pp. 48, 95).
- González, J., Barros-Loscertales, A., Pulvermüller, F., Meseguer, V., Sanjuán, A., Belloch, V., & Ávila, C. (2006). Reading Cinnamon Activates Olfactory Brain Regions. *NeuroImage*, 32(2), 906–912. <https://doi.org/10.1016/j.neuroimage.2006.03.037> (Cited on p. 20).
- Green, A. (2006). *Field Guide to Herbs & Spices: How to Identify, Select, and Use Virtually Every Seasoning at the Market*. Retrieved March 14, 2022, from <http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=9377726> (Cited on p. 47).
- Green, N. (Ed.). (2019). *The Persianate World: The Frontiers of a Eurasian Lingua Franca* (1st ed.). University of California Press. <https://doi.org/10.2307/j.ctvr7fdrv> (Cited on p. 96).
- Greppin, J. A. C. (1987). Some Early Botanical Loan Words Shared by Armenian and Semitic. *Annual of Armenian Linguistics*, 8, 73–82 (Cited on p. 120).
- Gutas, D. (1998). *Greek Thought, Arabic Culture: The Graeco-Arabic Translation Movement in Baghdad and Early 'Abbāsid Society (2nd-4th/8th-10th Centuries)*. Routledge. (Cited on p. 140).
- Gutas, D. (2012). The Arabic Transmission of Dioskurides: Philology Triumphant. *Journal of the American Oriental Society*, 132(3), 457. <https://doi.org/10.7817/jameroriesoci.132.3.0457> (Cited on p. 89).
- Guthrie, W. B. (2009). The Trade-Language Origin of "Turmeric". *Word*, 60(1), 79–90. <https://doi.org/10.1080/00437956.2009.11432594> (Cited on pp. 15, 118, 119).
- Hakluyt, R. (1589). *The Principall Navigations, Voiages, and Discoveries of the English Nation: Made by Sea or over Land to the Most Remote and Farthest Distant Quarters of the Earth at Any Time within the Compasse of These 1500 Years: Divided into Three Several Parts According to the Positions of the Regions Whereunto They Were Directed*. Imprinted at London by George Bishop and Ralph Newberie, deputies to Christopher Barker, printer to the Queen's Most Excellent Majestie. <http://online.canadiana.ca/view/oocihm.35668> (Cited on p. 57).
- Halikowski Smith, S. (2001). *Portugal and the European Spice Trade, 1480-1580* [Doctoral dissertation, European University Institute]. Fiesole. <https://doi.org/10.2870/92585> (Cited on p. 6).
- Hall, K. R. (2010). *A History of Early Southeast Asia: Maritime Trade and Societal Development, 100–1500*. Rowman & Littlefield Publishers. (Cited on p. 16).
- Hammarström, H., Forkel, R., Haspelmath, M., & Bank, S. (2022). *Glottolog 4.6*. Max Planck Institute for Evolutionary Anthropology. <https://doi.org/10.5281/zenodo.6578297> (Cited on pp. 35, 94).
- Hansen, V. (2012). *The Silk Road: A New History*. Oxford University Press. <https://global.oup.com/ushe/product/the-silk-road-9780190208929?cc=hk&lang=en&> (Cited on p. 16).

- Haq, I.-U., Imran, M., Nadeem, M., Tufail, T., Gondal, T. A., & Mubarak, M. S. (2021). Piperine: A Review of Its Biological Effects. *Phytotherapy Research*, 35(2), 680–700. <https://doi.org/10.1002/ptr.6855> (Cited on p. 102).
- Harper, D. (n.d.). *Online Etymology Dictionary*. <https://www.etymonline.com> (Cited on pp. 49, 106, 107, 118).
- Hartemink, R. (1995). *National Emblem of Sri Lanka - Coat of Arms (Crest) of National Emblem of Sri Lanka*. Heraldry of the World. Retrieved June 9, 2022, from [https://www.heraldrywiki.com/heraldrywiki/index.php?title=National\\_Emblem\\_of\\_Sri\\_Lanka](https://www.heraldry-wiki.com/heraldrywiki/index.php?title=National_Emblem_of_Sri_Lanka) (Cited on p. 83).
- Haspelmath, M., & Tadmor, U. (Eds.). (2009a). *Loanwords in the World's Languages: A Comparative Handbook*. De Gruyter Mouton. <https://doi.org/doi:10.1515/9783110218442> (Cited on pp. 146, 147).
- Haspelmath, M., & Tadmor, U. (Eds.). (2009b). *The World Loanword Database (WOLD)*. Max Planck Institute for Evolutionary Anthropology. <https://wold.clld.org/> (Cited on p. 152).
- Haw, S. G. (2017). Cinnamon, Cassia and Ancient Trade. *Journal of Ancient History and Archaeology*, 4(1), 5–18. <https://doi.org/10.14795/j.v4i1.211> (Cited on pp. 15, 22, 78, 80, 88).
- Hayyim, S. (1934–1936). *New Persian-English Dictionary, Complete and Modern, Designed to Give the English Meanings of over 50,000 Words, Terms, Idioms, and Proverbs in the Persian Language, as Well as the Transliteration of the Words in English Characters. Together with a Sufficient Treatment of All the Grammatical Features of the Persian Language*. Librairie-imprimerie Béroukhim. <https://dsal.uchicago.edu/dictionaries/hayyim/> (Cited on p. 152).
- Herman, L. (2015). *Herb & Spice Companion: The Complete Guide to Over 100 Herbs & Spices*. Wellfleet Press. (Cited on p. 14).
- Hernández, F. (1615). *Cuatro Libros De La Naturaleza Y Virtudes De Las Plantas Y Animales Que Están Recibidos En Uso De Medicina En La Nueva España [Four Books of the Nature and Virtues of Plants and Animals That Are Received in Use of Medicine in New Spain]*. Francisco Jiménez. (Cited on p. 46).
- Herodotus. (1921). *Herodotus II: Books III and IV* (A. D. Godley, Trans.). William Heinemann; G. P. Putnam's Sons. (Original work published 430 B.C.E.). (Cited on pp. 82, 83)
- Hill, T. (2004). *Contemporary Encyclopedia of Herbs and Spices: Seasonings for the Global Kitchen*. J. Wiley. (Cited on pp. 22, 101, 104, 105).
- Hoad, T. F. (2003). *The Concise Oxford Dictionary of English Etymology*. Oxford University Press. <https://doi.org/10.1093/acref/9780192830982.001.0001> (Cited on pp. 84, 86, 106).
- Hoogervorst, T. (2012). *Southeast Asia in the Ancient Indian Ocean World: Combining Historical Linguistic and Archaeological Approaches* [Doctoral dissertation, University of Oxford]. Oxford. (Cited on p. 16).
- Hooper, D. (1929). On Chinese Medicine: Drugs of Chinese Pharmacies in Malaya. *The Gardens' Bulletin Straits Settlements*, 6(1-5), 1–163 (Cited on p. 130).
- Hosseinzadeh, H., & Nassiri-Asl, M. (2013). Avicenna's (Ibn Sina) the Canon of Medicine and Saffron (*Crocus Sativus*): A Review. *Phytotherapy Research*, 27(4), 475–483 (Cited on p. 19).

- Hourani, G. F. (1975). *Arab Seafaring in the Indian Ocean in Ancient and Early Medieval Times*. Octagon Books. (Cited on p. 16).
- Hu, S.-Y. (2005). *Food Plants of China*. The Chinese University Press. (Cited on pp. 14, 15, 32, 63–66, 71, 72, 77, 78, 90–92, 110, 112, 113).
- Hu, S.-y. (1999). *An Enumeration of Chinese Materia Medica*, 中藥詞彙 (Y. C. Kong & P. P. H. But, Eds.; 2nd ed.). Chinese University Press. (Original work published 1980). (Cited on p. 90)
- Huang, C.-R., & Xiong, J. (2019). Linguistic Synesthesia in Chinese. In C.-R. Huang, Z. Jing-Schmidt, & B. Meisterernst (Eds.), *The Routledge Handbook of Chinese Applied Linguistics* (pp. 294–312). Routledge. <https://doi.org/10.4324/9781315625157-4> (Cited on p. 20).
- Ibn al-Bayṭār. (1874). *Kitāb Al-Jāmi‘ Li-Mufradāt al-Adwiya Wa-l-Aghdhiya [The Book of Medicinal and Nutritional Terms]*. [https://data.bnf.fr/en/12066947/\\_abd\\_allah\\_ibn\\_ah\\_mad\\_al-malaqi\\_ibn\\_al-bayt\\_ar/](https://data.bnf.fr/en/12066947/_abd_allah_ibn_ah_mad_al-malaqi_ibn_al-bayt_ar/) (Original work published ca. 1248). (Cited on p. 89)
- Ibn Khurdādhbih, A. ’. -Q. U. A. b. A. A. [ca. 870]. *Kitāb Al-Masālik Wa l-Mamālik [Book of Roads and Kingdoms]*. (Cited on pp. 83, 88).
- Ibn Manzūr, M. i. M. i. A. i. A. (1979). *Lisān al-‘Arab [The Tongue of the Arabs]*. Dar Sadir. (Original work published 1290). (Cited on pp. 58, 87)
- Ibn Sayyār al-Warrāq. (2007). *Annals of the Caliphs’ Kitchens: Ibn Sayyār al-Warrāq’s Tenth-Century Baghdad Cookbook* (N. Nasrallah, Trans.; Vol. 70). Brill. (Cited on p. 15).
- Ibn Sīnā. (1329). *Al-Qānūn Fī al-Tibb [The Canon of Medicine]*. <https://hdl.loc.gov/loc.wdl/wdl.15440> (Original work published 1025). (Cited on pp. 36, 70)
- James, W. (2022). *Pimento (Allspice)*. Webb James Srl. Retrieved August 26, 2022, from <http://www.webbjames.com/spices/pimento/> (Cited on p. 51).
- Jurafsky, D. (2014). *The Language of Food: A Linguist Reads the Menu*. W.W. Norton & Company. (Cited on pp. 1, 19).
- Katz, S. H. (Ed.). (2003). *Encyclopedia of Food and Culture*. C. Scribner’s Sons Thomson Gale. (Cited on p. 15).
- Katzer, G. (2006). *Gernot Katzer’s Spice Pages*. Gernot Katzer’s Spice Pages. Retrieved July 20, 2022, from <http://gernot-katzers-spice-pages.com/engl/> (Cited on p. 20).
- Kaufman, S. A., Hillers, D., Fitzmyer, J., & Sokoloff, M. (1987). *Comprehensive Aramaic Lexicon Project*. Hebrew Union College-Jewish Institute of Religion. <https://cal.huc.edu/> (Cited on p. 119).
- Kawatra, P., & Rajagopalan, R. (2015). Cinnamon: Mystic Powers of a Minute Ingredient. *Pharmacognosy Research*, 7(5), 1–6. <https://doi.org/10.4103/0974-8490.157990> (Cited on p. 79).
- Keay, J. (2006). *The Spice Route: A History*. University of California Press. (Cited on p. 13).
- Kikusawa, R., & Reid, L. A. (2007). Proto Who Utilized Turmeric, and How? In D. Eades, J. Lynch, & J. Siegel (Eds.), *Linguistics Description and Linguistic Applications: Studies in Memory of Terry Crowley* (pp. 339–352). John Benjamins Publishing Company. (Cited on p. 117).

- Kilgarriff, A., Baisa, V., Bušta, J., Jakubíček, M., Kovář, V., Michelfeit, J., Rychlý, P., & Suchomel, V. (2014). The Sketch Engine: Ten Years On. *Lexicography*, 1(1), 7–36. <https://doi.org/10.1007/s40607-014-0009-9/> (Cited on p. 37).
- Kilgarriff, A., Rychlý, P., Smrž, P., & Tugwell, D. (2004). The Sketch Engine. *Information Technology*, 105(116). <https://is.muni.cz/publication/560635/en?lang=en> (Cited on p. 37).
- King, A. H. (2007). *The Musk Trade and the Near East in the Early Medieval Period* [Doctoral dissertation, Indiana University]. (Cited on p. 15).
- Kleeman, J., & Yu, H. (Eds.). (2010). *The Oxford Chinese Dictionary: English-Chinese, Chinese-English*. New York. (Cited on pp. 53, 120, 121).
- Klein, E. (1971). *A Comprehensive Etymological Dictionary of the English Language: Dealing with the Origin of Words and Their Sense Development Thus Illustrating the History of Civilization and Culture* (Unabridged). Elsevier. (Cited on p. 118).
- Klein, E. (1987). *A Comprehensive Etymological Dictionary of the Hebrew Language for Readers of English*. Carta. (Cited on pp. 36, 68, 83–85).
- Kouyoumdjian, M. G. (1970). *A Comprehensive Dictionary Armenian-English*. Atlas Press. (Cited on p. 68).
- Krishnamurti, B. (2003). *The Dravidian Languages*. Cambridge University Press. [www.cambridge.org/9780521771115](http://www.cambridge.org/9780521771115) (Cited on p. 134).
- Krondl, M. (2007). *The Taste of Conquest: The Rise and Fall of the Three Great Cities of Spice*. Ballantine Books. <https://www.worldcat.org/title/147988350> (Cited on pp. 14, 113).
- Kurlansky, M. (2002). *Salt: A World History*. Walker and Co. (Cited on p. 14).
- Lakshmi, P. (2016). *The Encyclopedia of Spices and Herbs: An Essential Guide to the Flavors of the World*. ECCO. (Cited on p. 14).
- Lane, E. W. (1863). *An Arabic-English Lexicon: Derived From the Best and the Most Copious Eastern Sources* (S. Lane-Poole, Ed.). Williams and Norgate. (Cited on pp. 58, 70, 73, 109, 121).
- Langenheim, J. H. (2003). *Plant Resins: Chemistry, Evolution, Ecology, and Ethnobotany*. Timber Press. (Cited on p. 54).
- Lau, J. (n.d.). *Yellow Bridge*. <https://www.yellowbridge.com/chinese/dictionary.php> (Cited on p. 53).
- Laufer, B. (1919). *Sino-Iranica: Chinese Contributions to the History of Civilization in Ancient Iran, With Special Reference to the History of Cultivated Plants and Products* (Vol. 3). Field Museum of Natural History. (Cited on pp. 16, 29, 55, 56, 59, 80, 89, 120, 131).
- Lawrence, B. M. (1984). Major Tropical Spices-Ginger (*Zingiber Officinale Rosc.*) *Perfumer & Flavorist*, 9(5), 1–40 (Cited on p. 126).
- Leslau, W. (1991). *Comparative Dictionary of Ge'ez (Classical Ethiopic): Ge'ez-English, English-Ge'ez, with an Index of the Semitic Roots*. Harrassowitz. (Cited on p. 87).
- Leslau, W. (1996). *Concise Amharic Dictionary*. University of California Press. (Cited on p. 96).
- Leung, A. K. C., & Chen, M. (2019). The Itinerary of Hing/Awei/Asafetida across Eurasia, 400–1800. In P. H. Smith (Ed.), *Entangled Itineraries: Materials, Practices, and Knowledges across*

- Eurasia* (pp. 141–164). University of Pittsburgh Press. <https://doi.org/10.2307/j.ctvh9vzcl.10> (Cited on pp. 15, 54, 55, 59, 60).
- Lev, E., & Amar, Z. (2008). *Practical Materia Medica of the Medieval Eastern Mediterranean According to the Cairo Genizah*. Brill. (Cited on pp. 17, 68, 88).
- Lewicka, P. B. (2011). *Food and Foodways of Medieval Cairenes: Aspects of Life in an Islamic Metropolis of the Eastern Mediterranean*. Brill. (Cited on p. 15).
- Lewis, C. T., & Short, C. (1879). *A Latin Dictionary: Founded on Andrews' Edition of Freund's Latin Dictionary, Revised, Enlarged, and in Great Part Rewritten*. Clarendon Press. <http://www.perseus.tufts.edu/hopper/search> (Cited on pp. 48, 49, 67, 68, 83, 84, 106).
- Lewis, R. E., Schaffner, P., Latta, J., & Logarbo, M. (Eds.). (1952–2001). *Middle English Dictionary* (2nd ed. Online Edition in Frances McSparran, et al. (Eds.). (2000–2018). Middle English Compendium. University of Michigan Library.). University of Michigan Press. Retrieved April 2, 2022, from <http://quod.lib.umich.edu/m/middle-english-dictionary/> (Cited on pp. 49, 106).
- Liddell, H. G., & Scott, R. (1940). *A Greek-English Lexicon: Revised and Augmented Throughout* (H. S. Jones & R. McKenzie, Eds.; 9th ed.). Clarendon Press. <http://www.perseus.tufts.edu/hopper/search> (Original work published 1843). (Cited on pp. 67, 68, 84, 87, 106)
- Liu, Z., Gao, M., Mai, Y., & Shi, Y. (Eds.). (1985). *Hanyu Wailaici Cidian [A Dictionary of Loan Words and Hybrid Words in Chinese]*. The Commercial Press Hong Kong Branch. (Cited on p. 36).
- Löw, I. (1881). *Aramäische Pflanzennamen [Aramaic Plant Names]*. Engelmann. <https://menadoc.bibliothek.uni-halle.de/ssg/content/pageview/591571> (Cited on pp. 58, 68).
- Löw, I. (1924). *Die Flora der Juden [The Flora of the Jews]*. R. Löwit. <https://sammlungen.ub.uni-frankfurt.de/freimann/content/titleinfo/781127> (Cited on pp. 58, 69).
- Ma, T.-L. (1978). The Authenticity of the "Nan-Fang Ts'ao-Mu Chuang" 南方草木狀. *T'oung Pao*, 64(4/5), 218–252 (Cited on p. 72).
- Mabberley, D. J. (2017). *Mabberley's Plant-Book: A Portable Dictionary of Plants, Their Classification and Uses* (4th ed.). Cambridge University Press. <https://doi.org/10.1017/9781316335581> (Cited on pp. 32, 44, 55, 62, 101, 105, 117).
- Macdonell, A. A. (1929). *A Practical Sanskrit Dictionary With Transliteration, Accentuation, and Etymological Analysis Throughout*. Oxford University Press. <https://dsal.uchicago.edu/dictionaries/macdonell/> (Cited on p. 23).
- Machuca, P., Pulido-Salas, M. T., & Trabanino, F. (2020). Past and Present of Allspice (*Pimenta Dioica*) in Mexico and Guatemala: From Traditional Management to Current Large-Scale Markets. *Revue d'ethnoécologie*, (18). <https://doi.org/10.4000/ethnoecologie.6261> (Cited on p. 46).
- Mair, V. H., & Hoh, E. (2009). *The True History of Tea*. Thames & Hudson. <https://www.worldcat.org/title/true-history-of-tea/oclc/227016706> (Cited on pp. 14, 93).
- Matisoff, J. A. (2003). *Handbook of Proto-Tibeto-Burman: System and Philosophy of Sino-Tibetan Reconstruction*. University of California Press. (Cited on p. 132).  
OCLC: ocm53232585.

- McClatchey, W. (1993). Traditional Use of Curcuma Longa (Zingiberaceae) in Rotuma. *Economic Botany*, 47(3), 291–296 (Cited on p. 117).
- McCormick, S. I. (n.d.). *History of Spices*. McCormick Science Institute. Retrieved May 7, 2022, from <https://www.mccormicksceinstitute.com/resources/history-of-spices> (Cited on p. 46).
- McGee, H. (2004). *On Food and Cooking: The Science and Lore of the Kitchen* (2nd ed.). Scribner. (Original work published 1984). (Cited on p. 21)
- McKinney, W. (2011). Pandas: A Foundational Python Library for Data Analysis and Statistics. *Python for high performance and scientific computing*, 14(9), 1–9 (Cited on p. 94).
- MDBG. (n.d.). *MDBG Chinese Dictionary*. <https://www.mdbg.net> (Cited on pp. 52, 53, 60, 110, 112).
- Meghwal, M., & Goswami, T. K. (2013). Piper Nigrum and Piperine: An Update. *Phytotherapy Research*, 27(8), 1121–1130. <https://doi.org/10.1002/ptr.4972> (Cited on p. 102)
- Note: Review.
- Meri, J. W. (Ed.). (2006). *Medieval Islamic Civilization: An Encyclopedia*. Routledge. (Cited on p. 10).
- Merriam-Webster. (n.d.). *Merriam Webster's Unabridged Dictionary*. Retrieved November 12, 2021, from <https://unabridged.merriam-webster.com/> (Cited on pp. xix, 5).
- Miller, J. I. (1969). *The Spice Trade of the Roman Empire, 29 B.C. To A.D. 641*. Oxford University Press. <https://archive.org/details/spicetradeofrom0000mill> (Cited on p. 106).
- Milton, G. (1999). *Nathaniel's Nutmeg: Or, the True and Incredible Adventures of the Spice Trader Who Changed the Course of History*. Hodder & Stoughton Farrar, Straus and Giroux. (Cited on p. 13).
- Mirabal, S., Cadenas, A. M., Garcia-Bertrand, R., & Herrera, R. J. (2013). Ascertaining the Role of Taiwan as a Source for the Austronesian Expansion: Taiwan as Source for Austronesian Expansion. *American Journal of Physical Anthropology*, 150(4), 551–564. <https://doi.org/10.1002/ajpa.22226> (Cited on p. 125).
- Monier-Williams, M. (1899). *A Sanskrit-English Dictionary: Etymologically and Philologically Arranged with Special Reference to Cognate Indo-European Languages* (New Edition, Greatly Enlarged and Improved with the collaboration of Professor Ernst Leumann, Professor Carl Cappeller and other scholars). Clarendon Press. <https://www.sanskrit-lexicon.uni-koeln.de/> (Cited on pp. 63, 66, 69, 71, 106, 107, 110).
- Morton, T. (2006). *The Poetics of Spice: Romantic Consumerism and the Exotic*. Cambridge University Press. (Cited on p. 14).
- Musallam, B. (1987–2011). AVICENNA x. Medicine and Biology. In *Encyclopædia Iranica* (online, pp. 94–99, Vol. III/1). <http://www.iranicaonline.org/articles/avicenna-x> (Cited on p. 19).
- Musselman, L. J. (2012). *A Dictionary of Bible Plants*. Cambridge University Press. (Cited on p. 85).
- Nabhan, G. P. (2014). *Cumin, Camels, and Caravans: A Spice Odyssey*. University of California Press. <https://www.ucpress.edu/book/9780520379244/cumin-camels-and-caravans> (Cited on pp. 7, 14).
- Nair, K. P. (2019). *Turmeric (Curcuma Longa L.) and Ginger (Zingiber Officinale Rosc.) - World's Invaluable Medicinal Spices: The Agronomy and Economy of Turmeric and Ginger*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-29189-1> (Cited on pp. 116–119).

- Nair, K. P. (2020). *Geography of Black Pepper (Piper Nigrum): The “King” of Spices – Volume 1* (Vol. 1). Springer. <https://doi.org/10.1007/978-3-030-52865-2> (Cited on p. 102).
- Nair, K. P. (2011). *Agronomy and Economy of Black Pepper and Cardamom: The "King" and" Queen" of Spices*. Elsevier. <https://doi.org/10.1016/B978-0-12-391865-9.00001-3> (Cited on pp. 69, 105).
- Namdar, D., Gilboa, A., Neumann, R., Finkelstein, I., & Weiner, S. (2013). Cinnamaldehyde in Early Iron Age Phoenician Flasks Raises the Possibility of Levantine Trade With South East Asia. *Mediterranean Archaeology & Archaeometry*, 13(2) (Cited on p. 80).
- National Geographic. (2014, November 14). *The Nutmeg Wars | National Geographic* [Video]. YouTube. Retrieved August 22, 2022, from [https://www.youtube.com/watch?v=ygnzhWrML\\_4](https://www.youtube.com/watch?v=ygnzhWrML_4) (Cited on p. 30).
- Netchev, S., & Macquire, K. (2022, April 14). *Movement of "Tea" & "Cha" Around the Globe*. World History Encyclopedia. Retrieved May 23, 2022, from <https://www.worldhistory.org/image/14112/movement-of-tea--cha-around-the-globe/> (Cited on p. 93).
- Newman, P. (2007). *A Hausa-English Dictionary*. Yale University Press. (Cited on p. 96).
- Nilius, B., & Appendino, G. (2013). Spices: The Savory and Beneficial Science of Pungency. *Reviews of Physiology, Biochemistry and Pharmacology*, 164, 1–76 (Cited on p. 18).
- Nişanyan, S. (2022, June 30). *Nişanyan Sözlük - Türkçe Etimolojik Sözlük* [Turkish Etymology Dictionary]. Sevan Nişanyan. Retrieved July 3, 2022, from <https://www.nisanyansozluk.com/> (Cited on p. 70).
- Noonan, B. J. (2019). *Non-Semitic Loanwords in the Hebrew Bible: A Lexicon of Language Contact*. Eisenbrauns. (Cited on p. 85).
- Norman, J. (2015). *Herbs & Spices* (2nd ed.). DK Publishing. (Original work published 2002). (Cited on p. 14)
- Nugent-Head, J. (2014). The First Materia Medica: The Shen Nong Ben Cao Jing. *Journal of Chinese Medicine*, 104, 24–28 (Cited on p. 18).
- O’Connell, J. (2016). *The Book of Spice: From Anise to Zedoary*. Pegasus Books. (Cited on pp. 5, 14, 21).
- Oketch-Rabah, H. A., Marles, R. J., & Brinckmann, J. A. (2018). Cinnamon and Cassia Nomenclature Confusion: A Challenge to the Applicability of Clinical Data. *Clinical Pharmacology & Therapeutics*, 104(3), 435–445. <https://doi.org/10.1002/cpt.1162> (Cited on pp. 28, 79).
- Opara, E. I., & Chohan, M. (2021). *Culinary Herbs and Spices: A Global Guide*. Royal Society of Chemistry. <https://doi.org/10.1039/9781839164446> (Cited on pp. 14, 21, 45).
- Ortutay, G. (Ed.). (1977–1982). *Magyar Néprajzi Lexikon* [Hungarian Ethnographic Lexicon]. Akadémiai Kiadó. <http://mek.niif.hu/02100/02115/html/> (Cited on p. 146).
- OUP. (n.d.). *Oxford English Dictionary*. Oxford University Press. Retrieved March 24, 2022, from <https://www.oed.com/> (Cited on pp. 5, 47–49, 51, 53, 55–57, 60, 67, 68, 73, 83–86, 92, 95, 106–108, 112, 113, 118, 119, 121, 132, 134, 151, 152).
- Pali Text Society (Ed.). (1921–1925). *The Pali Text Society’s Pali-English Dictionary*. Chipstead. <https://dsal.uchicago.edu/dictionaries/pali/> (Cited on p. 71).

- Parthasarathi, P. T. (2015). Roman Control and Influence on the Spice Trade Scenario of Indian Ocean World: A Re-assessment of Evidences. *Heritage: Journal of Multidisciplinary Studies in Archaeology*, 3 (Cited on p. 7).
- Parthasarathy, V. A., Chempakam, B., & Zachariah, T. J. (Eds.). (2008). *Chemistry of Spices*. CABI. (Cited on pp. 17, 45, 105).
- Parti, G. (2017). *Arab-Indiai Kapcsolatok a Középkorban: Az Indiai-Óceáni Tengeri Kereskedelelem [Arab-India Relations in the Middle Ages: The Indian Ocean Maritime Trade]* [Master's thesis, Eötvös Loránd Tudományegyetem (ELTE)]. Budapest. (Cited on p. 134).
- Pearlstine, E. V. (2022). *Scent: A Natural History of Fragrance*. Yale University Press. <https://doi.org/10.2307/j.ctv2jnj91s8> (Cited on p. 91).
- Pearson, M. N. (Ed.). (1996). *Spices in the Indian Ocean World*. Variorum. (Cited on p. 16).
- Pegolotti, F. B. (1936). *The Practice of Commerce* [La Pratica Della Mercatura] (A. Evans, Ed.). The Medieval Academy of America. (Original work published ca. 1335–1343). (Cited on p. 7)
- Peter, K. V. (Ed.). (2006). *Handbook of Herbs and Spices, Volume 3* (1st ed.). Woodhead Publishing Limited. <https://www.sciencedirect.com/book/9781845690175/handbook-of-herbs-and-spices> (Cited on p. 32).
- Peter, K. V. (Ed.). (2012). *Handbook of Herbs and Spices* (2nd ed.). Woodhead Publishing Limited. <http://www.sciencedirect.com/science/book/9780857090409> (Cited on pp. 17, 20, 32, 44, 51, 57, 79, 86, 102, 103).
- Petruzzello, M. (2021). List of Herbs and Spices. In *Encyclopædia Britannica*. <https://www.britannica.com/topic/list-of-herbs-and-spices-2024392> (Cited on p. 7).
- Pliny the Elder. (1855). *Naturalis Historia* [The Natural History of Pliny] (J. Bostock & H. T. Riley, Trans.). Henry G. Bohn. <https://www.perseus.tufts.edu/hopper/text?doc=Plin.+Nat.+toc> (Original work published 77). (Cited on p. 36)
- Plotly Technologies Inc. (2015). *Collaborative Data Science*. <https://plot.ly> (Cited on p. 94).
- Polo, M. (1926). *The Travels of Marco Polo: The Venetian* (M. Komroff, Ed.). Horace Liveright. (Cited on p. 118).
- Polo, M., & Rusticiano, d. P. (2004). *The Travels of Marco Polo: The Complete Yule-Cordier Edition* (H. Cordier, Ed.; H. Yule, Trans.). <https://gutenberg.org/ebooks/10636> (Original work published 1903). (Cited on p. 118)
- POWO. (2022a). *Pimenta Dioica (L.) Merr.* Plants of the World Online: Facilitated by the Royal Botanic Gardens, Kew. Retrieved March 30, 2022, from <http://www.plantsoftheworldonline.org/> (Cited on p. 44).
- POWO. (2022b). *Plants of the World Online* (Botanical Database). Facilitated by the Royal Botanic Gardens, Kew. <http://www.plantsoftheworldonline.org/> (Cited on pp. 117, 126).
- Prance, G., & Nesbitt, M. (Eds.). (2005). *The Cultural History of Plants*. Routledge. (Cited on pp. 63, 117).
- Prasad, S., & Aggarwal, B. B. (2011). Turmeric, the Golden Spice. In *Herbal Medicine: Biomolecular and Clinical Aspects* (2nd ed.). CRC Press/Taylor & Francis. Retrieved August 25, 2022, from <https://www.ncbi.nlm.nih.gov/books/NBK92752/> (Cited on pp. 116, 117).

- Prescott, J., & Stevenson, R. J. (1995). Pungency in Food Perception and Preference. *Food Reviews International*, 11(4), 665–698 (Cited on p. 18).
- Putzel, D. (2017). *The Spice of Life: Black Cardamom Cultivation, Trade Networks, and Livelihoods in Yunnan, China* [Master's thesis, McGill University]. (Cited on p. 65).
- Quattrocchi, U. (Ed.). (2014). *CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology*. CRC Press. <http://www.crcnetbase.com/isbn/9781482250640> (Cited on p. 103).
- Rafinesque, C. S. (1836). *The American Nations: Or, Outlines of Their General History, Ancient and Modern: Including the Whole History of the Earth and Mankind in the Western Hemisphere; the Philosophy of American History; the Annals, Traditions, Civilization, Languages, &c., of All the American Nations, Tribes, Empires, and States* (Vol. 1). C. S. Rafinesque. (Cited on p. 47).
- Raghavan, S. (2007). *Handbook of Spices, Seasonings, and Flavorings* (2nd ed.). CRC Press. (Cited on pp. 34, 67).
- Rain, P. (2004). *Vanilla: The Cultural History of the World's Most Popular Flavor and Fragrance*. J.P. Tarcher/Penguin. (Cited on p. 14).
- Rao, P. V., & Gan, S. H. (2014). Cinnamon: A Multifaceted Medicinal Plant. *Evidence-Based Complementary and Alternative Medicine*, 2014, 1–12. <https://doi.org/10.1155/2014/642942> (Cited on p. 79).
- Ravindran, P. N. (Ed.). (2000). *Black Pepper: Piper Nigrum*. Harwood Academic Publishers. Retrieved February 22, 2022, from <http://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=181553> (Cited on pp. 22, 102–106).
- Ravindran, P. N. (Ed.). (2017a). *The Encyclopedia of Herbs & Spices*. CABI. <https://search-credoreference-com.ezproxy.lb.polyu.edu.hk/content/title/cabiherbs?tab=contents> (Cited on pp. 17, 32).
- Ravindran, P. N. (Ed.). (2017b). *Piper Nigrum*. In *The Encyclopedia of Herbs & Spices*. CABI. <https://search-credoreference-com.ezproxy.lb.polyu.edu.hk/content/title/cabiherbs?tab=contents> (Cited on pp. 102–104).
- Ravindran, P. N., & Madhusoodanan, K. J. (Eds.). (2002). *Cardamom: The Genus Elettaria*. Taylor & Francis. (Cited on pp. 62–64, 66, 67).
- Ravindran, P. N., & Nirmal Babu, K. (Eds.). (2005). *Ginger: The Genus Zingiber*. CRC Press. (Cited on p. 125).
- Ravindran, P. N., Nirmal Babu, K., & Shylaja, M. (Eds.). (2004). *Cinnamon and Cassia: The Genus Cinnamomum* (Vol. 36). CRC Press. (Cited on pp. 75, 77, 79, 90).
- Rayor, D. J., & Lardinois, A. (2014). *Sappho: A New Translation of the Complete Works*. Cambridge University Press. [www.cambridge.org/9781107023598](http://www.cambridge.org/9781107023598) (Cited on p. 82).
- Reed, C. E. (1995). "Youyang Zazu": *Miscellaneous Morsels From Youyang* [Doctoral dissertation, University of Washington]. Ann Arbor. <http://ezproxy.lb.polyu.edu.hk/login?url=https://www.proquest.com/dissertations-theses/youyang-zazu-miscellaneous-morsels/docview/304240545/se-2?accountid=16210> (Cited on p. 111).

- Regency Spices. (2022). *Regency Spices - The Hong Kong Spice Shop*. Retrieved August 26, 2022, from <https://regencyspices.hk/> (Cited on p. 110).
- Reid, A. (1988). *Southeast Asia in the Age of Commerce, 1450-1680: Volume One, The Lands Below the Winds*. Yale University Press. (Cited on p. 16).
- Riffle, R. L. (1998). *The Tropical Look: An Encyclopedia of Dramatic Landscape Plants*. Timber Press. <https://archive.org/details/tropicallookency00oriff/page/278/mode/2up?q=allspice> (Cited on p. 44).
- Roberts, E. (1837). *Embassy to the Eastern Courts of Cochinchina, Siam, and Muscat: In the U.S. Sloop-of-War Peacock, During the Years 1832-3-4*. Harper & Brothers. <https://www.wdl.org/en/item/7317/> (Cited on p. 69).
- Rosengarten, F. (1973). *The Book of Spices*. Pyramid Books. <https://archive.org/details/bookofspicesbyfroose> (Original work published 1969). (Cited on pp. 5, 7)
- Rosół, R. (2018). Early Semitic Loanwords in Greek. In Ł. Niesiołowski-Spanò & M. Węcowski (Eds.), *Change, Continuity, and Connectivity* (1st ed., pp. 334–344). Harrassowitz Verlag. <https://doi.org/10.2307/j.ctvckq4zg.21> (Cited on pp. 83, 84).
- Ross, A. S. C. (1952). *Ginger, a Loan-Word Study*. Basil Blackwell. (Cited on pp. 15, 134).
- Rossabi, M. (Ed.). (2013). *Eurasian Influences on Yuan China*. ISEAS.
- Roth, M. T., Biggs, R. D., Brinkman, J. A., Civil, M., Farber, W., Reiner, E., & Stolper, M. W. (Eds.). (2004). *The Assyrian Dictionary of the Oriental Institute of the University of Chicago* (4th ed.). The Oriental Institute. <https://oi.uchicago.edu/research/publications/assyrian-dictionary-oriental-institute-university-chicago-cad> (Original work published 1968). (Cited on pp. 68, 70, 95)
- Sajadi, M. M., Mansouri, D., & Sajadi, M.-R. M. (2009). Ibn Sina and the Clinical Trial. *Annals of Internal Medicine*, 150(9), 640–643 (Cited on p. 19).
- Salima, I. (2005). Diet. In D. B. Redford (Ed.), *The Oxford Encyclopedia of Ancient Egypt* (pp. 390–395, Vols. 3). Oxford University Press. <https://doi.org/10.1093/acref/9780195102345.001.0001> (Original work published 2001). (Cited on p. 106)
- Schafer, E. H. (1985). *The Golden Peaches of Samarkand: A Study of Tang Exotics*. University of California Press. (Cited on pp. 16, 29, 108, 111, 120).
- Schivelbusch, W. (1992). *Tastes of Paradise: A Social History of Spices, Stimulants, and Intoxicants*. Pantheon Books. <https://archive.org/details/tastesofparadiseoschi> (mode/2up) (Cited on p. 14).
- Schuessler, A. (2007). *ABC Etymological Dictionary of Old Chinese*. University of Hawai'i Press. (Cited on pp. 36, 110).
- Senaratne, R., & Pathirana, R. (Eds.). (2020). *Cinnamon: Botany, Agronomy, Chemistry and Industrial Applications*. Springer. <https://doi.org/10.1007/978-3-030-54426-3> (Cited on p. 9).
- Shaffer, M. (2013). *Pepper: A History of the World's Most Influential Spice*. Thomas Dunne Books. (Cited on pp. 14, 21, 102, 106).
- Sherman, P. W., & Billing, J. (1999). Darwinian Gastronomy: Why We Use Spices. *BioScience*, 49(6), 453–463. <https://doi.org/10.2307/1313553> (Cited on p. 17).

- Sheth, H. D. T. (1923–1928). *Paia-Sadda-Mahannavo: A Comprehensive Prakrit Hindi Dictionary, with Sanskrit Equivalents, Quotations and Complete References* (1st ed.). [Published by the author]. <https://dsal.uchicago.edu/dictionaries/sheth/> (Cited on pp. 106, 107).
- Shi, Y. (2000). *Hanyu Wailaici [Chinese Loanwords]*. Commercial Press. (Cited on p. 72).
- Sidebotham, S. E. (2011). *Berenike and the Ancient Maritime Spice Route*. University of California Press. (Cited on pp. 7, 16, 106).
- Small, E. (1996). Confusion of Common Names for Toxic and Edible "Star Anise" (*Illicium*) Species. *Economic Botany*, 50(3), 337–339 (Cited on p. 28).
- Smith, R. D. (1980). Avicenna and the Canon of Medicine: A Millennial Tribute. *Western Journal of Medicine*, 133(4), 367–370 (Cited on p. 19).
- Snoj, M. (1997). *Slovenski Etimološki Slovar [Slovenian Etymological Dictionary]*. Zalozba Mladinska Knjiga. (Cited on p. 96).
- Sonnad, N. (2018, January 11). *Tea If by Sea, Cha If by Land: Why the World Only Has Two Words for Tea*. Quartz. Retrieved May 23, 2022, from <https://qz.com/1176962/map-how-the-word-tea-spread-over-land-and-sea-to-conquer-the-world/> (Cited on p. 93).
- Sopher, D. E. (1964). Indigenous Uses of Turmeric (*Curcuma Domestica*) in Asia and Oceania. *Anthropos*, 93–127 (Cited on p. 117).
- Spence, C. (2018). Why Is Piquant/Spicy Food so Popular? *International Journal of Gastronomy and Food Science*, 12, 16–21. <https://doi.org/10.1016/j.ijgfs.2018.04.002> (Cited on pp. 18, 50).
- Spencer, R., & Cross, R. (2020). *Plant Names: A Guide to Botanical Nomenclature* (4th ed.). CSIRO Publishing. (Cited on p. 32).
- Spengler, R. N. (2019a). *Fruit From the Sands: The Silk Road Origins of the Foods We Eat*. University of California Press. (Cited on p. 13).
- Spengler, R. N. (2019b). Spices, Oils, and Tea. In *Fruit from the Sands* (1st ed., pp. 247–270). University of California Press. (Cited on p. 16).
- Spices Journey. (2022). *Quanxiangzi 全香子. 味旅 Spices Journey | 天然香辛料專賣品牌*. Retrieved August 26, 2022, from <https://spicesjourney.com/shop/aigo/> (Cited on p. 53).
- Srinivasan, K. (2007). Black Pepper and Its Pungent Principle-Piperine: A Review of Diverse Physiological Effects. *Critical Reviews in Food Science and Nutrition*, 47(8), 735–748. <https://doi.org/10.1080/10408390601062054> (Cited on p. 102).
- Steingass, F. J. (1892). *A Comprehensive Persian-English Dictionary: Including the Arabic Words and Phrases to Be Met With in Persian Literature*. Routledge & K. Paul. <https://dsal.uchicago.edu/dictionaries/steingass/> (Cited on pp. 55, 58, 69, 152).
- Sturgeon, D. (2021). Chinese Text Project: A Dynamic Digital Library of Premodern Chinese. *Digital Scholarship in the Humanities*, 36(S1), 101–112. <https://doi.org/10.1093/lhc/fqz046> (Cited on pp. 38, 90).
- Sturgeon, D. (n.d.). *Chinese Text Project*. Retrieved August 7, 2022, from <https://ctext.org/> (Cited on p. 38).
- Sultan Qaboos University. (1985). *Sultan Qaboos Encyclopedia of Arab Names*. <http://arabiclexicon.hawramani.com/sultan-qaboos-encyclopedia-of-arab-names/> (Cited on p. 109).

- Tavernier, J. B. (1678). *The Six Voyages of John Baptista Tavernier: A Noble Man of France Now Living, through Turky into Persia and the East-Indies* (J. Phillips, Trans.). Printed for R.L. and M.P. <https://archive.org/details/sixvoyagesJohnBooTave> (Cited on p. 86).
- Theophrastus. (1916). *Enquiry Into Plants* (A. Hort, Trans.). W. Heinemann; G.P. Putnam's Sons. (Cited on pp. 63, 82).
- TLFi. (2012). *Trésor de La Langue Française Informatisé [Digitized Treasury of the French Language]*. Analyse et traitement informatique de la langue française (ATILF). Retrieved June 22, 2022, from <https://www.cnrtl.fr/etymologie/> (Cited on pp. 47, 67, 83, 95).
- Törnwall, O., Silventoinen, K., Kaprio, J., & Tuorila, H. (2012). Why Do Some Like It Hot? Genetic and Environmental Contributions to the Pleasantness of Oral Pungency. *Physiology & Behavior*, 107(3), 381–389. <https://doi.org/10.1016/j.physbeh.2012.09.010> (Cited on p. 50).
- Toussaint-Samat, M. (2009). *A History of Food* (2nd ed.). Wiley-Blackwell. (Cited on pp. 15, 19).
- Tremblay, X. (2005). Irano-Tocharica et Tocharo-Iranica. *Bulletin of the School of Oriental and African Studies*, 68(3), 421–449. <https://doi.org/10.1017/S0041977X05000248> (Cited on pp. 57, 59).
- Trenckner, V. (1879). *Pali Miscellany*. Liams and Norgate. (Cited on p. 71).
- Turner, J. (2004). *Spice: The History of a Temptation*. Vintage Books. (Cited on pp. 5, 6, 14, 17, 46, 106).
- Turner, R. L., Sir. (1962–1966). *A Comparative Dictionary of the Indo-Aryan Languages*. Oxford University Press. <https://dsal.uchicago.edu/dictionaries/soas/> (Cited on pp. 57, 119).
- Ulanowska, M., & Olas, B. (2021). Biological Properties and Prospects for the Application of Eugenol—A Review. *International Journal of Molecular Sciences*, 22(7), 3671. <https://doi.org/10.3390/ijms22073671> (Cited on p. 45).
- Ulbricht, C., Seamon, E., Windsor, R. C., Armbruester, N., Bryan, J. K., Costa, D., Giese, N., Gruenwald, J., Iovin, R., Isaac, R., Grimes Serrano, J. M., Tanguay-Colucci, S., Weissner, W., Yoon, H., & Zhang, J. (2011). An Evidence-Based Systematic Review of Cinnamon (*Cinnamomum Spp.*) by the Natural Standard Research Collaboration. *Journal of Dietary Supplements*, 8(4), 378–454. <https://doi.org/10.3109/19390211.2011.627783> (Cited on pp. 79, 80).
- Unschuld, P. U. (2022, February 16). *On The First English Translation of the Classic Chinese Encyclopedia, Ben Cao Gang Mu*. UC Press Blog. Retrieved August 5, 2022, from <https://www.ucpress.edu/blog/58295/on-the-first-english-translation-of-the-classic-chinese-encyclopedia-ben-cao-gang-mu/> (Cited on p. 18).
- van der Veen, M. (2018). Archaeobotany: The Archeology of Human-plant Interactions. In W. Scheidel (Ed.), *The Science of Roman History* (pp. 53–94). Princeton University Press. <https://doi.org/10.2307/j.ctvc772w1.9> (Cited on p. 16).
- van der Veen, M., & Morales, J. (2015). The Roman and Islamic Spice Trade: New Archaeological Evidence. *Journal of Ethnopharmacology*, 167, 54–63. <https://doi.org/10.1016/j.jep.2014.09.036> (Cited on p. 16).
- van Wyk, B.-E. (2014). *Culinary Herbs and Spices of the World*. University of Chicago Press, joint publication with the Royal Botanic Gardens, Kew. <https://doi.org/10.7208/chicago/>

- 9780226091839.001.0001 (Cited on pp. 5, 7, 14, 21, 32, 43, 44, 50, 51, 54, 55, 57, 62–67, 77, 78, 86, 104, 105, 107, 109, 117, 119).
- Wang, G. (1958). The Nanhai Trade: A Study of the Early History of Chinese Trade in the South China Sea. *Journal of the Malayan Branch of the Royal Asiatic Society*, 31/2(182), 1–135 (Cited on p. 97).
- Wang, Q. J., Keller, S., & Spence, C. (2017). Sounds Spicy: Enhancing the Evaluation of Piquancy by Means of a Customised Crossmodally Congruent Soundtrack. *Food Quality and Preference*, 58, 1–9. <https://doi.org/10.1016/j.foodqual.2016.12.014> (Cited on p. 20).
- Wehr, H. (1976). *A Dictionary of Modern Written Arabic* (J. M. Cowan, Ed.; 3rd ed.). Spoken Language Services, Inc. (Cited on pp. 58, 60, 69, 70, 73, 87, 88, 90, 92, 109, 110, 112, 113, 121).
- Welles, C. B. (1934). *Royal Correspondence in the Hellenistic Period: A Study in Greek Epigraphy*. Yale University Press. //catalog.hathitrust.org/Record/001248055%20http://hdl.handle.net/2027/mdp.39015010575713 (Cited on p. 85).
- Wernick, R. (2014). *Pepper: A History*. New Word City, Inc. Retrieved March 28, 2022, from <https://www.overdrive.com/search?q=DC2DC794-E09B-420C-943E-A262210C9498> (Cited on p. 102).
- Wheatley, P. (1961). *The Golden Khersonese: Studies in the Historical Geography of the Malay Peninsula before A. D. 1500*. University of Malaya Press. (Cited on p. 71).
- Wijesekera, R., & Chichester, C. O. (1978). The Chemistry and Technology of Cinnamon. *CRC Critical Reviews in Food Science and Nutrition*, 10(1), 1–30. <https://doi.org/10.1080/10408397809527243> (Cited on pp. 28, 78).
- Wikipedia, E. O. T. (2022, August 19). Spice. In *Wikipedia*. Retrieved August 20, 2022, from <https://en.wikipedia.org/w/index.php?title=Spice&oldid=1105333543> (Cited on p. 5).  
note: Page Version ID: 1105333543.
- Wikipedia, E. O. T. (n.d.). *Wikipedia: The Free Encyclopedia*. [www.wikipedia.org](http://www.wikipedia.org) (Cited on pp. 72, 90, 92, 120).
- Wiktionary. (n.d.-a). Cinnamon. In *Wiktionary*. Retrieved May 26, 2022, from <https://en.wiktionary.org/w/index.php?title=cinnamon&oldid=66914125> (Cited on p. 94).  
note: Page Version ID: 66914125.
- Wiktionary. (n.d.-b). *Wiktionary: The Free Dictionary*. [www.wiktionary.org](http://www.wiktionary.org) (Cited on p. 52).
- Wollman, A. (1993). Early Latin Loan-Words in Old English. *Anglo-Saxon England*, 22, 1–26 (Cited on p. 10).
- Wood, C., Siebert, T. E., Parker, M., Capone, D. L., Elsey, G. M., Pollnitz, A. P., Eggers, M., Meier, M., Vössing, T., Widder, S., Krammer, G., Sefton, M. A., & Herderich, M. J. (2008). From Wine to Pepper: Rotundone, an Obscure Sesquiterpene, Is a Potent Spicy Aroma Compound. *Journal of Agricultural and Food Chemistry*, 56(10), 3738–3744. <https://doi.org/10.1021/jf800183k> (Cited on p. 105).
- Wood, S. (Ed.). (2000–2022). *Online Nahuatl Dictionary*. Wired Humanities Projects, College of Education, University of Oregon. <https://nahualt.uoregon.edu/> (Cited on pp. 23, 46).

- Wright, C. A. (2007). The Medieval Spice Trade and the Diffusion of the Chile. *Gastronomica*, 7(2), 35–43. <https://doi.org/10.1525/gfc.2007.7.2.35> (Cited on p. 15).
- Wu, J.-N. (2005). *An Illustrated Chinese Materia Medica*. Oxford University Press. (Cited on pp. 10, 18).
- Wu, Y., Schuster, M., Chen, Z., Le, Q. V., Norouzi, M., Macherey, W., Krikun, M., Cao, Y., Gao, Q., Macherey, K., Klingner, J., Shah, A., Johnson, M., Liu, X., Kaiser, L., Gouws, S., Kato, Y., Kudo, T., Kazawa, H., ... Dean, J. (2016, October 8). Google's Neural Machine Translation System: Bridging the Gap between Human and Machine Translation. <https://doi.org/10.48550/arXiv.1609.08144> (Cited on p. 94).
- Xu, L., & Sun, Y. (2021). 古代印尼與中國香料貿易的變遷影響 [The transition and influence of spice trade between ancient Indonesia and China]. *Journal of Chongqing University (Social Science Edition)*, 27(5), 125–134. <https://doi.org/10.11835> (Cited on p. 16).
- Yan, X. (2016). 衝突與調適:16~19世紀廣州口岸的中外香料貿易 [Conflict and Adjustment: The Spice Trade between China and Foreign Countries in Guangzhou Port from the 16th to the 19th Century]. *Guangdong Social Sciences*, 6, 129–139 (Cited on p. 16).
- Yan, X., & Hui, F. (2007). 宋代香料貿易及其影響 [Spice Trade and Its Influence in Song Dynasty]. *Jiangsu Business Theory*, 4, 172–174. <https://doi.org/10.13395/j.cnki.issn.1009-0061.2007.04.071> (Cited on p. 16).
- Yan, X., & Zhang, T. (2006). 香料與中國古代飲食 [Spices and Ancient Chinese Diet]. *Jiangsu Business Theory*, 10, 157–160. <https://doi.org/10.13395/j.cnki.issn.1009-0061.2006.10.063> (Cited on p. 15).
- Yan, X., & Zhang, T. (2012). 鄭和與明代西洋地區對中國的香料朝貢貿易 [Zheng He and the Spice Tributary Trade to China from the West in the Ming Dynasty]. *Research on Chinese Economic History*, 2, 77–84 (Cited on p. 16).
- Yang, S.-z. (1998). *The Divine Farmer's Materia Medica: A Translation of the Shen Nong Ben Cao Jing*. Blue Poppy Press, Inc. (Original work published ca. 206 B.C.E.–220). (Cited on p. 18)
- Yao, Y., & Su, Q. (2019). Chinese, Food and Menus. In C.-R. Huang, Z. Jing-Schmidt, & B. Meisterernst (Eds.), *The Routledge Handbook of Chinese Applied Linguistics* (pp. 81–91). Routledge. (Cited on p. 20).
- Yashin, A., Yashin, Y., Xia, X., & Nemzer, B. (2017). Antioxidant Activity of Spices and Their Impact on Human Health: A Review. *Antioxidants*, 6(70), 1–18. <https://doi.org/10.3390/antiox6030070> (Cited on p. 18).
- Yule, H., Burnell, A., & Crooke, W. (1903). *Hobson-Jobson: A Glossary of Colloquial Anglo-Indian Words and Phrases, and of Kindred Terms, Etymological, Historical, Geographical and Discursive*. J. Murray. <https://www.gutenberg.org/files/58529/58529-h/58529-h.htm> (Cited on p. 56).
- Zaicz, G. (2006). *Etimológiai Szótár: Magyar Szavak és Toldalékok Eredete* [Etymological Dictionary: The Origin of Hungarian Words and Affixes]. Tinta Könyvkiadó. (Cited on pp. 97, 126).
- Zaouali, L. (2007). *Medieval Cuisine of the Islamic World: A Concise History With 174 Recipes* (M. B. DeBevoise, Trans.). University of California Press. (Cited on p. 15).

- Zhang, Z., & Unschuld, P. U. (Eds.). (2015). *Dictionary of the Ben Cao Gang Mu Volume 1: Chinese Historical Illness Terminology*. University of California Press. (Cited on pp. 72, 90, 91).
- Zhao, Q., Huang, C.-R., & Ahrens, K. (2019). Directionality of Linguistic Synesthesia in Mandarin: A Corpus-based Study. *Lingua*, 232, 102744. <https://doi.org/10.1016/j.lingua.2019.102744> (Cited on p. 20).
- Zhao, Z., Guo, P., & Brand, E. (2018). A Concise Classification of Bencao (Materia Medica). *Chinese Medicine*, 13(18). <https://doi.org/10.1186/s13020-018-0176-y> (Cited on pp. xix, 18).
- Zhong, Y., & Huang, C.-R. (2020). Sweetness or Mouthfeel: A Corpus-Based Study of the Conceptualization of Taste. *언어연구 [Language Study]*, 37(3), 359–387. <https://doi.org/10.17250/khisli.37.3.202012.001> (Cited on p. 20).
- Zhong, Y., Huang, C.-R., & Dong, S. (2021). Bodily Sensation and Embodiment: A Corpus-based Study of Gustatory Vocabulary in Mandarin Chinese. *Journal of Chinese Linguistics*. <https://doi.org/10.1353/jcl.2017.0102> (Cited on p. 159).
- Zimmern, H. (1915). *Akkadische Fremdwörter Als Beweis Für Babylonischen Kultureinfluss [Akkadian Foreign Words as Evidence of Babylonian Cultural Influence]* [Doctoral dissertation]. Lipsiae [Lieipzig]. (Cited on p. 69).
- Zohary, D., Hopf, M., & Weiss, E. (2012). *Domestication of Plants in the Old World: The Origin and Spread of Cultivated Plants in West Asia, Europe and the Nile Valley* (4th ed.). Oxford University Press. (Original work published 1988). (Cited on p. 17)
- Zohary, M. (1982). *Plants of the Bible: A Complete Handbook*. Cambridge University Press. (Cited on p. 80).