

Nutmeg and the Identity of Chinese *Rou doukou*

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ABSTRACT

The Chinese term *rou doukou* has generally been taken to mean ‘nutmeg’. This identification dates from the nineteenth century. However, there is reason to think that *rou doukou* was originally not nutmeg, but the fruits of a plant of the ginger family, Zingiberaceae. Early descriptions and illustrations of *rou doukou* are clearly not of nutmeg: in Chinese pharmacopoeias, it is usually listed with herbs, not trees. The earliest reference to nutmeg is probably in the *Zhu fan zhi* of 1225. However, most Chinese references to *rou doukou* long after that date still refer to a plant of the ginger family.

KEYWORDS

nutmeg, mace, *Alpinia*, *Myristica*, *doukou*, China root, *Smilax*

1) INTRODUCTION: ASSUMPTIONS AND PROBLEMS

‘In order that Western science may profit by a study of Chinese botanical works it is necessary not only to understand the Chinese written characters but also to recognize the plants described and to ascertain their scientific names. Our knowledge of the Botany of China is still very defective Those regions of the Empire especially to which the majority of plants described in Chinese books refer, have never been trodden by the foot of a botanical collector. ... The only exact method of ascertaining the botanical names corresponding to

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Chinese denominations of plants is to obtain the plants *in naturâ* and to determine them. I may however observe that ... many ... plants, especially drugs, go under different local names in different provinces. ... In some instances also the same Chinese names are applied to distinct plants in different parts of China' (Bretschneider 1882: 105–106).

'Although Europe abounds in botanists, the number of those from whom a reliable determination of Chinese plants may be expected is very limited. For ... a thorough knowledge of the Flora of Eastern Asia is required Now-a-days all botanists agree that it is impossible to recognize and identify plants from descriptions only. ... I need not say that the determination of plants requires great experience and attention. Even the most accomplished botanists are liable to err in their diagnoses' (Bretschneider 1882: 108–109).

Thus wrote Bretschneider some 140 years ago. It would be worthwhile for anyone sufficiently interested to read more than just the above short extracts from his disquisition 'On the scientific determination of the plants mentioned in Chinese works' (Bretschneider 1882: 105–130). It sets out clearly a number of the issues surrounding the identification of plants of the Chinese *materia medica*. It may also be noted that many such identifications still accepted more or less without question today are owed ultimately to Bretschneider,¹ yet, as he himself admitted, knowledge of the plants of China in his time was extremely limited. Indeed, it is impossible to recommend reading Bretschneider without also pointing out that his work is often out of date and contains many errors. One question of fundamental importance which he fails to address in his discussion is how relevant identifications made in recent times are to earlier periods. As he himself noted, the same Chinese name has sometimes been applied to different plants. This is not necessarily only a matter of regional differences, but might equally apply over time. By way of analogy, it is almost certainly the case that ancient 'cinnamon' (*cinnamomum*, *kinnamômon*, etc.) was entirely different from what is known as cinnamon today.² It is in fact very rarely possible to identify plants and plant products mentioned in historical sources with any great degree of certainty. Information is usually inadequate.³ Unfortunately many historians, whose botanical knowledge is often very limited, have made claims on the basis of highly dubious assumptions relating to plants and plant products. An obvious example is Miller's hypothesis of a 'cinnamon route' which certainly never existed (Haw 2017: 6, 8–14).

A clear example of ambiguity of terminology relating to plants is the word 'galingale'. Both historically and in contemporary usage this refers to two completely different groups of plants. One includes the Chinese *gaoliangjiang* 高良薑 (*Alpinia officinarum* Hance, often known as lesser galangal) and a number of other plants of the same family, Zingiberaceae (the ginger family). Among these are *Alpinia galanga* (L.) Willd. (greater galangal, Siamese galangal, or Siamese ginger), *Kaempferia galanga* L. (East Indian galangal), and *Boesenbergia rotunda* (L.) Mansf. (Chinese keys, finger root, or Chinese ginger) (Quattrocchi 2012: 201–202, 204, 617, 2159). The other group includes species of the genus *Cyperus*, principally *Cyperus longus* L., of the family Cyperaceae, only distantly related to Zingiberaceae. This ambiguity dates back centuries. In 1551, William Turner (1509 or 1510–1568) wrote 'of Englyshe Golangal', or 'comon Galan-

¹ He made many identifications in Bretschneider 1895, most of which have never been questioned.

² For a full discussion of this and related issues, see Haw 2017.

³ For further discussion of this problem, see Haw 2019: 83–87.



gall ... a kynde of cypirus; and noted also that: ‘There groweth another kynde of Cyperus in Inde, which is supposed of Ruellius⁴ to be the comon curcuma;⁵ and it is lyke unto ginger’ (Turner 1551: 188–189). John Gerarde (c. 1545–1612) describes four different kinds of galingale or *Cyperus*: English, Spanish, Round and Cats-tail (Gerarde 1597: 28–29). In the following century, Edward Phillips (1630–c. 1696) defined ‘galangale’ as ‘an herb so called’ and ‘galingale’ as ‘the aromaticall root of the rush *Cypresse*, called *Acorus*’ (Phillips 1658: unnumbered pages; entries in alphabetical order). This is unhelpful, since *Acorus* is a genus distinct from *Cyperus* (Quattrocchi 2012: 65, 1288). Confusion continues to multiply. A recent work on a medieval medical treatise includes the following definition: ‘galanga [= galingale, ‘English galingale’, ‘sweet cyperus’; galangal, China root (*Cyperus longus* L.; *Alpinia officinarum* Hance; *Alpinia galanga* [L.] Willd.)]’ (Green 2001: 280). The most serious problem here is that China root has nothing to do with galingale or galangal. It refers to the tuberous rhizomes of species of the genus *Smilax* (Winterbottom 2015: 22–23).

Indeed, China root is a very informative example of the difficulties involved in identification of plant products. Even during the period when Europeans were actively importing this product from China, and using it medicinally, there was little clarity about exactly what plant it came from. The fundamental problem was one of those alluded to by Bretschneider: very few Westerners, if any, had ever seen the plant growing wild, or growing at all. Only the rhizomes, as supplied by Chinese merchants, were known to most Europeans. The earliest description of China root by a European is that of Garcia da Orta (c. 1501–1568), writing in Goa in about 1560:

‘it is a shrub, three to four *palmos* above the ground with a root one *palmo* long, a little more or less. It has a thick root and another thin When the root is taken up it is very tender, and it is eaten in mouthfuls, raw or cooked. ... From the root there come out some small fibres the size of writing pens, and as the root grows so the fibres shoot out, and from these shoots grow some leaves with the shape of young orange leaves. This shrub is called LAMPATAM [lam patā] by the Chinese. This is what I know about the shrub and root. I saw a small plant of it in Goa, but it withered before it could grow up’ (Garcia da Orta 1913: 387–388; Garcia da Orta 1563: f. 183).

The length of a *palmo* was somewhat variable. There were in fact two distinct *palmos*, the *palmo de vara* and the *palmo de goa*. The former was the *palmo comum* or *ordinário*, and was about 22 cm long (there was variation from time to time and place to place) (Vieira de Castro 2005: 190–191). This would mean that four *palmos* was less than a metre. In fact, however, most *Smilax* species are climbers, often with tendrils. With support, they may attain four or five metres in height. Some shrubby species are smaller, but usually up to at least a metre (Wu and Raven [eds.] 2000: 96–115). It is clear that da Orta knew the China root mainly as a root, and had little knowledge of the whole plant. The alleged Chinese name ‘lampatam’ or ‘lampatão’ (Garcia da Orta 1872: 183) is not readily explicable, and does not resemble Chinese names for species of *Smilax*. Winterbottom claims that it is ‘based on the Chinese ‘Lengfantuan’ (Winterbottom 2015: 28 note 39). Borschberg suggests a connection with Arabic ‘*labana*’ (Borschberg 2006: 103, 113 note 1) (not ‘*lambana*’, as stated by Winterbottom 2015: 28 note 39). These suggestions are not well supported by evidence. Borschberg’s source, Thevet’s *Cosmographie Universelle*, is full of an-

⁴ Jean Ruel (1474–1537), author of *De Natura Stirpium* (Paris, 1536).

⁵ Probably turmeric, *Curcuma longa* L.



ecdotes of doubtful veracity. In the same chapter where China root is discussed, it is claimed that the Ethiopian Prester John formerly ruled most of the East Indies! (Thevet 1575: f. 415 verso). It is also claimed that the Chinese eat bread like Europeans.⁶ In fact, the Arabic word *labana* (*laban*) means ‘milk’ (Lev and Amar 2008: 132, 572), and might well refer to the colour of the root when cut. There is no clear connection with ‘lampatam’. The Chinese name *lengfantuan* 冷飯團 is now usually applied to *Kadsura coccinea* (Lem.) A.C.Sm. (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui (ed.) 1999, vol. 2: 895), or, in Yunnan and Guizhou, to species of *Viburnum* (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui (ed.) 1999, vol. 7: 553, 562). A better phonetic resemblance would be with *lengfanteng* 冷飯藤, usually identified as *Kadsura oblongifolia* Merr. (Wu, Raven and Hong [eds.] 2008: 41). The connection with China root is far from obvious. There is, however, a Malay word *lampūyang* or *lěmpoyan*, which reportedly refers to zerumbet or galanga (Marsden 1812: 306; Wilkinson 1901: 602). Possibly this has something to do with ‘lampatam’. Da Orta’s book was one of the first to be printed at Goa, and is said to be full of typographical errors (Garcia da Orta 1913: xi). Perhaps ‘lampatam’ should read ‘lampaiam’, or something similar. As seen above, galangal and China root are sometimes confused. Da Orta never visited China and may well have received his information about the supposed ‘Chinese’ name from Melaka, where Malay was commonly spoken.

A possible source of confusion of China root with galangal or galanga is the *China Root Epistle* of Andreas Vesalius (1514–1564). He compares China root with galanga and also with *Acorus*. The Latin of his *Epistle* is extremely difficult to understand: it has been said that ‘Vesalius’ Latin in the *Epistle* makes it a foreign language even to the lifelong reader of Latin’ (Vesalius 2015: xxv). Perhaps, then, his account was indeed misunderstood, so that it was thought that China root, galanga and *Acorus* were more or less identical. The passage in question is as follows:

‘Those are perhaps darker, whereas the China is slightly reddish like common bitter root or what we call *galanga*. Indeed, what is more like the China than this *acorus* after it has rotted and taken on a dull flavor if you take away its size and hardness?’ (Vesalius 2015: 23). ‘Nisi fortè illæ magis nigricent: Chyna autem obscurè vulgaris acori, aut etiam nobis appellatæ galange modo rubescat, imò quid huiusmodi acoro iam corrupto, stupidôque iam sapore prædito, Chynæ est similis? si molem demas, & duriciem’ (Vesalius 1546: 19).

As Vesalius (2015: 22) admitted: ‘Until now I could not even be certain of the root’s name’.

A century later, in 1656, the Jesuit Michael Boym (c. 1612–1659) was able to publish a description and illustration of the plant (Boym 1656: illustration T [before p. H₂], description on p. I₂), but the information is still limited and somewhat vague. It would be very difficult to identify the plant with any degree of certainty from the illustration. Boym does, however, provide Chinese names for it, even with characters (on the illustration only). Unfortunately, the name given in the description, ‘Pe-fo-lim’, differs from that on the illustration, ‘Fõ Iim [presumably an error for Lîm] Xú Kên 茯苓樹根’ (*fuling shu gen* in modern Pinyin transliteration). The description states that it is a tree (‘arbor’), although it is depicted as a vine. It is said to grow in the provinces of ‘Yunnan, Quamsy [Guangxi], Quamtum [Guangdong], Kaoli [Gaoli, Korea], & Leaotum [Liaodong]’, which strongly suggests that two different plants are involved, one growing in subtropical south-

⁶ Thevet’s reputation has fluctuated widely: at one time he was considered ignorant and mendacious (Thevet 2010: xvii).



ern China and one in temperate Korea and adjacent Liaodong. Much fuller and more accurate information was given by Kaempfer in 1712, based on his observations in Japan. His text refers to ‘*Smilax minus spinosa*’, with the Japanese names ‘*Sankira*, vulgò *Quaquára*’, with the characters 山歸来 (Kaempfer 1712: 781, illustration: 782). His drawing is a good representation of *Smilax china* L. This, he says is what physicians call China root: ‘*Medicis Radix Chinæ dictâ*’ (Kaempfer 1712: 783). However, on the illustration there are only two characters, 菝葜 (*sarutori ibara*, read *baqia* in Modern Standard Chinese). *Smilax china* is indeed recorded from Japan (Ohwi 1965: 310) and Kaempfer may well have seen it there. Although he was largely confined to the Dutch trading post at Deshima (or Dejima 出島) in Nagasaki, he twice accompanied the annual Dutch journey to the court of the shogun at Edo (Kaempfer 1999: 5, 239–434). Towards the end of the eighteenth century, Loureiro described five species of *Smilax* in his *Flora Cochinchinensis*. Four are recorded only from Cochinchina (Vietnam), but *Smilax china* is recorded from both Cochinchina and China. Its Chinese name is stated to be ‘*Thù fū lin*’ (Loureiro 1790, vol. 2: 622). All this information from Boym, Kaempfer and Loureiro is certainly better than that provided by da Orta and Vesalius, but it remains difficult to make good sense of it.

The greatest difficulty is that the Chinese and Japanese names recorded by these authors do not agree either with each other or, in most cases, with modern Chinese and Japanese names for *Smilax china*. Nor has the situation been elucidated by modern commentators: quite the contrary, in fact. The editors of da Orta’s *Colloquies* identified the China root (‘*raiz da China*’) with *Smilax china* L., but gave as a synonym *Smilax ferox* Wallich (Garcia da Orta 1895: 271 note 2). However, *Smilax ferox* Wall. ex Kunth is not identical with *Smilax china*: it is a distinct species (Wu and Raven [eds.] 2000: 102). Even stranger is a claim that China root was *Smilax pseudochina* (the possibility that it might have been *Smilax china* is also recognised) (Cook 2016: 130). Since *Smilax pseudochina* L. is a North American species, endemic to the eastern U.S.A. (Flora of North America Editorial Committee [ed.] 2002: 475), it cannot possibly have been the original China root. Perhaps, however, *Heterosmilax japonica* Kunth is meant. Needham gives ‘*Smilax pseudo-China*’ as a synonym of *Heterosmilax japonica* (Needham 1986: 160).⁷ This is due to confusion which can be traced back to Thunberg’s *Flora Japonica* (Thunberg 1784: 152). However, it was corrected in 1918 (Juel 1918: 131). Laufer’s account of China root (Laufer 1919: 556–557), which no doubt contributed to the diffusion of this error, is confused and out of date. Recently, other historians have exercised caution. Borschberg (2006: 104) goes no further than stating that ‘*Radix Chinae* is essentially a tuber that belongs to the *smilax* family’. Winterbottom writes that ‘the historical trade seems to have consisted of the woody, climbing shrubs now differentiated as *Smilax China* and *Smilax Glabra*, as well as various substitutes from the genus *Smilax* and beyond’ (Winterbottom 2015: 23). The source of at least some of this appears to be a short article by Hance published in 1872. He declared that *Smilax china* L. was ‘apparently quite unknown to modern botanists’, and suggested (without evidence) that the species was the same as *Smilax ferox*. He was able to obtain from Guangzhou a living plant of the China root, with both roots and stems, which he identified as *Smilax glabra* Roxb. (Hance 1872: 102). It seems that the identification of China root with *Smilax china* ultimately derives from Kaempfer’s report. For example, Pereira’s description of ‘the China Root of the shops ... the produce of *Smilax china*’ appears to be more or less a translation of Kaempfer’s: ‘It occurs in large, ligneous, knotty pieces ... Externally it has a

⁷ Recently, *Heterosmilax* has been reduced to a section within the genus *Smilax*: Qi *et al.* 2013: 541. The accepted name of *Heterosmilax japonica* is now *Smilax bockii* Warb.: Kladwong and Chantaranothai 2022: 154–155.



grayish-brown colour, and internally a light flesh or yellowish-brown colour. It is inodorous, and has a slightly astringent taste' (Pereira 1842: 1003). Kaempfer's Latin reads: '*Radice gaudens magnâ, durâ, nodosâ, inæquali, ... extus rufâ vel nigricante, intus albidâ, saporis vapidî*' (Kaempfer 1712: 781, 783).

As for the various Chinese and Japanese names recorded by Boym, Kaempfer and Loureiro, it appears that most of them can be identified with modern names for several different species of *Smilax*. Kaempfer's '*Sankira*' and '*Quaquára*' (to be read *Kakara*) apparently apply to various Japanese species of *Smilax* (Ohwi 1965: 310–311). *Sarutori ibara*, Chinese *baqia*, is usually *Smilax china* (Ohwi 1965: 310; Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui (ed.) 1999, vol. 8: 157–158). Boym's names are more problematic. His '*Fô lîm Xú Kên*' (or *fuling shu gen*) does not seem to be recorded in Chinese sources. His '*Pe-fô-lim*' can probably be identified with *bai fuling* 白茯苓, now reported to be a name of *Smilax lanceifolia* Roxb. (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui [ed.] 1999, vol. 8: 162). '*Thù fû lin*' is almost certainly *tu fuling* 土茯苓, which is now applied to *Smilax glabra* (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui (ed.) 1999, vol. 8: 161–162). It is likely that Hance was right and that the true China root was in fact this species. The identification of China root as *Smilax china* probably originated with Kaempfer, but he had only visited Japan, not China. *Smilax glabra* is not recorded from Japan (Ohwi 1965: 309–311). However, it is almost certainly the case that several different species of *Smilax*, and even roots of completely different plants, were included as China root, if only as substitutes or adulterants. In the *Zhenglei bencao* 證類本草 of 1249 there are illustrations of four kinds of *baqia* from different places in China, only one of which, *Jiangzhou baqia* 江州菝葜,⁸ appears to be a *Smilax* species (Fig. 1). It would certainly be possible to discuss the identity of China root at much greater length, but this is sufficient to illustrate the serious problems which often beset the identification of plants and plant products mentioned in historical sources. The assumption that one particular name always applied to one particular plant or plant product is excessively simplistic and frequently fallacious. As Borschberg wrote, 'confusion is far more widespread and enduring than many historians of trade and medicine generally believe' (Borschberg 2006: 104).

2) NUTMEG AND TRADE

The precise origins of nutmeg and the period at which it began to be traded internationally are obscure. Indeed, although it is commonly stated that the true nutmeg tree,⁹ *Myristica fragrans* Houtt. (Fig. 2), originated only from the Banda archipelago (in modern Indonesia),¹⁰ or sometimes from Banda and Amboina (Ambon) (Sinclair 1958: 237), this is very much less than certain. It seems that *Myristica fragrans* now occurs only as a cultivated plant (or as plants escaped from cultivation) and is unknown as a truly wild plant (de Wilde 1990: 244; de Guzman and Siemonsma [eds.] 1999: 143; Sinclair 1958: 237–238). Although it is probably native to the Banda islands, its original area of distribution may have been more extensive. Rumphius suggests that it occurred in a number of islands beyond the Banda group, but that the Dutch destroyed all nutmeg trees

⁸ Jiangzhou of the southern Song period is now Jiujiang 九江.

⁹ Sometimes referred to as 'Banda nutmeg' (Flach 1966: 1, 4).

¹⁰ See, for example, Czarra 2009: 16; Rema and Krishnamoorthy 2012: 399.





Figure 1: Two kinds of *Baqia*, as illustrated in the *Chongxiu Zhenghe jingshi zhenglei beiyong bencao* (1249): Jiangzhou *baqia* (top) and Jiangningfu *baqia* (Tang Shenwei 1957, *juan* 8: 214). The former is clearly a *Smilax* species, the latter is obviously quite different.



Figure 2: *Myristica fragrans*, as illustrated (under the synonym *Myristica moschata*, ‘nutmeg tree’) in Woodville (1792), vol. 2: Plate 134 (between pp. 362 and 363).

except for those of the Bandas (Rumphius 1741: 17; cf. Crawford 1820, vol. 1: 505–506). This was part of a deliberate attempt by the Dutch to establish a monopoly in the trade of spices (Donkin 2003: 169). There has also been some confusion regarding the distribution of nutmeg because there is a considerable number of species in the genus *Myristica* (about 175) (de Wilde 2000: 360), which were not always recognised as distinct.¹¹ Indeed, it is certainly the case that the seeds of several different species have been used as ‘nutmeg’ at various periods. At least ten species of *Myristica* may still be so used now, and there are trees of different genera also involved. These include the African calabash nutmeg (*Monodora myristica* (Gaertn.) Dunal), the Madagascan clove-nutmeg (*Cryptocarya agathophylla* van der Werff; synonym *Ravensara aromatica* Sonn.) and the Brazil nutmeg (*Cryptocarya moschata* Nees & Mart.) (de Guzman and Siemonsma [eds.] 1999: 145; Steentoft 1988: 74, 76; Kostermans 1950: 51; Seidemann 2005: 124, 238, 243–246, 313; Couvreur 2009: 28, 118, 121). It is of course the case that plant products produced locally may often be more readily available and cheaper than products imported from more or less distant places, which gives local products a considerable advantage. ‘For most people over countless centuries, condiments, aromatics and drugs were of local or, at the most, regional origin’ (Donkin 2003: 105). Undoubtedly, at times when international commerce was poorly developed, or was disrupted, local plant products were utilised in preference to expensive or unobtainable imports.¹² Thus, it cannot be assumed, as Zumbroich apparently does, that nutmegs found at archaeological sites in northern India, dating from at least a few centuries BCE, came from *Myristica fragrans* (Zumbroich 2012: 55–56). The south Indian species *Myristica malabarica* Lam. would be a far more likely source.¹³ Trees of the genus *Myristica* occur naturally from southern India and Sri Lanka, across Southeast Asia to northern Australia, and on Pacific Islands to as far east as Fiji. Species are particularly numerous on New Guinea (de Wilde 2000: 360). In about 1770, Sonnerat described a number of different kinds of nutmeg (‘Muscades’) obtained from locals in the vicinity of New Guinea. One kind he says was not at all aromatic, but two others, which he calls ‘male’ and ‘female’, clearly were. The former, he says, was preferred in Europe, the latter in the Indies. Yet another kind was longer and more aromatic and was traded to the Malay Peninsula, and from there to China and India (Sonnerat 1776: 194). This was possibly the ‘Papua nutmeg’ or ‘long nutmeg’, *Myristica argentea* Warb. (de Guzman and Siemonsma [eds.] 1999: 140–141; de Wilde 2000: 408–409).

It is generally accepted that nutmeg was not known to the ancient Greeks or Romans (Donkin 2003: 118; Weiss 1997: 215). Claims that Dioscorides mentions mace from *Myristica fragrans*¹⁴ are certainly wrong.¹⁵ So also is the claim that nutmegs from the Moluccas were known in Europe as early as the sixth century, or specifically in 540: ‘The first authentic European record is from AD 540, and stated to be by Actius of Constantinople’ (Weiss 2002: 86).¹⁶ The assumption was that Arab traders carried nutmegs from the Moluccas via India to the Eastern Mediterranean region, where they were acquired by Europeans: ‘The Arabs had pinpointed the Moluccas as the source of nutmeg by the 13th century, though they hid this from European purchasers’ (Pickers-

¹¹ See the comments in Crawford 1820, vol. 1: 505; and Donkin 2003: 12.

¹² An example is the case of ‘rhubarb’ in thirteenth-century China (Haw 2006: 124–126).

¹³ On this species, see Banik *et al.* 2017: 9–10; Chelladurai and Ramalingam 2017: 255–258.

¹⁴ See, for example, Riddle 1985: 37.

¹⁵ The identification of the ‘mace’ (μάκερ/μάκιρ) of Dioscorides, ‘a bark brought from abroad’, with *Holarrhena* is much more probable (Dioscorides 2005: 63).

¹⁶ Similar claims can be found in Rhind 2014: 208; Rhind 2020: 470; and Pickersgill 2005: 166.



gill 2005: 166; cf. Rhind 2020: 470). Claims such as these arose at least as early as 1874 (Flückiger and Hanbury 1874: 451–452).¹⁷ However, ‘Actius of Constantinople’ is an error: no such person existed. In reality, it was Aëtius of Amida (mid-5th century–mid-6th century) who mentioned ‘nucis indicas’ (Aëtius Amideus 1542: 928), which probably does not mean nutmegs (Flückiger and Hanbury 1874: 451) (and even if it does, could well refer to nutmegs from *Myristica malabarica*). Ibn al-Bayṭār (1197–1248) cites no earlier authority on nutmeg than Rhazes (Muhammad ibn Zakariyyā al-Rāzī, c. 860–925) (Ibn el-Beithar 1877: 378–379). It is unlikely that nutmegs reached Europe before Arabs knew of them. The claim that al-Qazwīnī ‘expressly named the Moluccas as the native country’ (Flückiger and Hanbury 1874: 452) of nutmegs and mace is simply untrue. The edition of al-Qazwīnī’s *Cosmography* cited as the source for this claim makes no specific mention of the Moluccas (El-Kazwīnī 1868: 227). Indeed, in relation to the geography of Southeast Asia according to Arabic texts, it has been stated that al-Qazwīnī ‘gives us nothing of importance at all’ (Tibbetts 1979: 91). It seems that the earliest mention in any Arabic text of the Moluccas by name, ‘Malūkū’, dates from the 1550s (Tibbetts 1979: 180–181). During the first half of the fourteenth century, Ibn Baṭṭūṭa thought that not only nutmegs and mace came from the same tree, but also cloves!

‘What people in our country call ‘the flower of the clove’ is what falls from the flowers and is like orange flowers. The fruit of the clove is the nutmeg, known among us as the perfume nut. The flower that forms within it is mace. I have seen all this and been witness to it.’¹⁸

Mace is the aril enclosing the shell within which is the seed, which is the nutmeg. Clearly, Ibn Baṭṭūṭa cannot have seen cloves and nutmegs on the same tree. In fact, in view of the claims often made regarding the part played by Arabs in the maritime trade of the Indian Ocean region, including the South China Sea,¹⁹ writers in Arabic were remarkably ignorant about a number of products which were important items of commerce. As late as the thirteenth century, Ibn al-Bayṭār was still quoting Dioscorides on pepper, without comment or correction: Dioscorides thought that long pepper and black pepper grew on the same plant, long pepper being immature black pepper (Ibn el-Beithar 1883: 41). The reality is that long pepper, *Piper longum* L., and black pepper, *Piper nigrum* L., are two different plant species. Similarly, writers in Arabic had very little idea of what lac was: they knew only that it was produced on trees in India. Some authors confused it with sappan (brazil wood) or with kermes, while others thought that it fell from the sky onto the trees (Amar and Lev 2017: 121). In contrast, the Chinese were fully aware at an early date of the difference between long pepper (*biba* 萆薢; *bibo* 萆撥) and black pepper (*hu jiao* 胡椒) (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui [ed.] 1999, vol. 3: 434, 439; Laufer 1919: 374–375). They also knew that lac was produced by insects at least as early as the

¹⁷ The ‘Actius’ story may be the ultimate source of the claim that: ‘In the sixth century AD records exist of the nutmeg having formed an article of Arabian import from the East, and export to Europe’ (Watt 1891: 313). There are no such records.

¹⁸ Ibn Baṭṭūṭa 1994: 882. In footnote 21 on this page, Gibb comments that ‘I.B.’s botany is as unreliable as his history’, yet Tibbetts thought that his account was ‘fairly accurate’ (Tibbetts 1979: 181).

¹⁹ See, for example, Hirth and Rockhill 1911: passim.; Boxer 1969: 44–46; Hourani 1995: passim.; Schottenhammer 2010: 117–124.



860s, and possibly as early as the fourth century (Laufer 1919: 475–478; Reed 2003: 125).²⁰ All this clearly suggests that there are problems with the commonly-accepted narrative regarding the role of Arabs in maritime trade.

Nutmeg of some kind, but not necessarily from *Myristica fragrans*, was certainly known in Europe by the twelfth century. ‘*Nux muscata*’ is included among medicinal products by Matthaeus Platearius (?–1161) in his *De Simplicibus Medicina* (also known as *Circa Instans*) (Platearius 1582: f. 199 recto; Platearius 1913: 139–140). At the same period, Hildegard of Bingen (1098–1179) wrote that nutmeg (*nux muscata*) could make people cheerful and of good disposition, and gave a recipe for biscuits made with flour, nutmeg, cinnamon and cloves (Hildegard von Bingen 1998: 21; Hildegard 1855: col. 1139). A couple of centuries later, ‘notemuge to putte in ale’ is mentioned in Chaucer’s ‘Tale of Sir Thopas’ (Chaucer 1933: 198). It is probable that nutmeg reached Europe from southwest India via the Red Sea and Egypt. A memorandum composed during the 1130s in Aden refers to nutmeg and mace, as well as to silk cloth from Kūlam (Kollam in Kerala) (Goitein and Friedman 2008: 377, 382, 383). A slightly earlier document (1120s), written in Fustat (Cairo), also mentions mace and nutmeg (Goitein and Friedman 2008: 469). Whether these were nutmeg and mace of *Myristica fragrans*, or of *Myristica malabarica* (or some other species), cannot now be known, but it is quite possible that nutmeg from the Banda islands was reaching India via Java or Sumatra at this period. During the late thirteenth century, Marco Polo mentions nutmegs among other spices available in Java (Marco Polo 1938: 368; Marco Polo 2018: 185; Marco Polo 2008: 280). When the Portuguese became directly involved in trade in the Indian Ocean region after about 1500, they quickly understood that the best mace and nutmeg came from the Banda islands, and that these spices reached Gujarat and Aden from Melaka and Java (Pires 1944, vol. 1: 43, 56, 159, 204, 205–207). During the eighteenth and early nineteenth centuries, *Myristica fragrans* was successfully introduced to a number of places outside its original area of cultivation, including Mauritius, Penang, Singapore, Sri Lanka and the West Indies. Today, Grenada in the West Indies is the only major rival to Indonesia in the commercial production of nutmeg and mace (Weiss 1997: 216–217). Trees in Penang and Singapore were productive for a few decades, but later suffered serious damage by insect pests and ceased to be commercially important (Sinclair 1958: 237–238).

3) EARLY DESCRIPTIONS AND ILLUSTRATIONS OF *ROU DOUKOU*

There are several reasons to question whether Chinese *rou doukou* 肉豆蔻 was always nutmeg. Firstly, the name *doukou* usually refers to the fruits and seeds of plants of the ginger family, Zingiberaceae (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui [ed.] 1999, vol. 8: 589–590, 596, 607, 608, 612, 614). Secondly, the qualifier *rou* 肉 means ‘fleshy’. While the nutmeg does have an outer pericarp which is fleshy, it is normally rather hard (Sinclair 1958: 334), and in any case it is unlikely that the pericarp was ever carried to China, where only the imported nutmegs (the hard seeds inside the pericarp) would generally have been known. Thirdly, some Chinese descriptions of *rou doukou* suggest that it is not a tree, but a herbaceous plant. Indeed,

²⁰ The possible fourth-century reference is quoted in a number of works, including Ouyang Xun 歐陽詢 *et al.* 1982, vol. 4, *juan* 97, 1689–1690 (early seventh century); Yue Shi 樂史 2007, vol. 8, *juan* 171: 3271–3272 (late tenth century). The ninth-century description of lac is in Duan Chengshi 段成式 1981, *juan* 18: 178.



in the Chinese *bencao* 本草 literature, it is usually included in the chapters concerned with *cao* 草 (herbs), not *mu* 木 (trees) (for example, Tang Shenwei 1957, *juan* 9: 231; Li Shizhen 李時珍, vol. 1, *juan* 14: 876). It is also the case that most illustrations in pre-modern and early modern Chinese works do not resemble nutmeg. The claim that nutmeg, *Myristica fragrans* Houtt., ‘was cultivated successfully in Kuangtung [Guangdong] by the beginning of the Sung [Song] period’ (Needham 1986: 275) is unlikely to be correct. Although *Myristica fragrans* is indeed cultivated in China today (Wu, Raven and Hong [eds.] 2008: 99), there is no record of its introduction before the twentieth century. In 1921, Woon Young Chun recorded the cultivation in China of a number of introduced trees, including *Cinnamomum zeylanicum* Nees (a synonym of *Cinnamomum verum* J. Presl.: the source of true cinnamon), and *Ficus elastica* Roxb. ex Hornem. (the rubber tree) (Chun 1921: 120, 155), but he makes no mention of *Myristica fragrans*. In 1911, it was specifically stated that nutmeg was not produced in China, but imported (Smith 1911: 276).

This being the case, the question must arise of what the original *rou doukou* may have been. A Chinese description dating from the early 1060s says:

‘*Rou doukou* comes from *hu* countries.²¹ Now, people plant it in Lingnan [approximately modern Guangdong, Guangxi and Hainan provinces]. In spring it produces shoots and flowers. The fruits are like those of *doukou* but round and small. The skin is purple, tight and thin. The flesh inside is spicy hot. They are gathered in the sixth and seventh months.’ 肉豆蔻出胡國。今惟嶺南人家種之。春生苗花。實似豆蔻而圓小。皮紫緊薄。中肉辛辣。六月七月採。(Su Song 1994, *juan* 7: 229).

This is obviously not nutmeg, which has much larger fruits than any plant of the ginger family (*doukou*). Moreover, they are not purple. The fact that the plant is said to produce shoots in spring suggests that it was herbaceous, dying down in winter. The illustration of *rou doukou* in the *Zhenglei bencao* is also clearly not nutmeg (Tang Shenwei 1957, *juan* 9: 231). It resembles *bai doukou* 白豆蔻 (probably an *Alpinia* species) (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui [ed.] 1999, vol. 8: 608) as illustrated in the same work (Tang Shenwei 1957, *juan* 9: 239). Needham reproduces an illustration from a slightly earlier pharmacopoeia, which is very similar to that in the *Zhenglei bencao* (Needham 1986: 290, Fig. 54c). Both may well have been copied from the now lost illustration in the *Bencao tuijing* 本草圖經 of 1061 (Fig. 3).

According to the *Haiyao bencao* 海藥本草, *rou doukou* came from the countries of Qin 秦 and Kunlun 崑崙 (Li Xun 1997, *juan* 2: 27). It is very unlikely that these could refer to Da Qin 大秦 (the Roman Empire) and the Kunlun mountains in modern Xinjiang, as has been suggested (Li Xun 1997, *juan* 2: 27 notes 2, 3). On the basis of this information, Schafer claims that nutmeg was a product of ‘Kurung and Rome’, which, he says, ‘tells us little about where nutmeg was grown, but a great deal about the extent of the trade in it; East Indian nutmeg was known in Europe in the sixth century’ (Schafer 1963: 185). This last claim has already been disproved above: Schafer’s account of nutmeg is largely fantasy. Kunlun, Schafer’s ‘Kurung’, refers to parts of Southeast Asia.²²

According to Kou Zongshi 寇宗奭 (fl. c. 1115), author of the *Bencao yanyi* 本草衍義 (completed in 1116), as quoted in later pharmacopoeias, ‘*Rou doukou* is so called by comparison with *cao doukou*. The outer shell is removed and only the flesh is used. That which is the colour of

²¹ On the term *hu*, see Haw 2018: 420–421.

²² On ‘Kurung’, see Schafer 1963: 45–46. On Kunlun, see Pelliot 1904: 219–221.





Figure 3: *Bai doukou* (left) and *rou doukou*, as illustrated in the *Chongxiu Zhenghe jingshi zhenglei beiyong bencao* (1249) (Tang Shenwei 1957, *juan* 9: 231, 239).

oil is best. 肉豆蔻對草豆蔻言之。去殼只用肉。肉油色者佳’ (Tang Shenwei 1957, *juan* 9: 231; Li Shizhen 1982, vol. 1, *juan* 14: 876). Today, *cao doukou* is usually identified with *Alpinia katsumadai* Hayata (now considered a synonym of *Alpinia hainanensis* K.Schum.) (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui [ed.] 1999, vol. 8: 596; Wu and Raven [eds.] 2000: 339). Almost certainly, *rou doukou* was originally not nutmeg, but most likely a plant of the ginger family, of the genus *Alpinia*, like other kinds of *doukou*. This is also suggested by the statement in the *Zhenglei bencao* that a foreign name of *rou doukou* was *jiajule* 迦拘勒²³ (Tang Shenwei 1957, *juan* 9: 231). This is a transcription of Sanskrit *kakkola*,²⁴ Tamil *kaccōlam*,²⁵ or a related word in another Indian language, which often refers to cardamom, a plant of the ginger family (Hoogervorst

²³ Early Mandarin *kje-ky-laj* (Pulleyblank 1991: 143, 163, 184).

²⁴ Defined as ‘a species of plant (bearing a berry, the inner part of which is waxy and aromatic)’ (Monier-Williams 1899: 241).

²⁵ Defined as ‘Husk of cardamom’ (University of Madras 1939: 178).

2017: 417). Arabic *qāqulla*, in the sense of an *Amomum* species (Lev and Amar 2008: 100), is likely to be a loan from an Indian language (Nasrallah 2018: 556). There are some species of *Alpinia* which have fleshy seed capsules, red or black in colour (some are red when unripe and black when ripe) (Keng, Chin and Tan 1998: 54; Wu and Raven [eds.] 2000: 333). Plants of this genus bear flowers and fruits at the ends of leafy shoots, as appears to be the case in the early illustrations of *rou doukou*. This is an important characteristic, as many plants of the ginger family (though not species of *Alpinia*) bear flowers on basal shoots separate from their leafy shoots (Wu and Raven [eds.] 2000: 322, 333; Kubitzki [ed.] 1998: 474–475, 489). It is not really possible to identify the original *rou doukou* with any very high degree of certainty, but *Alpinia aquatica* (Retz.) Roscoe can be suggested. This is not now found in China (although it has sometimes been reported there) (Wu and Raven [eds.] 2000: 336; Wu Te-lin [ed.] 1981: 72), but is common in parts of Southeast Asia (Newman, Lhuillier and Poulsen 2004: 7–8; Keng, Chin and Tan 1998: 54). It might well have been cultivated in China in the past.

4) NUTMEG AS *ROU DOUKOU*

It is far from clear exactly when, and how, nutmeg came to be known as *rou doukou*. It is possible that confusion arose because nutmeg is known by a name similar to *doukou* in some Southeast Asian languages. An example is *duguan*, a word for nutmeg in the Philippines (de Guzman and Siemonsma [eds.] 1999: 143; Quattrocchi 2012: 2597). This Tagalog word means ‘bloody’. Many vernacular names of nutmeg have this or similar meanings, referring to the blood-red sap which flows from the trees if the bark is damaged (de Guzman and Siemonsma [eds.] 1999: 142). It must also be assumed that nutmeg had similar medicinal properties to the original *rou doukou*, otherwise it could hardly have become a substitute for it in the Chinese pharmacopoeias. Whatever the reason for the substitution, it seems to have begun at some time around the year 1200. It would certainly seem that the *rou doukou* described in the *Zhu fan zhi* 諸蕃志 of about 1225 is most probably nutmeg (although not certainly from *Myristica fragrans*):

‘*Rou doukou* comes from the distant foreign lands of Huangmazhu and Niulun.²⁶ The tree is like the cypress tree of China, up to 100 feet tall, with a luxuriant trunk and branches, spreading widely enough to shelter 40 or 50 people. Its flowers open in spring. They are collected and dried in the sun. This is what is now called *doukou hua*. Its fruits are like *feizi*.²⁷ If their shell and flesh are removed and they are stored in lime, they can be kept for a long time. According to the pharmacopoeias, it is warm in nature.’

肉豆蔻出黃麻駐、牛崙等深番。樹如中國之柏高至十丈，枝幹條枚繁衍數廣蔽四五十人。春季花開採而曬乾。今豆蔻花是也。其實如榧子去期殼，取其肉以灰藏之可以耐久。按本草其性溫。²⁸

²⁶ There are a number of proposed identifications of these places, but none are much more than guesses. Possibly Niulun 牛崙 might be Neira in the Banda archipelago.

²⁷ Now usually identified with the seeds of *Torreya grandis* Fortune ex Lindley, the ‘Chinese nutmeg tree’ or ‘Chinese nutmeg-yew’ (Wu and Raven [eds.] 1999: 94; Quattrocchi 2012: 3753–3754).

²⁸ Zhao Rukuo 趙汝适 2000, *juan xia*: 182. Note that Hirth and Rockhill’s translation of this passage is inaccurate in several respects; their notes are also full of inaccuracies (Hirth and Rockhill 1911: 210–211).



This is not a very accurate description of *Myristica fragrans* and its fruits. The comparison with cypress, *bai* 柏 (*Platycladus orientalis* (L.) Franco or *Juniperus chinensis* L.) (Wu and Raven [eds.] 1999: 64, 74) is not at all appropriate. *Bai* is a conifer, but *Myristica* is a genus of broadleaved trees. The alleged height of up to 100 feet is excessive: *Myristica fragrans* does not normally exceed 10 m (about 35 ft) (de Wilde 2000: 471; ‘20 to 40 feet in height’: Sawyer 1894: 8). Possibly this is an indication that the tree intended was a different species: *Myristica argentea* Warb. is reported to reach up to 40 m in height. This species is cultivated in New Guinea for its mace and has sometimes been a source of nutmegs (de Wilde 2000: 408–409). Again, *Myristica fragrans* flowers at various times of year and often has ripe fruits and flowers at the same time. Mace, *doukou hua*, is not the dried flowers, but the dried aril which surrounds the shell of the nutmeg, inside the outer fleshy part of the fruit (Donkin 2003: 7; Van Gils and Cox 1994: 120). Nutmegs are said to be harvested three times a year (Milburn 1825: 397), or even continuously (Flach 1966: 22). The comparison with *feizi*, the fruits of *Torreya grandis*, the ‘Chinese nutmeg-yew’, is apt and clearly indicates that this *rou doukou* must be nutmeg, not fruits of any *Alpinia* species. Unlike Hirth and Rockhill, I have taken *hui* 灰 to mean ‘lime’, rather than ‘ashes’ (Hirth and Rockhill 1911: 210). It was common practice to soak nutmegs in a mixture of sea water and lime, both to prevent the nutmegs being eaten by insects and to kill the seeds so that they would not germinate (Milburn 1825: 397–398). The desire to prevent the nutmegs germinating stemmed from the monopolistic intentions of the Dutch, who tried to keep European trade in nutmegs entirely in their own hands (Zumbroich 2005: 156).

As far as I have been able to ascertain, this description in the *Zhu fan zhi* is the earliest certain application of *rou doukou* to nutmeg. A little earlier, the *Lingwai daida* 嶺外代答 (completed in about 1178), contains no mention of *rou doukou*. Nor does the early twelfth century *Pingzhou ke tan* 萍洲可談.²⁹ The *Lingwai daida* does, however, describe *doukou hua* 豆蔻花, but it is quite clear that what is meant is not mace:

‘There are many *doukou*. White *doukou* comes from the southern foreign regions; grassy *doukou* comes from the streams and gorges of Yongzhou [modern Nanning]. Moreover, among the mountains of every region there are *doukou* flowers (*doukou hua*), which are extremely attractive. Their leaves grow in clumps like those of ginger. When they flower, they produce a stalk with leaf sheaths clasped around it. When these part, there is a cluster of flowers with several tens of bracts around it, just like fingertips. They are pale red in colour, like lotus flowers that have not yet opened, and they hang down like grapes.

豆蔻多矣。白豆蔻出南蕃，草豆蔻出邕州溪峒。而諸郡山亦有豆蔻花最可愛。其葉叢生如薑葉。其開花抽一幹有蘗包之。蘗去有花一穗藥數十綴之悉如指面。其色淡紅如蓮花之未敷，又如葡萄之下垂。’ (Zhou Qufei 周去非 1999, *juan* 8: 332).

This is a good description of some species of *Alpinia*, several of which have pendulous inflorescences (Fig. 4). These include *Alpinia zerumbet* (Persoon) B.L. Burt & R.M. Smith, which is often cultivated in south China;³⁰ *Alpinia blepharocalyx* K. Schumann, which occurs wild in Yunnan, Guangxi and Guangdong; and *Alpinia pinnanensis* T.L. Wu & S.J. Chen, from Guangxi

²⁹ Zhu Yu 2007 (entire text searched electronically).

³⁰ This species should not be confused with *Zingiber zerumbet* (L.) Roscoe ex Sm., which is a different plant (Wu and Raven [eds.] 2000: 326).





Figure 4: *Alpinia zerumbet*, as illustrated (under the synonym *Alpinia nutans*) in Norton (1893): Plate 35.

(Wu and Raven [eds.] 2000: 336, 339, 344–345). White *doukou* (*bai doukou* 白豆蔻), however, is usually now identified as *Amomum krervanh* Pierre ex Gagnep. (sometimes incorrectly written ‘*kravanh*’), which is indeed a foreign plant from Southeast Asia (Guojia Zhongyiyao guanliju «Zhonghua bencao» bianweihui [ed.] 1999, vol. 8: 608; de Padua, Bunyapraphatsara and Lemmens [eds.] 1999: 117). (*Amomum krervanh* Pierre ex Gagnep. is now considered a synonym of *Wurfbainia vera* (Blackw.) Škorničk. & A.D.Poulsen; see de Boer *et al.* 2018: 30.) Presumably the author, Zhou Qufei, had not seen this exotic plant. Grassy *doukou* (*cao doukou* 草豆蔻) is an *Alpinia* species (see above). Clearly, at least for Zhou Qufei, *doukou hua* meant flowering *Alpinia* species, not mace. It may be that nutmeg and mace were not yet known in China in his time, or at least not well known. A century earlier, Shen Kuo stated that: ‘The flowers of *gaoliangjiang* [galangal] form spikes and are ornamental and attractive ... southerners also call them mountain ginger flowers (*shan jiang hua*), or *doukou* flowers (*doukou hua*). 高良薑花成穗芳華可愛 ... 南人亦謂之山薑花又曰豆蔻花’ (Shen Kuo 2003, *bu bi tan*, *juan* 3: 279). It may be doubted whether all these names referred to exactly the same plants, but clearly they were all plants of the ginger family. It seems likely that nutmegs and mace began to be imported into China at some time after the 1170s but before about 1220. This dating can only be very approximate, however.

There is a possible complication here. The sixth-century *Qi min yao shu* 齊民要術 includes a quotation from an earlier work referring to a ‘*doukou* tree (*doukou shu* 豆蔻樹)’ (Jia Sixie 1982, *juan* 10: 616–617). Unfortunately, the description of this tree is brief and incomplete. It is said to come from a place called Xinggu 興古, today approximately in the region where Yunnan borders



on Guizhou. It is therefore extremely unlikely that it could have been *Myristica fragrans*. It has been suggested that it might have been *Myristica yunnanensis* Y.H.Li (Mou Qiyu and Qiu Zeqi 1990: 81–82). It must be noted, however, that this *doukou* tree is never mentioned in the *bencao* literature. Exactly what tree it was, and what connection it had with *rou doukou* (if any) is impossible to ascertain.

Well after 1220, the *bencao* literature continued to cite earlier information about *rou doukou* as fruits of *Alpinia*. Reference has already been made to the *Zhenglei bencao* of 1249, in which the illustration of *rou doukou* is clearly *Alpinia* rather than *Myristica*. Similarly, Li Shizhen, author of the *Bencao gangmu* of the late sixteenth century, makes no distinction between different kinds of *rou doukou*. He comments that: 'It is so called because both its flowers and fruits are like those of *doukou*. 花實皆似豆蔻故名.' (Li Shizhen 1982, vol. 1, *juan* 14: 876). As already seen, *doukou* normally refers to species of *Alpinia*. Just a little later, an illustrated pharmacopoeia depicts *rou doukou* as what is apparently *Alpinia* (Fig. 5).



Figure 5: *Rou doukou*, as illustrated in the *Tuxiang bencao mengquan* (1628) (Chen Jiamo et al. 1628, *juan* 2: 12b).



The illustration is not very accurate and was probably copied from an earlier pharmacopoeia. This suggests that nutmegs may still not have been commonly used in medicine at this period, even though they had been known in China for about four centuries. However, a pharmacopoeia dating from the middle of the eighteenth century says the following about *rou doukou*: ‘It comes from Lingnan and resembles *cao kou*. Outside it is wrinkled, inside it has blotches. It is coated with glutinous rice flour or ordinary flour’ (Wu Yiluo 1958, *juan* 2: 52: 出嶺南似草寇，外有縐紋，內有斑紋。糯米粉裹或麵裹). This seems likely to be a hybrid description. The locality of origin and comparison with *cao [dou]kou* was probably taken from earlier pharmacopoeias and applies to *Alpinia*, but the appearance, and coating with flour (perhaps really lime), may well refer to nutmegs. The Japanese pharmacopoeia *Honzō zufu* 本草図譜, compiled in the early nineteenth century but not printed in full until 1920–1921, has two very good illustrations of *rou doukou* which clearly depict nutmeg (Iwasaki 1921, vol. 1, *juan* 10: 12b–14a). On the other hand, the *Zhiwu mingshi tukao* 植物名實圖考 of 1848 has a puzzling illustration of *rou doukou* which is certainly not nutmeg, but does not look like an *Alpinia* species either (Fig. 6).



Figure 6: *Rou doukou*, as illustrated in the *Zhiwu mingshi tukao* (Wu Qijun 1848, *juan* 25: 63a).

5) CONCLUSION

It is clear that *rou doukou* originally was the fleshy fruit of a plant of the ginger family, most likely a species of *Alpinia*. It is not possible to be sure exactly which species. After about 1200, nutmegs from one or more species of *Myristica* became known in China and began to replace the original *rou doukou*. Nonetheless, Chinese pharmacopoeias continued to quote earlier information about the original *rou doukou* long after nutmegs had begun to be imported into China. When the process of replacement was completed is uncertain, but by the late nineteenth century there seems to be no hint that *rou doukou* was anything other than nutmeg. In 1874, Soubeiran and de Thiersant gave ‘jou-teou-ko; jou-teou keou’ [*rou doukou*] as equivalent of *Myristica aromatica* (a synonym of *Myristica fragrans*), or *noix muscades* (nutmegs) (Soubeiran and de Thiersant 1874: 205, 307). Some 20 years later, Bretschneider wrote unhesitatingly that: ‘jou (fleshy) tou kòu [*rou doukou*] is the Chinese name for *Nutmegs*’ (Bretschneider 1895: 124). Nutmegs never seem to have been much used in China other than as medicine. Soubeiran and de Thiersant reported that they were very rarely used as spice (Soubeiran and de Thiersant 1874: 205). There is no trace of *rou doukou* (whether nutmeg or not) as an ingredient of the recipes in the *Yinshan zhengyao* 飲膳正要 of 1330, only a couple of mentions of *bai doukou* seeds (Buell and Anderson 2010: 313 [5A], 315 [6B]). Here, *bai doukou* should perhaps be identified with *Amomum krervanh* (*Wurfbainia vera*; see above). It is probably not ‘true cardamom’, as claimed by Buell and Anderson (2010: 102–103 note 56), which is *Elettaria cardamomum* (L.) Maton, a plant native only to southern India (Nair 2020: 2–4). Although now cultivated elsewhere, including parts of Southeast Asia, this may be a comparatively recent development. In 1980, it was stated that ‘the true cardamom is to some extent cultivated in Thailand as it is throughout the tropics’ (Larsen 1980: 165). However, it is not recorded from Malesia (Newman, Lhuillier and Poulsen 2004: 68). Outside its original area of distribution, it seems to be grown on a large scale only in Sri Lanka, Papua New Guinea, Tanzania and, particularly, parts of Latin America. Guatemala is a major producer, but it was introduced there only as recently as 1920 (Nair 2020: 1, 4, 5).

Mentions of *rou doukou* in Chinese literature of almost any period before the late nineteenth century cannot be taken to refer to nutmeg, unless there is information which suggests such an identification. The name alone is not sufficient. For example, there is mention of *rou doukou*, as an ingredient of wine, in the *Bei shan jiu jing* 北山酒經 of about 1100 (Zhu Gong, *juan* 2: 20). Needham (2000: 186, 237) simply translated this as ‘nutmeg’, but there is nothing to indicate that this is correct. Indeed, as seen above, there is no evidence that nutmeg was known in China at that time. The term *rou doukou* originally applied to a plant or plants of the ginger family, most likely to one or more species of *Alpinia*, and only later came to mean ‘nutmeg’. The identification of plants and plant products mentioned in pre-modern works is a complex problem fraught with difficulties. Far too often, assumptions have been made which are not justified by evidence. It can never be assumed that one particular name always refers to the same plant or plant product. Such an assumption is far too simplistic.



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