

**Plant Series, No. 5. Manuscript MS408. Portfolio 4, Left (JPEG 008).****Gerard E. Cheshire.****Abstract.**

The plants individually described in Manuscript MS408 have all been identified as species from the environs of the Mediterranean Basin, in accordance with the location of origin for the manuscript. This series of papers presents each plant species separately with a translation of its accompanying text and any relevant cross-reference information. In addition to the linguistic value, there is plenty of historical, cultural and scientific knowledge to be gleaned from each of these manuscript pages, so they will be of interest to scholars from various disciplines.

Manuscript MS408 originates from Castello Aragonese, Ischia. It was written as an *aide-memoire* for Maria of Castile, Queen of the Crown of Aragon, c. 1444, whilst her husband, Alfonso V, was conquering the City of Naples. The manuscript remained in the castle library until 1912 when the citadel was sold into private hands by the Italian government and its contents were removed and traded off. Two years later the document found its way out of Italy and the nation unknowingly lost an important part of its heritage.

Within the manuscript there is a series of illustrations of medicinal herbal plants with accompanying text. This project identifies the plant species and translates the text to reveal the information imparted by the author and artist of each entry. The algorithmic method, of priority array queuing, was used to translate and identify the words in the text, as described in the following paper: <https://ling.auf.net/lingbuzz/004653> The method takes Latin as the principal source, with Old and Modern Romance as the secondary and tertiary sources. We can see that the language is placed somewhere between Latin and Romance in linguistic evolutionary terms: i.e. it is a vestigial form of prototype Romance.

Palaeography from historic languages and writing systems is never an exact science, especially when both are unfamiliar, but the subsequent transliterations into English phrasing provide adequately legible intention of meaning. In addition, many of the words are unambiguous in their Latin root and the text cross-references with botanical and medicinal information about the plants described in the images, so serving to verify the methodology.

The plant images are naïvely and inaccurately drawn and coloured, as the artist was untrained and should be viewed as simplified cartoon representations rather than anatomical illustrations. The images also focus on the relevant medicinal or culinary parts of the plants, so that the specimens are often incomplete, disproportionate, unscaled and shown in varying stages of development from young seedlings to mature plants in seed. A few of the images also contain additional pictorial information or annotations to highlight particular points for identification.

Some of the plants would have been grown in the physic and vegetable gardens of Castello Aragonese or else collected from Ischia island. Others would have been purchased from herbal plant suppliers travelling from mainland Europe, as dead specimens collected in the field and preserved by desiccation. Tinctures and essential oils would also have been available for purchase. It is apparent that the illustrations essentially function in substitution for the plant names, simply because scientific names were not yet conceived, and common names would have varied regionally. So the combination of visual and written information was intended to enable the reader to identify the species and use them for medicine or food accordingly.

**Plant Species.****Ivy-leaved Bellflower. *Hesperocodon hederaceus*. Syn. *Wahlenbergia hederacea*.**

This manuscript illustration is rather stylized and exaggerated, but it still provides sufficient information to accurately identify the species:

- Bell-shaped blue flower, with no visible joins between the petals which turn outwards slightly at their tips.
- Whitish stamens and pistil visible at bell opening.
- Small streamlined sepals seamlessly joined with petals, and small receptacle seamlessly joined with pedicel.

- Very long filiform pedicels carrying single flowers with no whorl of tepals.
- Narrow and glabrous (hairless and smooth) stem terminating in pedicels and regularly branched with fine leaf stalks, in the manner of ivy.
- Leaves joined peltate (attached from below centre) to stalks.
- Leaves palmate (hand-like) and facetted with angular and acuminate (narrowing to a point) corner projections facing both forwards and backwards.
- Unilinear root, slender, slightly hairy and tapering to anchor into narrow gaps, with ferrule joint between stem – here shown with several truncation scars, having been harvested a number of times before.
- Leaves and stems green, root red-brown outer, whitish inner.

Thus, although the draughtsmanship of the illustration is untrained and naïve, the anatomical details are telling and lead to only one species by process of elimination: Ivy-leaved Bellflower (*Hesperocodon hederaceus*). This is also an extremely small plant, which would have made accurate observation and drawing difficult without magnification, thereby resulting in exaggerated and cartoon-like features. The flowers and leaves are only 5-10mm in length, whilst the pedicels and stems are just 0.5-1mm. The whole plant seldom grows larger than 200mm. There are a few related and similar species, in the *Campanula* and *Wahlenbergia* genera, but none satisfies this checklist of anatomical details.

The earliest known scientific name for Ivy-leaved Bellflower is *Cantabrinæ anquillaræ*, which translates from the Latin as ‘small snake of Cantabria’ – as the flower buds bear a glancing similarity, in shape and posture, to the heads of snakes amongst the sward. The leaves are peltate so that they can be held aloft to gather light, and the pedicels are long so that the flowers can be displayed above the sward to small flying insects, for the purpose of fertilization. The flower buds are streamlined to enable egress through the undergrowth, without catching on obstacles. The term peltate derives from the Latin *pelta*, which was a type of military shield held at the centre.

In modern Portugal the plant is called Ruinas (ruins), as it is typically found growing between the stones of ruined buildings. In Galician it is Tapiceira (carpet weaver) due to its habit of covering the ground or walls in mats. In German it is the Efeu-moorglöckchen (ivy, tiny moor bell). In the Netherlands it is Klimopklokje (ivy-bell). It is invariably found growing in watery, damp and shady locations across western Europe north to south, from Britain across to Denmark and down to Iberia and France<sup>1&2</sup>.

In *Historia Plantarum*, 1686, by John Ray (1627–1705) this species is listed first as *Campanula cymbalariae foliis*. This is followed by variants: *Cymbalariae foliis*, *Cymbalariae folio hederacea*, *Campanula folio hederacea* and *Cantabricæ anguillaræ*. This demonstrates that early botanists had difficulty describing the plant in relation to others.

Subsequent names have included *Campanula hederacea*, *Campanula billardieri*, *Cantabrinæ anquillaræ*, *Roucela hederacea*, *Schultesia hederacea*, *Aikinia hederacea*, *Cervicina hederacea*, *Campanula hederæfolia*, *Campanula pentagonophylla*, *Valvinterlobus filiformis*, *Campanopsis hederacea*, *Wahlenbergia hederifolia*, *Wahlenbergia stenocalyx*, *Wahlenbergia hederacea* and *Hesperocodon hederaceus*: the current name. The new genus name *Hesperocodon* translates as ‘western handbell’. The species name *hederaceus* alludes to the ivy-like leaves.

The genus name *Roucela* is now used as a family subdivision of *Campanula* to contain a complex clade of closely related plants found in Greece, Turkey and the Archipelago between<sup>3</sup>. The genus name *Wahlenbergia* was assigned in the 19<sup>th</sup> century to contain this species and a number of similar species. However, genetic tests have shown Ivy-leaved Bellflower to be unique among them, so it was assigned its own genus *Hesperocodon* in 2014<sup>4</sup>. Such was the confusion about its relatedness to other plants that in the 18<sup>th</sup> century, before the concept of genetics had been realized, it was thought that Ivy-leaved Bellflower was a natural hybrid of a *Campanula* species and Ivy-leaved Speedwell (*Veronica hederifolia*)<sup>5</sup>.

The plant was once known as *Cervicaria hederacea*, as the Latin root word *cervice* alludes to the use of the plant for treating throats – thus it was known as Throatwort in English vernacular translation<sup>6</sup>. By extension, this meant the throat of the uterus (the cervix) as well as the windpipe, so it fits that the plant is used in the

manuscript to treat the woman's birth canal following her ordeal with æora (see Plant Series, No. 4: <https://ling.auf.net/lingbuzz/004880>). Here, in the manuscript, the cervix/vagina is described in Italian/Latin as the epe'os domoa (belly-mouth family: mouth of family belly). Such traditional beliefs would have been entrenched since antiquity, as people followed the advice of the Ancients throughout the Medieval<sup>7</sup>. It may have originally been used only for the cervix, but mistranslation of the Latin led to its use for treating throats. Also, both are similarly moist orifices, so it would have been logical to use the same plant for both.

### **Translation.**

Note: This text follows on from the previous manuscript page, as it is a treatment for the mother following the ordeal of æora, which has left her mentally and physically traumatized: <https://ling.auf.net/lingbuzz/004880>

1. lo'aus [abb. lo austro: for below: Spanish, Latin] epe'os [pl. epa: the belly, mouth, opening: Old Italian, Portuguese, Latin] domoa [of family. Latin] æa [herbal magic. Latin] eleor [v. eleos. pity, sympathy. Latin from Greek] a lo'aus [of the below. Spanish, Latin] t [triumphalis] ora [now. Portuguese]
2. nausa [v. nauza. upset, injury, harm, damage. Vulgar Latin] doméor [of dome (belly): Latin] oléos [oils. Portuguese] olos [v. ολό (όλο): whole, entire, all. Latin from Greek.] or'amor [abb. por amor: for love. Portuguese] nor'nas [gods of destiny. Latin]
3. olos'a [it is whole, entire, all. Latin from Greek] éo r æor t \_e it (eo rei æora triumphalis e it) [it's a treatment with victory out of it. Latin] éosa [it is. Latin] é'ea'lasa olae [abb. e ea lasanum olae: from the cooking pan. Latin]
4. donas [gifts.] é t (testamento) éa [it is a testament that is. Catalan] léior [reliable. Catalan] olas [dish, stew, recipe. Latin] no s (situs) éias \_es [it presents no faults. Latin]
5. a'éias [the faults. Latin] o'méar [v. mejor: to urinate. Latin] éo [it's the. Portuguese] s [abb. solvit: solves. Latin] éas [and the. Portuguese] ele'a [she at. Portuguese]
6. os [the. Portuguese] éios (leios) los [smooth them. Latin-Greek, Portuguese] éon'asa [with time. Portuguese] éasa [happens. Latin]

Note: The abbreviation or'amor (por amor) 'for love' is likely to be a further abbreviation of the common Iberian phrase 'por amor de dios' (for/by/through the love of god).

Note: The Nor'nas are three Pagan virgin gods of destiny, corresponding to past, present and future. They were believed to have the power to spare lives when praised. Nor'nas is the Iberian phonetic pronunciation of Norns, also known as the Parcae, the Moirai or the Fates<sup>8</sup>.

Note: The Greek goddess Eleos was the personification of compassion. The spelling variant resulted from the 'o' being pronounced 'or', which led to the 'r' replacing the 's' as it became silent. By extension eleor/eleos came to mean 'oil of mercy' in the Medieval as the Greek for oil is elao (έλαο), thus the herbal substance was added to olive oil and believed to provide relief from ailments and injury. It was known as Holy Unction or Anointing, otherwise called Euchelaeon (Ευχέλαον): holy blessing with oils. In essence it was a blend of Christian and Pagan belief.

Note: The phrase lo'aus (for below), used twice in the first sentence, has a flattened 'o' to signify the junction.

Note: The word nausa/nauza comes from the Greek ναυσα (shaking, rocking, moving), which relates to motion sickness: the root being nau (ship). Thus the term is used here to refer to the injury caused to the womb by æora (violent physical manipulation of the body): as described in Plant Series, No. 4: <https://ling.auf.net/lingbuzz/004880> The Latin words nausea (sickness) and noxia (damage, harm) are, of course, related<sup>9</sup>.

Note: In accordance with Medieval logic, *Hesperocodon hederaceus* is associated with urination because the plant grows in damp watery places.

Note: The Latin word æa (herbal magic) is derived from name of the island home of Circe, the Greek goddess of herbal magic and potions. Coincidentally, the island of Æa (Aea, Aia) is thought to be Isola di Ponza, which lies about 100km west of Ischia, in the Tyrrhenian Sea<sup>10</sup>.

Note: The Latin word éios derives from the Greek λειος (leios): smooth, plain, even, normal, comfortable. For example, leiotrichous and leiothrix both mean ‘smooth haired’.

For below - the family belly mouth (the womb/vagina). Herbal magic for sympathy below to now triumph by mercy oiling the whole injured belly for the love of Nor'nas (goddesses of destiny). It is for complete triumph over æora (physical manipulation) from the cooking pan, as the recipe is a reliable gift with no faults. It solves the problems with urinating by smoothing them with time.

7. méos [v. meios: urination. Latin] o'méa'sa [of the mother, hers. Portuguese, Old French] é'os [it's for. Latin] equasa [adequate. Italian] t [terminus].
8. aléa [chance/hazard. Old French] léosa [to read. Galician] é'os [its' for. Portuguese] é'eleor [v. é eleos: is pity, sympathy. Latin/Greek] ola [all. Latin/Greek]
9. amé-eas [love and the. Portuguese] olier [oil. Latin] eme'ono'ara [acquire, procure it now. Latin, Catalan] é'os [it's for. Latin] eme'a [acquire, procure it. Latin]
10. o'é'ot [it is have. Portuguese, French] naus [food. Vulgar Latin] dolæor [trimming, reducing. Spanish] naua [sickness] éor [sister. Latin] olas a [dish, stew to. Latin]
11. æo æo [v. io, io: hurry, hurry. Latin] ele o elea [it and she has. Portuguese] méios [v.meior: urination. Latin] éo'naus [to it, the food. Galician] éo'sa [to it is. Spanish]
12. o æ (e dans l'a) [of it's in the. Portuguese, French] éo nais [to it Nais (water spirit). Latin] améa [v. amié a: to friend. French] méos [v. meios: urination. Latin] léasa [v. lése: to read imperatively, urgently. Spanish] t [terminus. Latin]
13. æas [v. eas/eo: to progress: Latin] ælaus [v. alaos: unseen. Latin from Greek] dolé'a [to hurt, suffer. Latin] ama [to nurse, care for, to love. Portuguese] emear [v. semear: to sow, disseminate: Portuguese] éla [she. Portuguese]
14. nais [Nais (water spirit) Latin] æia (eia) sa [to urge: come on, vigour. Latin, Old Catalan] a leasa [to reduce, lessen. Latin]

Note: The Portuguese word emear (semear) can be used in the literal sense – to sow seed – but also in the figurative sense – to spread the word, to disseminate love. The silent ‘s’ is frequent in Iberian pronunciation.

Note: The Latin word ælaus (alaos) is derived from the Greek ἀλαος [blind, unseen, out of sight, invisible, prevented from seeing, depriving the eyes], as the injury is inside the womb.

It's for adequate urination of the mother. Obliged to read it is for total sympathy and love to acquire now. Have to eat from the stew to reduces the sickness. Hurry, hurry, to eat for urination. It is our friend Nais (the birth spirit) in the urination, so it is urgent. Progress unseen the hurting by sowing the care of Nais. Come on, come on, vigour to reduce the suffering!

### **Summary.**

For below – the family belly mouth (the womb/vagina). Herbal magic for sympathy below to now triumph by mercy oiling the whole injured belly for the love of Nor'nas (goddesses of destiny). It is for complete triumph over æora (physical manipulation) from the cooking pan, as the recipe is a reliable gift with no faults. It solves the problems with urinating by smoothing them with time.

It's for adequate urination of the mother. Obliged to read it is for total sympathy and love to acquire now. Have to eat from the stew to reduces the sickness. Hurry, hurry, to eat for urination. It is our friend Nais (the birth spirit) in the urination, so it is urgent. Progress unseen hurting by sowing the care of Nais. Come on, come on, vigour to reduce the suffering!

### **Discussion.**

Following on from Plant Page No. 4: <https://ling.auf.net/lingbuzz/004880>, this text offers the herbal remedy for treating the internal damage resulting from æora and for restoring the ability to urinate by reducing the inflammation caused by the forced birth. It was believed that the Nor'nas, goddesses of fate, and Nais, goddess of water, therefore had the necessary powers, with the addition of the ‘oil of mercy’ as magic. As Ivy-leaved Bellflower was known for healing orifices and is found in watery habitats, then it was clearly also considered appropriate for this ailment.



Fig. 1. Ivy-leaved Bellflower (*Hesperocodon hederaceus*). Manuscript Portfolio 4, left. The leaves and flowers are exaggerated by the artists because the plant is extremely small in real life and would have been difficult to study without magnification.



Fig. 2. Various images of Ivy-leaved Bellflower (*Hesperocodon hederacea*) growing in situ, showing the variation in leaf shape, size and number of cornered facets and joined peltate. Also, we can see the diagnostic single flowers on long filiform pedicels and wiry stems. The accompanying grass stems also demonstrate the diminutive size of the plant.



Fig. 3. Two images of Ivy-leaved Bellflower (*Hesperocodon hederacea*) to show the scale of the leaves and flowers.



Fig. 4. Two pressed, dried and faded specimens of Ivy-leaved Bellflower (*Hesperocodon hederacea*), showing the characteristic stems, pedicels, flowers, leaves and roots, as depicted in the manuscript.



Fig. 5. Left: 1863 Lithograph of Ivy-leaved Bellflower (*Hesperocodon hederacea*) by Charlotte Gower, in *Wild Flowers of Great Britain* by Robert Hogg & George Johnson. Horticultural and Cottage Gardener. London. Right: 1860 painting of Ivy-leaved bellflower, unknown artist, Yartmore, Penrith, Cumbria.



Fig. 6. 1885 engraving of Ivy-leaved Bellflower (*Hesperocodon hederacea*) by Walther Otto Muller (1833—87) in *Flora von Deutschland Österreich und der Schweiz* (Flora of Germany, Austria and Switzerland). Otto Wilhelm Thome. Eugen Kohler Brothers. Showing the fine unilobed tapering root and ferrule connection with stem, as shown in the manuscript illustration.

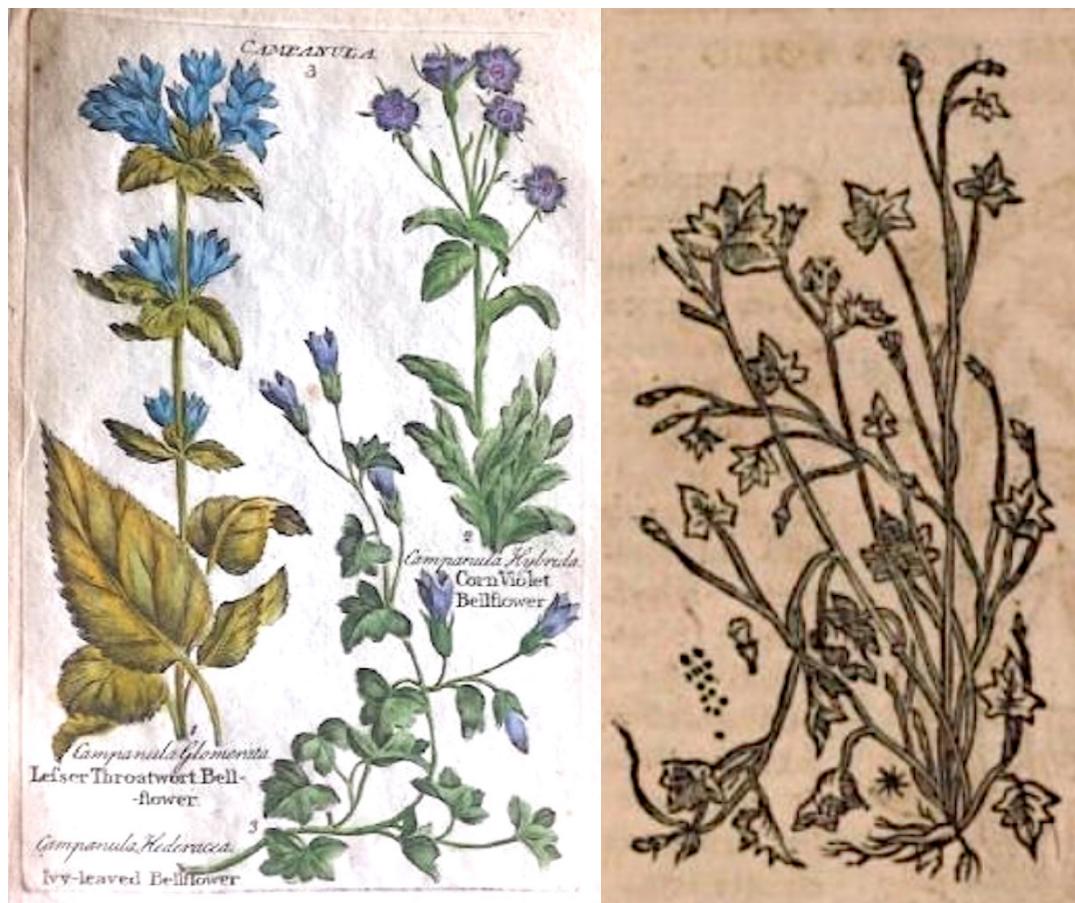


Fig. 7. Left: 1792 Engraving of Ivey-Leaved Bellflower (*Hesperocodon hederacea*) (middle) by John Hill, in *Culpeper's English Family Physician*, by Nicholas Culpeper, Joshua Hamilton & Willian Saunders. Locke. London. Right: 1651 Engraving of *H. hederaceus* as *Campanula folio hederaceo*, species *Cantabrinæ anguillaræ*, in *Historia Plantarum Universalis Nova et Absolutissim, Tomus II*, (Universal History of Plants, New and Complete, Book II) Page 797. by Johanne Bauhino, et al. This was the earliest known image of the plant species until its discovery in the manuscript.



Fig. 8. Left: 1823. Ivy-leaved bellflower (*Hesperocodon hederacea*) by H. Humitzsch, in *Iconographia Botanica Seu Plantae Criticae*, by HGL Reichenbach. Right: 1824. Ivy-leaved Bellflower by John Curtis, in *British Entomology*, Ellis & Co. London.

### Conclusion.

Although the draughtsmanship of the manuscript illustration is rather inaccurate, the image provides sufficient information to pinpoint the correct species; Ivy-leaved Bellflower (*Hesperocodon hederacea*). Without magnification it would have been difficult to observe the detail of such a small plant and the artist has evidently elaborated the flowers and leaves to some extent, perhaps from memory or a dash of artistic license. The photographs seen in Figures 1, 2, 3 show how variable the leaves are between specimens and the drawings seen in Figures 4, 5, 6, 7, 8 show different ways in which other artists have captured the character of Ivy-leaved Bellflower from specimens in different countries.

The species is not known to contain or produce any active compounds that might be of medicinal benefit, and the plant is so small that its use was clearly based on belief alone, due to naïve logic according to its moisture-loving nature. In fact its chemical inertness may have reinforced belief in its efficacy, precisely because recovery from æora and spurge poisoning was not further antagonised and therefore simply left to chance and placebo effect: i.e. the basis of homeopathy. Indeed, the use of the word æa tells us that this particular treatment was regarded as magic, rather than having any specific physical effect, as spurge does. The manuscript image indicates that the leaves were used for this herbal magic, as one leaf has been plucked away from its stem. So, the manuscript does contain some magic after all.

### References.

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10. Mitchell Carroll. 2018. *Greek Women*, Vol I. Outlook Verlag. ISBN: 9783734033957.

### Further reading:

1. Plant Series, No. 1. Manuscript MS408. *Atropa baetica*: <https://ling.auf.net/lingbuzz/004797>
2. Plant Series, No. 2. Manuscript MS408. *Serratula erucifolia*: <https://ling.auf.net/lingbuzz/004845>
3. Plant Series, No. 3. Manuscript MS408. *Nymphaea alba*: <https://ling.auf.net/lingbuzz/004864>
4. Plant Series, No. 4. Manuscript MS408. *Euphorbia myrsinifolia*: <https://ling.auf.net/lingbuzz/004880>
5. The Language and Writing System of MS408 (Voynich) Explained. <https://www.tandfonline.com/doi/full/10.1080/02639904.2019.1599566>
6. Linguistic Missing Links. <https://ling.auf.net/lingbuzz/003737>
7. Linguistically Dating and Locating Manuscript MS408. <https://ling.auf.net/lingbuzz/003808>
8. Consonants & Vowels, Castles and Volcanoes. <https://ling.auf.net/lingbuzz/004381>
9. The Algorithmic Method for Translating MS408 (Voynich). <https://ling.auf.net/lingbuzz/004653>

Symbol key for Manuscript MS408. Gerard Edward Cheshire. University of Bristol. www.sciencesurvey.ink

Symbol-Italic key for MS 408.			
Symbol	Italic	Symbol	Italic
α	a (trapped)	ᾳ	a (free)
ᾳ	ais	ᾳ	aus
ꝑ	æ (ae, a, e, i)	ꝑ	d
ꝑ	e (short)	ꝑ	e'e (intonation)
ꝑ	é (long)	ꝑ	i
ꝑ	l (ll)	ꝑ	ele (elle)
ꝑ	m (mm)	ꝑ	eme (emme)
ꝑ	n (nn)	ꝑ	o
ꝑ	p (pp)	ꝑ	epe (eppe)
ꝑ	qu	ꝑ	eque
ꝑ	r (rr)	ꝑ	s/z (ss, zz)
ꝑ	s/z (ss, zz)	ꝑ	sa/za
ꝑ	t (tt)	ꝑ	ta
ꝑ	u	ꝑꝑꝑ	v, f, fv, ph, pv