

THE GEOGRAPHY OF THEOPHRASTUS' LIFE AND OF HIS BOTANICAL WRITINGS (*ΠΕΡΙ ΦΥΤΩΝ*)

COSTAS A. THANOS
DEPARTMENT OF BOTANY
UNIVERSITY OF ATHENS, ATHENS 15784, GREECE
(*email cthanos@biol.uoa.gr*)

ABSTRACT

Theophrastus of Eressus (371-286 BC) is widely recognised as the founder of Botany and the co-founder, together with Aristotle, of the science of Biology. Theophrastus studied at a young age in Plato's Academy in Athens where he was acquainted with Aristotle. It is suggested that since then (355 BC) the two friends and colleagues were never separated. They traveled to Assos, Lesbos, Macedonia (Pella, Mieza and Stagira) and returned to Athens in 335 BC, to found the Peripatetic School in the Lyceum.

In his botanical writings (*ΠΕΡΙ ΦΥΤΩΝ ΙΣΤΟΡΙΑΣ - ΠΕΡΙ ΦΥΤΩΝ ΑΙΤΙΩΝ*), Theophrastus makes a total of 903 direct and distinct geographical citations which correspond to a total of 314 different entries (geographical terms) which can be grouped further to a total of 243 geographical 'entities'. Most of his geographical information is contained in 4 (out of the 9) books of *HP* (particularly books 4 and 9 on phytogeography and ethnobotany).

Theophrastus' Science is undoubtedly global, as any true science should be. His universal perspective is illustrated by numerous examples. Theophrastus world is certainly centered around Greece and Asia Minor but it also includes a North African belt, much of southern Europe, the Middle East while extending eastwards to Persia and India. In Theophrastus' works, numerous plants are given a geographic epithet denoting the origin of the particular taxon usually in comparison with other, more or less similar but discreet taxa ('genera' according to Theophrastus). In several cases of cultivated plants, the geographical epithet denotes the provenance of a landrace or a cultivar.

Theophrastus deals with Plant Science in a masterly, scientific way by: a. critically quoting the accumulated botanical knowledge of Classical Antiquity, b. processing information furnished by trained informants, professional people or simply laymen and c. personal experience through his own observations and travels. In regard to the latter, he was obviously familiar with significant parts of Lesbos, Troad, Macedonia and Attica while a year-long trip to either Arcadia or Egypt cannot be ruled out.

INTRODUCTION

Theophrastus of Eressus (371-286 BC) is currently widely appraised as the founder of Botany (Father of Botany according to Carolus Linnaeus) and co-founder, together with Aristotle, of the science of Biology (McDiarmid 1976, Morton 1981, Kiortsis 1989, Thanos 1994). He is also considered as the founder of several disciplines of Plant Biology, such as plant morphology, plant physiology, plant taxonomy, phytogeography, seed biology as well as plant ecology and ethnobotany (Morton 1981, Evenari 1984, Thanos 1994). Diogenes Laertius lists 227 works of his with a total of 232.808 lines.

THE GEOGRAPHY OF THEOPHRASTUS' LIFE

Theophrastus, son of Melantas, a wealthy fuller, was born in 371 BC in Eressus (Eresos), a small town of southwestern Lesbos Island. His original name was Tyrtamos, but he was renamed Theophrastus (literally: 'God-spoken' or 'indicated by God') by Aristotle, 'on account of his graceful (divine) style'. He studied first under Alkippos in his native Lesbos (Richter 1965) but at an early age (ca. 355 BC) he went to Athens (arrow 1, Figure 1) and enrolled in Plato's Academy, where he was acquainted and associated with Aristotle. According to Morton (1981), Aristotle evidently took to the highly intelligent, industrious and good-natured young man who was to become his closest friend and a life-long collaborator.



Figure 1. Theophrastus' travels. Numbers and arrows denote order and direction of the major whereabouts of Theophrastus. See text for additional explanations and a comprehensive account for each travel. The inset bust of Theophrastus is a coloured modification from a photo of his only extant bust found on a herm in Villa Albani, in Rome (Richter 1965).

After Plato's death (347 BC) and apparently as a result of his non-designation as the new director of the Academy (although this is refuted by Owen, 1976), Aristotle, with a team of colleagues and followers (including Theophrastus), traveled (arrow 2, Figure 1) to Assos of Troad (Asia Minor) upon an invitation by Hermeias (the hegemon of the city and a former student of Aristotle). Aristotle and his associates founded the School of Assos but, unfortunately, the venture came to an abrupt end, three years later (344 BC), with the assassination of their patron, Hermeias; thus the staff of the school had to flee the city and move to Theophrastus' homeland, the Island of Lesbos, just a few kilometers across the North-East Aegean Sea (arrow 3, Figure 1).

The company had an apparent rest at Lesbos for two years (344-342 BC); their place of residence was either (or both) Mytilene, the capital or Eressus, but also Pyrrha (in the centre of the island) and its lagoon (today Kalloni Gulf) are said to be the favourable place of Aristotle. It seems that it was in Lesbos that Aristotle and Theophrastus were motivated to pursue an organized study of the living world; a rough division of labour was mutually agreed, Aristotle choosing animals and Theophrastus plants as their respective fields of interest. Thus 344 BC was proposed as the birth-year of the Science of Biology in general and of its twin pillars, Zoology and Botany, in particular (Thanos, 1994).

In 342 BC, Aristotle, at about the age of 42, was invited by Philip B', king of Macedonia, to serve as a tutor for his 13-year-old son, the future Alexander C' the Great. So Aristotle returned to his native country where he spent several years at the royal court, in the capital Pella, teaching the young prince 'το εὖ ζῆν' (in free translation 'the quality of life'). Moreover, a new royal School was established in a nearby, countryside location, Mieza. Although there is no direct information, it seems highly probable that during his sojourn in Pella and afterwards in Stagira (when Alexander came of age), Aristotle was accompanied by Theophrastus. The Mieza School operated for 3 years (342-339 BC) until Alexander came of age and several other tutors assisted Aristotle. Although Amigues (1988) suggests that Theophrastus was separated from Aristotle during (at least) the 3-year long tutorship of Alexander, I strongly believe that Aristotle would repay his friend's hospitality by taking him along, right from the beginning (thus arrows 4 and 5 in Figure 1, 342 and 339 BC, respectively).

Alexander gratified his tutor by rebuilding the town of Stagira, Aristotle's birthplace, which Philip B' had destroyed earlier. After three years at the Macedonian court, Aristotle withdrew and returned to his paternal property at Stagira. There he continued the associations of his philosophical circle, which still included Theophrastus and other pupils of Plato. When Theophrastus wrote his will he was in possession of land property in Stagira; *'The estate at Stagira belonging to me I give and bequeath to Callinus.'* (Diogenes Laertius, *Theophrastus*, v. 52).

They lived there until 335 BC and in the meantime Theophrastus had several opportunities to collect information and to visit sites beyond the Strymon River in eastern Macedonia and northwards to the Rhodope massif (Amigues 1988). In 335 BC, when Aristotle was almost 50 years of age, they once again returned to Athens (arrow 6, Figure 1). At this time the leadership of the Academy became vacant by the death of Speusippus, and Xenocrates of Chalcedon, Aristotle's associate in biological research, was elected to the post. Aristotle, assisted by Theophrastus, founded, in 335 BC, a rival institution in the Lyceum, a gymnasium attached to the temple of Apollo Lyceus, situated in a grove just outside Athens. On the exact locality of the Lyceum (suggested to be the area where Heridanos flows into Ilissos River) the reader is referred to a detailed, reliable and very informative account by Economides (1972).

From the fact that Aristotle's lectures were given in the peripatos, ie. a covered walkway of the gymnasium, the school derived its name of Peripatetic. The main

difference between the Peripatetic and the Academy was that the scientific interests of the Platonists centered on mathematics whereas the principal contributions of the Lyceum lay in biology and history. On the death of Alexander the Great in 323 BC a brief but vigorous anti-Macedonian agitation broke out in Athens. Aristotle felt in danger, left Athens and withdrew to his mother's estates in Chalcis on the Island of Euboea. There he died in the following year (322 BC) from a stomach illness at the age of 62 or 63. So, Theophrastus became the Director of the School.

The Lyceum and the Peripatetic School reached its apogee of success during Theophrastus' 37 years of administration. The function of the institution was to train the leaders, officials and experts of the new era (Morton, 1981). Like its rival Academy, the Lyceum was a true University of its epoch: an up-to-date curriculum emphasizing the observational sciences, numerous lecturers, as many as two thousand students and a spacious, well designed 'campus' with buildings and open-air facilities, a very important library, a museum and the first botanical garden (Morton 1981, Thanos 1994; but refuted by McDiarmid, 1976). Shortly before his death, at the age of 85 (286 BC), Theophrastus retired leaving Strato as head of the School.

According to Hort (1916), Aristotle in his will left his books and his garden in the Lyceum to Theophrastus. However, no mention of books or garden is made in Aristotle's will. On the other hand it is Theophrastus who in his will spoke about books and the garden: *'The whole of my library I give to Neleus. The garden and the walk and the houses adjoining the garden, all and sundry, I give and bequeath to such of my friends hereinafter named as may wish to study literature and philosophy there in common ... Let me be buried in any spot in the garden which seems more suitable, without unnecessary outlay upon my funeral or upon my monument.'* (Diogenes Laertius, *Theophrastus*, v. 52-53). He did not forget to show his respect towards his mentor and friend: *'Secondly, to replace in the temple the bust of Aristotle with the rest of the dedicated offerings ...'* (v. 51). It is quite strange but Hort (1916) was obviously confused; when referring in his short Introduction to Aristotle's will; this mistake has been perpetuated since then (partly due to Hort's prestige).

According to Einarson (1976), in addition to critically quoting the accumulated botanical knowledge of Classical Antiquity, Theophrastus also consulted informants, as seems to be Satyrus (*HP 3.12.4*). In his discourse on wild trees his chief sources of information were the woodcutters of Mt Ida, Macedonia and Arcadia – he was certainly well acquainted at least with the former two. Einarson (1976) supposes that his close ties with Aristotle made him familiar with both Chalcidice in general and Chalcis (several citations). He also appeared to have visited Philippi (Einarson 1976) while in Macedonia and the Orchomenia Lake (Copais Lake) while in Athens, (Amigues 1988).

Amigues (1988) posed the question: 'did Theophrastus visit Crete, Egypt and Cyrenaica?' Taking into account his duties in the Lyceum, such a trip could have been possible either in 318 BC (when he was in a self-exile after a law had been passed in Athens which imposed restrictions on the philosophical schools) or during 342-339 when she postulates that Theophrastus was not with Aristotle (arrow 8, Figure 1). However, Amigues (1988) believes that Theophrastus spent his enforced 'sabbatical' writing instead of traveling. It is true that he seems more of a philosopher than a traveler – preferring meditation than action; on the other hand, the scientific mission of Callisthenes (Aristotle's cousin) who was following Alexander, had already (332-327 BC) offered valuable information for the flora of Libya, Egypt, Ethiopia, Arabia, Palestine, Syria, Babylonia and Persia. Therefore, we conclude that Theophrastus might have spent his self-exile year visiting Arcadia (arrow 7, Figure 1).

THE GEOGRAPHY OF THEOPHRASTUS' BOTANICAL WRITINGS

Theophrastus' botanical works (*ΠΕΡΙ ΦΥΤΩΝ ΙΣΤΟΡΙΑΣ* - *HISTORIA PLANTARUM* - *ENQUIRY INTO PLANTS HP*, *ΠΕΡΙ ΦΥΤΩΝ ΑΙΤΙΩΝ* - *DE CAUSIS PLANTARUM* - *CAUSES OF PLANTS CP*), were scanned for specific, named geographical references in all available publications. The following editions were searched both through the ancient Greek texts and their respective translations in English: *HP*, Hort 1916, 1926 - *CP*, Einarson and Link, 1976, 1990, French: *HP* books 1-6, Amigues 1988, 1989, 1993 and modern Greek: *HP* and *CP*, Cactus editions 1998. An electronic database comprising all entries and their respective passages was built; comments were also incorporated, mostly in regard to the modern names of a number of relatively 'obscure' geographical localities (the database is available upon request from the author).

An overview of Theophrastus' geography

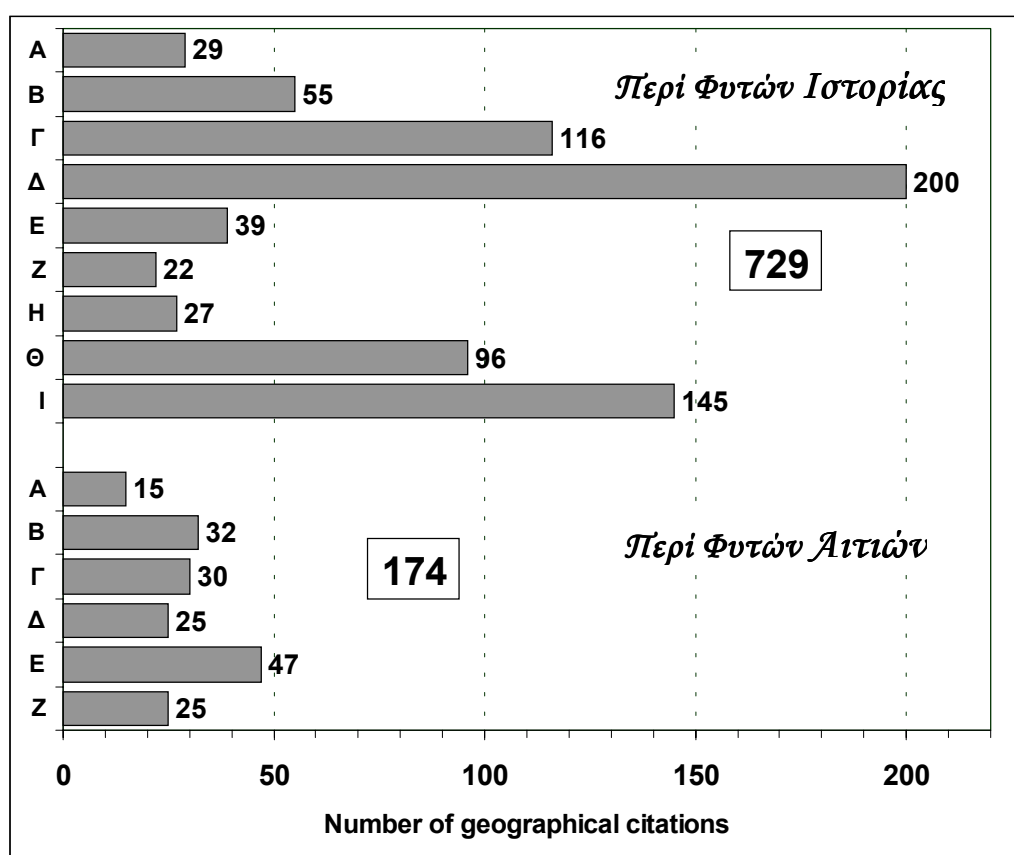


Figure 2. A bar graph illustrating the number of distinct references to geographical entities per individual 'book' of the 2 botanical works of Theophrastus. The boxed numbers, 729 and 174, show the total number of geographical citations in *HP* and *CP*, respectively.

In his botanical writings (*ΠΕΡΙ ΦΥΤΩΝ*), Theophrastus makes a total of 903 direct and distinct geographical citations, distributed over the 15 'books' of his 2 works as shown in Figure 2. The 4 books with the highest numbers of references all belong to the rather descriptive *HP* and comprise more than 2/3 of the total number. Their respective 'titles' (according to Hort 1916, 1926) are: Book III (116) *Of wild trees*, Book IV (200) *Of the trees and plants special to particular districts and positions*, Book VIII (96) *Of herbaceous plants: cereals, pulses, and 'summer crops'* and Book IX (145) *Of the juices of plants, and of the medicinal properties of herbs*. The 2 books with the most

numerous citations, Book 4 and Book 9 are indeed considered the first ever treatises of phytogeography and ethnobotany, respectively.

Table 1. The commonest direct citations (in descending order) to geographical entities in the botanical writings (*HP*, *CP*) of Theophrastus; numbers in right column represent the total distinct references to each particular entry.

Egypt	Αίγυπτος	48
Syria	Συρία	33
Arcadia	Αρκαδία	26
Mt Ida	Ίδη	22
Crete	Κρήτη	21
Macedonia	Μακεδονία	20
Thrace	Θράκη	17
Hellas	Ελλάς	16
Egyptian	Αιγύπτιος	14
Babylon	Βαβυλών	14
Thessaly	Θετταλία	14
Cilicia	Κιλικία	13
Euboea	Εύβοια	12
Euboean	Ευβοϊκός	11
Philippo	Φίλιπποι	11
Pontos	Πόντος	11
Athens	Αθήνα	10
Indians	Ινδοί	10

The overall number of geographical citations (903) corresponds to a total of 314 different entries (geographical terms) which can be grouped further to a total of 243 geographical ‘entities’. The commonest direct citations (out of the total of 314 entries) are listed in Table 1. Surprisingly enough, Egypt and Syria get the highest ranks. However, when the entries are grouped in ‘entities’ the general pattern is modified. Grouping is carried out with wider geographical regions; thus Egypt now includes Egypt and Egyptians (people), Egyptian – adjective usually referring to particular plants as well as various geographical terms belonging to Egypt (eg. Nile River, Nile Delta, Elephantine Island, Heroes’ Gulf [Gulf of Suez], Cities of Heroes, Thebes, Coptos and Memphis). The list of the commonest citations to geographical regions (the grouped approach – a total of 243 regions) is shown in Table 2. The pattern emerging from this Table is more balanced and not unexpected – the rank of each region is a function of proximity, size and botanical importance.

Most citations refer to various countries, regions, cities and their respective people; however significant additional mention is made by Theophrastus to specific geographical terms: 27 different Mountains with a total of 92 direct, separate citations; Islands 22 (89); Rivers 12 (22); Seas 7 (24); Lakes 4 (7). Among mountains, the most cited one is by far Mt Ida of Troad (22) (Thanos 2002) followed by the highest Greek mountain, Mt Olympus (8) and Mt Parnassus (6). Among islands, the most cited is Crete with 21 direct references, followed by Euboea (12), Cyprus (7), Rhodes (7) and Sicily (6).

Table 2. The commonest direct citations (in descending order) to large geographical regions in the botanical writings (*HP*, *CP*) of Theophrastus; numbers in right column represent the total distinct references to each particular entry.

Sterea Hellas	Στερεά Ελλάς	130
Asia Minor	Μικρά Ασία	109
Egypt	Αίγυπτος	82
Peloponnese	Πελοπόννησος	81
Syria-Mesopotamia	Συρία-Μεσοποταμία	71
Macedonia	Μακεδονία	67
S. Italy-Sicily	Ν. Ιταλία-Σικελία	48
Pontus	Πόντος	38
Crete	Κρήτη	35
Libya-Tunisia	Λιβύη-Τυνησία	35
Arabia-Ethiopia	Αραβία-Αιθιοπία	29
Thrace	Θράκη	27
India	Ινδία	26
Aegean Islands	Νήσοι Αιγαίου	23
Thessaly	Θεσσαλία	22
Persia	Περσία	21

Theophrastus' World

Despite the fact that he apparently was not much of a traveler, Theophrastus' Science is undoubtedly global, as any true science has to be. His universal (for the circumstances of his era) perspective is illustrated in Figure 3 and quite expectedly is East-Mediterranean centered but also includes a North African belt, much of southern Europe, the Middle East and extends eastwards to Persia and India. The following passages (based on the translation by Hort, 1916, 1926) correspond to the numbers shown in Figure 3.

1. Akesines River, today Chenab, a tributary of Indus River, E. Punjab

The Indian (reed) is very distinct, and as it were a totally different 'genus'; the male is solid and the female hollow ... As for the leaf, it is not long but similar to that of the willow; in regard to size these reeds are large and strong, so they are used as javelins. They grow by the river Akesines. (HP 4.11.13.)

Theophrastus refers to two distinct bamboo species, presently identified as *Bambusa arundinacea* and *Dendrocalamus strictus*, respectively (Hort 1926; Amigues 1989).

2. Tylos Island, today Bahrain

In the island of Tylos ... there is water from heaven though they do not use it for the crops; but there exist many springs on the island, from which they water everything, ... Wherefore, even if it rains, they water (open the ditches) as though they are washing away the rain water. (HP 4.7.8.)

On salty soil; watering washes away the salt splashed on the plants by the raindrops.

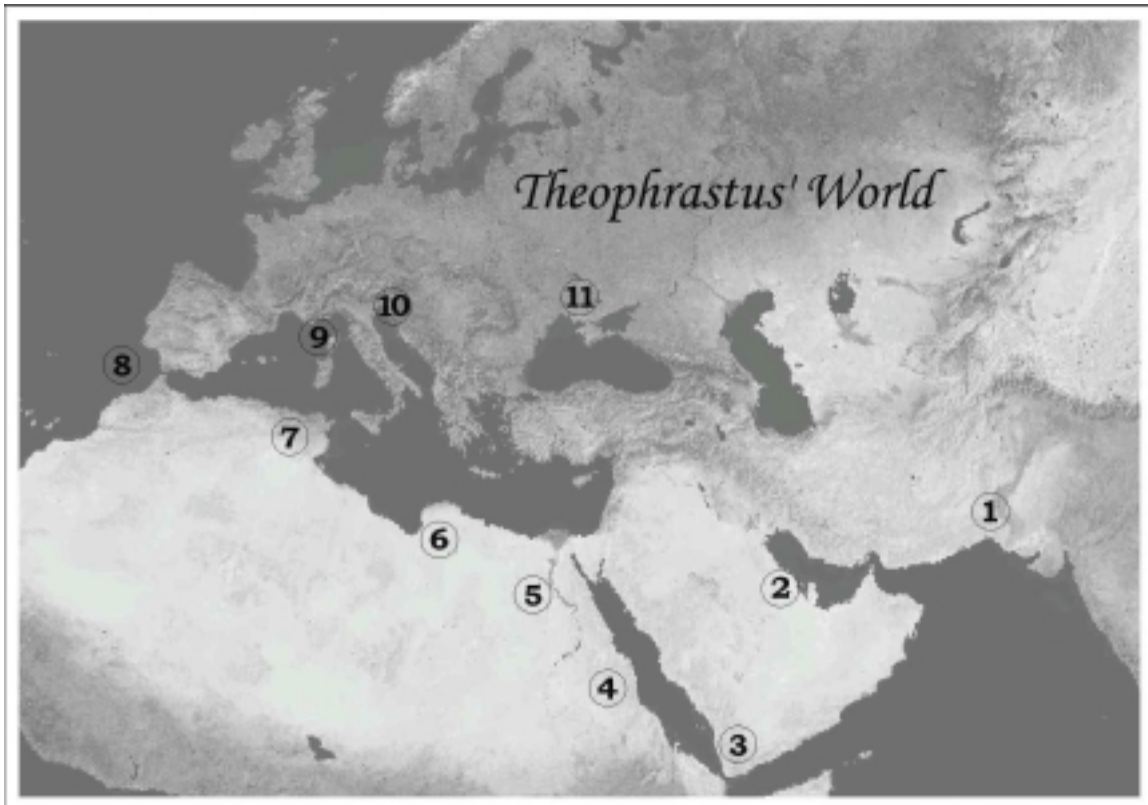


Figure 3. Theophrastus' World. The numbered circles correspond to specific passages on 'exotic' plants, recounted and briefly commented in the text.

3. Arabian Peninsula, land of Saba (now Yemen)

Thus frankincense, myrrh, cassia and cinnamon as well grow in the Arabian Peninsula, about Saba, Hadramyta, Kitibaina and Mamali. (HP 9.4.2.)

On exotic fragrant plants; the majority of those come from places in the south and in the east.

4. Ethiopia

There is another 'genus' [of palm] which is said to be abundant in Ethiopia, called 'coicas' [or cycas]; these are shrubby, not having a single stem but several ... Its fruit is rounder, larger and pleasanter to the taste [than the date] ... (HP 2.6.10.)

On palms; Theophrastus devoted the whole chapter *HP 2.6.* to palms, describing and comparing their different kinds; the 'Ethiopian' palm described above is the doum palm, *Hyphaene thebaica*.

5. Elephantine Island of Nile River, Upper Egypt (Aswan area)

Thus in the district of Elephantine neither vines nor figs are said to shed their leaves. (HP 1.3.5.)

On the extensive growing period under favourable conditions.

6. Cyrene (today Tripoli), Libya

Again, in some places they say that after rain a more singular abundance of vegetation has been known to spring up; for instance, at Cyrene, after a heavy pitchy shower had fallen: for it was under these circumstances that there sprang up the wood which is near the town, though till then it did not exist. They say also that silphium has been known to appear from some such cause, where there was none before. Such are the ways in which these kinds of generation come about. (HP 3.1.6.)

- On plant generation modes; in this passage dispersal of seeds with rainwater is implied (perhaps coupled as well with a showing up of the soil seed bank); ‘silphium’ is *Ferula tingitana* (Hort 1926) or *F. assa-foetida* (Amigues 1993).
7. Libya, Lotus-eaters’ Island, today Djerba Island (Tunisia)
In Libya the ‘lotos’ is most abundant and fairest ... The whole tree is peculiar, as tall as a pear-tree ... the fruit is as large as a broad bean and when ripening it changes its colour like the grapes. When eaten, the one growing among the people called ‘Lotos-eaters’, is sweet, pleasant and harmless and even good for the stomach ... (HP 4.3.1.)
 On desert plants; lotus is *Zizyphus lotus* (Hort 1926).
8. Outer Sea (Atlantic and Indian Ocean) and Pillars of Hercules (Strait of Gibraltar)
Again in the ocean, about the pillars of Hercules, there is a [seaweed] kind of marvellous size, they say, which is larger, about a palmsbreadth. This is carried into the inner sea along with the current from the outer sea, and they call it ‘sea-leek’; and in this [outer] sea in some parts it grows higher than a man’s waist. (HP 4.6.4.)
 On aquatic plants. According to Amigues (1989) this ‘sea-leek’ is *Saccorhiza bulbosa* and not *Laminaria saccharina* (Hort 1926).
9. Cyrnos Island, today Corsica
But largest of all, they say, are the trees of Cyrnos; for whereas silver-fir and pine grow in Latium to a very great size, and are taller and better than the silver-firs and pines of South Italy, these are said to be nothing to the trees of Cyrnos. (HP 5.8.1.)
 On the localities where the best timber grows.
10. Adriatic Sea
But of the aromatic plants none grows in these lands, except the iris in Illyria and on the shores of the Adriatic; for here it is excellent and far superior to that which grows elsewhere; but in hot places and those which face the south the fragrant plants grow ... (HP 4.5.2.)
 On aromatic plants.
11. Scythia and Lake Maeotis (today southern Ukraine and Sea of Azov)
‘Scythian root’ is also sweet; some indeed call it simply ‘sweet-root’. It is found about Lake Maeotis; it is useful against asthma or a dry cough and in general for troubles in the chest; also, administered in honey, for wounds; also it has the property of quenching thirst, if one holds it in the mouth; wherefore they say that the Scythians, with the help of this and mares’ milk cheese can go eleven or twelve days without drinking. (HP 9.13.2.)
 On roots possessing remarkable taste or smell; according to Hort (1926) the ‘Scythian root’ is liquorice *Glycyrrhiza glabra* while according to Gennadios (1914) it may be *G. glabra* and/or *G. echinacea*.

Geographic epithets of specific plants

In Theophrastus’ works, numerous plants are given a geographic epithet denoting the origin of the particular taxon usually in comparison with other, more or less similar but discreet taxa (‘genera’ according to Theophrastus). In several cases of cultivated plants, the geographical epithet denotes the provenance of a landrace or a cultivar.

In the following section, a rather extensive (but not exhaustive) number of plants with geographical epithets are mentioned and briefly commented.

1. Three types of nut-tree are described by Theophrastus: the Persian nut-tree, walnut, (*Juglans regia*) [HP 3.6.2.], the Euboean nut-tree, sweet chestnut (*Castanea sativa*) [HP 4.5.4.] and the Heracleotic nut-tree, hazelnut (*Corylus avellana*) [HP 3.15.1.-2.].
2. Besides the common fig (*Ficus carica*) other types of fig-tree include the Egyptian fig, carob tree (*Ceratonia siliqua*) [HP 1.11.2.], the Indian fig, banyan (*Ficus bengalensis*) [HP 1.7.3.] and the Cyprian fig, a variety of sycamore (*Ficus sycomorus*, according to Hort, 1926) or *F. pseudosycomorus* (according to Amigues, 1989) [HP 4.2.3.].
3. In regard to various juniper species, called ‘cedars’ even today: the Phoenician ‘cedar’ is *Juniperus excelsa* and the Lycian ‘cedar’ is *J. oxycedrus* [HP 3.12.3.] (according to Amigues, 1989) while the Syrian cedar (which grows abundantly in Syria and Cilicia, HP 3.2.6.) is a true cedar, *Cedrus libani* (Amigues, 1989 and not *J. excelsa*, according to Hort, 1926).
4. The Egyptian sycamore (*Ficus sycomorus*, HP 1.1.7.) is a different ‘genus’ to Theophrastus from the also called (in Greek) ‘sycamore’ i.e. the mulberry (*Morus nigra*).
5. The Persian (or Medic) ‘apple-tree’ is citron (*Citrus medica*) [HP 4.4.2.].
6. The Phrygian ‘amarakos’ is marjoram (*Origanum majorana*) [HP 1.9.4.].
7. The Scythian root mentioned previously is liquorice.
8. The Idaeon pine is black pine; *Pine is not divided into male and female as is the rule with other plants, but according to the people of Ida into the Idaeon pine and the maritime pine. (HP 3.9.1.)*. Unfortunately, Arnold, the authority of *Pinus nigra*, was obviously unaware of Theophrastus’ works; otherwise he might have named this species *Pinus idaea* (Thanos 2002).
9. The laurel of Alexandria is *Ruscus hypoglossum*, (butcher's broom or Caesar's laurel) [HP 3.17.4.], correctly identified by Amigues, 1989 (*Ruscus hypophyllum* according to Hort, 1926). The vernacular name ‘laurel of Alexandria’ is a very ancient one and, surprisingly, still in use today. According to Amigues (1989), based on Strabo, Alexandria is a region (or a village) in the slopes of Mt Ida, near Antandros and its name is a tribute to Paris, also called Alexander (Thanos 2002).
10. Various landraces of wheat (*Triticum* spp.) (‘genera’ from different countries) are: Libyan, Pontic, Thracian, Assyrian, Egyptian, Sicilian, Alexandrian, Boeotian and Akragantine [HP 8.4.3.-6.].
11. Different ‘genera’ of radish, *Raphanus sativus* are: Corinthian, Cleonaeon, Leiothasian (or Thracian) and Boeotian [HP 7.4.2.].
12. Different ‘genera’ of cucumber (*Cucumis sativus*) include: Laconian and Boeotian [HP 7.4.6.].
13. Different ‘genera’ of onion (*Allium cepa*) are: Sardian, Cnidian, Samothracian, Ascalonian and Cretan [HP 7.4.7.-9.].
14. Besides the Indian reed mentioned previously, a reed diverging from the typical kind (*Arundo donax*) is the Laconian reed [HP 4.11.12.].
15. The Egyptian bean (HP 4.8.7.) is *Nelumbo nucifera* (Amigues 1989) or *N. speciosum* (Hort 1926) and is a totally different plant from broad beans (*Vicia faba*) bearing the same Greek name ‘bean’ (κúαμος); only its seeds bear some resemblance to broad beans.
16. Diverging from their respective, typical kind are the Sicilian beet (*Beta maritima*, HP 7.4.4.) and the Laconian lettuce (*Lactuca sativa*, HP 7.4.5.).

Theophrastus' objectivity

Despite the numerous geographical references he has amply used throughout his works, Theophrastus does not make a single mention of Eressus, his hometown. He also refrains from citing Assos, Pella and Mieza while he is very chary in referring to Lesbos in general (4 relevant passages, see below), Stagira (twice; *HP* 3.11.1.; *HP* 4.16.3.), Athens and Attica (10 for Athens, Table 1, plus another 16 for the rest of Attica, i.e. a total of 26 for a place where he lived for almost half a century). A single, indirect citation is made to the Lyceum (when discussing root growth): *For instance the plane-tree by the watercourse in the Lyceum when it was still young sent out its roots a distance of thirty-three cubits, having both room and nourishment.* (*HP* 1.7.1.; a distance of almost 15 meters, Amigues 1988).

The direct citations to Lesbos are given below (Theophrastus' passages) and briefly commented.

1. On pine regeneration; of course Theophrastus is well aware that all pines and generally the conifers can regenerate only through seed and not vegetatively (*HP* 2.2.2.) However, he cautiously refers to this exceptional 'resprouting' (*according to some*) which might be due to a prolific, postfire density and growth rate of pine seedlings; thus, within a few years, the burnt mountain close to Pyrrha could appear fully covered by vegetation, green and growing.

... the 'mountain pine' (πέυκη), if it is burnt down to the roots, does not resprout, while the 'common pine' (πίτυς), according to some, will do so, as for instance in Lesbos, when the pine forest on the Pyrrha mountain was burnt. (*HP* 3.9.5.)

2. On modification of the properties of selected plants when offspring is grown by seed; the particular oak species is *Quercus ithaburensis* subsp. *macrolepis*. *The oak also deteriorates from seed; at least many persons having raised trees from acorns of the oak at Pyrrha could not produce one like the parent tree.* (*HP* 2.2.6.)

3. On 'good-named', a euphemism for the poisonous shrub *Rhododendron luteum*, 'rediscovered' and properly identified in Lesbos, for the first time, by Papaioannou (1949).

The tree called 'εὐώνυμον' grows, among other places, in Lesbos, on the mountain Ordymnos. It is as large as the pomegranate and ... This tree, if eaten by sheep, is fatal to them, both the leaf and the fruit, and it is especially fatal to goats ... (*HP* 3.18.13)

4. The final relevant passage is found in *CP* 2.6.4. and refers to the nutritive quality of natural water; an example of 'quite unnutritious' water is furnished by the water of the city of Pyrrha.

Already at Theophrastus' time, it was regarded as improper scientific style to include details or incidents that could be considered personal! On the same grounds it was good form not to mention a contemporary by name. Despite the fact that throughout the *HP* and *CP*, Theophrastus cites by name several of his predecessors and other informants, Aristotle, the most prominent of course of all his sources and a major pillar of influence is never mentioned by name though often discussed and sometimes corrected (Einarson 1976). Similarly, Phantias of Eressus, a contemporary and townsman, referred by Diogenes Laertius as a peripatetic (v. 37), who also wrote on plants and corresponded with Theophrastus, is not mentioned by him.

EPILOGUE

To quote Richter (1965) ‘Though not an original thinker like Plato or Aristotle (or perhaps because of that – my note), Theophrastus had a critical and sceptical mind, which enabled him to apply, develop and enlarge the new scientific foundation for philosophy that Aristotle had laid’. However and by all means, Theophrastus was an outstanding scientist (Morton 1981, Amigues 1988). In relation to his teaching activities, in a fragment of a letter to his peer and fellow Eressian Phantias, Theophrastus is quoted by Diogenes Laertius (v. 37): *For it is not easy to lecture in front of a small circle, let alone a crowd of the sort one wishes; and reading leads to rewriting; one’s age no longer allows postponing everything and not caring about.* His works were indeed textbooks for his lectures (Einarson 1976) and seem as they were under continuous updating. Moreover, his critical attitude is evident throughout his botanical writings: a particularly Theophrastean characteristic is that many of his discourses end with the word ‘σκεπτέον’ or ‘επισκεπτέον’, meaning that the matter needs further investigation (considered as the typical scientific attitude nowadays). It is this sceptical, ever-questioning and ever-doubting approach that Rahl (deliberately or unconsciously) captured in the expression of Theophrastus’ face on the magnificent mural of the University of Athens (Figure 4).



Figure 4. Detail of the mural on the frieze of the interior forefront in the Main Building of the National and Kapodistrian University of Athens. The mural is a composition representing the renaissance of Sciences and Arts under King Othon (Otto), the first king of modern Greece; thanks to the full sponsorship of Nikolaus Dumba the painting was accomplished in 1888, on the basis of the drawings made by the Austrian painter Karl Heinrich Rahl (1812-1865). One of the themes of this majestic painting illustrates Aristotle about to launch a swan anatomy demonstration in front of his sceptical colleagues and students, Theophrastus and Strato. Not shown (to the left) Alexander the Great and Demetrius of Phaleron complement the Aristotle-Theophrastus group (representing the science of Biology).

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