

Plant Series, No. 3. Manuscript MS408. Portfolio 3, Left (JPEG 006).**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.

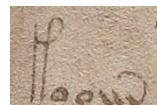
The plant images are naïvely and inaccurately drawn and coloured, as the artist was untrained and should be viewed as simplified cartoon representations rather than anatomical illustrations. The images also focus on the relevant medicinal or culinary parts of the plants, so that the specimens are often 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.

European White Waterlily. *Nymphaea alba* (*Nymphaea alba*, *Nuphar alba*). See Figure 2.

This manuscript page demonstrates a Medieval Latin name for the white waterlily, or pond lily, in the Mediterranean, which was lotus (v. *lotos*, *lotous*). The name comes from the Greek *λωτός* (*lōtós*), which means foodplant. By extension, *lōtus* came to mean washed or bathed in Classical Latin, due to the association with water. In the manuscript, the plant name is written with a silent junctural ‘t’, so that it is both spelled and pronounced *lo’ous*, using an inflective transition between the two ‘o’ letters, as seen below:



The large elongated rhizome, shown in the manuscript illustration, identifies the species as *Nymphaea alba*, the European White Waterlily, as they were peeled, boiled and eaten as a root vegetable, being highly nutritious and also containing aporphine alkaloids, which have a pleasant mildly sedative effect¹. It has also been used for reducing vaginal soreness and discharge either as a douche or as a pessary².

In the book *Herbal or General History of Plants*, 1597, by John Gerard (1545—1612), and elsewhere, the European White Waterlily is named *N. alba major*, with *N. alba minor* being a smaller subspecies, now known as *N. alba candida* or *N. alba occidentalis*. See Fig. 6. The genus name is sometimes given as *Nuphar*, as this alludes to another Medieval Latin name for the waterlily, nenuphar, from Arabic نيلوفر (ninofer), which survives in French as nénufar or nénuphar. *N. alba* is perennial and has an edible rootstock known as a rhizome, which grows in a direction perpendicular to the plant so that new stems and roots can emerge from budding nodes and so expand the size of the plant laterally. The large rhizome stores energy for the plant in the winter months, ready for new growth in the springtime, which is why it is a good source of starchy food for humans.

The similar Egyptian White Waterlily (*Nymphaea lotus*) differs from the European White Waterlily in having serrated leaf edges and egg-shaped rhizomes. The Sacred Lotus (*Nelumbo nucifera*) looks similar too, but its leaves have no split and are held above the water, whilst its rhizomes are smooth and segmented, rather like strings of large beads. The Yellow Waterlily, *Nymphaea lutea*, has a similar rhizome but it has a cup-shaped yellow flower and ovate leaf. The Blue Waterlily, *Nymphaea caerulea*, has a striking blue flower and its rhizome has far stronger narcotic effects, which are described on a separate manuscript plant page. The Snowflake lily, *Nymphaoides indica*, belongs to a different plant family and is a tiny plant of the tropics only, with very frilly petals (hence its common name), that floats on the water's surface with hanging roots and has no edible rhizome. Thus, *N. alba* is the remaining species by elimination.

The rhizomes of *N. alba* naturally lie in the muddy sediment below waterbodies from where they send down roots and send up long stems to the surface bearing leaves (waterlily pads) and flowers, which both float on the water. The manuscript image shows a long mature rhizome with most of its stems and roots cut away to leave many small stumps. In addition, the artist has been observant enough to include the petiolar air canals in cross-section (as black dots on the stumps). They are a characteristic of *Nymphaea* species in making the stems buoyant with gas, so that the leaves and flowers can reach the surface of the water to do their jobs. See Figure. 3.

The single leaf and flower are evidently included in the illustration as a visual aid to identification. However, the manuscript flower is anatomically incorrect as it has a trumpet form with only a few petals with protruding feathery pistil, unlike the real waterlily flower. The explanation for this is that the flowers and leaves of *N. alba* are fleshy and perishable so the rhizomes would have been delivered to Ischia island fully trimmed as a root vegetable, leaving the artist with no specimens as models, and having to rely on memory and second-hand information. This is supported by another tell-tale error in detail with the stem, as real waterlily stems have no branching. Instead, each of the leaves and flowers has its own individual stem from the rhizome, so this was not sketched from life either. The extemporised flower is evidently modelled on the White Hibiscus (*Hibiscus syriacus*) which would have been familiar as a flower grown for decoration and scent in Mediterranean gardens. It has the trumpet form and protruding feathery pistil, as well as only a few petals with wavy outer edges and the green calyx and receptacle as described in the manuscript. So, the hibiscus flower was used as a 'make-do' or 'stand-in' for the waterlily flower. See Figure 4.

In conclusion.

Examining the evidence; that we know the plant is *N. alba*, from the provided name lotus and the accurately drawn rhizome, then it is clear that the leaf, the stems and the flower were simply not available as specimens, which is why they have been improvised. European White Waterlily rhizomes were a staple root vegetable in the 15th century Mediterranean, as New World alternatives, such as the potato and topinamber had yet to be introduced, in the following century. The rhizomes were harvested commercially from large bodies of freshwater (ponds, lakes and slow-flowing rivers). Having been washed and trimmed of their roots and stems they were then stored in canvas sacks to keep them dry and free from rot, so they could be transported considerable distances to market without spoiling. This is how they would have arrived at Ischia port, as maritime cargo, so the artist had to use creative license for the rest of the plant and omitted to attempt drawing the roots altogether. This is all a matter logical deduction from detailed research and cross-reference of the information provided by the manuscript image and text.

Translations & Transliterations.

1. lo'ous [lotous, lotus: waterlily: Medieval Latin from Greek] é eo péos [is at the feet. Portuguese] o maus [of v. mauz: of banana-like rhizome. Vulgar Latin from Arabic] o nais [of birth. Latin, French] é'os [it's for. Portuguese] nais æ (a dans l'a) ma (mamma) [baby at the breast. French, Latin]
2. léo léa [lion or lioness. Latin] æo [proceed. Latin] æor doméo [to build. Latin, Galician] roei [gnaw at, chew at. Portuguese] t [terminus. Latin] doma [home. Latin] é'os nais [it's for baby. Latin, French]
3. o méa [v. o'meus: of my. Latin] é'os [it's for. Portuguese] réa [resuscitating. French] éor [sister. Latin] éo na [and on. Latin] éo nais [and baby. Latin, French] é eme a nauis [is acquired as food. Latin, Vulgar Latin]
4. æo é oro [it is holy, sacred. Portuguese] éi'os éo [for the mouth. Latin] nauis [food. Vulgar Latin]

Note: The word lo'ous (lotus) was the common or vernacular name for *N. alba* during the Medieval, because it was a staple foodplant, containing nutritious carbohydrates.

Note: The word maus (mauz) is derived from the Arabic word موز, meaning banana or plantain, which is where we get the banana genus name *Musa* from. Thus, the manuscript uses the word in allusion to the elongated banana-like form of the waterlily rhizome, which also has yellowish flesh and a sweet flavour due to the starch converting to sugar on the tongue. See Figure 4.

Lotus: The rhizome is born at the feet (of the plant). It is for the baby at the breast. Gnaw it to build a lion or lioness (healthy and strong child). In my home it is for the baby and for resuscitating the mother (sister), as it is sacred food for the mouth.

5. léos [see them. Portuguese] æa naius [it is emerge. Portuguese, Latin] é e'loa [of with praise. Portuguese] t [terminus. Latin] æ [abb. et dans l'a: It is. French] ea nos [that we. Latin] éor [sister. Latin] nauis [eat. Vulgar Latin]
6. nos eor [we proceed. Latin] é'os [it's for. Portuguese] éor [sister. Latin] lior [smoothing. Latin] éa é [it is. Portuguese] ma nauis [mother food: breast milk. Latin, Vulgar Latin] o méos éas [of them to rejoice. Latin]
7. nauis [food. Vulgar Latin] éo [for. Latin] mé ea [it my. Latin] domeia [household. Latin] éo lio [it is calm. Latin] t [terminus. Latin] éi et [and it. Latin] ét é [has been. French] e aus [from below. Latin]
8. éo loiæ e [it is messy of. Latin] é'os [it's for. Portuguese] éior éor [sister. Latin] noro na [in fatigue, exhaustion. Latin]

To see them (mother and child) emerge with praise. It is food for the sister to smooth the breast feeding and for them to rejoice as it makes the household calm. It also serves to remove the mess from below as it is for our sister in her exhaustion.

Text in summary:

Lotus: The rhizome is born at the feet (of the plant). It is for the baby at the breast. Chew it to build a lion or lioness (healthy and strong child). In my home it is for the baby and for resuscitating the mother (sister), as it is sacred food for the mouth. To see them (mother and child) emerge with praise. It is food for the sister to smooth the breast feeding and for them to rejoice as it makes the household calm. It also serves to remove the mess from below as it is for our sister in her exhaustion.

Discussion.

The text for this page is only brief as *Nymphaea alba* would have been a familiar root vegetable in southern Europe at the time, so it didn't need much introduction, suffice it for the author to say that it was known to be good for the mother and baby as a source of nutrition and for calming the mood. Clearly using the name lotus (lo'ous) as the very first word of the text would have been sufficient to identify the plant to a contemporaneous reader immediately, so it didn't really matter that the flower was contrived. The identity of the plant would have been as obvious then as it is now.



Fig. 1. European White Waterlily. *Nymphaea alba*. Portfolio 3. Left. The large edible rhizome is seen at the foot of the page, trimmed of its roots and stems, as it would have been delivered as a root vegetable, but including the addition of an anatomically incorrect stem with leaf and flower to assist the reader with identification.

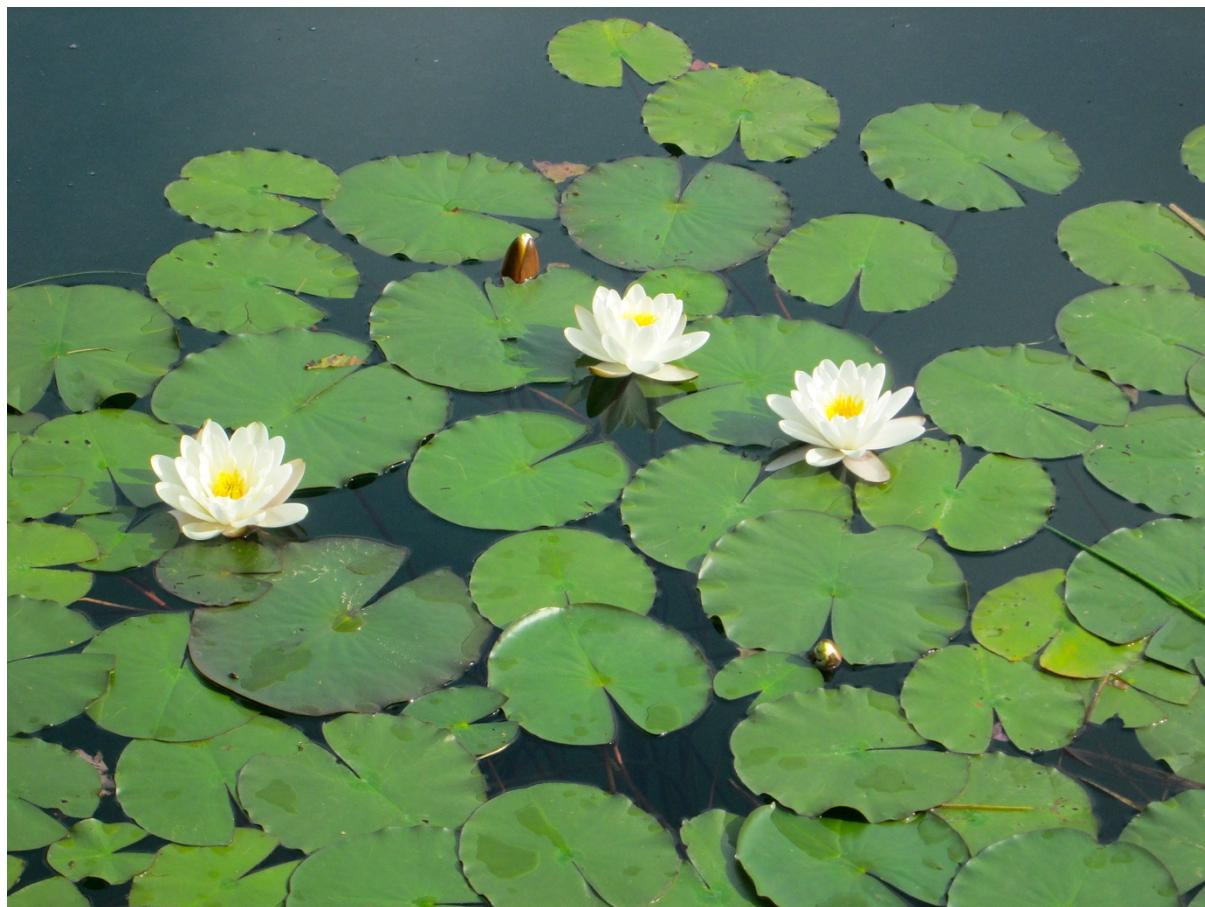


Fig. 2. European White Waterlily, *Nymphaea alba*, showing the floating leaves and flowers.



Fig. 3. Petiolar air tubes seen in cross section: in the manuscript image (left), on a living plant (centre), on cut specimens (right).



Fig 4. The *Nymphaea alba* flower (left), the manuscript flower (centre) and *Hibiscus syriacus* flowers (right). Clearly the hibiscus flower has been used as the substitute model for the manuscript drawing in the absence of a waterlily flower to examine on the island.

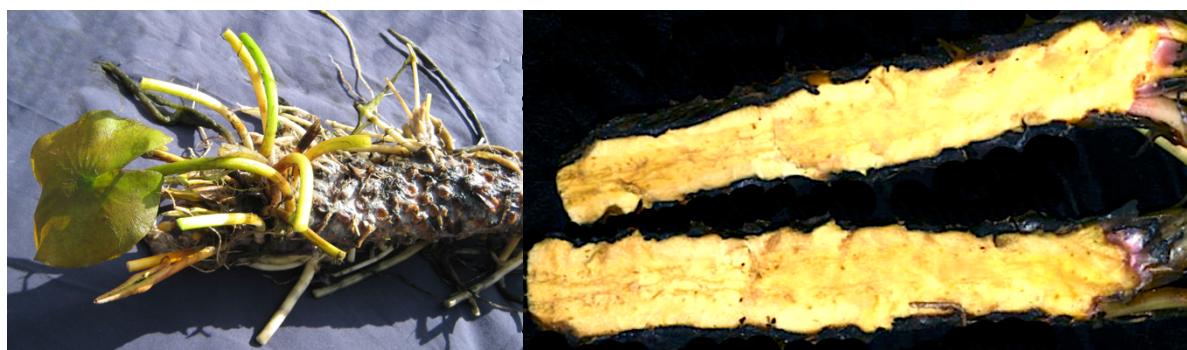


Fig 5. The edible rhizome of *Nymphaea alba*. Left: with most of the stems and roots cut away. Right: trimmed and bisected to show the yellowish flesh within, giving it a banana-like appearance.

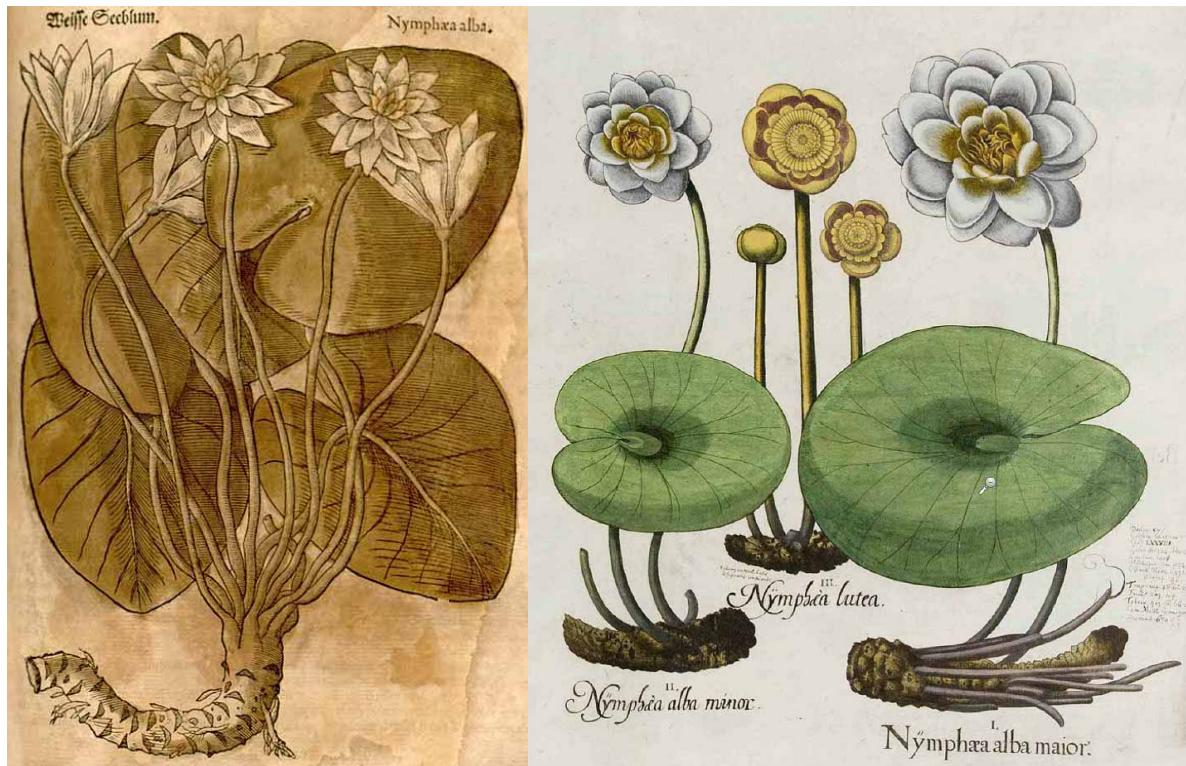


Figure 6. Left: Engraving of *N. alba*, by P. A. Mattioli, from *Neu Kreüterbuch* (New Herb-book) 1563 by Leonhart Fuchs (1501–66). Right: Engraving of *N. alba minor* (left), *N. lutea* (middle) and *N. alba major* (right), from *Hortus Eystettensis* (Garden of Eichstätt), 1613, by Basilius Besler (1561–1629).

Citations:

1. Bosi, G., Mercuri, A. M., Guarneri, C., & Mazzanti, M. B. (2009). Luxury food and ornamental plants at the 15th century AD Renaissance court of the Este family (Ferrara, northern Italy). *Vegetation History and Archaeobotany*. Vol. 18. Issue. 5. pp. 389-402.
2. Lakshmi, T., Madhusudhanan, N., & Rajendran, R. (2013). *Nymphaea alba* Linn-An Overview. *Research journal of Pharmacy and Technology*. Vol. 6. Issue 9. pp. 974-977.

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. The Language and Writing System of MS408 (Voynich) Explained. <https://www.tandfonline.com/doi/full/10.1080/02639904.2019.1599566>
4. Linguistic Missing Links. <https://ling.auf.net/lingbuzz/003737>
5. Linguistically Dating and Locating Manuscript MS408. <https://ling.auf.net/lingbuzz/003808>
6. Consonants & Vowels, Castles and Volcanoes. <https://ling.auf.net/lingbuzz/004381>
7. 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
ꝝ	a (trapped)	ꝝ	a (free)
ꝑ	ais	ꝑ	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