

Spices in the Ancient World

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Summary

The movement and consumption of spices and aromatics has been a feature of human history for many millennia. They have been found in contexts as diverse as early Iron Age Phoenician flasks, containing traces of cinnamon, to black peppercorns inserted into Rameses II's nose cavity, as part of the mummification process. Traditionally these plant (and occasionally animal and mineral) products have been viewed as the preserve of the elite, at least in the Mediterranean world and parts of Europe where many of them do not naturally grow. However, by the early centuries CE, thanks to a growing web of connections spanning Afro-Eurasia, especially via the Indian Ocean, a much wider range of peoples got a chance to experience spices. This impacted on everything from how their food tasted and smelled to the way in which religious and funerary rituals were performed.

Advances in archaeobotany and the archaeological sciences enable us to build an increasingly more complex picture of the contexts in which spice consumption took place, the connected social paraphernalia that was associated with this, and the diversity of people involved. Moreover, these methods and bodies of data are also contributing to our identification of the spices and aromatics that were being consumed, adding more detail to the sometimes hazy picture provided by our ancient authors.

Keywords: spices, aromatics, Roman cuisine, ancient Afro-Eurasia, black pepper, cinnamon

Introduction

Human beings have been making use of what we today call spices for millennia, as a growing body of archaeometric studies on material from locations across Afro-Eurasia makes clear. For instance, analysis of phytolith traces in the lining of pre- and early-historic pottery from Europe and the Near East reveal evidence for spice consumption, such as cumin (*Cuminum cyminum*) at Tell ed-Der (Saul et al., 2013). Similarly, micro-fossil starch grains of ginger (*Zingiber officinale*) and turmeric (*Curcuma longa*) have been identified on a *handi* or slender-mouthed cooking pot from Farmana, a Bronze Age settlement linked to the Indus Valley Civilization (Kashyap and Weber, 2010). Other studies indicate that such plant products were not simply being ingested, they could also be employed in more varied contexts like funerary rites, including the insertion of black peppercorns into the nasal cavity of Ramesses II (Plu, 1985). Further east, the archaeobotanical remains of Sichuan pepper (*Zanthoxylum bungeanum*) and ginger have been discovered in connection with a high-status burial from the Chu state (Wangshanqiao Tomb No. 1, Jingzhou) around 300 BCE (Sheng et al., 2020).

The advent of writing systems in different parts of Afro-Eurasia enabled many of these ancient peoples to express their growing desire and appreciation for spices and aromatics. Notably, in the *Tanakh* the Queen of Sheba is said to have come with a great caravan consisting of gold, gems and spices/aromatics in her first visit to King Solomon (*1 Kings* 10), while Moses was instructed to make a sacred anointing oil made up of liquid myrrh (from *Commiphora myrrha*), olive oil, *kaneh bosem*, cinnamon and cassia (*Exodus* 30.22-30; whether the last two were the products we know today has been the cause of some debate, outlined further below). The importance of anointing oneself with aromatic substances is also mentioned in the fifth century BCE *Tāṇḍyamahā Brāhmaṇa* (McHugh, 2012, pp. 235-236), and a number of early Chinese texts refer to the production of scented water (using processed plant materials) for ritual purification, such as the *Chuci* 楚辭 (*Songs of Chu*), a series of poems dating to the Warring States or Early Han period (Milburn, 2016, p. 444).

Iconographic evidence further underlines the symbolic importance that might attach to the acquisition and use of these spices and aromatics. One of the most famous examples of this is the expedition to Punt which is depicted on reliefs at Hatshepsut's temple at Deir el-Bahari (ca. fifteenth century BCE; as a side note, Punt was perhaps never a fixed place, but a nebulous location associated in the Egyptian imagination with valuable products, including aromatics, that derived from northeast Africa and/or southwestern Arabia: see Phillips, 1997; Breyer, 2016). A caption associated with this imagery speaks of boats returning from Punt with wonderous goods, including myrrh resin, cassia, and incense (Falk, 2013, p. 58). In one sense, we can tie this imagery and text to the cosmological sense of Egypt as the centre of order (*Ma'at*), with the Pharaoh whose role it was to maintain this order. And yet Punt, as the distant (hard to reach) source of fragrant incenses required for worshipping the gods, seems to have acquired a special status as an imagined borderland between the human and the divine (Moers, 2010, pp. 171-176). In a different context, we can also see incense tied up into ideological expressions of (divine) power. On the North Stairs, Central Relief of the late sixth century BCE palace at Apadana (Persepolis) there is an image of the Persian King receiving an important official. Among the other attributes expressing his status and power are two incense burners which are situated before the enthroned King.

As should be apparent, spices and aromatics were more than just products to make food taste more flavourful or things smell nicer but could potentially be embedded into symbolically charged and ritually significant activities. They were employed for numerous purposes across the ancient world, from religious and funerary rituals to perfumes, dyes, cosmetics, ointments, medicines, and ingredients for food and drink. Where they came from and the means by which they were acquired, how were they used, who was able to use or consume them, and the varying perceptions of esteem or banality to which they were subject never remained static. These phenomena are always dependent upon immediate socio-cultural context and bound up in

wider historic circumstances. However, before going on to dissect these themes, it is worth further exploring the thorny questions of what exactly constitutes a spice.

What are spices?

Most of us probably have a sense of what spices and aromatics are, but when scratching beneath the surface of our own geographic, cultural, and historic vantage points the potential ambiguities start to become more apparent. This is evident when looking at several modern English dictionary definitions, including the Oxford English Dictionary, Cambridge Dictionary, Britannica, Collins, Merriam-Webster, and the American Heritage College Dictionary, as well as definitions offered by organisations such as the U.S. Forest Service and the European Spice Association. These dictionaries outline several common attributes, describing spices as plant-based substances of strong flavour or aroma, deriving from tropical plants, and used in cuisines, condiments, and perfumes. Some writers on this topic place further emphasis on an apparent distinction between herbs and spices. The former are said to derive from the leaves of annual plants (i.e., they die each year) and are more often used in fresh, rather than dried, form. Whereas the latter are often traded and stored in dried form (though they can be consumed fresh) and might consist of the seeds, roots, rhizomes, barks, buds, and sometimes also the stigma (like saffron, *Crocus sativus*) and leaves (like bay leaf, *Laurus nobilis*) of plants (Miller, 1968, p. 1; McGee, 2004, p. 248; Czarra, 2009, pp. 9-10; García-Casal, Peña-Rosas and Malavé, 2016, pp. 3-4). Regardless of such distinctions, both spices and herbs chemically induce (mildly toxic) reactions in our taste buds and odour receptors. The associated plants evolved such mechanisms as defences against insects and herbivores, but which humans have come to “tame” and dilute through cooking (among other methods), creating pleasurable sensations as a result (McGee, 2004, pp. 387-389).

Darriet (2006, pp. 206-207) accuses many dictionary definitions of being redundant. This may be a little harsh, but it is clear that the boundaries of what constitutes a spice are porous and open to interpretation. For instance, would we consider a dried bay leaf to be a spice, but a fresh leaf a herb? Saffron is often seen as a spice, but it commonly grows north of the Tropic of Cancer rather than in tropical climates. Similarly, cumin can be grown in various places from the Mediterranean to Central Asia and India, though in the case of the Roman Empire, the first century CE satirist Persius (*Satires* 5 ll. 55) speaks of it as an eastern import alongside pepper (*piper*). As Parti (2023, p. 6) observes, the differentiation between herbs and spices may make sense to a cook but it is pretty meaningless to a botanist.

More importantly, it is also not clear that our distinction between herbs and spices would have been understood in quite the same way in various ancient societies. For example, Pliny the Elder, writing in the mid-first century CE, exclaims that Nature (as a divine force) provides remedies for all humankind from local plants, lamenting that in his own time fabulous medicinal concoctions based on Arabian and Indian products had become so fashionable (*Natural History* 24.1.4-5). Here the distinction is primarily based on the perception of the local versus the foreign or exotic, rather than the physical attributes of the plant or plant products. Nor are their methods of cultivation, processing and preservation what separates them. Interestingly, it is often this perceived “otherness” that played a role in spices and aromatics being viewed as both potent (compare Pliny’s (*Natural History* 12.26.45) description of different types of nard, in which the best is said to come from India) and luxuriant (Totelin, 2015, pp. 156-157; Simmons, 2020, pp. 315-317). It is not uncommon to see a deliberate stress on the origin of certain spices, such as in the late fifth to early fourth century BCE Hippocratic Corpus, where we have references to Indian pepper and Ethiopian cumin (Totelin, 2015, p. 153).

We should also consider the difference between spices and aromatics. The latter often derive from exudates, plant resins or oils (more scientifically, having a benzene chemistry), and much focus tends to be placed on their smell (e.g., use in perfumes and incenses) rather than their taste. However, some of our ancient authors offer an intriguing mix of support for, and contradiction of, this distinction. Theophrastus (ca. late fourth to early century BCE) in his work *On Odours* (10) describes perfumes and fragrant substances as spoiling food, whether cooked or not, but being suitable to add to wine. Similarly, Pliny (*Natural History* 13.5.24-25) disparages the fashion for putting bitter unguents (*unguenta*) into drinks to gratify both smell and taste. But in the *De re coquinaria* (*On the Subject of Cooking*) a Late Antique compilation of recipes (for a useful commentary, see Grocock and Grainger, 2006), we do have occasional examples of bitter aromatics being used in Roman cuisine (dating individual recipes is difficult, but some may go back as far as the first century CE; the moniker Apicius is attributed to the text and may allude to the first century gourmand Marcus Gavius Apicius, whose name became a byword for culinary excess). Notably, spikenard (*Nardostachys jatamansi*) is included in a recipe for silphium or laser sauce (1.32), and it is said that it could be added, alongside honey, to try and remedy a bad smelling broth (1.9). Conversely some spices that people now commonly use as a flavouring or in dishes tended to be mainly employed for perfumes and medicines in the Roman world (Miller, 1968, p. 2; Grainger, 2021, p. 165).

We can look back to the roots of our own modern English terms spice and aromatic, which respectively derive from Classical Latin and Ancient Greek. But here we find as much fluidity and potential ambiguity as we do with our own usage. It is commonly noted that the English term spice ultimately derives from the Latin *species* (via the Old French *espice*), which can mean a thing of value (Miller, 1968, p. 1; McGee, 2004, p. 248; Potts, 2012; Parti, 2023, 6). However, the term has a broader range of meanings and is often used to designate a type of something (as opposed to a *genus*, a group with common characteristics). For instance, in book

13 of his *Natural History*, Pliny talks of different kinds (*species*) of pomegranate (13.34.113), as well as referring to nine types (*species*) of plants that resemble Indian nard (13.2.16). Thus, trying to make our own notions of spices conform to the original Latin term *species* would be unhelpful.

The Ancient Greek term *aromata* (ἀρώματᾶ), singular *aroma* (ἄρωμα), is the source of the modern English word aromatic. It had also found its way into Latin usage, as *arōma* (sg.) and *arōmata* (pl.). This term perhaps comes closer to our own (slippery) definitions of spices and aromatics, with Theophrastus describing ἀρώματᾶ as having pungent, astringent, sharp, and hot qualities, and some also bitter (*On Odours* 5.21). However, when speaking about different plant products used to make perfumes (literally, aromatic things = τὰ ἀρώματα), Theophrastus mentions a range of items that we might be willing to ingest (perhaps failing under our label spice) and some that we generally would not, although we might enjoy them for their odour (falling under our more olfactory conception of aromatics). These include, cardamom (*Elettaria cardamomum*), cinnamon, cassia, spikenard, balsam of mecca (*Commiphora gileadensis*), storax (*Styrax officinalis*), saffron-crocus, myrrh, dill (*Anethum graveolens*) and sweet marjoram (*Origanum majorana*) (*Enquiry into Plants* 9.7.3). Thus, the Greek term ἀρώματᾶ could be rendered as spices, aromatics or perfumes, depending upon the context (other more specific terms also existed, like θυμιάματα (*thumiamata*) for incense and θηριᾶκή (*theriaca* in Latin) for complex antidotes against poison – Miller, 1968, p. 2; Totelin, 2015).

Reflecting upon these points, it becomes apparent that trying to apply watertight definitions to the terms spices and aromatics is unhelpful. And that we should be willing to accept a certain degree of flexibility in our historical analysis. These mainly harvested and/or processed plant products were appreciated in the ancient world for their variously fragrant, pungent, hot, sweet, sharp/biting and astringent qualities. They were employed in various ways

and in different social contexts, frequently appearing in combination with other ingredients in perfumes, medicinal concoctions, incense mixtures, ointments, embalming fluids, cosmetics, and culinary dishes. Perhaps most importantly, they were regarded as imported, non-local items, which might be perceived as exotic or intrusive. In the latter case, these “foreign” plant products are sometimes regarded as displacing more traditional materials, such as when both Ovid (*Fasti* 1.337-342) and Pliny (*Natural History* 12.41.82-74) complain about incense being used profusely in religious rites, whereas formerly offerings of salted cakes, barley and spelt grain would suffice.

These imputed (rather than inherent) qualities could give them a sense of the luxurious, decadent, potent, dangerous and immoral, depending upon one’s perspective, which was often influenced by wider social discourse. A sense of otherness might not be solely geographic but could also come from negative or positive moral associations with the “other”. In the negative, we see intellectual justifications for rejecting the use of incense and perfumes in religious rites among Christian writers around the second to fifth centuries CE (despite this, incense would go on to be highly important in liturgical practices in later centuries). A strong reason for this was the association of incense use with Roman polytheistic and Gnostic rites, but this rejection also necessitated a rationalisation of earlier “obsolete” Jewish practices involving these aromatic materials (Caseau, 2022).

This focus on the notion of “otherness” might seem Eurocentric, but it is worth noting that it was not only people in the Euro-Mediterranean region that imported a diverse variety of plant products from afar. For instance, the semi-utopian land of Da Qin (often equated with the Roman Empire; see Leslie and Gardiner, 1996) was known (rightly or wrongly) in Chinese texts as a source of numerous valuable products including storax (*suhe*), frankincense (*xunlu*), and various blended fragrances (*Hou Hanshu* 88.12; *Weilüe* “Peoples of the West” 12; *Zhenglei bencao*; *Jiayou buzhu Shennong bencao*). Similarly, many aromatic substances are presented

as exotic and deriving from remote (and sometimes tributary) places in pre-modern South Asian texts, such as in the *Mahābhārata* (ca. 400 BCE – 200 CE) (McHugh, 2012, pp. 161, 166-169). The flow of plant products from west to east is noted by the author of the *Periplus Maris Erythraei*, a mid-first century CE Greek guide to goods that could be acquired and sold at different Indian Ocean emporia. He reports that saffron (a product of the Eastern Mediterranean) was in demand at the Arabian port of Muza (al-Mukhā) (24.8.3a; see Casson, 1989, p. 152). Pliny also comments on the seemingly surprising fashion for foreign perfumes in Arabia (which was known as a major producer of aromatic substances), opining that people tire of what is familiar to them and crave what others have (*Natural History* 12.38.78).

How were spices used?

As has been made clear, spices and aromatics could appear in a huge number of different contexts, but certain products might become strongly associated with a specific use. For instance, black pepper (*piper nigrum*) is the most widely named spice in the *De re coquinaria*, being referenced some 368 times (Grainger, 2021, p. 161), as well as appearing in over 80% of the recipes (Cobb, 2018a, p. 534). It does get mentioned in medical texts as well, and was viewed as having medicinal benefits (Simmons, 2021, p. 365), but its culinary popularity is in little doubt. By way of comparison, frankincense (various *Boswellia* species, including *Boswellia carterii*) was employed frequently in religious and funerary rituals, being burnt (sometimes with other things in incense compounds) and used in oils for ritual anointment (see, among others, Peacock and Williams 2007). Nonetheless, there was rarely ever an exclusive use for a particular spice or aromatic. Frankincense might have been “food for the gods”, but it could also be used in a pastil alongside other ingredients to treat bleeding piles and anal fissures according to the first century medical encyclopaedist Celsus (*On Medicine* 5.19).

The versatility of many spices and aromatics is underscored by the fact the same item might feature in culinary recipes, perfumes, cosmetics, and medical concoctions. In fact, we can sometimes see an intersection between these uses. Theophrastus, for instance, mentions how perfumes might simultaneously have medicinal qualities due to their ingredients. One example he provides is *megaleion*, which is said to contain burnt resin, cinnamon, cassia and myrrh. Besides its fragrant properties, it purportedly helped with inflammation caused by wounds (*On Odours* 35). In a similar vein, Schafer (1985, p. 155) observes that the boundaries between perfumes, drugs, spices, and incenses in East Asia were porous, with these products being used for various spiritual and mundane purposes. Indeed, the Chinese practice of wearing spice bags upon one's person can be traced back to the latter half of the first millennium BCE, being thought to improve health and ward of malevolent spirits (Di Lu and Lo 2015).

An important intersection also existed between cuisine and health. In the Graeco-Roman world, numerous spices were believed to generate heat, aid digestion and be useful for purging the system (Wilkins and Hill, 2006, pp. 216–244; Wilkins 2015, p. 7); notably Galen advises patients to maintain heat in their stomach (*Natural Faculties* 2.4, Kühn 2.89; Grant, 2018, p. 547). Occasionally these products might also be used to disguise the taste of other “medicine”, with several writers suggesting that pepper could be used to make unpalatable concoctions more tolerable for patients (Simmons, 2020, p. 279). A quite vivid example is provided by Pliny (*Natural History* 28.77.256) who, in a seemingly matter-of-fact manner, repeats Osthane's claim that bitter tasting nard added to billy-goat urine can help a woman forget her former lover—a spoonful of nard helping the medicine go down, to misquote Julie Andrews. Spices and aromatics abound in Roman Imperial era medical treatises, including those written by Dioscorides (*Medical Materials*), Celsus (*On Medicine*), and Galen (numerous works, including *On the Properties of Food Stuffs*). In fact, we have far wider range of medicinal allusions to spices and aromatics in Greek and Roman texts than culinary ones.

The belief in the impact of spices (and aromatics) on bodily health was by no means confined to the ancient world, but also influenced medieval and early modern thinking (Freedman, 2008, pp. 4-5, 60), and persists to this day, as we can see in both discourses about traditional and herbal medicines, as well as medical and Food Science literature (McGee, 2004; García-Casal, Peña-Rosas and Malavé, 2016; Al-Dahmash et al., 2021; Smiechowska, Newerli-Guz and Skotnicka, 2021). This is not to say, however, that concerns about health always mandated what people ate or overrode popular tastes (Freedman, 2008, p. 57). As we have already seen, the widespread popularity of black pepper in the Roman Empire was almost certainly tied to an appreciation for its taste (black pepper was regarded as less medicinally effective than long and white pepper by our Classical authors, though it still had some potency – Simmons, 2020, pp. 312-314). Even the moralising Pliny (*Natural History* 12.14.27-29), who is dismissive of this spice's pungent (*amaritudo*) popularity, accepts that its taste is agreeable (*gratius*).

The products referred to as cinnamon and cassia by our Greek and Roman authors provide a useful case study of this adaptability. Both featured in spiced wines (Dioscorides *Medical Materials* 5.49; also *Geoponica* 8.25), while cassia is said to have flavoured olives (Persius *Satires* 2 ll. 61-68) and been infused into olive oil (Virgil *Georgics* 2 l. 466). Both cinnamon and cassia might also be ingested as part of an antidote against poison according to Celsus (*On Medicine* 5.23.1-3) or in a pastil designed to aid in the passing of bladder stones (5.19.2-6). Furthermore, they are mentioned in connection to an emollient designed to treat liver pain (5.18.3), while Dioscorides reports that cassia could be applied to the skin lesions (*Medical Materials* 1.12). Martial alludes to the use of cinnamon and cassia in perfumes (*Epigrams* 3.63, 6.55) and cinnamon in fragrant hair oils for personal grooming (Martial *Epigrams* 3.63). In funerary contexts, Persius castigates the stingy heir for not ensuring that the cinnamon is fresh and the cassia free of adulteration (*Satires* 6 ll. 33-37) and, more

disturbingly, Martial mockingly claims that Zoilus would stoop to the level of stealing cassia, myrrh, and frankincense from the funeral pyre, and cinnamon from the stygion couch (that is the bier). In terms of religious activity, Augustus is reported to have been the first to burn cinnamon to worship Jupiter (Ovid *Fasti* March 17), while his widow Livia also dedicated a cinnamon root to her departed (defied) husband, and Vespasian placed processed cinnamon encased in gold in the Temple of Concord (Pliny *Natural History* 12.42.19).

Identify spices: where did they originate from and how were they traded?

The range of contexts in which cinnamon and cassia appeared and the uses to which they were put is impressive. However, these products are not only indicative of the wide-ranging social significance of spices, they also exemplify the challenges faced by modern researchers when exploring the history of spice trade and consumption: namely where did these spices originate from? Can we easily identify the species from which they were cultivated or collected? And do the names we now give to specific spices and aromatics actually equate with their ancient namesakes?

All these questions are particularly relevant for cinnamon and cassia. Today we identify cinnamon as *Cinnamomum verum* (synonym *C. zeylanicum*), originating from Sri Lanka and southern India, and cassia as *Cinnamomum cassia* (also *C. burmannii*), originating from East and Southeast Asia (Ravindran and Babu, 2003, p. 1; Ravindran et al., 2003, p. 14-16). Some ancient historians are willing to connect the products known to our Greek and Roman authors with species from the *Cinnamomum* genus, although they debate which one. Casson (1989, pp. 122-124) believed this cinnamon was in fact *C. verum*, Miller (1969, pp. 42-47, 74-77) argued for *C. macrophyllum* from Indonesia, and Manniche (1999, p. 17) has even proposed *C. camphora*, suggesting that it came from East Africa, although it is native to East Asia. By

contrast, De Romanis (1996) argues that the cinnamon and cassia known to our Classical authors were, in fact, East African plants, not of the *Cinnamomum* genus, tracing the etymological origins of their names back to Egyptian and Semitic antecedents.

Various arguments have been made for or against these positions, with Seland (2010, p. 40) contending that cinnamon was not being harvested in South Asia around the turn of the first millennium CE, and therefore questions whether the spice known as cinnamon to the Greeks and Romans was the same thing. Miller made a similar point (1969, pp. 74-77, 153-172), noting that no reference to cinnamon is made in connection with Taprobanê (Sri Lanka) in Claudius Ptolemy's *Geographia* (second century CE), leading him to suggest Southeast Asia as an alternative source. Ravindran and Babu (2003, p. 5) note that cinnamon wood, a separate product from cinnamon bark (with its sweet taste), if burnt to produce a fragrant smoke, cannot be the wood of *C. verum* but perhaps instead the wood from the East African plant *Cinnamosma fragrans* (note the above ancient testimony linked to religious and funerary practices).

We can try to look to our ancient texts for solutions, but the testimony is not always precise and easily interpreted. Pliny describes the plant from which cinnamon derives as a shrub two cubits high (roughly a metre) and four fingers in breadth (about 45 centimetres), preferring dry climates and having leaves like wild marjoram (*Natural History* 12.42.89). He further describes the product as sticks of dried bark that crumble with enough pressure, with black and white varieties, the former being more favoured by his own time (12.42.92). Additionally, Dioscorides (*Medical Materials* 1.13) describe cinnamon as sweet smelling. Some elements of this description seem close, others are wide of the mark. It is true that wild *Cinnamomum verum* can grow up to 16 metres tall and 30-60 centimetres in diameter, but cultivated species often form dense bushes around 2 to 2.5 metres high (Orwa et al. 2009), which does not seem a million miles away from Pliny's claim. However, the species definitely prefers warm and wet climates, not dry ones. It is not possible to know if his description of the tree and its habitat is

second hand (though this seems likely), but he almost certainly will have seen the harvested and dried product.

In the case of cassia, Pliny (*Natural History* 12.43.95-97) similarly describes it as a shrub, though in this case growing to 3 cubits (ca. 1.5 metres) in height and with a habitat not far from the area in which cinnamon is harvested. Unlike cinnamon, where intact sticks were said to be preferred, crumbled pieces of bark that has fallen of the tree is said to be most valuable. The fresh bark is described as bitter and hot to taste, but with a delicate smell, and due to this is mainly employed for medicinal purposes. Again, we have a mixture of elements that both accord with, and diverge from, our notions of *Cinnamomum cassia*. The bark product that derives from it is similar to cinnamon, but with a less delicate flavour (Davidson 2014a), it is also hotter to taste, though it is certainly not as bitter as Pliny suggests. The tree also very much prefers (semi) tropical conditions.

If the details given by Pliny leave several ambiguities, the wider debate in the Graeco-Roman literary tradition about the origins of cinnamon and cassia is even more fraught. The earliest and most fanciful claims go back to Herodotus (fifth century BCE) who spoke of cassia being grown around a shallow lake in Arabia, protected by dangerous winged creatures similar to bats, while cinnamon is said to be obtained from the inaccessible nests of the phoenix of which pieces had fallen to the ground (*Histories* 3.110-111). Other sources continue to assign the origins of cinnamon and cassia to Arabia (Agatharkhides 99b + c = (b) Diodorus Siculus *Bibliotheca Historica* 3.46.1-5; Ovid *Fasti* 3.731; Ovid *Metamorphoses* 10.308, 15.398-9; Propertius 3.13.8; Dioscorides *Medical Materials* 1.12 Statius *Silvae* 4.5.30-2; Arrian *Anabasis* 7.20.), but Pliny explicitly challenges this idea (*Natural History* 12.42.85) and asserts that East Africa is their source (he specifically mentions it coming from the land of the Aethiopians who are intermarried with the Trogodytae). Strabo stands out in his claim that southern India is one of the sources of cinnamon (*Geography* 15.1.22). Unfortunately, the

author of the *Periplus Maris Erythraei* does not make explicit reference to cinnamon, although he does mention that cassia was available at emporia on the East African coast, namely at Munda, Mosyllon, the Spice Port, and Opônê (9.4.3, 10.4.10, 12.4.27, 13.5.4.). It is likely that some of these contradictory claims result from a conflation of the place where the trees/shrubs grew, and the emporia at which it could be acquired. Pliny claims as much when asserting that East Africa was the true origins of these products.

It is worth noting that in a study published in 2015, Gilboa and Namdar claimed to have identified traces of cinnamaldehyde from ten Phoenician flasks (ca. late eleventh to tenth century BCE) discovered in Israel. Since cinnamaldehyde is an organic compound occurring naturally in the *Cinnamomum* plant *genus*, we appear to have an example of cinnamon being brought to the Mediterranean region. This discovery does not necessarily resolve the debate, but future residue studies could hold the potential to expand our knowledge. Consequently, we are left with a number of possibilities:

- 1) The original terms cinnamon and cassia alluded to different plant products, but over time (during Antiquity) they eventually became applied, by at least some authors, to the products we now know as *Cinnamomum verum* and *Cinnamomum cassia*.
- 2) Cinnamon and cassia were being utilised, but these products were known by different names in Antiquity.
- 3) The ancient names cinnamon and cassia originally referred to plant species and products from East Africa (or Arabia), the names continued to be applied to the plants from East Africa, but new products (*Cinnamomum* bark) from South and/or Southeast Asia also acquired these labels.
- 4) The ancient names cinnamon and cassia refer to different, probably East Africa (or Arabian), plants and plant products, this usage never changed, and people from the

Euro-Mediterranean region remained largely ignorant of *Cinnamomum verum* and *Cinnamomum cassia* (with possible rare exceptions).

To my mind, option 2 seems the most likely, and option 4 the least, with options 1 and 3 remaining possibilities if Strabo's claim (borrowed from Aristobulus) about cinnamon being available from southern India reflects a genuine expansion of knowledge. To this point, we can add the observation that Pliny refers to various types of nard growing in several disparate regions, including Syria, Gaul, Crete and India (*Natural History* 12.26.42-46.). These were clearly different species, but they shared the same nomenclature, presumably because they were felt to share similar qualities or attributes. Thus, reminding us that these taxonomic classifications were not always rigid (on these challenges, see Wendrich et al., 2003, pp. 70-71; Cappers, 2006, p. 5).

Not all spices mentioned by our Classical authors have proved as controversial to identify. In some cases, the descriptions provided offer enough detail for a specific type of the species to be recognised. Scarborough (2010, p. 138) asserts that Dioscorides' description of aloe is precise enough that we can be confident that he is referring to a variety found on the island of Socotra (*Aloe perryi*), while Dalby (2000, p. 102) claims that the ancient testimony about cardamom seems to approximate with our own *Elettaria cardamomum*. In other cases, it is possible for modern scholars to identify the misunderstandings of our ancient authors, such as Celsus' and Pliny's conflation of aloe wood with true aloe (Scarborough, 2010, p. 139).

In the case of some spices, there was a reasonable conception of the actual region from which they were collected or cultivated, as we can see with some of the *piper* species. As far back as Theophrastus, there is an awareness that black pepper and long pepper (*Piper longum*) derive from different plants (*Enquiry into Plants* 9.20.1), and by Pliny's time there was a keen financial, medicinal and culinary distinction between black, white (the latter being the berries

of *piper nigrum* which had ripened fully, subsequently soaked to remove the skin, and then dried) and long pepper as products, even if he muddles his description of the botanical features of the plants from which they derived (*Natural History* 12.14.26-8; on finer distinctions in taste, see also Dioscorides *Medical Materials* 2.189). The author of the *Periplus Maris Erythraei* (56) correctly noted that black pepper was grown in the Kottanarikê hills (Western Ghats) of southern India. He was less precise when it came to locating long pepper, merely noting that it could be acquired at the port of Barygaza (near the mouth of the River Narmada, Gujarat) in the northwest (*Periplus Maris Erythraei* 49), although it grows much further north in the foothills of the Himalayas (Davidson, 2014b).

The variability in the details we get from our literary sources is likely a reflection of the increasingly complex networks of exchange that were developing from the late first millennium BCE into the early first millennium CE. The maritime transit of goods, including spices and aromatics, can be traced back to the Bronze Age, as Egyptian expeditions to Punt and links between the Indus Valley civilisation, Oman and Mesopotamia demonstrate. Nevertheless, Miller (1968, p. 24) claimed that the development of cross oceanic voyaging in parts of the Indian Ocean, making use of the seasonal monsoon winds, enabled the flow of a much larger volume of spices than had been possible with overland transit. There is some truth to Miller's claims, but two important caveats need to be made. First of all, a neat distinction between maritime, riverine and overland transport often belies a more complex reality. Secondly, Miller's dating of this development is too late, and too Romano-centric.

The movement of black pepper between southern India and the Roman Empire in the early first millennium CE provides a nice exemplar of caveat one. There is no doubting that by the first century CE the volume of pepper being imported into the Euro-Mediterranean region reached a scale that had not been seen previously, as a range of literary, documentary and archaeobotanical evidence indicates (Cobb 2018a; Cobb 2022). This was facilitated by high

levels of connectivity across the wider Indian Ocean and the potential development of a class of large ships (μέγιστα πλοῖα) that specialised in acquiring black pepper (among other products) from south-western India (De Romanis 2020). Nonetheless, this by no means an exclusively maritime endeavour. Local populations in the Western Ghats (especially those around the Vembanad Lake up to Nilgiris) will have collected and processed the black (and white) peppercorns, while a variety of individuals involved in transiting these goods travelled via a mixture of overland and riverine routes, such as taking them on rafts down the Periyar River to Muziris (*Akanānūru* 149) or transiting them east on wagons to places like Puhar on the coromandel coast (*Pattinappalai* 186). In the case of Muziris, small boats (*lintrēs*) or canoes may have been used to take these goods out to the large vessels moored offshore, as indicated by Pliny (*Natural History* 6.26.104) and potentially hinted at by the discovery of the remains of a water-logged canoe and a wharf at Pattanam, a site thought to be either ancient Muziris or a satellite settlement (Cherian et al. 2009). After crossing the Arabian Sea, Gulf of Aden and Red Sea and arriving at the port of Berenike, the unloaded black pepper, and other commodities, including spices like malabathron (leaves of *Cinnamomum tamala*), which was similarly available at Muziris (*Periplus Maris Erythraei* 56), would have been assessed for taxation (Muziris Papyrus = *P. Vindob.* G 40822) and stored at the spice warehouse (Ast and Bagnall, 2015), before being transited across the Eastern Desert via pack animal to the customs house at Koptos. Then some or all of these goods would be floated down the Nile River on barges to the customs house at Alexandria, with much of this cargo then being sold at auction and shipped to other ports in the Roman dominated Mediterranean.

Coming to the second caveat noted above, the idea that full knowledge of how to exploit the monsoon winds (by people from the Graeco-Roman dominated Mediterranean) developed as late as the mid-first century CE (an idea that Miller derives from Warmington, 1928) now seems much less likely. The development of cross-oceanic voyaging appears to have been a

long-term development taking place during the late centuries BCE (Tchernia 1995; Cobb, 2018b, pp. 39-45). Increasingly complex networks began to link up different parts of the Arabian Sea, Bay of Bengal and South China sea regions during this period (Abraham 2023; Bellina, 2022; Cobb, 2023), involving historical actors from multiple ethno-linguistic, cultural and socio-economic backgrounds (Simmons, 2023). This high level of connectivity often meant that numerous spices and aromatics (among other goods) cultivated/collected and processed in one region were made available to purchase in another. The availability of Gangetic nard at the Muziris (near the Kerala coast) is one such example (*Periplus Maris Erythraei* 56; Muziris Papyrus = *P. Vindob.* G 40822 verso).

These complex networks enabled products from the eastern edges of Afro-Eurasia to reach the west, and vice versa (via direct or indirect networks of exchange). For example, coins minted in the Roman Empire ended up in Thailand, Vietnam and Java (Hoppál et al., 2018, pp. 461–478; Borell, 2019, pp. 60–61), as did gemstones carved with Graeco-Roman style imagery (Borell, 2017, p. 25; Borell, Bellina, and Chaisuwan, 2014, pp. 102–104), while sapphires from southeast Asia seem to have found their way to Italy (Butini et al., 2018). The extent to which spices originating from East and Southeast Asia made it to the Euro-Mediterranean region in Antiquity has proved trickier to assess. One interesting spice to evaluate is ginger, which derives from several species native to Southeast Asia, and was possibly transplanted to China by the first millennium CE (Miller, 1968, p. 53). It can be consumed fresh, but for long-distance transport its rhizome was likely either dried or pickled; Dioscorides (*Medical Materials* 2.160) mentions the latter. Like cinnamon and cassia, many of our ancient authors attribute its origins to East Africa, Arabia (Dioscorides *Medical Materials* 2.160; Pliny *Natural History* 12.14.28), or Sri Lanka in the case of Claudius Ptolemy (*Geography* 7.4.1). These claims raise the following possibilities: namely ginger is the same product that we know today, and it was transited from East or Southeast Asia. Alternatively, it was a different product from a different

plant species, with the name eventually shifting to the product we now know as ginger. Our sources confuse the emporia where it was available with its actual natural habitat and place of cultivation. And finally, ginger (*Zingiber officinale*) could have been transplanted further west (later dying out). The latter scenario is by no means impossible. Unlike the environmentally sensitive clove (*Syzygium aromaticum*, synonym *Eugenia caryophyllata*), nutmeg and mace (*Myristica fragrans*), which for a long time only grew in the Moluccas, ginger is easier to transplant to sufficiently warm climates. Indeed, the transplantation scenario has gained some traction (see, Raschke, 1978, pp. 652–655; Dalby, 2000, pp. 21–26; Seland, 2010, pp. 40–41).

Cloves, the sun-dried, unopened flower buds from the Moluccas, was a product highly sought after across Afro-Eurasia during the medieval and early modern periods (Freedman 2008; Ptak 1993); one of our earliest secure archaeological attestation comes from a tenth to eleventh century layer at the Sri Lankan port of Mantai (Kingwell-Banham et al., 2018; a find has been claimed for eighteenth century BCE Terqa, Syria). By comparison, the extent of its popularity in the ancient world and how widely it circulated is less clear. Miller (1968, pp. 47-51) argues that Pliny's reference to *caryophyllon* is our earliest Classical attestation (*Natural History* 12.15.30; he further speculates that Pliny could have been drawing upon an earlier Greek source), while the Ayurvedic medical text the *Charaka Samhita* may indicate the cloves were reaching South Asian around the end of the first millennium BCE to beginning of the first millennium CE (Zumbroich, 2012, pp. 64-67). By the Late Antique period we have more evidence, including allusions from sixth and seventh century CE writers like Cosmas Indicopleustes (*Christian Topography*), Anthimus (*On the Observance of Foods*), Paulus of Aegina (*Medical Compendium in Seven Books*) and Alexander of Tralles (*Twelve Books on Medicine*). To this we can add the *Liber Pontificalis* (a collection of biographies on Roman bishops) which records various endowments made under Pope Sylvester (314-335 CE). One purported endowment for the Basilica of St. Peter the Apostle included an Egyptian estate

which, in addition to its annual revenues, also sent goods in kind, including 150 libra (ca. 49 kilograms) worth of cloves (*cariophyllu*), as well as other items like cassia, nard oil, saffron and storax (*LP* 34.20)—presumably intended for use in liturgical practice (Seland, 2012, pp. 123-124).

It would be remiss not to end this section with some mention of the now (in)famous cinnamon route theory long ago proposed by Miller (1968, pp. 153-172). He argued that Pliny's description of raft-men, who lacked oars, steers, and rudders, and were at the mercy of the wind on the open sea, was a simplified allusion to Austronesian outriggers sailing for Madagascar and then up the coast of East Africa (*Natural History* 12.42.19). These so-called raft-men are said by Pliny to have carried cinnamon from northeast Africa (Trogodytica) over to Ocilia (almost certainly Ocelis on the SW Arabian Peninsula – Casson 1989, pp. 157-158), after which merchants took it to the Roman Empire. Suffice to say, this theory has been subject to some scepticism and even a little scorn (see Raschke 1978, pp. 652-554, who is perhaps one of the harshest critics; but also De Romanis, 1996; and for a more neutral view Horton, Boivin and Crowther (2020): 394-95). That said, a few scholars have either given some credence to the theory or suggested a variation upon it (see Beaujard, 2007; E. M. Pearce and F. M. Pearce, 2010, pp. 71-80). Certainly, sailing from Southeast Asia to Madagascar was possible, either via the Sunda straits, subsequently using sub-equatorial currents to reach the Comoros and Madagascar, or via Indonesia stopping en route at the Maldives and Chagos archipelago, or alternatively north via Sri Lanka (Boivin et al., 2013, p. 255; C. E. M. Pearce and F. M. Pearce, 2010, pp. 67-85). Nonetheless, a late first millennium CE phase for Madagascan colonisation tends to be favoured (Boivin et al., 2014, pp. 554-555), and even if it were earlier, this is not sure proof of the existence of a “cinnamon route”.

Were spices regarded as luxuries?

Whatever the actual historical details (if any) that underlay Pliny's account of the raft men, he, nevertheless, uses the story as an opportunity to sneer at women's fashion (since the raft men are said to have traded the cinnamon for necklaces, bracelets, buckles and other items), just as he elsewhere bemoans *luxuria* and often misogynistically singles out women (*Natural History* 12.42.88). The ephemeral nature of spices and aromatics meant that they were liable to the accusation of being superfluous. For example, Pliny (*Natural History* 13.4.20) dismisses perfumes for the very transitory nature of the smell they provide, saying that at least pearls and gems retain their value. Additionally, decadent cuisine (involving a complex range of ingredients, including spices) could be attacked, especially in light of the emphasis placed on traditional Roman values of simplicity (Edwards, 1993, p. 186; Garnsey, 1999, p. 113).

High-quality paraphernalia also developed in connection with the use of spices and aromatics, such as the finely decorated incense burners appearing from the late first millennium BCE in China, which included depictions of animals or burners shaped to resemble natural features like mountains (Milburn, 2016, pp. 442-444). In the Roman Empire several *piperatoria* or pepper shakers (these were not mills as they did not grind the spice) have been found at sites dating from the first to fourth centuries CE, including Pompeii in Italy, Chaource and Vienne in France, Hoxne in Britain, Nicolaevo in Bulgaria, Sidon in Lebanon, and Histria in Romania (Țârlea et al., 2020). These idiosyncratic objects were mostly made of silver, though the one from Histria is made of bronze, but was probably originally gilded with gold (Țârlea et al., 2020, p. 124). A few of these objects symbolically convey images of power and subjugation, such as the so-called 'Sleeping African Slave' *piperatorium* from Chaource (British Museum 1889, 1019.16; Simmons, 2021, p. 369) which depicts a figure squatting to take a nap, with a lantern between their feet (perhaps representing a slave waiting for their master and mistress to exit from a late evening banquet to which they were guests). Eckhardt

has also suggested that these *piperatoria* could have been intended to be exotic, matching the spices which were their contents (2014; also Țârlea et al., 2020, p. 139).

This mix of literary testimony and associated material culture might lead one to the impression that spices were regarded as luxuries in many ancient societies. Certainly, the bundling up of spices and aromatics, alongside other Indian Ocean goods, into the (reductive) category of luxury was not uncommon in earlier scholarship (e.g., Warmington, 1928, pp. 40-42, 79-83; Miller, 1968, p. vii; Casson, 1989, pp. 15, 19; De Romanis, 1996; Keay, 2005, pp. x-xi). Raschke (1978, p. 650) even suggest that the supposed drain of wealth from the Roman Empire to pay for eastern goods was primarily due to the demand for spices rather than silks. This premise, however, has long since been challenged. This is both on the broader sociological point that luxury is not a fixed category, but socially negotiated, as well as the fact that, as we have seen, spices and aromatics were embedded into a huge array of different social activities and consumption patterns, some of which may have been seen as morally and religiously necessary, others as medically useful (van der Veen, 2003; Sidebotham, 1986; Sidebotham, 2011; Cobb, 2013; Cobb, 2018b; Simmons, 2020). On their own, most spices would probably not be seen as luxurious *per se*, but they could in certain contexts, like elite dining and drinking parties (*convivia*), become part of the expression of connoisseurship and taste, both literally and in connection with the associated paraphernalia used at such events (Cobb, 2013; Simmons, 2021, p. 367).

By the Roman Imperial period, some of these spices and aromatics were comparatively cheap, notably black pepper was valued by Pliny at 4 denarii (16 sestertii) per libra (323g) (although long pepper costs 16 denarii and white pepper 7 denarii), and for frankincense he prices it at 6, 5 and 3 denarii, depending upon the quality (*Natural History* 12.14.28, 12.32.65). Even the more expensive spices like Malabathron leaf (60 denarii) and spikenard (100 denarii), would pale in comparison to the cost of the most expensive pearls, gemstones, and dyed silks.

Commodities like black pepper and frankincense were well-within the reach of many people of middling economic means (skilled artisans, small businesses people, those engaged in professions), and even somewhat poorer urbanites, given that most individuals would not be purchasing a whole libra, but more modest amounts, or consuming small amounts as part of pepper-flavoured dishes (Cobb, 2018a; Cobb 2022; Simmons, 2020). The latter include the beets prepared in wine and pepper that Martial (*Epigrams* 13.13) describes as the fare of simple craftsmen, or a wine and honey flavoured drink called *piperatum* (Pliny *Natural History* 14.19.108). Indeed, Grainger (2021, p. 161) notes that many of the dishes in the *De re coquinaria* are relatively simple, often only using three to four different types of seasoning (frequently including black pepper), and those not involving expensive types of meat or fish were likely not too expensive to prepare (see also Miller, 1968, p. 10). The claim made by Horace (*Epistles* 1.14.20-26) that pepper and Arabian frankincense are the sort of things one might associate with a low-brow tavern in Rome makes sense if we understand that pepper flavoured snacks and drinks were available to purchase, and frankincense was potentially being burnt to create a more pleasant odour for the clientele.

This does not mean that products like black pepper and frankincense became banal and forgettable. Even if they ceased to be rare, they never seemed to lose the exotic associations due to their (imagined) connection with India and other lands at the edges of the *oikoumene* or inhabited world (Cobb, 2018a; Cobb 2022; Simmons, 2020). For instance, even as late as the third century CE, the Greek intellectual Philostratus (*Life of Apollonius of Tyana* 3.4) included an account about monkeys collecting pepper in his (mock) biography of the wonder worker Apollonius (De Romanis, 2015, p. 144-150, has noted some intriguing parallels in Indian folklore about *vānaras* or monkeys). Pollard (2013) even argues that the mysterious and exotic associations that India (sometimes hazily encompassing East Africa and Arabia) evoked in the

minds of many people from the Roman world underpinned their usefulness for the performance of magical rites.

Future directions for studying the history of spice consumption

Studying the rich history of the harvesting, exchange, and consumption of spices across ancient Afro-Eurasia allows us to appreciate how deeply embedded they became in many social practices, especially by the turn of the first millennium CE. They were not simply added to food to make things taste nice, or perfumes to make them smell nice (though these uses were significant). They were believed to be important in placating the gods and warding off evil spirits. They could be consumed to keep one's humors in balance or be applied as salves or ointments to treat wounds or infections. In the right contexts they might be useful for displaying one's status, sophistication or even power, but in others they might simply be part of a nice treat.

We are fortunate that many of our ancient authors (in Classical, Indian and Chinese traditions, among others) provide accounts about these products, their uses and the plants from which they derive from, even if the quality and accuracy of these botanical descriptions may vary. Other methods like etymological analysis and cross-linguistic comparison—studying links between the names given to spices in different languages (e.g., classical Latin, Greek, Sanskrit, Tamil, Malay, etc.)—can potentially help us to identify patterns of interaction and exchange. To this we can add new bodies of evidence, notably the increasing find of archaeobotanical remains, as well as documentary material, like ostraca from the Eastern Desert of Egypt and wooden leaf-tablet from Vindolanda in northern Britain, which give occasional insights into the consumption of spices like black pepper by non-elites. To be clear, these bodies of evidence also present their own challenges. In the case of archaeobotanical

material there is a bias in the types of conditions in which they tend to survive (hyperarid and waterlogged (anaerobic) conditions, and certain circumstance where material has either become charred or mineralised), and a bias toward certain types of plant parts, with seeds, nutshells, fruit stones and the woody stems tending to fare better than leaves and petals (Cappers, 2006; van der Veen, 2011; Livarda, 2011).

The application of scientific techniques like residue or lipid analysis can shed further light both on the types of spices and aromatics being utilised, as well as the material culture associated with that use and, in some cases, methods for the preparation of particular products. For example, a team undertaking mass spectrometric analyses on glass *unguentaria* found at Oplontis (Ribechini et al., 2008) were able to compare their findings with ancient accounts of the materials used and methods of preparation involved in the productions of perfume, notably those given by Pliny (*Natural History* 13.2.4-18). He mentions the use of balanus oil and other vegetable oils or animal fats as a base, with fragrances being added from aromatics, resins and flowers. The use of hot or cold maceration to extracting these fragrant elements is also alluded to be our ancient authors and seems to have been borne out by this study.

A similar study has been undertaken of an *unguentarium* made of rock crystal recovered from a Roman mausoleum in Carmona (southwest Spain), and more specifically its dolomite stopper. This stopper, which had been in contact with the contents of the *unguentarium*, was subject to various X-Ray, spectroscopic, and gas chromatographic tests. It seems the stopper was covered in bitumen to act as a sealant, absorbing the perfume components inside the jar, which appears to have been infused into patchouli essential oil and some fatty vegetable oil (Cosano et al., 2023). Again, the use of essential oil (made from flower parts, roots, or resins) to create perfumes accords with the testimony provided by our Classical authors (Cosano et al., 2023, p. 4488).

Of course, the utilisation of these archaeometric methods comes with its own challenges, just as with the other approaches outlined. When studying organic residues, it is apparent that what remains often represents a mix of degraded substances, which due to method of treatment might diverge in composition ‘compared with the parent components’ (Ribechini et al., 2008, p 159). Nevertheless, the growing application of scientific techniques to the study of such material is sure to offer valuable insights into the history of ancient spices, complimenting the existing array of methods at our disposal.

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