

BEANS, BOATS AND ARCHAEOBOTANY. A NEW TRANSLATION OF *PHASOLUS*
OR WHY THE ROMANS ATE NEITHER KIDNEY BEANS NOR COWPEAS

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ABSTRACT: Among classicists, archaeobotanists and agricultural historians, the meaning of the word *phasolus* (*φασήλιος* in Greek) is ambiguous. While Latin scholars have agreed that the word refers to a type of pulse or bean, there are various interpretations and subsequent identifications as to which botanical species is meant. The current paper aims to address this ambiguity by assessing the validity of the proposed interpretations. This will be done on three levels. First, the *a priori* feasibility of the interpretations will be ascertained. Second, all classical mentions of *phasolus*, both in Greek and Latin, will be reviewed and analysed. The aim of this step is to find what biological traits and characteristics were associated with *phasolus*, which may aid in confirming or rebuking an identification. Thirdly, we will assess the archaeobotanical evidence pertaining to the proposed interpretations for the Roman period. This paper includes the assessment of several classical sources previously absent from the debate as well as a new botanical identification of a key archaeobotanical sample previously used to prove the presence of cowpea (*Vigna unguiculata*) in the Mediterranean during Antiquity.

KEYWORDS: Roman agriculture, Greek agriculture, *phasolus*, *dolichos*, bean, cowpea, kidney bean, Archaeobotany, Classics, Agricultural history, Taxonomy.

1. INTRODUCTION

That plant names are among the most difficult words to translate from one language into another is perhaps best illustrated by the existence of a standardized taxonomic nomenclature of scientific plant names. The system of binominal nomenclature in taxonomy was first applied by Linnaeus in 1735 with the publication of *Systema Naturae*.¹ It enabled 18th century biologists to go beyond the confusion of unsystematic common names expressed differently in various, at that time European, languages and dialects, and to arrive at a situation in which an academically communicated name is linked to an archetypical specimen. With this system, it should be crystal clear to every reader which species was being referred to by an author.

Though botany was practiced in Antiquity, the best example being Theophrastus' *Enquiry into plants*, there was no overarching standardized system of plant names. While Ancient plant names must have held a more or less specific meaning to ancient language users, and reference a *de facto* species, it is not always unproblematic for us to grasp that meaning. This article sets out to reassess the meaning of one of these more problematic plant names: *phasolus*. *Phasolus*, with myriad of alternative spellings including *phaseolus*, *faselus*, *phaseus* or *fasiolis* originated in Greek (*φάσηλιος*) and was later also used

in Latin. In *scholarly* literature, *phasolus* is often associated with a crop named *dolichos* (*δολίχος*) which means long.⁴ While there is a consensus that the name refers to a pulse or legume of sorts, which places it the Fabaceae family, there are several different interpretations as to which species is meant, but the number of options is limited: for most names we know which plant belongs to it. Therefore, the list of potential identifications grows short. Common translations of *phasolus* into English include, among others, 'kidney' or 'French' bean (*Phaseolus vulgaris*), 'cowpea' or 'black-eyed bean' (*Vigna unguiculata*) and the more general term, 'calavance'. We should note that the interpretation of an Ancient plant name and the translation into a modern English common name is not necessarily the same as identifying the botanical species referred to in a classical text. Of course, reaching the latter level should be the aim of the translator in order to facilitate the study of classical texts best; this can be done in a commentary while a fitting, unambiguous, common name could be used in the translation.

The difficulties in understanding which species is meant in a classical text are many. First, the lack of drawings and limited morphological descriptions may pose an impediment for the reliable identification of a species, subspecies or a variety. Plants on frescos and mosaics, such as the examples that were found at Pompeii and other places throughout the Empire, tend not to be

accompanied by a written name. Either they were meant to be obvious, for instance in the case of fruits for the table and Egyptianising lotuses, or meant to be unrecognizable elements of background landscapes – what irreverently could be described as ‘scenic shrubbery’. Similarly, literary references, with some exceptions, tend to lack depictions and detailed morphological descriptions. Many scholars have addressed this and have attempted to (re)interpret both Greek and Roman plant names, though for some names, including *phasolus*, the identification is still debated or unclear.²

A lack of understanding of modern taxonomy complicates matters further once an interpretation or translation to a modern common name is reached. Modern scientific plant names are continuously revised due to new insights. For instance, species can be moved from one genus to another if it is shown that there is a stronger relationship to that genus, while new taxa may be recognized or old ones eliminated. In recent times, genetic research has played a role in this process as well. Taxonomic names that are eliminated can later be reused to name another species. Therefore, for most botanical species there are various invalid names, (sometimes multiple) synonyms, conserved names, as well as names of which the status is still unresolved. For biologists, this is not so much of a problem as these matters are at the core of their discipline. Moreover, there are bodies that oversee the approval of names and maintain old and new names in sourcebooks and (online) databases.³ In order to further avoid misunderstandings, the name of the author of a botanical name becomes part of the botanical name. ‘L.’ for instance is added to a name designated by Linnaeus, while ‘Walp.’ refers to a name designated by W.G. Walpers. Most classicists, historians, archaeologists, lexicographers and even some archaeobotanists however, are not familiar with the ‘historiography’ of plant-names, let alone the resources available to avoid mistakes. Therefore, it is possible that a non-biologist links an ancient plant name to a different botanical name than the common name he has in mind. Invalid names are not only present in ‘older’, but even relatively recent, literature, including archaeobotanical reports.

The fact that early Western botanists like Linnaeus drew heavily on Greek and Latin when they created their plant names is an additional complication in this context: there is not necessarily a direct relationship between a scientific Latin name and a classical Latin name; which may be confusing to non-biologists. Parts of some scientific names have moreover become part of ‘normal language’, for instance, variations on *phasolus* referring to (different) beans in various languages (see below); non-biologists might be tempted to include such word use in their considerations.

In this article, it will be our objective to ascertain which identification of *phasolus* is best supported by textual and archaeobotanical evidence. Our starting point will be the three most common interpretations of *phasolus* in

scholarly literature: ‘kidney bean’, ‘cowpea’ and ‘calavance’. First, we will briefly assess their *a priori* feasibility: which botanical species are meant by these names and is it possible that the Greeks and Romans had access to these species? The second step in our assessment will consist out of a review of all classical Greek and Latin occurrences of *phasolus*. The aim of this review is to analyse descriptions of characteristics and traits attributed to *phasolus* in classical texts. These primarily pertain to growing conditions, processing practices and culinary preparations. Such descriptions can aid us through determining which botanical species share in these characteristics and are potential candidates for identification. The last step of this article will be to critically assess an archaeobotanical sample that has been identified botanically and afterwards interpreted as *phasolus*.

2. INTERPRETATIONS OF *PHASOLUS*

On the first, and oldest, interpretation of *phasolus*, ‘kidney bean’, we can be very brief. The common name ‘kidney bean’ is in English linked to the scientific name *Phaseolus vulgaris* L., which is a Mesoamerican species. Therefore, we may reasonably assume that it was unknown to the Greeks and Romans and can exclude this species as a candidate. Though this fact has long been known,⁵ the translation persists among some historians and classicists.⁶ The scientific name of the kidney bean, given by Linnaeus himself, *Phaseolus vulgaris*, is likely to be the culprit causing the confusion. A similar type of confusion may well be expected in future historical assessments or references of several pulses, for instance from the Indian subcontinent and the Far East, as various species have been moved from the genus *Phaseolus* to the genus *Vigna*.⁷

The translation ‘calavance’, sometimes spelled ‘garavance’, poses a linguistic challenge in itself. The name entered English allegedly in the 17th century via the Spanish word *garbanzo* and originally came to mean Chickpea (*Cicer arietinum*).⁸ However, as in Latin *cicer* refers to chickpea we may conclude this interpretation is unlikely for *phasolus*. Later ‘calavance’ also came to refer to the hyacinth bean or lablab (*Lablab purpureus*). This species was originally placed in the *Dolichos* genus by Linnaeus as *Dolichos pupureus* L. (or synonymously *Dolichos lablab*), but currently is in a monotypic, genus. In some English, French, Italian and Portuguese common names, references to *dolichos*, that inadvertently may invite association, remain (e.g. ‘*dolichos* bean’ in English). The species was originally domesticated in East Africa, and many of its common names reference this origin: ‘Egyptian kidney bean’ (English), *dolique d’Egypte* or *dolique du Soudan* (French), *Ägyptische Fasel* (German), *fagiolo egiziano / dolico egiziano* (Italian), *dólico do Egipto* (Portuguese).⁹ From East Africa, the species reached the Indian subcontinent by the 4th

millennium BC.¹⁰ Some consider the modern Indian cultivar a subspecies (*Lablab purpureus* subsp. *bengalensis* (Jacq.) Verdc.), while others consider them to be landraces of the same species.¹¹ Whether a subspecies or landrace, the Indian type is often referred to as ‘Horse gram’ or ‘Bengalese hyacinth bean’, adding to the confusion of common names. It is not impossible that specimens of lablab reached the Ancient Mediterranean; since the species mainly thrives in the tropics, widespread cultivation seems less likely. This conclusion seems to be supported by the lack of any archaeobotanical finds of lablab in the Mediterranean (most archaeological finds of lablab pertain to India and Nepal).¹² In a third meaning, that also has become common, ‘calavance’ is a general name for any type of bean – we will return to this interpretation later.

A case has also been made for the interpretation ‘cowpea’ (*Vigna unguiculata*, or *Vigna sinensis* or *Dolichos sinensis* synonymously). This interpretative translation of Latin *phasolus* into English can be traced back at least to 1921, when W.T. Thiselton-Dyer made it in his contribution to the *Companion to Latin Studies*. The Greek translation of *phasolus* as ‘cowpea’ even appeared in the 19th century editions of Liddell *et al.* *A Greek English Lexicon*. This explains the use of this translation in various dictionaries and much classicist scholarship since, either via direct or indirect citation. However, Thiselton-Dyer’s argument is not overly strong. The “recent research that without doubt” proves *phasolus* is cowpea, is not cited by Thiselton-Dyer. He only mentions that the cowpea is the *fagiulo dall’occhio* of the medieval and modern Italians. This Italian common name refers to the black, eye-shaped, coloration around the hilum of the seed. After that, Thiselton-Dyer states that Columella’s use of the adjective ‘long’ (*phasolus longa*) equates the *phasolus* with *dolichos*. Confusingly, Thiselton-Dyer translates *phasolus* as ‘calavance’ but then identifies it botanically as cowpea, which seems to be contradictory. He does mention a Col. Sir James Murray who suggested that ‘calavance’ was derived from Greek *ἐρέβινθος* (*erébinthos*), which at one point meant ‘chickpea’ but then changed its meaning.¹³ While this latter statement may or may not hold merit, it does not explain why *phasolus* should be seen as ‘calavance’ or why either should

be interpreted as ‘cowpea’. Also in the Loeb series translations of Columella’s *De Re Rustica* (with H.B. Ash and E.S. Forster & E.H. Heffner as editors of the respective volumes, see below) ‘calavance’ and ‘cowpea’ are used interchangeably as translations of *phasolus*. Regardless of this less than sturdy argument, cowpea, though of West-African origin, could in theory have been spread to the Mediterranean in Antiquity. It was spread to India early (2300 BC) where it was formerly believed to have originated.¹⁴ Hence, the species could have been introduced into the Mediterranean either via the South (for instance via Egypt) or via the East. It should be noted there are various subspecies of cowpea, including *Vigna unguiculata* subsp. *cylindrical* (L.) Verdc. and *Vigna unguiculata* subsp. *sesquipedalis* (L.) Verdc. As we will further explore in the section on archaeobotanical evidence, there are alleged finds of *Vigna unguiculata* for the Roman period.

3. PHASOLUS IN GREEK LITERATURE

Being a crop and foodstuff, it is no surprise that most references to *phasolus* in classical texts pertain to the food and agricultural economy or to eating in a more general or cultural sense. There was also a Greek and later Roman city on the southern coast of Anatolia by the name of *Phaselis*, which is known from both Pliny and Lucan. Within this article, we will direct our attention to textual references of the crop and foodstuff *phasolus*. Most occurrences of *phasolus* written in Greek are rather late. Only Aristophanes and some early Ptolemaic papyri are Pre-Roman; new occurrences in Greek only continue from the 2nd century AD onwards.¹⁵

In Aristophanes’ *Peace* (excerpt below), from 421 BC, it reads that *phasolus* is boiled together with wheat (and served with fresh figs on the side). Mixtures of pulses and cereals, in which in both cases dried kernels or seeds are used, are known throughout Antiquity.¹⁶ In recent years, such mixes (re)gained much popularity in the Western world as health foods. However, it does not narrow our search as practically any cereal or pulse would be suitable for this mode of preparation.

ἀλλ’ ἄφενε τῶν φασήλων ὃ γίναται τρεῖς χοίνας,
τῶν τε πυρῶν μείζον αὐτοῖς, τῶν τε σίκων ἔξελε,
τόν τε Μανῆν ἢ Σύρα βωσπηρῆσάτω κ’ τοῦ χωρίου.

Ar. *Pax*. 1144.
(F. Hall & W. Geldart, Oxford, OUP. 1907)

Wife cook three measures of *phasolus*,
mix in with them some wheat, bring out some figs and
Syrian! Call Manes away from the fields.

(D.A. Wilkins)

Atheneaus, in the late 2nd and early 3rd century AD, also makes reference to *phasolus* in *Deipnosophists* (a treatise on banqueting, see excerpt below), but two different modes of preparation are suggested here: (presumably) boiling and baking or roasting. In Polemo's section, a Spartan dessert is described where dried figs and apparently two types of pulses are consumed: a not further defined type of bean and *phasoli*. These are either 'fresh', 'pale green', 'bleached' or 'pallid' depending on which meaning of the adjective *χλωρός* is chosen.

'Fresh' could have several meanings here. After the harvest of pulses, the seeds and pods (which strictly speaking are *fruits* in botany) were often separated. The emptied pods would then be discarded or potentially used as fodder while the seeds were either boiled and eaten (as is often still done with the faba bean, *Vicia faba*) or dried and stored under dry circumstances like cereals – these would be 'dried beans'. Alternatively, pulses could be harvested before the seeds were fully ripened. They could then be separated from the pod and be boiled or eaten raw (like for instance edamame – the unripe seed of the soya bean (*Glycine max*) – is today). They could also be consumed in their entirety, either boiled as today is often the case with string beans (a variety of *Phaseolus vulgaris*), or as a raw snack (as is still the case with faba bean (*Vicia faba*) and chickpea (*Cicer arietinum*)) or as a salad.¹⁷ It is important to note that many beans can thus be

very versatile and consumed either as a grain-crop, or as a vegetable. In its fresh state, the shelf-life of the beans would be much shorter than that of dried beans, unless they would have been pickled. Some form of preparation is likely to have occurred when beans were consumed in sizeable quantities. Even non-toxic pulses contain oligosaccharides such as raffinose and stachyose. As the molecules of these substances are too large to be properly digested by humans they cause the well-known digestive discomforts associated with pulse consumption such as flatulence. The soaking and boiling of beans greatly helps to break down these compounds. On the other hand, as a second harvest moment is introduced to the same crop, the practice of eating both the unripe pod and seed and the ripe seed can have a risk-reducing effect. Either way, eating these 'fresh beans' would be somewhat of a seasonal pleasure which might explain their use in a dessert with (sweet) dried figs. Alternatively, if 'pallid' (especially as in 'bland' or 'dull') is chosen as meaning, Polemo might have wanted to emphasize the austere ways of the Spartans. However, the fact that Epicharmus associates the *phasolus* with Dionysus and that Demetrius mentions it alongside the fig would tentatively go against the latter interpretation. Demetrius' comment is unfortunately out of context and it is unclear what sort of similarity is meant exactly.

ΦΑΣΗΛΟΙ.

Λακεδαιμόνιοι ἐν τοῖς δεῖπνοις τοῖς
καλουμένοις κοπίσι διδόασι τραγήματα σῦκά τε
ξηρὰ καὶ κνάμους καὶ φασήλους χλωρούς· ἴστορεῖ
Πολέμων.

Ἐπίχαρμος: ...
φασήλους φῶγε θᾶσσον, αἶ χ' ὁ Διόνυσος φιλεῖ.

Δημήτριος:
ἢ σῦκον ἢ φάσηλον ἢ τοιοῦτό τι.

Ath. 2.46

(C. Gulick. London. Heinemann. 1927)

Concerning Phasoloi

The Spartans, in those dinners that they call Kopsi, give for dessert dried figs, and beans and pale green phaseli: such is the tale of Polemo

[and] *Epicharmus* [says]
Bake some phaseli quickly, since Dionysos loves them.

[and] *Demetrius* [says]
A fig, or a phaselus or something like that.

(D.A. Wilkins)

Lastly, *χλωρός* may also refer to a description of the actual colour of the bean. This would make the *phasolus* (at whatever stage or preparation that is implicitly meant) 'yellow-greenish' or 'pale', which however does not help us pinpointing a specific species. Epicharmus refers to a preparation method of roasting or baking the *phasolus*. 'Fresh' beans in the pod can be oven-baked (e.g. as with modern string beans), but so can the seeds. An example is the *molleboon*, a traditional delicacy from the Dutch city

of Groningen. In this case, the seed of a faba bean (*Vicia faba*) has been baked in a bread-oven or pan-roasted. Various roasted pulses, including Chickpea (*Cicer arietinum*), are presently sold as 'healthy snacks' in many places. Therefore, Julius Pollux's comments brings us no closer to an identification.

Another Greek reference to *phasolus* originates from the *Corpus Hippiarticorum Grecorum* (130; 134), a late

antique (5th/6th century AD) treatise on equine medicine, which unfortunately is non-descriptive.

Phasolus is also mentioned in various of the Ptolemaic and Roman papyri from Egypt. Schnebel, in a papyrological chapter on the cultivation of legumes in Greco-Roman Egypt, informs us that the cultivation of *phasolus* occurs in 2nd century BC tax papyri from Tebtunis and Theadelphia in the Fayum and 4th century AD tax-papyri from Hermonthis (near Thebes). On 3rd century AD invoices found at Theadelphia and Oxyrhynchites amounts of *phasoli* are also mentioned.¹⁸ Being invoices and tax-lists, neither of these mentions is particularly descriptive, but for one aspect: the amount of beans is expressed in *artabas*, which is a dry volume measurement.¹⁹ This would suggest that in the papyri, we are dealing with the dry seed. Archaeobotanist Marijke van der Veen mentions that Schnebel interprets *phasolus* as ‘cowpea’.²⁰ In his text, Schnebel writes: “*Auch die Phaseolosart unserer Bohne ist uns im hellenistischen Ägypten bezeugt*”, which we believe points more in the direction of the interpretation ‘kidney bean’.²¹ In the

standard English translations of the papyri, *phasolus* is only translated as ‘kidney bean’.²²

In Julius Pollux’s 2nd century AD *Onomasticon* (1.247), we find another mention of *phasolus*. Here *φασίολοι* appears in a list of “garden plants” that are “called after the brassica”, but without any further description. In the same list several other beans are named, which would suggest that for Pollux, *phasolus* referred to a specific and individual species. Other pulses in this list include, lentil (*Lens culinaris*), ‘pale bean’, *dolichos*, chickling (*Lathyrus sativus*), chickpea (*Cicer arietinum* - if *ερέβινθοσις* translated thus), *arakos*, which we here interpret neutrally as ‘wild chickling’ (some, like Hort, translator of Theophrastus (below) have argued *Vicia sibthorpii* Boiss., while others like Powell, translator of Galen (below) suggest *Lathyrus annuus*; see discussion below) and can thus be excluded in this context. Which species is meant by “pale bean” is unclear, though it is unlikely that what in English are called ‘white beans’ are meant, as these are a variety of *Phaseolus vulgaris*.

ΛΑΧΑΝΩΝ ΟΝΟΜΑΤΑ:

κράμβης ἐκκαυλούμενος, γογγυλῖς, κολοκύνθη, πυροὶ, κριθαὶ, ὄσπρια, κατέρικτα, φασίολοι, φακὴ, κύαμοι,

ὠχροὶ, δόλιχοι, λάθνηροι, κνίκος, ερέβινθος, ρούστραχοι, ἀράκη, κύμινον.

Julius Pollux, *Onomasticon* 1.247
(W. Dindorfi. 1824)

THE NAMES OF GARDEN HERBS:

Wild or cultivated, called after the brassica are the turnip, pumpkin, wheat, barley, pulses, katericta,

phasolus, lentils, pale beans, *dolichos*, *lathuros*, chickpeas, safflower, *arakos* [wild chickling], cumin.

(D.A. Wilkins & F.B.J. Heinrich)

The mention of *dolichos* is curious as *dolichos* has been believed to be somewhat synonymous to *phasolus* by several scholars.²³ Theophrastus, often called the “Father of Botany” mentions *dolichos* twice in his *Historia Plantarum* (see below), but *phasolus* does not appear

in his work. Therefore, we will take a brief *excurs* to ascertain whether the assertion that *phasolus* and *dolichos* are the same is defensible and if it can aid us in identifying *phasolus*.

[...] ὁ δὲ
δόλιχον ἐάν παρακαταπήξῃ τις ξύλα μακρὰ
ἀναβαίνει καὶ γίνεται κάρπιμος, εἰ δὲ μήταυλος
καὶ ἐρυσιβωδης. [...]

Theophrastus, *Historia Plantarum* 8.3.2.
(A. Hort, London, Heinemann 1980)
Translation adapted as Hort translates *Phasolus* as calavance.

[...] while *dolichos*, if long stakes are set by it, climbs them and becomes fruitful, whereas otherwise the plant is unhealthy and liable to rust. [...]

[...] Ἐνια δέ βλαστά νει μὲν ἐν ταχέως δέ
σηπεται, καθ' ἅπερ ὁ κραιμὸς καὶ μάλλον
ὁ τεραμῶν ταχὺ δ' ἡ ἀράκη καὶ ὁ δόλιχος [...]

[...] Some germinate well, but soon rot, as
beans, and especially those that are
cookable'; so do tare [vetch] and dolichos. [...]

Theophrastus, *Historia Plantarum* 8.11.1.

(A. Hort, London, Heinemann 1980)

Translation adapted as Hort translates *dolichos* as calavance.

Dolichos is generally identified as *Vigna unguiculata* by most classicists.²⁴ It is then translated into English either by the general term 'calavance' as in Hort's translation, or more commonly, as '(yard) long bean'. This is somewhat imprecise, as what in English is called the 'yard long bean' (or synonymously 'bora', 'long-podded cowpea', 'pea bean', 'asparagus bean', 'snake bean' or 'Chinese long-bean' – or *kousenband* ('garter-slip') in Dutch) is actually one of the four subspecies of *Vigna unguiculata*: *Vigna unguiculata* subsp. *sesquipedalis*. Of this specific subspecies, the immature pods – that can reach a length of 35 – 75 centimetres (*sesquipedalis* meaning 'one-and-a-half-foot-long') are eaten (generally boiled or stir-fried). This mode of consumption is quite different from that of the *Vigna unguiculata* subsp. *cylindrica* (which is generally meant if cowpea or black-eyed pea is mentioned), where the dried seed is boiled and eaten. The name *dolichos* in itself, referring to 'long', could serve as an argument for an identification of *dolichos* as 'yard-long bean'. As noted in the previous section, some also see a parallel between *dolichos* and Columella's *phasolus longa*.

From Theophrastus we learn that the *dolichos*, like many Fabaceae, can climb and grow as a vine, and that the seed will germinate easily, but it is susceptible to rot. While the latter observations are too unspecific, cowpea (*Vigna unguiculata* subsp. *sesquipedalis*), just as several varieties of (New World) *Phaseolus vulgaris*, is cultivated by guiding it along sticks. Cowpea is able to do so as it is equipped with tendrils while the string bean twines. However, other species would meet part of the description too. The pods of the faba bean (*Vicia faba*) for instance, can reach a considerable length, some modern cultivars growing up to 25 centimetres, though wild specimens and older varieties tend not to exceed 10 centimetres.²⁵ While this length is not nearly as impressive as that of the yard-long bean it still is long in comparison to other Mediterranean pulse-pods such as lentil, chickpea and pea. This could warrant calling it 'long'. While many varieties of *Vicia faba* grow completely unsupported, some larger varieties, are provided with support, as one would a sunflower. It should be noted though, that *Vicia faba* does not climb by itself as it has no tendrils, nor does it naturally twine. Therefore, *dolichos* cannot be *Vicia faba*. Pea, (*Pisum sativum*) does climb as it has tendrils, yet it is not a particularly long-podded species and is therefore a less likely candidate. The lablab bean (*Lablab purpureus*) is both cultivated along sticks, has

tendrils and has long pods and could hence serve as a candidate as much as cowpea.

The suggestion of *dolichos* as *Vigna unguiculata*, as long as one would specify that is the *sesquipedalis* subspecies that is meant, is not without merit; though other interpretations share some or all of the traits. However, this in itself does not justify equating *dolichos* and *phasolus*, for Theophrastus does not mention *phasolus* and authors like Julius Pollux see fit to actively distinguish between the two. Traits and characteristics in the other Greek references above are too vague to either justify the equation of *phasolus* and *dolichos* or to properly identify *phasolus* for that matter.

4. PHASOLUS IN LATIN LITERATURE

The first occurrence in Latin of *phasolus* as a bean comes to us through Varro's *Rerum Rusticarum Libri Tres* from the first century BC (the word being absent in Cato the Elder's *De Agri Cultura*). The word *dolichos* was not taken up into Latin and only occurs in Latin literature as the name of a gladiator featuring in Horace's *Epodes* and as an Olympic sport in Pausanias.²⁶ In most Latin dictionaries, *phasolus* is either translated in an un-descriptive fashion as 'a type of bean' or 'calavance' or more specifically as *Vigna sinensis*, a synonym of *Vigna unguiculata*.²⁷ However, there is a second, metaphorical, meaning of the word: 'boat' or 'ship'.²⁸ This meaning occurs far more often than the meaning 'bean'.²⁹ It is supposed to refer to a light boat or skiff, and it has been suggested that the boat was named after the bean, because of a similarity in shape.³⁰ It is unclear whether this etymology is correct and what sort of resemblance is meant exactly. The resemblance could be that the ship type was long and slender like a bean, or small (and stout) like a beanseed.³¹ The similarity could also be in an individual part. For instance, the strongly pronounced hilum that is found on the seeds of certain beans, most notably the lablab bean (*Lablab purpureus*), could be imagined to resemble a ship's keel. The lower petals of flowers of the subfamily Papilionoidae (to which beans belong) are named 'keel petals' in modern botany. It is not inconceivable that the ancients made similar assertions about the similarity in shape. However, such explanations of the etymology must remain speculative. The 'boat' meaning of *phasolus* was not only predominant in Classical, but also in Medieval

Latin:³² only in Giovanni Pontano's (1429-1503) *Eglogae* are there two references of *phasolus* as bean.³³

The uptake in Latin of what was clearly a Greek loanword may be explained within the context of the increased incorporation of the Greek-speaking world in the Roman sphere of influence, and the simultaneous incorporation of Rome within the Hellenistic cultural sphere. *Phasolus* may have been a previously unknown species that was introduced to the Romans through their increased contact with the Eastern Mediterranean world. This may explain why Cato the Elder did not yet use the word, while Varro did use it about a century later. However, we may not *a priori* assume that this was the case. Instead of the diffusion of an actual crop, a Greek word may just have been added to Latin vocabulary as a replacement or

synonym of a Latin name previously used. If we choose this cultural interpretation, we could even explain the absence of *phasolus* in Cato's work as a result of his notorious opposition to any aspect of Hellenization of Roman culture; he may have just used another name. Hence, the fact that Cato does not use the word is not unequivocally helpful.

The use of *phasolus* in Varro is limited to a single reference, in which the species is mentioned in list of foods to be used in pigeon-breeding. Here *phasolus* is clearly a specific species. The description does not allow for any inference as to which species is meant, though it would appear that *phasolus* is used as a grain-crop in this case rather than as a vegetable. We can, however, exclude 'pea' (*Pisum sativum*) and '(bitter) vetch' (*Vicia ervillia*).

*Cibus apponitur circum parietes in canalibus,
quas extrinsecus per fistulas supplent.
Delectantur milio, tritico, hordeo, piso, fasiolis, ervo.*

*Food is furnished them in troughs running
Around the walls, which are filled from the
Outside through pipes. Their favourite foods
are millet, wheat, barley, peas, phasolus and
vetch.*

Varro, *Rerum Rusticarum* III.VII. 5-8.
(W.D. Hooper, Cambridge MA. Harvard University Press, 1934)
Translation adapted as Hooper translates *phasolus* as kidney-bean.

Virgil in *Georgica*, a lengthy poem on agriculture, also mentions *phasolus* once. In this instance, *phasolus* is presented as somewhat of an inferior or less profitable crop (depending on the level of poetic liberty) alongside the (presumably bitter) vetch (*Vicia ervillia*) and a variety of lentil from Pelusium (a city in Egypt). While references to Roman constellations such as Bootes are no longer valid due to the earth's axial precession, the planting

time can still be determined due to phrase "halfway into the winter". While *pruina* literally refers to 'hoarfrost' and metaphorically to 'snow', it is here used as a metonymy for 'winter'; though pulses can be grown as winter crops they are not particularly resistant to frost.³⁴ In Italy, this criterion would make *phasolus* an autumn or winter-sown crop.

*[...]si vero viciamque seres vilemque phaselum,
nec Pelusiaca curam aspernabere lentis,
haud obscura cadens mittet tibi signa Bootes:
incipie et ad medias sementem extende prunias.*

Virgil G. 1.227
(F. Hirtzel. Oxford University Press, 1942.)

*[...] If you will indeed sow the vetch
and the paltry phasolus, nor scorn care of the
Pelusiac lentil, Bootes will descent and send
you no uncertain sign: begin and extend your
sowing halfway into the winter.*

(D.A. Wilkins & F.B.J. Heinrich).

The sowing time of *phasolus* is a recurring theme in its textual mentions; as a criterion it could potentially provide an argument for identifying the species. In Columella's agricultural manual *De Re Rustica*, the sowing-time of *phasolus* appears twice. First in Book II, in a section on the sowing of legumes, it is suggested that *phasolus* should be sown after lupines (2.10.4). These, in a previous section (2.10.1-2.), are supposed to be sown

between "September after the equinox" (*i.e.* after around September 22nd) and "the Calends of October" (being October 1st). In Book XI, an agricultural work calendar for the estate bailiff, it is suggested *phasolus* should be sown in late October, apparently when common millet (*Panicum milliaceum*) and foxtail (or Italian) millet (*Setaria italica*) were to be harvested.

[...] *ab hoc recte phaselus terrae mandabitur vel in vetereto vel melius pingui et restibili agro, nec amplius quattuor modii iugerum obseretur. Similis quoque ratio est pisi, quod tamen facilem et solutam terram desiderat tepidumque locum et caelum frequentis umoris. Eadem mensura iugerum vel modio minus quam phaselum licet obserere primo tempore sementis ab aequinoctio autumnali.[...]*

Next after this it will be proper to commit to the earth the phasolus either in old fallow ground, or better in rich ground that is tilled every year; the sowing of one iugerum will require not more than four modii. The same may be said of the pea, which desires, however, an easy and loose soil, a warm situation, and a climate where it often rains. The same quantity may be sown to the iugerum as in the case of the phasolus, or one modius less, at the beginning of seed-time after the autumnal equinox.

Columella *De Re Rustica* 2.10.4.

(Text and translation adapted after H.B. Ash. London. Heinemann. 1940)

Millium et panicum hoc tempore demetitur, quo faseolus ad escam seritur Nam ad percipiendum semen ultima parte Octobris circa calendas Novembres Melius obruitur.

Common and Italian millet are reaped at this time when the phasolus is sown for food; for in order to obtain seed from it, it is better to cover it up in the ground at the end of October towards November 1st.

Columella, *De Re Rustica* 11.2.72.

(Text and translation adapted after E.S. Forster & E.H. Heffner, Cambridge MA, Harvard University Press, 1955)

It is unclear why Columella provides two different sowing times for *phasolus*, roughly a month apart, but both in autumn. Similar dates are mentioned in Palladius' *Opus agriculturae* (mid-4th to early 5th century AD). Palladius was the last of the Roman agronomists and is often accused of being greatly indebted to Columella's work. This is illustrated by his wording of the statement on *phasolus* being sown after the harvest of Italian millet and common millet, which he places at the end of September or in early October. He does specify that *phasolus* is *ad escam*. However, it is unclear if we should interpret this as 'for eating', or (human) 'food' or (animal) 'fodder' (or less likely: 'bait'), as either meaning is possible. That Columella and Palladius feel they have to specify

does suggest that *phasolus* for them was either one specific species with multiple applications, or a generic name for multiple taxa, by which the addition of *ad escam* was made more specific.

Palladius' Section 11.1. is very similar to Columella as well (*cf. De Re Rustica* 2.10.4), though he believes *phasolus* should be planted before October 15th rather than November 1st. More useful is that Palladius lets *phasolus* be sown alongside several species of wheat and barley (mentioned at length earlier in Section 11.1. and is not taken up into the excerpt below) and various other pulses and sesame. This places it within a standard Mediterranean pantheon of autumn sown crops that can be harvested in spring or early summer.

Nunc quibusdam locis panicum metetur et milium Tempore hoc faseolus ad escam seratur. Nunc in amitibus adparetur aucupium noctuae ceteraque instrumenta capturae, ut circa calendas exercentur octobres.

Now Italian millet and common millet will be harvested in some places. At this point phasolus should be sown for food. Now the poles for fowling are prepared along with other tools for catching animals, so that it can be conducted around the calends of October.

Palladius *Opus agriculturae* 10.12.

(J. Schmitt. Leipzig. Teubner. 1898)

(D.A. Wilkins)

Etiam nunc eruum, lupinum et pisum et sisamum seremus, ut dixi: sisamum usque ad idus octobres et faseolum, tamen terra pingui aut restibili agro. Quattuor modii iugerum conplebimus.

Palladius *Opus agriculturae* 11.1
(J. Schmitt. Leipzig. Teubner. 1898)

Now also we sow the vetch, lupine, pea and sesame, as I have said: the sesame and the phasolus until the ides of October; but in fertile or re-fertilized land. We will fill an iugerum with four modii.

(D.A. Wilkins)

Spurr, in his study on Roman arable agriculture, devotes a brief section to *phasolus* and the pea; in his identification of the species, Columella plays an important role. Spurr is keen to note that the modern French bean (*Phaseolus vulgaris*) is indeed a New World species. Without any further argumentation, he then concludes *phasolus* should be its ‘European near-equivalent’ the *fagiolo dall’occhio*, after which he expatiates on the sowing times.³⁵ While the cowpea is hardly ‘European’, the similarity between *Phaseolus vulgaris* and *Vigna unguiculata* is open for discussion. It is at least curious that a distinctive characteristic as the ‘black-eye’ is used in modern English and Italian, but is entirely absent from classical descriptions. However, there is a wide range of (taxonomically identical) cultivars of cowpea of different markings and colours many of which lack the black eye (cf. figures 3a and 3b); it is possible that if cowpea was grown in Italy in Antiquity different cultivars were used than at present. That the species is cultivated in modern Italy is however no evidence for its presence in Antiquity; it could have been introduced later, just as American species such as potatoes and maize that are also grown in present-day Italy.

Marijke van der Veen, in a botanical study on the Roman and Islamic port of Quseir al-Qadim, devotes a section to *Vigna unguiculata* in her chapter on summer crops. She states that Spurr’s identification of *Vigna unguiculata* as *phasolus* is incorrect as the criterion “autumn-sown” rules out that species.³⁶ Modern agronomic literature supports van der Veen’s statement. For instance, the FAO states that *Vigna unguiculata* is only grown as a summer crop.³⁷ In Australia, the New South Wales Department for Agriculture advises its cultivators that this crop is best grown under warm and humid conditions between 20 and 30 degrees Celsius.³⁸ The United States Department of Agriculture’s Sustainable Agriculture Research and Education Centre even argues that cowpea should not be sown before soil temperature is stable at 18 degrees Celsius as the seed may rot in cool and wet soils.³⁹ This makes sense as the *Vigna unguiculata* is a very drought resistant crop because it makes use of the C4 photosynthesis pathway. As opposed to plants that use C3 photosynthesis (this group includes the great majority of crop plants), C4 plants through the use of a different carbon-fixing enzyme can limit the amount of water they lose through photorespiration. This places them at an ecological advantage under dry conditions.

If we assume Columella was using the standard Julian calendar and was writing for an Italian audience, we can rule out *Vigna unguiculata* as *phasolus* in his work. Most (non-tropical) pulses, including lentil, pea, and faba bean can be adapted to be both spring- and winter sown, and it could be Columella had one of these in mind with *phasolus*.⁴⁰

Vigna unguiculata can be, and is indeed, cultivated in modern Italy as Spurr claims, but as a summer crop. It is generally intercropped with other C4 crops, such as Maize (*Zea mays*) and Sorghum (*Sorghum bicolor*). Besides generating a yield, it serves as a cover-crop that helps to control weed growth and retain soil moisture; as many Fabaceae it also increases soil fertility through the nitrate fixation by bacteria on its roots. Hence, it is not impossible that the Romans cultivated *Vigna unguiculata*, but then as a summer crop. In determining whether this was the case, we cannot rely on modern agronomic studies on cowpea cultivation or modern agricultural practice as Spurr did. Such studies, often in their introductions, state that the Greeks and Romans cultivated *Vigna unguiculata*, but cite either directly or indirectly sources in which *phasolus* has been translated as ‘cowpea’.⁴¹ This leads to a very interdisciplinary, yet ultimately very circular argument.

The other criteria in Columella 2.10.4 and 11.2.72 are too vague to be useful in an identification. That the *phasolus* can be sown on old fallows or on rich grounds that are tilled yearly, may be interpreted as Columella appreciating its soil-enriching qualities as Spurr argues,⁴² but that is a characteristic of many Fabaceae. The ‘antithesis’ with the pea, informs us that the *phasolus* clearly requires less rain and warmth, but at the same time is more drought resistant than the pea; this again does not lead us to a particular species. The same goes for the quantity of sowing seed (which at 4 *modii* per *iugerum* amounts to 139.68 litres per hectare) that should be applied.⁴³

Columella mentions *phasolus* another four times in *De Re Rustica*. Most enlightening perhaps is the account of pickling lettuce and *phasolus* together in section 12.9.1. From the description, it is clear that Columella is discussing whole (*integri*) either green or fresh (depending on which meaning of *virides* one chooses) *phasoli*. First, in a little literary play, *phasoli* are used as the distance the stalks of lettuce have to be apart during drying. From a practical point of view, no great distance between the

stalks would have been required for drying – hence little can be inferred from this comment. In the preservation technique described the *phasoli* are soaked for twenty-four hours in brine, after which they are dried like the lettuce. It stands to reason that this procedure is meant to not only clean the beans physically, but also to kill any insects (and insect eggs) or fungi present that could otherwise spoil the product. Then they are pickled alongside the lettuce (that has been seasoned with condiments) and submerged in a mixture of brine and vinegar. Both vinegar and the salt in brine have anti-microbial properties, while submersion creates an anaerobic environment, hence ensuring a long-lasting preservation. Similar techniques for preserving vegetables were in use in Western Europe and North America, though they have fallen out of favour over the past half-century due to the rise of refrigerators, freezers and store-bought rather than home-grown food. Various recipes for dill-pickled French beans

(*Phaseolus vulgaris*) can still be found in hobby cooking books and cooking blogs, though boiling the beans is generally an added step.⁴⁴

After an exhortation on the correct pickling procedure (omitted in the excerpt), it is mentioned that the pickling operation takes place in spring. For lettuce this is curious – various types can be grown even into autumn in Italy, making lettuce primarily unavailable in winter and early spring. One could argue summer or autumn would be a better time for preserving. For some producers spring may have held a comparative advantage perhaps – for instance because of the availability of water or less competition for available labour from other tasks. For *phasolus*, a harvest in spring may be both indicative of late autumn/winter sowing or early spring sowing, which would be congruent with Columella's earlier statements, and which again would argue against the identification *Vigna unguiculata*.

Conditura lactucae. Caulus lactucae ab imo depurgatos eatenus, qua tenera folia videbuntur, in alevio salire oportet, diemque unum et noctem sinere, dum muriam remittent: deinde muriam eluere, et expressos in cratibus pandere, dum assiccescant: tum substeneri anethum aridum et faeniculum rutaecque aliquid et porri concidere, atque ita miscere: tum siccatos coliculos ita componere, ut faseolivirides integri interponantur, quos ipsos ante dura muriadie et nocte macerari oportebit, similiterque assiccatos cum fasciculis lactucarum condi et superfundi ius quod sit aceti duarum partium atque unius muriae: deinde arido spissamento faeniculi sic comprimi, ut ius supernatet. [...]

Lettuce is preserved in the following manner: The stalks of the lettuce should be stripped off from the bottom upwards up to a point where the eaves appear to be tender, and salted in a basin and let stand a day and a night till they yield up the brine; then wash out the brine and after squeezing them spread them out on hurdles till they become dry; then strew underneath them dry dill and fennel and cut up a little rue and leek and mix it in; then when the stalks are dry, you should so arrange them that entire green phasoli may be placed between them, which themselves will have to be steeped for a day and a night in hard brine and, after being similarly dried must be pickled with the bunches of lettuce, and a liquid, consisting of two parts of vinegar and one of brine, must be poured over them; then they must be pressed down with a dried plug of fennel in such a manner that the liquid floats above them.

[...] Haec autem, quae supra scripta sunt, verno tempore componuntur.

All the above preparations are made during the spring.

Columella, *De Re Rustica* 12.9.1.

(Text and translation adapted from E.S. Forster & E.H. Heffner, Cambridge, MA. Harvard University Press, 1955)

The last two references to *phasolus* by Columella are occurrences in lists: one of useful legumes at 2.7.1., and a second, more prosaically written, of garden plants from Book 10. In the former list *phasolus* is reckoned among the most useful of legumes and mentioned besides faba bean, pea, chickpea, and lupine – all of which may therefore be ruled out as candidates for *phasolus* in Columella's work. The other plants are not legumes by modern definition: the millets and barley are cereals. *Tisana*, the product that provides barley with its importance according to Columella, translates into a drink called 'barley-water'

or alternatively 'pearl-barley', which are polished barley-groats used to make gruel or barley porridge. Linseed (*Linum ussitatissimum*) can be used as an oil crop and fibre crop (then referred to as flax), and the same goes for hemp (*Cannabis sativa*) – sesame is used both as an oil crop and as a condiment. The potential use of the stems and leaves for fibre aside, all these crops, though not all legumes, have something in common. They can be used as grain crops. While there is no conclusive evidence, we would tentatively argue that here we are dealing with *phasolus* as a dried bean (seed).

Leguminum genera cum sint complura, maxime grata et in usu hominum videntur faba, lenticula, pisum, phaselus, cicer, cannabis, milium, panicum, sesama, lupinum, linum etiam et hordeum, quia ex eo tisana est.

While there are many kinds of legumes, those seen to be most dear and useful to man are the faba bean, lentil, pea, phasolus, chickpea, cannabis [hemp], common millet, Italian millet, sesame, lupine, linseed and also barley, because tisana comes from it.

Columella *Rust.* 2.7.1 (H.B. Ash. London. Heinemann. 1940) (D.A. Wilkins)

In a section on the labour requirements of ploughing, harrowing and harvesting, *phasolus* is again discussed. The four *modii* required as sowing seed for a *iugerum* (cf. 2.10.4), are sown in two days while harrowing and harvesting each take a day. While these comments do not

help us in gaining a better understanding of what *phasolus* refers to, we can exclude other pulses mentioned in Chapter 12: chickpea, chickling (*cicercula*, see below), bitter vetch, common vetch, lentil and lupine.

Phaseoli modii quattuor obruuntur totidem operis, occantur Una, mentuntur una.

Four modii of phasolus are put under ground with the same number of days, are harrowed in one day and harvested in one.

Columella. *Rust.* 2.12.3. (H.B. Ash London. Heinemann. 1940)

Columella's Book 10 was written as a poem in dactylic hexameters; between lines 369-378, Columella deals with the vegetable garden. *Phasolus* is described here as an aggressive plant apparently able to overgrow and threaten *arrach* (*atriplici*). *Arrach* may refer to the garden orache (*Atriplex hortensis*), a salty, spinach-like vegetable common in the Mediterranean though various other edible species of *atriplex* are present there. The garden orache has an erect branching stem, that may grow as tall as 180 centimetres.⁴⁵ A climbing or vine plant could easily climb up such a plant, hindering its growth and, hence, be considered a threat. This would make *phasolus* a climbing

pulse species or variety, but that remains somewhat speculative. The adjective 'long' (*longa*) could refer to the size of the plant as a whole or to the size of the pods. The latter seems more likely, as a pulse plant that grows erectly (which seems important in order to be considered long or tall), would not overgrow its neighbours, unless it also branched out, which for most pulse-crops is not the case. In this passage we seem to be dealing with a long-podded (again, whether or not this is hyperbolic depends on poetic liberty) climbing pulse, that as opposed to *phasolus* in Section 2.7.1., is considered a vegetable rather than a grain-crop.

*Iamque eruca salax fecundo provenit horto,
lubrica iam lapathos, iam thamni sponte virescunt
et scilla, hirsuto saepes nunc horrida rusco
prodit et asparagi corruda simillima filo
umidaque andrachle sitientis proteggit antes
et gravis atriplici consurgit longa phaselus.*

*Now in the fruitful garden springs apace
Salacious rocket; likewise now begin
The slipp'ry rhubarb, buckthorn, and sea-leek,
Spontaneous to wax green; the prickly hedge,
Horrid with butchers-broom, begins to shoot:
Wild sperage likewise, which great likeness
bears. T' asparagus; the outmost ranks Opprest
with thrift, moist purslane now protects:
And the long phasolus, a constant foe
To arrach, at same time lifts up his head.*

Columella, *De Re Rustica* 10.369-378
(A. Millar. London. 1745)

Pliny the Elder, Columella's somewhat younger contemporary, references *phasolus* in his famous encyclopaedia. Walter Hondelmann, in a lemma on *phasolus*, saw in Pliny's mention of *phasolus* possessing veined leaves direct evidence for the interpretation cowpea, as he claims that this is a remarkable characteristic that does not occur in most other pulses. Combining it with Columella's statement that *phasolus* is eaten as a vegetable, he sees strong evidence for the interpretation.⁴⁶

While *Vigna unguiculata subsp. cylindrica* indeed has a very pronounced venation, various other exotic beans, such as the lablab (*Lablab purpureus*) and mung bean (*Vigna radiata*) possess the same characteristic – and no argument is provided as to why any of these species could not be *phasolus*. Though 'veined' seems like a clear characteristic with respect to gradation, it is subjective and depends on with what the author and audience are familiar. Though not as pronounced as in *Vigna unguiculata*

subsp. cylindrica, the nervature on *Vicia faba* (faba bean) is still very clear and could justify using 'veined' for the author and audience unfamiliar with *Vigna unguiculata*. Whereas in Section 18.33 the shape of the pods of pea and chickpea are discussed specifically, *phasolus* is clearly considered to conform to the general statement on leguminous plants: the pods are long and broad. This would disqualify the trait 'long' in general, while 'broad' serves as an argument against *Vigna unguiculata subsp. cylindrica* whose fruits would normally not be considered 'broad'. In Section 18.33, *phasolus* is also again mentioned to be sown between mid-October and early November, making it a winter crop, excluding (sub)tropical crops such as cowpea and lablab. Chickpea, pea, and lupine can be excluded in Section 18.33, while in Section 18.58 chickpea, pea, faba bean and bitter vetch can be excluded on account of being mentioned independently.

*Siliquae rotunda cicero, ceteris leguminum longae
et ad figuram seminis latae piso cylindratae. Passiolorum
cum ipsis manduntur granis; serere eos qua velis terra licet
ab idibus Octobrius in kal. Novembres. Legumina cum
maturescere coeperint rapienda sunt, quoniam cito exilunt
latentque cum decider, sicut et lupinum.*

*The chickpea has round pods, whereas those of other
leguminous plants are long, and broad to fit the shape
of the seed; the pod of the pea is cylindrical. The pods of
phasolus are eaten with the seeds themselves. They may
be sown in any ground you like from the middle of
October to the beginning of November. Leguminous
plants ought to be plucked as soon as they begin to
ripen because the seeds quickly jump out and when they
have fallen on the ground cannot be found; and the same
as regards lupine.*

Plinius Maior, *Historia Naturalis* 18.33.
(W.H.S. Jones. London. Heinemann. 1950)

Utrumque et quidquid in stipula est in cacumine unum folium habet — sed hordeo scabra sunt, ceteris levia —, multifolia contra faba, cicer, pisum. frumentis folium harundinaceum, fabaebean rotundaet magnae leguminum parti, longiora erviliae et piso, phasiolis venosa, sesamae et irioni sanguinea

Plinius Maior, *Historia Naturalis* 18. 58.
(W.H.S. Jones. London. Heinemann. 1950)

Each of these and all the plants that make straw have one leaf at the top—though barley leaves are rough and those of the rest smooth—whereas the chickpea and the pea are many-leaved. In grain the leaf is like that of a reed; those of the [faba] bean and a large part of the leguminous plants are round; those of the vetch and the pea rather long, that of phasolus veined, that of sesame and winter cress the colour of blood.

The culinary writer Apicius also mentions *phasolus* in his *De Re Coquinaria*. Book 5 of that work is devoted to legumes. The fourth chapter deals with recipes for peas and beans boiled in the pod (a preparation referred to as *conchicla*), but *phasolus* nor any species besides the faba bean (as an additional ingredient) is mentioned here. In Chapter Six, recipes for *fabaciae viridis et Baianae* (green and *Baian* beans, the latter being a topographical reference) are given, but there is no specific mention of *phasolus* nor of any other species. However, Chapter Eight specifically deals with two or three variations on a recipe for green *phasoli* with chickpeas (see excerpt). The first recipe appears to be referring to fresh green *phasoli*, that are served with the other ingredients. Only the method of serving, not that of preparation, is mentioned here. If freshly harvested, both the *phasoli* and the chickpeas (if taken out of the pod) could have been eaten as a salad. Dried chickpeas would at least require being soaked for a night (as otherwise they would be too hard to be eaten), but could then have been added to a salad.⁴⁷

The second recipe would almost seem to consist out of two separate recipes, as translator Bill Thayer in his commentary suggests. In the first part, the beans and chickpeas are ‘cooked’ (*frictos*) in a wine sauce and seasoned with pepper. Thayer provides ‘roasted’ as an alternative translation, which we think may be better in this context, as the second part of Part 2 already explicitly deals with boiling (*elixati*, again translated with the more general ‘cooked’ by Thayer). Here, the adjective ‘green’ (or ‘fresh’), *viridis* was omitted by Apicius – either because he wanted to avoid repetition or because this time we are dealing with the dried beans as opposed to fresh beans. This would explain boiling and/or roasting. In the second part of Recipe 2, the beans are to be boiled ‘richly’ and the seeds are to be removed. The beans are then served as a salad with eggs and as many other ingredients as the cook sees fit. A similar dish, not only using the French bean, but also the pods of the Faba bean, is still prepared today.⁴⁸ Why Apicius would have us remove the seeds is unclear.

VIII. FASEOLI ET CICER:

1. *Faseoli virides et cicer ex sale, cumino, oleo et mero modico inferuntur.*

2. *Aliter faseolus sive cicer: frictos ex oenogaro et pipere gustabis. et elixati, sumpto semine, cum ovis in patella, feniculo viridi, piper et liquamine et caroeno modico pro salso inferuntur, vel simpliciter, ut solet.*

Apicius, *De Re Coquinaria* 5.8.
Bibliotheca Augustana.⁴⁹

1. *Green phasoli and chickpeas are served with salt, cumin, oil and a little pure wine.*

2. *In another way phasoli or chickpeas are cooked in a wine sauce and seasoned with pepper. And cook [the beans] in a rich manner, remove the seeds and serve as a salad, with hard eggs, green fennel, pepper, broth, a little reduced wine and a little salt or serve them in simpler ways as you may see fit.*

B. Thayer, University of Chicago, Penelope project.⁵⁰

Another source in which *phasolus* plays a role is Diocletian's *Price Edict* (*Edictum De Pretiis Rerum Venalium*) dating to 301 AD. In this *Edict* a multitude of maximum prices of products and services was determined

in an attempt to stabilize the Roman economy. *Phasolus* appears three times in this text, each time as a different consumer product. First it appears as 'dry *phasolus*',

1.23

(*de frugibus*):

fasioli
sicci [k. mo. unum]
κ centum

6.33.

(*de oleribus et pomis*):

fasiolorum
fascis habens n. XXV
κ quattuor

6.39.

fasioli viridis purg[a]ti
Ital. s. unum
κ quattuor

(*on fruits*):⁵¹

phasolus
dry [one military modius]
100

(*on vegetables and fruits*)

phasolus
[a bundle of 25]
4

Green, de-shelled *phasoli*
[one Italian sextarius]
4

Edict. Diocl. *Corpus Inscriptionum Latinarum*, vol. III

(D.A. Wilkins)

and undoubtedly, the dried bean seeds are meant here. One modius of 8.73 litres was placed at 100 *denarii*. In Section 6.33. *phasoli* are sold in bundles of 25 for 4 *denarii*. In this case, the beans appear to be sold fresh, still in the pod, and apparently bound in fascicles (*fascis*), being 'bundles' or 'clusters'. This description readily invites the association with *Vigna unguiculata subsp. sesquipedales* that are sold in a bundle.⁵² Not only *phasoli* were sold in bundles of 25, but so were *Aspargi Hortulani* (garden asparagus, at 6 *denarii*) and *Ciceris viridis* (fresh or green chickpeas at 4 *denarii*). *Rusci* (*Ruscus aculeatus*, Butcher's Broom) was sold at 4 *denarii* for a bundle of 60.⁵³ While asparagus and Butcher's Broom (shoots or sprouts) can be imagined to be tied together in an actual bundle, – this would seem inconceivable with the small pods of the chickpea. Therefore, it is more likely that these bundles consisted out of uprooted (unripe) chickpea plants of which the pods are eaten as a snack, such as in parts of the modern Middle East.⁵⁴ Hence, "bundle"

cannot serve as too strong evidence for the identification of *Vigna unguiculata subsp. sesquipedales* as many more products can be 'bundled' in one form or other. In Section 6.39, green or fresh *phasoli* are mentioned again, now sold per Italian *sextarius*, which is 1/16th of a modius (0.545 litre). These *phasoli* are described as *purgati*, as is the item above it in the list: *fabae viridis purgatae*, green faba beans, also at 4 *denarii*. While several ancient medicinal text described the purging qualities of *phasoli* and several other pulses (see below), we here suggest that *purgati* should mean 'de-shelled' or 'de-podded'. Different prices for sea urchins, at several stages of freshness and processing have also been incorporated in the *Price Edict*. The verb *purgo* is used for one of these stages, and is generally translated as 'cleared' or 'cleaned'. More botanically, in Pliny the Elder we find *purgabilis* used to describe easily peeled chestnuts.⁵⁵ As discussed above the seeds of various beans can be, and are still, eaten fresh. The smaller unit by which these beans are

sold (and presumably processed by the seller) would make sense with respect to spoilage and the amount needed for a meal. At 64 denarii the fresh *phasoli* seeds seem considerably cheaper per modius than the dry *phasoli* seeds at 100 denarii per modius. If we are indeed dealing with the same botanical species, there are only two reasons why the dried beans could be more expensive than the fresh bean seeds. The first would be that the consumer was charged for the extra labour put into the drying of the beans for longer preservation, or alternatively that the dried beans had a greater density and weight per volume unit. Even when taking this into consideration, the price difference is quite substantial. Therefore, we could be dealing with different species or products that were all referred to as *phasolus*. This would come closest to the ‘calavance-hypothesis’ that we discussed earlier and we have ample opportunity to explore it further with the last classical author whose mentions of *phasolus* we will review: Galen (late 2nd to early 3rd century AD).

While actually writing in Greek, for both content and chronological reasons, we have chosen to discuss Galen at the end of this literature review. Galen, renowned medical author and court physician from Marcus Aurelius’ to Caracalla’s reign, wrote various treatises. One of these is *De alimentorum facultatibus*, in which the medical and health properties of various foodstuffs are discussed. Of particular interest are Sections 1.25 and 1.28 of this work, in which the medicinal and digestive qualities of *phasolus* and *dolichos* appear. These sections have not previously been used within the debate on *phasolus*. In Section 1.25, *phasolus* is mentioned only in passing together with chickpea and various other pulses as part of a supposedly ‘healthy diet’ of an eccentric Alexandrian physician.⁵⁶ Of far greater value is Section 1.28 (see below). In this section, Galen is placed before the same predicament as we are in the present paper: he has trouble identifying both *dolicho* and *phasoli*. First, Galen observes that what he believes to be *dolicho* are referred to by two common names: *loboi* and *phaseoli*. *Loboi* translates into ‘pods’, which is more descriptive of the processing stage rather than species. *Phaseoli* in itself is non-descriptive and it would be somewhat speculative to suggest that the processed product ‘dry bean seeds’ is meant by it.

Galen considers *phaseoli* (on account of the number of syllables) a different species than *phaselos*, which he sees as a species (or what we would call a subspecies or variety) of *lathuros*. The modern genus *Lathyrus* contains many African and Eurasian species among which *Lathyrus sativus* (grass pea or chickling) and *Lathyrus cicera* (vetchling) of which the seeds are eaten and *Lathyrus tuberosus*, of which the starchy tubers are eaten. Of these the first two would seem most likely; both are native to Europe and were domesticated in the Balkans and Southern-France and the Iberian peninsula respectively after the Neolithization process reached the area. Whereas *L. sativus* was spread throughout Eurasia and North-Africa, *L. cicera* did not spread much further beyond its domicile

than Italy; there is abundant archaeobotanical evidence for the cultivation of these species.⁵⁷ Hence it could be that Galen has *L. cicera* in mind when he suggests *phasolus* is a “variety” of *lathuros* (the latter name referring to *L. sativus*). From a practical, agricultural or consumer point of view, the differences between the species are small and their appearance is similar. It is therefore conceivable that some considered them more or less identical. Some claim that the Latin equivalent of *lathuros* is *cicercula*, perhaps due to the similarity of the modern Italian name for *L. sativus*, *cicerchia*.⁵⁸ However, most dictionaries maintain it is a small seeded variety of chickpea (*Cicer arietinum*). The latter may be a misunderstanding, based on categorisation by Pliny in *Hist. Nat.* 18.32, a section on ‘varieties of chickpea’ in which *cicercula* is defined as such. Pliny of course was not practising modern taxonomy, but his description here “uneven in shape and with corners like a pea” does match *L. sativus*; as does his description in Section 18.53 (304) where the bitter flavour of the crop is mentioned. Some medicinal qualities (purging) are attributed to it too (22.72 (148)). Palladius recommends *cicercula* is sown in February (Jan. 5 id. Febr. 4). Columella (*De Re Rustica* 2.10.19, 2.13.1) seems to equate *cicercula* with *cicer* which appear to him as varieties of the same species. They resemble pea and should be sown in January or February, though in some parts of Italy they are sown before November 1st. This would be congruent with what was said by Virgil, Columella, Pliny and Palladius about the sowing time of *phasolus*. Columella considers *cicercula* a good general fodder (6.3.3). He considers a mix of crushed *cicercula* and faba beans as either a good food for lambs or sick pigs (7.3.22, 7.10.5), while (potentially) the skins are considered good chicken-feed (8.4.4.) and the soaked seeds are suitable for hares kept in captivity (9.1.8). Therefore, we may maintain that *lathuros* and *cicercula* both refer to *L. sativus*. Because of the appearance of both *cicercula* and *phasolus* within the same list of crops mentioned by Columella (2.12.3, above), we can rule out the suggestion that they are the same, and thus *phasolus* cannot be *L. sativus*, though *L. cicera* is still a possibility.

Both *L. cicera* and *L. sativus* often function or functioned as ‘insurance’ crops that would still provide a reasonable harvest in dry areas when other crops failed. Because of the neurotoxicity of these species, which can cause lathyrism if they are consumed in large quantities over extended periods of time, the price of escaping famine can be steep. Goya vividly depicted this in an aquatint from the famines during the Peninsular (Napoleonic) War, titled *Gracias a la almorta* (*Thanks to the Grass pea*). Many still are affected by the affliction in contemporary Ethiopia, though small amounts can be eaten safely as is still practiced in Spain and Italy. If *phasolus* refers to *L. cicera*, this could explain Virgil’s reference to the “paltry *phasolus*” (above), while it would also explain the relatively low frequency of mentions of *phasolus*: such a species would be of little importance to the great

landowners in Italy (other than as fodder, such as Varro's *phasolus* pigeon feed or the mentions of *cicerula* in Columella, above) who wrote and read the farming manuals. Columella's Iberian origin (he was born in Gades) could explain why he was more familiar with the species, and mentions it most often of all classical authors.

While this alternative interpretation is very interesting, definitive proof is difficult to obtain. Unfortunately, the criteria for the identification Galen uses primarily pertain to flatulence, laxative properties and attributed nutritious qualities that he cross-references with Diocles' work. While somewhat similar uses of *cicerula* are mentioned by Pliny (*Hist. Nat.* 22.148), such traits cannot be properly tested because of obvious methodological and practical reasons.

Powell's translation of ὄχρους as 'birds' pea' is somewhat curious. ὄχρους literally translates into 'pale', 'pallid' or 'yellow-greenish', much like χλωρούς in Athenaeus

(above). In his commentary, Powell interprets it as *L. ochrus*, of which the common name is 'birds pea' or 'Cyprus vetch'. However, we are somewhat uncertain about the relationship between the Ancient and scientific names.⁵⁹ It is possible another small seeded vetch is meant. Another occasionally eaten lathyrus is *L. clymenum* (Spanish vetchling), which appears to be a mainly Greek crop, primarily cultivated on the island of Santorini both at present and in the past.⁶⁰ There is also some confusion in the translation of other plant names. *L. Annuus* (red fodder pea) for instance is suggested as identification of *arakos* (αρακος) which is translated into 'bird vetch'. That English common name is normally used to refer to *Vicia cracca*, which may or may not be linked to the leguminous plant by the name of *cracca* mentioned by Pliny. This plant is described as producing green fodder, while the seeds are much loved by pigeons (Pliny, *Hist. Nat.* 18.41).

Περὶ δολίχων

τὸ τῶν δολίχων ὄνομα γέγραπται μὲν καὶ παρὰ τῷ Διοκλεῖ μετὰ τῶν ἄλλων, ὅσα τῶν τρεφόντων ἡμᾶς σπερμάτων ἐστὶν ὀνόματα, γέγραπται δὲ καὶ τῷ Περὶ διαίτης Ἱπποκράτους, ὑπὲρ οὗ καὶ πρόσθεν ἤδη διήλθον. ἠγοῦμαι δ' αὐτοὺς οὕτως ὀνομάζειν τὸ σπέρμα τοῦ κηπευομένου φυτοῦ, καλουμένου δὲ νῦν ὑπὸ τῶν πολλῶν κατὰ τὸν πληθυντικὸν ἀριθμὸν διττῶς. ἔνιοι μὲν γὰρ λοβοῦς, ἔνιοι δὲ φασηόλους ὀνομάζουσιν αὐτοὺς διὰ τεττάρων συλλαβῶν τὴν φωνὴν προφερόμενοι καὶ κατὰ τοῦτο ποιοῦντες ἕτερον ὄνομα τοῦ διὰ τριῶν συλλαβῶν λεγομένου φασηίου. τινὲς δὲ τὸν αὐτὸν εἶναι λέγουσι τὸν φάσηλον τῷ λαθύρω. τινὲς δ' εἶδος αὐτοῦ.

τούς γε μὴν δολίχους τεκμήραιτ' ἂν τις ὀνομάζεσθαι τὰ κηπευόμενα ταυτὶ φυτὰ κάξ ὣν ὁ Θεόφραστος ὑπὲρ αὐτῶν εἶπεν ἐν τῷ ογδόῳ Περὶ φυτῶν ἱστορίας (...) ἐν δὲ τῷ Περὶ διαίτης Ἱπποκράτους οὕτω γέγραπται•

οἱ δὲ πισοὶ φυσῶσι μὲν ἥσσον, διαχωροῦσι δὲ μᾶλλον, ὄχροι δὲ καὶ δόλιχοι διαχωρητικώτεροι τούτων. ἥσσον δὲ φυσώδεες, τρώφιμοι δέ.

παραβάλλον γὰρ ἐν ταύτῃ τῇ ῥήσει τοὺς πισοὺς τοῖς κνάμοις, ὑπὲρ ὧν ὡς φυσώδους ἐδέσματος προειρήκει, τοὺς δ' ὄχρους καὶ δολίχους ἐφεξῆς γράφων ἐνδείκνυται τῶν ὁμογενῶν τι τοῖς προειρημένοις σπερμάτων εἶναι τὸν δόλιχον καὶ μάλιστα τοῖς ὄχροις, ἀλλ' ἐκ τοῦ μηδ' ὄλωσ αὐτὸν μνημονεῦσαι λαθύρων καὶ

On dolichoī

The name *dolichoī* is used in Diocles' writings alongside all the other names of seeds that are nutritious for us, and it is also used in the text of 'On Regimen by Hippocrates', which I dealt with earlier. I believe that they give that name to the seed from the garden plant that is nowadays called by many people in the plural in two ways: some call them *loboi*, others *phaseoloi*, pronouncing the word with four syllables and thereby creating a name that is different from the three-syllable *phasolos*. Some say *phasolos* is identical to *lathuros* others that it is a variety of it.

That by means of *dolichoī* these very garden plants are referred to might be inferred from what Theophrastus, in the eighth book of the 'Enquiry into Plants' says about them (...). In on 'Regimen by Hippocrates' the following is written:

Peas cause less flatulence and are more laxative, bird's peas and *dolichoī* are more laxative than these, less flatulent and nutritious.

By placing in these words, peas next to beans, which he had previously spoken of as being a flatulent foodstuff above, and next writing on bird's peas and *dolichos*, he shows that the *dolichos* is one of the seed that are of the same kind as the ones discussed

φασήλων ὑποψία τίς ἐστίν, ὡς ἐκείνων τι τῶν σπερμάτων
ἐνδεχόμενον εἶη κεκληῖσθαι δόλιχον. εἰ δὲ καὶ τοὺς
φασήλους τις ἐν τῷ γένει τῶν λαθύρων περιλαμβάνει,
τό γε τοὺς λαθύρους μὴ δύνασθαι λεχθῆναι
δολίχους ἐν τῇ προκειμένῃ ῥήσει διαφυγεῖν οὐχ οἶόν τε

Διοκλῆς δ' ἐν τῷ τῶν ὀσπρίων καταλόγῳ κνάμους
πρῶτον εἰπὼν, εἶτα πισούς, ἐφεξῆς γράφει κατὰ λέξιν
οὕτω•

δολίχοι δὲ τρέφουσι μὲν οὐχ ἥττον τῶν πισῶν, ἄφουσι
δ' εἰσὶ παραπλησίως, πρὸς ἠδονὴν δὲ καὶ διαχώρησιν
χείρους.

ἀλλὰ καὶ οὗτος ἐφεξῆς ὄχρων μὲν καὶ φακῶν ἐρεβίνθων
τε καὶ ὀρόβων μνημονεύσας, παραλιπὼν δὲ τὸ τῶν
λαθύρων ὄνομα, τὴν αὐτὴν ἀμφιβολίαν παρέχει. καὶ τις
δύναται λέγειν ἐν εἶναι γένος ταῦτα πάντα, λαθύρους
ὄχρους φασήλους, ὀνόμασι πλείοσι κεκηρημένα, τάχα μὲν
ὡς κίων καὶ στῦλος, ἴσως δὲ καὶ κατὰ τινὰς ἐμφαινομένης
αὐτοῖς διαφορᾶς. ἀλλὰ τό γε τοὺς δολίχους οὐχ ἥττον τε
τῶν πισῶν τρέφειν ἀφύσους τ' εἶναι παραπλησίως ἐκείνοις
ἐνδεικτικόν ἐστι τοῦ κεκληθέναι τὸν Διοκλέα τοὺς νῦν
ὀνομαζομένους φασηόλους οὕτως. ὁ γὰρ τοὶ λάθυρος οὐκ
ἐστὶν αφυσόπερος πισοῦ καθάπερ οὐδ' ὄχρος οὐδὲ φάσηλος,
εἴθ' ἐν γένος ἐστίν, ὡς ἔφην. εἴτε καὶ διαφοραὶ τινες ἐνὸς
γένους ταῦτα.

Φιλότιμος δὲ καὶ Πραξαγόρας οὐδενὸς τῶν τοιοῦτων
ἐδεσμάτων ἐμνημόνευσαν. ὅτι μὴ κνάμων τε καὶ πισῶν
μόνων, ὥστε παρά γε τούτων οὐδὲν ἔχομεν εὐπορηῆσαι περὶ
τοῦ τῶν δολίχων ὀνόματος, ἐφ' ὅτῳ πράγματι τέτακται.
καὶ τοίνυν καλεῖται μὲν ἕκαστος, ὡς ἂν ἐθέλη, τοὺς νῦν ὑπὸ τῶν
πολλῶν ὀνομαζομένους φασηόλους τε καὶ λοβούς, ἴστω δὲ
τὴν δύναμιν αὐτῶν οὔσαν οἷαν ὁ Διοκλῆς εἶπε περὶ τῶν
δολίχων. ἐγγὺς δὲ τῆς γνώμης αὐτοῦ καὶ ὁ τὸ Περὶ διαίτης
Ἱπποκράτους γράψας ἤκει τοὺς ὄχρους τε καὶ τοὺς δολίχους
διαχωρητικωτέρους μὲν εἶναι λέγων τῶν πισῶν, ἥσσον
δὲ φουσάδεις, ἀλλὰ καὶ τροφίμους αὐτοὺς εἶναι μαρτυρεῖ.

before, especially bird's peas. However, from
the fact that he does not mention lathuroi and
phaseloi at all one may suspect that it was
possible to use the name dolichos for one of
those seeds. However, if one includes also the
phaseloi in the class of lathuroi, one cannot
escape the conclusion that in the quoted
sentence, the name dolichoī is given to
lathuros.

Diocles, in his catalogue of pulses, mentions
beans first, then peas, and next writes as
follows and I quote:

Dolichoī are no less nutritious than peas, and
they are about as non-flatulent, but they are less
tasty and pass less easily.

But he too, by mentioning next bird's peas,
lentils, chickpeas and bitter vetches, but
omitting the name of lathuros, presents the
same ambiguity. One may say that all these
lathuros, bird's peas, and phaseloi, are one
kind but have more names, perhaps just as
pillar and column do, perhaps also in
accordance with some differences that manifest
themselves in them. But saying that dolichoī
are no less nutritious than peas but are about
as non-flatulent shows that what Diocles called
such are what are nowadays called phaseoloi.
For lathuros is not more non-flatulent than
peas, nor phaselos, whether they are one kind,
as I said, or different species of one kind.

Philotimus and Praxagoras did not mention
any of this kind of foods except for beans and
peas only, so that we cannot expect any help
from them concerning the question what the
word dolichos refers to. And so let everyone
name what are nowadays called by ordinary
people phaseoloi and loboī what he wants, but
let him know that its power is like the one
Diocles attributed to the dolichoī. Close to his
view comes the writer of 'On Regimen by
Hippocrates', who says that bird's peas and
dolichoī are more laxative than peas,
but less flatulent, but also testifies to their
being nutritious.

Galenus, *De Alimentorum facultatibus* 1.28

Text and translation adapted from P. Van der Eijk. Brill. London.
2000 and O. Powell. CUP. Cambridge 2003.

After various exhortations, in the last two paragraphs of his section included here, Galen concludes *phaseoloi*, *phaselos*, *loboi*, *lathuroi* and *dolichos* could be synonymous “like pillar and column” or that they could be “different species of a kind” with some minor differences. Therefore, he argues that it doesn’t matter which name one picks, as long as its digestive qualities are understood, as Diocles suggested for *dolichos*. Galen’s confusion about whether these names refer to the same or different species or varieties is curious. Though not an agronomist, Galen seems to have had sufficient knowledge of many food plants, and had lived and travelled both in the Latin speaking and Greek speaking parts of the Empire. One could suggest that the meaning of the many words referring to minor pulse species got confused over time and space. However, *phasolus* is used again in the *Edict of Prices*, which is yet another century later. As the very purpose of that document was to communicate prices of very specific objects and services to an audience of buyers and sellers, it stands to reason the audience was expected to know which product was meant. Where Columella still seemed to have had a particular species in mind, only a century later, Galen is a bit at a loss. Even more curiously, in Section K.546 (not included here), Galen does manage to produce the information that *dolicho*i are eaten whole with their seeds before they ripen and that it is difficult to store them. His father, he mentions, stored them safely through drying them thoroughly, which made them “as valuable” as peas. Galen concludes by noting that a friend of his from Rome, hailing from Ceramos (near Halicarnassus), says *dolichos* is grown there and that it has a more elongated shape than *lathuros*. The pods of *L. sativus*, with a length up to about 5 centimetres, are not exceedingly long – especially not if compared to cowpea or even faba bean. What is more important is that they could be perceived as somewhat stout and broad compared to their length. *Dolichos*, in this case, is not necessarily long, or even longer than *lathuros*, its length and width just have a different ratio. It may be that instead of ‘long’ in the literal sense, also authors such as Columella may have meant ‘elongated’ when writing on *phasolus*.

A point of importance may follow from the confusion in Galen: perhaps *phasolus* in some contexts or from some point in time onwards referred to a specific *consumer product* rather than an *agricultural crop* or *botanical species*, while in other contexts, it could be have been interchangeably used as a generic word. The processing stage, preparation method, freshness or even the local linguistic tradition would then be the relevant identification criterion for the consumer. For us as non-native speakers – non-contemporaries with an entirely different cultural background – these nuances would be very difficult to grasp. With respect to beans many similar examples of such nuances exist in modern languages. In Dutch, for instance, if someone would mention eating *boontjes* (the diminutive of the generic word for beans) for dinner,

any native Dutch speaker would understand that whole, green, fresh French beans (*Phaseolus vulgaris*, *sperziebonen* in Dutch) are meant. Similarly, *gebroken boontjes* also refers to green, fresh French beans, but then broken into halves prior to preparation. A non-native Dutch speaker or translator would be at a loss finding out which species is meant because of the non-descriptive nature of the reference and his unfamiliarity with the cultural meaning. Without access to a good dictionary, the non-native Dutch speaker might venture to incorrectly speculate that the bean in question must be very small as the diminutive was used, or try to reconstruct ‘breaking’ as a vital step in the processing process. He may also try to find the answer through one of the several Dutch proverbs involving *boontjes* – only to find that these are just as undescriptive and illusive (and not actually applying to French beans but just ‘beans’ and only metaphorically). Similarly, most native English speakers will know what to expect when they are (very non-descriptively) told they will be having baked beans (or just beans) for breakfast: the seeds of a variety of *Phaseolus vulgaris*, generally haricot or navy beans. Likewise in Egypt and Sudan (and various other Arabic speaking countries) a consumer will expect mashed faba beans if they order فول (*fūl*, literally: beans). In a similar fashion, in Arabic لوبيا (*lūbīyā*, also beans) refers to whole green, stewed or slow-cooked French beans in Lebanese cuisine while in Moroccan cuisine, it refers to stewed (de-podded) dried (generally white) beans. In the last example, it seems as if the name may have originated from the preparation mode and was reused when a different species or material from a different processing stage was substituted for the original in a local tradition; even within the same language and era the corresponding species is dependent on location.

Lastly, there are generic names with multiple meanings in one language (as the example of calavance above) or very similar words in different languages with the same meaning. In the Germanic languages bean, *boon* (Dutch) and *Bohne* (German) are all generic words for ‘bean’ and usually part of the common name (generally placed at the end, e.g. kidney bean, *sperzieboon*, *Kuhbohne*). In most modern Roman languages the generic name for beans is far more reminiscent of *phasolus*. In Italian *fagioli* is used, but it is placed in front of the part of the name referring to the specific species (e.g. *fagioli bianchi*, *fagioli comune*, *fagioli di Lima* etc.). The same goes for Spanish, Romanian, Catalan and Portuguese where *frijoles*, *fasole*, *fesols*, and *fejões* are used respectively; French, which uses *haricot*, is the only exception in the Romance languages. Also in modern Greek, Maltese, Arabic and Turkish words very akin or identical to *phasolus* are used as a generic bean name: *φασόλια* (*phasolia*), *fazola*, فصوليا (*fāṣūlīyā*) and *fasulye* respectively.⁵⁹ In many Slavonic languages the situation is similar. In Serbian, there is *начуљ* (*pasulj*), in Russian *фасоль* (*fasol’*), in Belarussian *фасолю* (*fasoliu*), while Czech uses *fazole*, Polish *fasola*, Slovenian *fižol* and Slovak *fazuľa*.⁶¹ While

for some of these languages, there is no direct relationship with the ancient Greek and Roman word use and the loanword was incorporated post-classically (or perhaps even post-Linnaean in some cases), it is striking that in so many languages a derivative of *phasolus* functions as a generic name for beans. The adjectives, unwritten cultural understanding, or non-descriptive linguistic elements are used to distinguish between species, preparation methods or processing states – not the word ‘bean’ itself.

As far as the Latin literary evidence is concerned there is very little useful evidence to reach a positive identification with any of the suggested interpretations, or any other interpretations for that matter. Most Latin mentions are too vague and non-descriptive to bridge the gap of presumed understanding by the audience. Where *phasolus* in Columella has been interpreted as *Vigna unguiculata* (or where it could be interpreted as such in Palladius or Vergil) the sowing time makes this interpretation impossible. The different mentions in the *Price Edict* and in Galen’s work would suggest that *phasolus* had different, perhaps even somewhat confused, meanings during the later Roman period.

5. ARCHAEOBOTANICAL FINDS INTERPRETED AS *PHASOLUS*

Of the commonly suggested interpretations of *phasolus* that were introduced at the beginning of this article, only two have not been rebuked. The first is the *Vigna unguiculata* (either as the subspecies *unguiculata* or *sesquipedalis*), but as a summer crop, rather than as a winter crop as has been erroneously inferred from Columella. The second is one of the meanings of ‘calavance’: any type of bean in general. For obvious reasons the latter can neither be proven nor rebuked through archaeobotanical evidence. A general linguistic term naturally has no specific biological equivalent. For the cowpea matters lie differently: we can assess whether or not it has been reported in archaeobotanical samples from Roman archaeological contexts. However, we should remember that if it is encountered this does not necessarily imply that cowpea and *phasolus* are one and the same: there is a difference between botanical identification and linguistic interpretation. In other words: if the Romans were familiar with the cowpea they need not have called it *phasolus* – though a case could be made for it. If cowpea was not encountered, its presence becomes highly unlikely.

From archaeobotanical studies throughout the area that once made up the Roman Empire, it would appear there is very little evidence for cowpea. It should be noted that pulses as a crop category can be somewhat underrepresented in archaeobotanical assemblages. This is mainly because of the manner in which they are processed and consumed. As we have discussed, pulses can be boiled, roasted, baked, either as a whole pod or de-podded seeds

(which can even be ground into a flour) prior to consumption, after which they pass through the human digestive system. The processing, preparation, chewing and digestion can render the seeds and pods unrecognizable – as is also the case for most leafy vegetables. Small seeded fruits that are ‘inadvertently’ eaten and excreted intact (such as fig seeds (*Ficus carica*) or inedible stone fruits (such as olive stones (*Olea europea*) that are discarded with the waste have a greater chance of being recovered. Cereals, once completely processed and consumed, are also more difficult to recover and identify, yet during various processing and preparation stages seeds and other plant parts may be actively separated and used for different purposes (e.g. chaff), may be discarded or may accidentally be lost and charred and thus preserved. The chances of this happening with pulses is in many cases smaller. However, botanical remains of all the other major Roman pulses mentioned in this article, are still encountered regularly.

One of the very few botanical finds of cowpea in the ‘greater Mediterranean’ prior to the fall of the Roman Empire, hails from Old Kingdom Egypt and dates to the 5th dynasty (c. 2465 – 2325 BC). It belonged to the mortuary temple of Sahure at Abusir.⁶² The sample was interpreted as a sacrificial offering, and contained a mix of barley (*Hordeum vulgare*) and cowpea. The material became part of Schweinfurt’s botanical collection and is now part of the collection of the Berliner Museum. The sample was later described in Germer’s catalogue of the Schweinfurt collection at Berlin and cited by Germer in her book on the plants of Pharonic Egypt.⁶³ There was no photograph of a specimen included in either publication; while in the catalogue’s glossary specimens of all other species had been included. Descriptions of the morphological characteristics of the specimens were absent as well. This occurrence of cowpea has since been widely cited as evidence that *Vigna unguiculata* was present in Ancient Egypt,⁶⁴ and, apparently per consequence, must have been available in the Hellenistic and Roman world as well.⁶⁵ We believe it is too great a leap to assume the presence of cowpea throughout the Roman Empire, based on a single find over two millennia earlier in Egypt. Following Germer’s publication, archaeobotanist Marina Ciaraldi reported another instance of cowpeas in Antiquity, which hails from Pompeii in Roman period Italy. Ciaraldi herself does not link cowpea to *phasolus* in her text. A single occurrence of a species for the entire Roman Empire and entire Roman period is a remarkably low frequency. This, assuming the identification and dating are correct, would go against widespread cultivation or cultivation at all. This in turn, would make it less likely for a common word as *phasolus* to refer to it. Ciaraldi suggests the find of ‘East Asian’ cowpeas serves as “proof that during the last period of Pompeii’s life Asian commodities were regularly arriving in the town”. Regardless of the correctness of the identification, this explanation seems highly unlikely. For the more perishable fresh beans the journey would have simply taken too long, while it is



Figure 1. Overview of pulse fragments from sample Schw. Nr. 385. Photo: S. Bollendorf ©Herbarium B Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin.



Figure 2. Detail of pulse fragments from sample Schw. Nr. 385. Photo: S. Bollendorf. ©Herbarium B Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin.

inconceivable that the (bulky) dried beans would be considered exotic enough and go for a high enough price to warrant the costs of long distance transport, as opposed to for instance pepper. One could perchance explain the presence of an 'outlandish' species in a port on the Red Sea (directly in contact with India, see below) as part of an incoming ship's provisions, like this, but not in a provincial Roman town. Some specimens identified as cowpea have been depicted and described by Ciaraldi.⁶⁶ Assessment of this mention led archaeobotanist Marijke van der Veen to express strong doubts regarding the reliability of these particular identifications.⁶⁷

Even for Egypt, the Abusir cowpeas are unique as the species is found nowhere else in the country until well into the Islamic period, about 35 centuries later. For the Hellenistic and Roman periods it was not even encountered in the Red Sea ports from where extensive contacts

with India and the East African coast were maintained. At the Hellenistic and Roman port of Berenike for instance, René Cappers did encounter some seeds of the Indian mung bean (*Vigna radiata*), but none of *Vigna unguiculata*.⁶⁸ *Vigna radiata* is a long-podded, small seeded pulse primarily known in the West for its bean sprouts. The species shares many characteristics with the cowpea, both in its agricultural application as well climatic requirements and is also cultivated in areas of the modern Mediterranean as a summer crop.⁶⁹ As no other finds of mung bean have been reported in the Roman world, cultivation seems unlikely and Cappers' explanation of incidental import or the specimens belonging to a trade ship's food stores satisfactory.

Marijke van der Veen in her study on the Roman and Islamic port of Myos Hormos (Arabic: Quseir al-Qadim) only encountered cowpea in Islamic contexts dating to the 11th through 15th centuries AD.⁷⁰ Therefore, it is not inconceivable that the Abusir sample was misdated or originated from a different context or site. During the 19th and early 20th century, it was not uncommon that artefacts and archaeological materials were acquired by museums and collectors through purchase from private local individuals. While much of such material would be archaeological, its provenance and dating would be less reliable.⁷¹ The only method for obtaining certainty on the age of the material would be carbon dating as van der Veen suggested, which within the confines of study was unfortunately not possible.⁷² However, more important than the age of the sample is the correctness of its identification.

Though some outsiders consider archaeobotany more of a science than a humanity, archaeobotanical identifications do not automatically carry the same epistemological value as 'facts' or an 'objective' reading (such as an identification of species using DNA). Obviously, every



Figure 3a./b. Modern seed of *Vigna unguiculata* subsp. *cylindrica*. Photo: R.T.J. Cappers. © Digital Plant Atlas project. www.plantatlas.eu.

botanical specimen would belong to what we call a species (or to state a truism: “it is what it is”), but this does not mean it always *can*, or *is*, identified correctly, especially not if a specimen has been preserved poorly. The identification of an archaeobotanical specimen is an *interpretation* based on the visual examination of the presence and absence of certain morphological characteristics, preferably aided by a reference collection of known specimens (both modern and sub-fossil), seed atlases and keys with identification criteria. The experience and skill level of the archaeobotanist, the quality of the reference collections and other aids may influence the reliability of the identification.

Over time the identification criteria of many species have been updated as new insights became available; materials that were analysed long ago might today be identified differently, hence making it a necessity to reanalyse or ‘translate’ some mentions of species in older publications. Lastly, archaeobotanists do not universally agree on all selection criteria; therefore one archaeobotanist could argue she could identify a certain specimen only on family level, while her colleague may argue she could identify it on species level. Therefore, explicitly mentioning which identification criteria were used and providing a photograph so colleagues can scrutinize the identification is quintessential to making research

verifiable. We would strongly recommend this practice in the case of unique finds, as botanical material after analysis is often placed in long-term storage or sometimes is discarded, making it very difficult or impossible to reassess it.

Because of the importance of the Abusir sample, we believed it necessary to make a new identification of the pulse seeds in that sample. Through the help of the Berlin Museum, we were able to obtain photographs from the pulse-fragments from the Abusir sample (Figures 1 and 2). As aids in the analysis we used the Groningen Institute of Archaeology’s Archaeobotanical Reference Collection, and in support several keys.⁷³ Visual analysis of the morphological characteristics of the depicted fragments does not actively support an identification of cowpea. The characteristic pronounced hilum of *Vigna unguiculata* is not present, while the thick and leathery nature of the fragments is far more reminiscent of the faba bean (*Vicia faba* - for comparison see Figures 3a, 3b and 4). While DNA-testing (in addition to carbon dating) would provide more conclusive evidence as to which (sub)species the pulses in this sample belong, we would at this point conclude that there is no cause to identify these specimens as *Vigna unguiculata*. Consequently, other sources that base their conclusions on this identification or that cite it (such as Zohary and Hopf’s famous



Figure 4. Charred sub-fossil seeds of *Vicia faba* var. *minuta*. Photo: R.T.J. Cappers. © Digital Plant Atlas project. www.plantatlas.eu.

Plant Domestication in the Old World) cannot be used towards claiming *Vigna unguiculata* was present during the Hellenistic and Roman periods, let alone that the word *phasolus* referred to it.

6. CONCLUSION

In this article, we reviewed several common interpretations of the word *phasolus*. The kidney bean (*Phaseolus vulgaris*) could be rebuked as an American species that only shares similarity in name to *phasolus* due to Linnaeus' name giving choices. We consider the translation 'calavance' undesirable as its archaic meaning of 'chickpea' cannot be correctly applied to *phasolus* and its meaning of 'lablab bean' is not supported by positive archaeobotanical evidence. Its meaning 'any type of bean' could be better expressed in exactly that wording, so as to avoid the general reader's confusion about which meaning of 'calavance' to choose.

The case that some have made for 'cowpea' (*Vigna unguiculata*) could also be rebuked. Within the literary sources there is only little and no exclusive evidence (e.g. many pulses can be eaten as a vegetable) that points towards this species, while there is more direct evidence that would rule it out, especially its sowing time in winter. Though not impossible, it would seem unlikely that cowpea was grown as a summer crop either, because there is no convincing, verifiable archaeobotanical evidence for the Roman period. Germer's claims of finding cowpea in the Schweinfurt sample from Old Kingdom Abusir, widely used to mark the point in time when the cowpea entered the greater Mediterranean, can be refuted based on a lack of any positive evidence arising from the material during our new identification. It is more likely that this sample consists of regular faba beans. Similar claims based on this identification, without providing

any additional evidence, should therefore be treated with scepticism and cannot serve as evidence. This we believe, until new archaeobotanical evidence should arise, removes immediate grounds to the claim of *phasolus* being the cowpea. Especially as there is a myriad of African, Indian, Far Eastern and European pulses with economic applications that in some contexts, depending on the interpretation, could share in some or all of the characteristics attributed to *phasolus*, the cowpea does not deserve preferential treatment. At this point, we also see no convincing evidence that *dolichos* is the cowpea. Moreover, where *dolichos* and *phasolus* are mentioned individually within a passage, they should not be seen as identical; though it is possible that at some point, due to the confusion of names as is seen in Galen they came to refer to the same species. Galen's suggestion that *lathuros* may be *phasolus*, is new to the discussion and from this perspective intriguing.

Of many potential candidates for *phasolus* the Roman name (if the species was known and used by the Romans at all) is unknown or uncertain. However, one of the best candidates would be the lablab (*Lablab purpureus*) that has not been encountered archaeobotanically for the Roman period. Pigeon pea (*Cajanus cajan*), Hungarian vetch (*Vicia pannonica*), bard vetch (*Vicia monantha*), winter or hairy vetch (*Vicia villosa*), Spanish vetchling (*Lathyrus clymemum*), moth bean (*Vigna aconitifolia*), mung bean (*Vigna radiata*) and black gram (*Vigna mungo*) could also fit part of the descriptions in classical texts, but were never considered.

The results of the literature review (for an overview, see table 1) moreover lead us to conclude that it is likely that in addition to context bound specific meanings, *phasolus* would have been used as a generic word for 'beans'. Adjectives, non-descriptive elements or just cultural understanding in which we do not share, would then have allowed producers and consumers to distinguish between

species, or perhaps more relevant to them, processing states and products, as in the *Price Edict*. Thinking in scientific plant names based on taxonomy is a modern academic pursuit – outside that context more practical considerations can dictate name divisions as the variety of modern names used to refer to different varieties or preparations of *Phaseolus vulgaris* illustrates. The confusion of names in Galen should moreover open us to possibility that the meaning of *phasolus* may have differed through time and space.

In a translation, we should therefore assess the meaning of *phasolus* for each context or author individually. Where *phasolus* is used in lists that sum up plants, or where multiple crops are mentioned in the same passage, we may assume *phasolus* refers to a specific taxon and is not a synonym for any of the others that are mentioned. In other cases, we exclude species as identification candidates because they do not meet certain characteristics. Some of these characteristics are ‘absolute’. A crop is for instance said to be sown in winter, or it is not. Other characteristics are less straightforward. An adjective such as “veined-leafed” for instance, describes an actual morphological feature, but is still subjective. It depends on the comparison by the audience of the referred species with the pantheon of all species known to it. We may think species X has particularly veined leaves, while an individual familiar with species Y as well may judge Y possess this quality much more strongly. Besides, all leaves are ‘veined’ as they possess venation. Characteristics such as ‘long’ are even more problematic: in addition to depending on comparison we do not necessarily know to which aspect of the species long pertains. Galen’s description of *dolichos* as more ‘elongated’ than the relatively short and broad *lathuros* illustrates this. Adjectives with multiple meanings that can each be interpreted as attributes, complicate matters further.

In the work of an author such as Aristophanes, we have no evidence at all as to which species is meant. Here we should translate *phasolus* neutrally as ‘(any type of) bean’. In Julius Pollux’s *Onomasticon*, several species mentioned (including *dolichos*) in the same list can be excluded (see table 1) as candidates, but we have no evidence to make further suggestions. Again we should translate *phasolus* as ‘bean’ and in a note explain it is not any of the other pulses mentioned in the text. Only in a limited number of cases we can go further in our identification. In Columella, faba bean, lentil, chickpea, chickling, lupine, common vetch, bitter vetch and pea can be excluded on account of being mentioned in the same list. The criterion “autumn-sown/spring-harvested” moreover excludes the cowpea, lablab, or any other (sub-) tropical pulse listed above that requires warm weather

and dry conditions. The criterion ‘long’ is too subjective to be of use (and in its context perhaps more poetic for ‘elongated’ than literally descriptive), while the various other traits are somewhat vague. One could suggest that *phasolus* may refer to one of the many minor Eurasian pulses, either vetchlings such as *L. cicera*, *L. ochrus* or *L. clymenum* or vetches such as *Vicia pannonica*, *Vicia monantha* or *Vicia villosa*. However, the nature and content of the descriptions of traits and characteristics is not such that it facilitates a further identification with unacceptable guesswork. Moreover, it is certainly conceivable that *phasolus* could apply to multiple of these scientific taxa at once if one notes the willingness of ancient authors such as Columella and Galen to consider similar species as varieties of each other. Also in the case of Pliny, chickpea, pea, common vetch, faba bean and lupine can be dismissed on account of being mentioned separately. Species with a well-known Latin name that do not appear explicitly, such as lentil and bitter vetch, can here be judged unlikely. Because of the sowing time, (sub-) tropical pulses need not be considered, again making one of the various vetches and vetchlings the most likely candidate for identification.

Therefore, it is our assessment that in written sources where *phasolus* can be constructed as to be considered a specific species by the classical author, we should refrain from translating it into a specific botanical species. It is better to conclude what the potential options and exclusions are for that context, as we did in the previous paragraph, than to circulate faulty translations that will start leading their own life throughout disciplines and end up being circularly referenced. When in doubt we recommend *phasolus* is better left untranslated or alternatively translated neutrally as ‘bean’. With that, our conclusion is the complete opposite of Galen’s, who suggests we use whichever name we please in his discussion of the topic nearly two millennia ago.

7. ACKNOWLEDGEMENTS

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Table 1. Overview of mentions of *phasolus* and *dolichos*.

Source					
	Use of the word		Species excluded because of independent reference	Characteristics	Appreciation by author
	Specific Taxon	Product, Generic word and/or Taxon			
Phasolus					
<i>Ar. Pax.</i> 1144		x			
Ath. 2.46a		x		pale, green, pallid (χλωρός)	
Ath. 2.46b		x			
Ath. 2.46c		x			
Pollux 1.247	x		Dolichos, chickpea, pea, lentil, 'pale beans' (birds' vetch?), wild chickling, chickling		
Vergil G. 1.227	x		(Pelusiac) Lentil, bitter vetch	Winter-sown	low
Col. 2.7.1.	x		Faba bean, lentil, pea, chickpea, lupine		high
Col. 2.10.4.	x		Pea	To be sown between September 22nd and October 1st; To be sown in old fallow ground or rich, yearly tilled land at 4 <i>modii</i> per <i>iugerum</i> ; Does not require soil as loose as; it requires less warmth and moisture than pea	
Col. 2.12.3	x		Bitter vetch, chickpea, chickling (<i>cicerula</i>), (common) vetch, bitter vetch, lentil, lupine	An amount of 4 <i>modii</i> is sown in 2 days, harrowed in 1, and harvested in one.	
Col. 10 369-378	x			Long; threatens (garden) orache	
Col. 11.2.72.		x		<i>phasolus</i> for 'food'; to be sown between late October and November 1st	
Col. 12.9.1.		x		Processed (and presumably harvested) in spring. Pickled with lettuce.	
Palladius 10.12		x		Sow <i>phasolus</i> for food (<i>ad escam</i>) when millets are harvested	
Palladius 11.1	x		Common vetch, lupine, pea	Sow when millets are harvested, but before October 15th. Sow in fertile or re-fertilized land, at 4 <i>modii</i> per <i>iugerum</i> .	
Pliny <i>Hist. Nat.</i> 18.33.	x		Chickpea, pea, lupine	To be sown between late October and early November on any type of soil. The pods are eaten with the seeds.	
Pliny <i>Hist. Nat.</i> 18.58.	x		Faba bean, chickpea, pea, (common) vetch	Leafs are veined	

Source					
	Use of the word		Species excluded because of independent reference	Characteristics	Appreciation by author
	Specific Taxon	Product, Generic word and/or Taxon			
Phasolus					
Apicius <i>De Re Coquinaria</i> 5.8 a		x	Chickpea	Green	
Apicius <i>De Re Coquinaria</i> 5.8 b		x	Chickpea	Seeds are removed, pods eaten as salad	
Edict. Dicoel. 1.23		x		Dried, sold per dry-measure (<i>modius</i>)	
Edict. Dicoel. 6.33		x	Chickpea, faba beans	Fresh (?), sold per bundle of 25	
Edict. Dicoel. 6.39		x		Green/Fresh, de-shelled, sold per 1/16th <i>modius</i>	
Galen <i>De alimentorum facultatibus</i> 1.25	x		Pea, lupine		
Dolichos					
Theophrastus <i>Hist. Plant</i> 8.3.2	x			Requires long stakes to climb in order to bear a good crop and be unaffected by rust.	
Theophrastus <i>Hist. Plant</i> 8.11.1	x		(common) Vetch	Germinates well but rots quickly	
Pollux 1.247	x		Phasolus, chickpea, pea, lentil, 'pale beans' (birds' vetch?), wild chickling, chickling		
Galen <i>De alimentorum facultatibus</i> 1.28; K 546 *	x		Lathuros	Pods eaten whole with the seeds. More elongated than lathuros. Was (also) grown in Southern Anatolia (Cerasos, near Halicarnassus)	

* Galen 1.28 - K546 could also apply to *phasolus* if one argues *dolichos* and *phasolus* are identical

8. NOTES

1. Linnaeus, 1735.
2. e.g. Hondelmann, 2002; André, 1961; 2010; Cappers & Neef, 2012.
3. Instrumental in this process are the International Code for algae, fungi and plants (ICN) and the International Plant Name Index (IPNI). A side project to the IPNI by the Royal Botanic Gardens and the Missouri Botanical Garden is the Plant List database which contains accepted names, synonyms and unsolved names. The use of scientific names in the present paper follows this *cf.* Mabberley 2008. *cf.* Cappers *et al.*, 2012; database. The database is available at www.theplantlist.org (accessed: 3-4-2014).
4. Thiselton-Dyer, 1963: p. 73., Lidell *et al.*, 1925, *cf.* André, 1961; 2010.
5. Thiselton-Dyer, 1963: p. 73, in the first edition of 1921 he made same assertion. *cf.* André, 1961.
6. Allen 2011 for instance uses kidney bean in his discussion of Diocletian's Price Edict.
7. For an in-depth discussion of the Indian pulses, see Fuller & Harvey, 2006: pp. 219-246.
8. The word garbanzo is believed to come from Old Spanish *arvanco*, somewhat akin to Latin *ervum* and to either originate from the Greek *erèbinthos* or alternatively Basque *garbantzu*. In American English garbanzo may still mean chickpea. For a discussion, see the *Oxford English Dictionary*.
9. <http://www.plantnames.unimelb.edu.au/Sorting/Lablab.html#purpureus> (accessed: 3-4-2014)
10. Fuller & Madella, 2001: pp. 317-390.
11. <http://www.plantnames.unimelb.edu.au/Sorting/Lablab.html#purpureus> (accessed: 3-4-2014) *cf.* note 3.
12. Fuller & Madella, 2001: pp. 317-390
13. Thiselton-Dyer, 1963:73, in the first edition of 1921 he made same assertion. *cf.* note 8, Hondelmann, 2002: p. 49.
14. Fuller & Madella, 2001: pp. 317-390
15. Due the fact that authorship, and hence dating, are problematic, the references in the *Corpus Hippocraticum* have been omitted here, and will be discussed in the section on mentions by Galen.
16. Bagnall, 1993: p. 31.
17. A Dutch common name for the French bean (*Phaseolus vulgaris*) *slaboon* ('salad-bean') refers to that practice, the first occurrence of the word dating to 1746. See van Veen & van der Sijs 1997, lemma 'slaboon'. Some pulses are quite toxic when uncooked, such as White lupine (*Lupinus albus*) that may cause alkaloid poisoning while the toxicity of others, such as vetchling (*Lathyrus sativus*), that may cause lathyrism paralysis, is increased by boiling.
18. See Schnebel, 1925: pp. 193-194 for an overview of the relevant papyri.
19. e.g. P.Ryl.II. 209, 4.
20. Van der Veen, 2011: p. 105.
21. Schnebel, 1925: p. 193.
22. e.g. the translation of P.Ryl.II. 209 available at <http://www.papyri.info/hgv/31164> (accessed at 15-4-2014)
23. *cf.* André, 1961; 2010.
24. See note 4.
25. See for instance Link *et al.*, 2008.
26. Hor. *Ep.* 1, 18, 19; Paus. 6.9.1.
27. e.g. lemmas in Lidell *et al.*, 1925 and Pinkster, 1998.
28. Pinkster, 1998, lemma *phaselus*.
29. References in Latin to phaselus as ship or boat include: Auson. *Ep.* 26, Auson. *Mos.* 221, Cicero *Att.* 1.13.1., Cicero *Att.* 14.16, Cat. 4, Gell. 10.25, Hor. *Carm.* 3.2.28, Juv. 15.127, Luc. 5.518, Luc. 8.251, Mart. 10.30.13, Ov. *Am.* 2.10.9, Ov. *Pont.* 1.10.39, Prop. 3.21., Prop. 4.7, Prudent. *C. Symm.* 2.2.530, Prudent. *Perist.* 5.498, Sen. *Her. O.* 695, Stat. *Silv.* 5.1.245, Virgil, *G.* 4.289.
30. Thurston Peck 1898. Thurston Peck however, translates phaselus as kidney-bean.
31. *cf.* a Dutch term for a small vessel is 'notendop' (nutshell).
32. References in Medieval Latin to phaselus as ship or boat include: Cambini, C. Aurelio (1463-1494) *Opusculum Elegiarum* 4.1; 71, Cancianini, Gian Domenico Spilimbergo (1547-1630) *Odes* 17.38, Gambara, Lorenzo Brescia (c.1496-1586) *de Navigatione Christophori Columbi* 534, Landino, Cristoforo (1424-1498) *Xandra* 23.33-4, Rota, Berardino (1509-1574) *Elegiae* 10.17-8 (ad Christi Dei Crucem), Aleandro, Gerolamo (1574 - 1629) *Mocenica* 20, Anechini, Gerardo (14th century) *De Miraculis Occursis Mutine* 4.55, Augurelli, Giovanni Aurelio (1456-1524) *Carminum Libri* 9.4-5, Balbi, Girolamo (1450-1530) *Carmina* 839, Bargeo (1517-1596) *Syrias* 225, Bologni, Gerolamo (1454-1517) *Candidae* 1.29-30, Callimacho Esperiente San Gimignano (1437-1496), *Epigrammatum Libri Duo* 59.12, Chaula, Tommaso (c.1500-1600) *Bellum Parthicum* 329, 436, 6.105, Flaminio, Marco Antonio (1498-1550) *Carmina* 42.21, Guarino Veronese (1374-1460) *Carmina* 64.18, Lazzarelli, Ludovico (1450-1500) *De Gentilium Deorum Imaginibus* 645-6, Molza, Francesco (1489-1544) *Elegiae* 8.25, Sannazaro, Iacopo (1457-1530), *De Partu Virginis* 478, Sannazaro, Iacopo (1457-1530) *Eclogae Piscatoriae* 14, Stellato, Palingenio (1500-1543) *Zodiacus Vitae* 261-4, Verino, Ugolino (1438-1516) *Flametta* 10.7-8, 12.5, Zovenzoni, Raffaele (1431-1480) *Istrias* De Scardona ad Gorgidem Suum.3.
33. Pontano, Giovanni (1429-1503) *Eglogae* 5, 30.
34. *cf.* Prinster, 1998 lemma *pruina*.
35. Spurr, 1986: pp. 112-113.
36. Van der Veen, 2011: pp. 104-105.
37. <http://www.fao.org/ag/agp/AGPC/doc/gbase/data/pf000090.html> (accessed: 20-2-2014)
38. Mullen, C.L. *et al.*, 2003: p. 3. Online publication, accessed 20-2-2014 at http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0006/157488/cowpea-lablab-pigeon-pea.pdf
39. USDA SARE database, accessed: 24-3-2014 via <http://www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition/Text-Version/Legume-Cover-Crops/Cowpeas>
40. McGee *et al.*, 2014: p. 1 <http://css.wsu.edu/biofuels/files/2014/02/McGee2014OSDS.pdf>, online publication only. (accessed: 9-5-2014).
41. e.g. the genetics study by Perrino *et al.*, 1992: p.122.
42. Spurr, 1986: pp. 112-113.
43. 1 modius = 8.73 litres, 1 iugerum = 0.25 hectare.
44. e.g. <http://www.simplycanning.com/dilly-beans.html>, <http://www.mccormick.com/Recipes/Sauces/Dill-and-Garlic-Pickled-Green-Beans> http://www.pickyournown.org/greenbeans_pickled.htm (all accessed: 25-2-2014)

45. Lemma *Atriplex hortensis* L. in the online database *Germplasm Resources Information Network (GRIN)*. United States Department of Agriculture, Agricultural Research Service. (accessed: 5-3-2014).
46. Hondelmann, 2002: p. 49.
47. In modern Mexican salads (canned) kidney beans are often added, while in some Japanese salads the seeds of soybean are added.
48. C. McFadden speaks of very tender, young faba bean pods that are 'barely emerged from the flower', see note 26. Similarly, immature soybeans are often boiled 'in the pod' a preparation that is called *edamame*.
49. Available online at http://www.hs-augsburg.de/~harsch/Chronologia/Lspost04/Apicius/api_re00.html (accessed: 9-5-2014).
50. Available online at http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Apicius/5*.html#IV (accessed: 9-5-2014).
51. In the case of *frux*, as opposed to the more narrow *pomis* in section 6.33, 'fruit' is to include cereals and pulses.
52. For photographs of the different *Vigna unguiculata*'s at various stages, see Cappers *et al.* 2009 vol. 2a. p. 664-665.
53. Edict. Diocl. *Corpus Inscriptionum Latinarum*, vol. III, section 6.33.
54. For photographs of chickpea and chickpea pods, see Cappers *et al.* 2009: vol. 2a p. 566-568.
55. Pinkster, 1998 – lemma *purgabilis*.
56. Galen, *De alimentorum facultatibus* 1.25.
57. Kislev, 1989: pp. 262-270
58. Cappers & Neef, 2012: p. 18
59. Powell, 2003: p. 170
60. Sarpaki & Jones, 1990: pp. 263-268.
61. Curiously, as mentioned before, in German, *Faselbohne* refer specifically to the lablab bean (*Lablab purpureus*), for most other Germanic and Roman languages either use lablab or a variation on *dolique* or *dolico*.
62. In Farsi, Armenian, Azerbaijani and Georgian the common names for beans are لوبیا (*lubia*, also used in Arabic), [լոբի (*lobi*), *lobya* and ლობიო (*lobio*) respectively. These names seem somewhat akin to the *loboi* from Galen's text though it is beyond the scope of this article to explore the feasibility of a possible Persian loanword. *cf.* Van der Veen, 2011: p. 105 for a discussion on *lubia* in medieval Arabic.
63. Germer, 1988: p. 35 – sample Schw. Nr. 385
64. Germer, 1988: p.35.
65. Germer, 1985: p. 87-88.
66. Zohary *et al.*, 2012: p. 14.
67. Ciaraldi, 2007: p. 147;165.
68. Van der Veen, 2011: pp.104-105.
69. Cappers, 2006: pp. 176-177. This corrected the erroneous identification of the specimens as Pigeon pea (*Cajanus cajan* (L.) Millspaugh) in an earlier publication (Cappers, 1999: p. 188).
70. Perrino *et al.*, 1992: pp. 121-125.
71. Van der Veen, 2011: pp. 104-105.
72. Cappers, 2007: pp. 165-214.
73. Van der Veen, 2011: pp. 104-105.
74. These were Cappers *et al.*, 2009 (especially volume 2a, section on Fabaceae), Cappers & Neef 2012 (especially p. 322-338), Cappers & Bekker 2013 (especially the section on Fabaceae) and Neef *et al.* 2012 (especially pp. 214-219).

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