THE NOMENCLATURE OF TURMERIC AND OTHER CEYLON ZINGIBERACEAE

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ABSTRACT. Preliminary matter for the account of Zingiberaceae for the *Flora of Ceylon* includes a discussion of the nomenclature and typification of turmeric (*Curcuma longa* L.). *Alpinia nigra* (Gaertn.) B. L. Burtt is shown to be the correct name for *A. allughas* (Retz.) Roscoe; *Zingiber sylvestre* Gaertn., originally said to come from Ceylon, probably refers to an African cardamom (*Aframomum*) but it has not yet been identified with certainty.

The preparation, with Miss R. M. Smith, of the account of Zingiberaceae for the *Revised Handbook to the Flora of Ceylon* has necessitated the detailed investigation of several species. Some names have been justified, others have had to be changed, either for nomenclatural reasons or through reclassification. Certain results have already been published elsewhere, but in order to make this paper complete they are also listed here. In all there are five items:—

1. The typification of *Curcuma longa*, the turmeric of commerce (see below).
2. *Curcuma zedoaria*: Burtt in Gard. Bull., Singapore (in press). After a full investigation it is shown that this name must be retained, but with the revised citation *Curcuma zedoaria* (Christm.) Roscoe. The first valid publication of the basionym has hitherto been overlooked: it was as *Amomum zedoaria* Christmann in Christmann & Panzer, Linn. Pflanzensyst. 5:12 (1779).
3. *Alpinia allughas* becomes *A. nigra* (see below).
4. *Amomum involucratum* and *A. floribundum* have been transferred to *Alpinia:* see R. M. Smith, A preliminary review of the large bracteate species of Alpinia (in Notes R.B.G. Edinb. 34:149–182, 1975). In recent usage these two names had become transposed. Neither epithet is available for use in *Alpinia* and the new names are *Alpinia fax* Burtt & Smith (*Elettaria involucrata* Thwaites—cincinni pubescent, bracteoles always tubular) and *A. abundiflora* Burtt & Smith (*Elettaria floribunda* Thwaites—cincinni glabrous, bracteoles usually open to the base).
5. *Zingiber sylvestre* Gaertn. (see below).

1. The typification of Curcuma longa L.

The original publication of *C. longa* in *Species Plantarum* (1:2, 1753) was as follows:—

longa. 2. Curcuma foliis lanceolatis: nervis lateralibus numerosissimis. Curcuma foliis lanceolatis utrinque acuminatis, nervis lateralibus numerosissimis. Roy. lugdb. 12. Fl. zeyl. 7. Mat. med. 5. Curcuma radice longa. Herm. lugdb. 208, t. 209. Habitat in India. [Perenn.]

For many years the name was used for the cultivated turmeric without question, but in 1918 Valeton included a survey of the eastern species of *Curcuma* in his studies of Zingiberaceae and rejected *C. longa* as a *nomen dubium*. He said that the name was "based only on Hermann" and that the description and illustration given by this author referred in the main to *C. aromatica* Salisb. It is true that the other references given by Linnaeus all mention Hermann, but not exclusively. We shall return to these in detail below; the point to be made here is that Valeton failed to appreciate that other elements were involved. Therefore his use of Hermann's account as the sole basis for the name *C. longa* does not amount to the choice of a lectotype. He did not realise that a choice was possible.

Subsequently Merrill (1935, p. 119) disagreed with Valeton. He knew that Linnaeus's *Flora Zeylanica* was based on the Hermann herbarium now in the British Museum; he knew, too, that Trimen (1887, p. 133) had recorded the existence in it of a specimen of *Curcuma longa*. It was this specimen that Merrill proposed to take as lectotype, saying that he preferred to rely "on a specimen examined by Linnaeus and one that is still extant". Unfortunately Merrill's choice cannot be upheld. Linnaeus gives no original description of this specimen, he merely identifies it, and it could not have been the basis for the descriptive phrase in *Species Plantarum*, for this, as can be seen above, gives only leaf characters: the Hermann specimen (vol. 3, fol. 5) consists of a flowering spike, without leaves. However, judging from the shape of spike and bracts, localization of pigment spots near to the margin of the bracts, and their texture, it can be said that this specimen is indeed the cultivated turmeric. It shows that the plant was known to Hermann.

Thus neither Valeton's nor Merrill's treatment of the problem was adequate. Not surprisingly, current usage is mixed. We must start again from the beginning. It will be simplest to deal first with the account and illustration given by Hermann, for these are the source of most of the confusion.

Hermann headed his account of *Curcuma radice longa* with references to earlier publications, Bauhin's *Pinax* etc., which, as far as they are recognizable, refer to the cultivated turmeric. He says then that this was one of the plants that he had brought home from the East and that it was still growing at Leiden. The illustration consists of a plant with horizontal rhizome, a tuft of leaves and an inflorescence arising from the rhizome separately from the leaf tuft: there is also an isolated flower.

Dryander (1792, p. 213) pointed out that the flower does not belong to the plant illustrated: it is almost certainly copied from Rheede's figure of Manja Kua [*Curcuma rotunda* L. now *Boesenbergia rotunda* (L.) Mansf.]. Why should this have been done? Perhaps because Rheede gives no illustration of the flower of Manjella Kua (turmeric) but says that it is the same as that of Manja Kua. However that may be, it seems that Hermann had access to Rheede's work although this was not actually published for another five years. Valeton has taken the leafless inflorescence to indicate that Hermann was illustrating *Curcuma aromatica* Salisb., not the turmeric. Certainly Hermann refers again to the lateral position when discussing *Zingiber latifolium sylvestre* (pp. 636–640); it was scarcely an error. Yet it must be admitted that the inflorescence drawn is much more like that of turmeric than that of *C. aromatica*, which is usually more massive with blunter bracts

and with larger sheaths on the longer peduncle. The position of the inflorescence is also odd, for though it is central to the leaves in the true turmeric, in *C. aromatica* it arises close alongside the leaf-tuft. In Hermann's illustration it is entirely separated from the leaves on an unnatural-looking horizontal rhizome. However Hermann describes the bracts as becoming pinkish, and pale yellow or purplish petals: colours that point to *C. aromatica* rather than turmeric. His note, that no garden is without this plant, suggests turmeric rather than *C. aromatica*. The safest conclusion is that even if a plant of *C. aromatica* flowered at Leiden, Hermann's account is a hopeless mixture and cannot be relied on.

It will be noticed, in the extract given above, that Linnaeus's definition of *C. longa* is taken verbatim from van Royen; the small omission of "utrinque acuminatis" is simply due to this phrase also occurring in van Royen's definition of *C. rotunda*, and Linnaeus wanted to give only contrasting characters. However Linnaeus's use of van Royen's phrase does not, in this case, have any deep significance in the typification of the species. Van Royen simply expressed in neat botanical Latin an observation which had originally been made by Rheede (see below).

It is more useful, at this point, to look at Linnaeus's fuller treatment in *Flora Zeylanica*. Here his entry is:—

7. Curcuma foliis lanceolatis utrinque acuminatis nervis lateralibus numerosissimis. Roy. lugdb. 12.
   Curcuma foliis longioribus et angustioribus. Breyn. prodr. 2. p. 40.
   Curcuma radice longa. Herm. lugdb. 208 t. 209. Burm. zeyl. 203.
   Cyperi genus ex India. Bauh. pin. 37.
   Manjella Kua. Rheed. Mal. 2. p. 21. t. 11.
   Kaha. Herm. zeyl. 30.
   Pharmac. Curcumae radix.

We see that Linnaeus used van Royen's definition, and it may be added that van Royen himself simply gave the references to Breynius and Hermann. Breynius was recording rare species he had seen growing in gardens in the Netherlands, and it is interesting to note that he reports this *Curcuma* both at Leiden and at Amsterdam. The earlier references reached through Bauhin's *Pinax* are those that deal with the root as a drug or article of commerce, they are of no help in identifying the plant: Bontius (Hist. nat. 117, 1658) had in fact associated an illustration of leaves and fruits of *Canna indica* with his account of the root.

The important reference is that to the Manjella Kua of Rheede's *Hortus Malabaricus*. Rheede illustrated and described three plants that have been placed in *Curcuma*: Kua [= *Curcuma zedoaria* (Christm.) Roscoe], Manja Kua [= *Curcuma rotunda* L., now *Boesenbergia rotunda* (L.) Mansf.] and Manjella Kua (the cultivated turmeric). He seems to have thought the last two to be more closely related to one another than to Kua, and this must have been because both these have a central inflorescence while that of Kua is lateral to the leaf tuft. It is, I think, worthwhile giving a translation of his account of Manjella Kua.

"The fifth species, Manjella Kua, in Brahmi Alady, is the true Cucuma [sic] and likes all soils. The root is tuberous like that of the ginger, two digits thick, elegantly tinged outside with yellow, inside with watery red, which also turns yellow, hard, fleshy, not marked by rings but of the same colour

throughout, provided with numerous small roots that lead on into capillary rootlets, furthermore as in Manja Kua it is of very pleasant smell and taste, but stronger. The leaves are produced like those of Kua but their petioles, after they diverge from the pseudo-stem [stipite] are longer. The nerves which run transversely forwards from the middle of the leaf are closer together and more slender. The leaf itself [i.e. lamina] is larger and paler. The flowers arise at the centre of the leaves, in form like those of Manja Kua, as are the seeds, thus there is little difference between this plant and Manja Kua except in size, and in more outstanding value, in scent and taste. It is found not only in waste ground but is also cultivated in the fields, and this as a cash-crop [lucri causa] for there are no families which do not include it in their diet." Then follows an enumeration of its medicinal virtues.

The notes added by J. Commelin, who edited this volume after Rheede's death, are also worth translating:—

"This plant described by our Author is indeed the true Cucuma [sic]. I have cultivated it for a number of years in the Hortus Medicus at Amsterdam and I affirm that it exactly agrees with this description. It is distinguished from Kua by the pseudostem [foliorum caulis] being weaker. The illustration of Bontius is worthless, for instead of this plant he has a figure of *Canna indica*. The illustration of Dr Hermann is also poor, and agrees very little with that of our Author, especially in the growth of the flower [i.e. inflorescence], which was observed much better by our Author. This root, which is much used amongst the Indians, is called by them Borri-Borri, other names can be seen in Bauhin's Pinax".

It should be noted that Commelin's comparison of the figure given by Hermann with that of the *Hortus Malabaricus* is misleading. Rheede observed and described the origin of the inflorescence, but he did not illustrate it: the plate of Manjella Kua is of leaves and tuber only. Commelin's notes suggest either that the plant at Amsterdam was the true turmeric, while that grown at Leiden by Hermann was *C. aromaticus*, or that Hermann's illustration was indeed a very bad one. Whichever view one takes, these notes confirm that the true turmeric was known at that time.

We have now reached the position where we can say with some certainty that Linnaeus was naming the plant which was the source of turmeric, not just one plant which flowered in the garden at Leiden. The best and least ambiguous account of turmeric cited by Linnaeus is that given by Rheede under the name Manjella Kua. It is therefore proposed that *Curcuma longa* L. be typified by this reference, and thus the name will be retained for the turmeric of commerce.

Having rejected *C. longa* as a *nomen dubium*, Valeton gave the name *C. domestica* Val. to the cultivated turmeric, basing it on Koenig's decription of the plant. This now becomes a synonym of *C. longa*, for which full citations follow.

Curcuma longa L., Sp. Pl. 1:2 (1753) pro max. parte; Koenig in Retz., Obs. Bot. 3:72 (1783); Roxb. in Asiat. Res. 11:340 (1810); Horan., Monogr. 23 (1862); Baker in Hook. f., Fl. Brit. Ind. 6:214 (1890); K. Schum., Pflanzenr. Zingib. 108 (1904); Wealth of India (Raw. Mat. 2:402 (1950); Burtt & Smith in Notes R.B.G. Edinb. 31:185, 225 (1972).

Syn.: [*Manjella kua* Rheede, Hort. Malab. 11:21, t. 11 (1692).]
[*Curcuma domestica minor* et *major* Rumph., Herb. Amboin. 5: t. 67 (1749).]
Amomum curcuma Jacq., Hort. Vindob. 3: t. 4 (1776).
Kua domestica Medik. in Act. Acad. Theod. Palat. pars phys. 6: 396 (1790).
Stissera curcuma Giseke, Prael. Ord. Linn. 249 (1792).
Curcuma domestica Val. in Bull. Jard. Bot. Buitenz. 2 ser. 27:31 (1918); Holttum in Gard. Bull. Singapore 13: 68 (1950); Back. & Bakh. f., Fl. Java 13:72 (1968); Burtt & Smith in Notes R.B.G. Edinb. 31: 203 (1972).
Lectotypified by *Manjella kua* Rheede.

3. Alpina nigra (Gaertn.) B. L. Burtt, **comb. nov.**
Basionym: *Zingiber nigrum* Gaertn., De Fruct. & Sem. 1:35, tab. 12 (1788).
Syn.: [*Cardamomum zeylanicum, fructu rotundo nigro, in caulium summitate* Hermann, Parad. Bat. Prod. 320 (1689); Burmann, Thes. Zeyl. 54 (1737).]
[*Mala-inschi-kua* Rheede, Hort. Malab. 11:29, t. 14 (1692).]
[*Alughas* Linn., Fl. Zeyl. 207 No. 449 (1747).]
Heritiera allughas Retz., Obs. Bot. 6: 17, t. 1 (1791).
Hellenia allughas (Retz.) Willd., Sp. Pl. 1:4 (1797).
Alpinia allughas (Retz.) Roscoe in Trans. Linn. Soc. 8:346 (1807); Roxb. in Asiat. Res. 11:353 (1810); Baker in Hook. f., Fl. Brit. Ind. 6:253 (1892); Trimen, Handb. Fl. Ceylon, 4:247 (1898); K. Schum., Pflanzenr. Zing. 344 (1904)—excl. syn. *Languas chinensis* Koen.; Burtt & Smith in Notes R.B.G. Edinb. 31:201 (1972).
Alpinia rheedii Wight, Ic. Pl. Ind. Or. 6:19, t. 2026 (1853).
Languas allughas (Retz.) Burkill in Kew Bull. 1935, 317, et Dict. Econ. Prod. Mal. Penin. 2:1305 (1935).

Gaertner's illustration of fruit and seed fit well with the plant currently known as *Alpinia allughas*. Hermann had two plants under the name Allughas, but they were not known to Linnaeus. In *Flora Zeylanica*, based on the Hermann herbarium now in the British Museum, Linnaeus lists them as nos. 448 and 449 in the group "Barbarae", comprising plants of which no specimens were found. Nor are there specimens in the collection studied by Burmann, now at Paris (Lourteig, 1966). However Hermann's descriptive phrase "fructu rotundo nigro, in caulium summitate" is clear and decisive: it can refer to no other member of Zingiberaceae in Ceylon. There can be no doubt that *Zingiber nigrum* is *Alpinia allughas*.

There is one discrepancy in the record. Retzius cites Linnaeus, *Flora Zeylanica* no. 448 under *Heritiera allughas*. Gaertner's references belong to no. 449. Both are "Alughas". No. 448 appears under *Zingiber sylvestre* Gaertn., though it may be questioned whether the fruits and seeds that Gaertner illustrated belong to the plant named by Hermann (see below). Nevertheless there is no evidence, other than the common name Allughas, to link the two plants. It is perhaps simplest to assume that Retzius made a mistake and quoted 448 in error for 449, which is certainly the plant he described.

K. Schumann (1904, p. 344) cited "Languas chinensis Koenig" as a synonym, and Alston (1931 p. 282) took the name into use, although it was not validly published by Koenig. Validation of the epithet *chinensis* for Koenig's plant was effected by Retzius under *Heritiera* simultaneously with publication of the name *H. allughas*. However Burkill (1935a, p. 317 and 1935b, p. 1305) suggests that the Malay plant to which *H. chinensis* refers is not the Allughas of Ceylon, but may be *A. melanocarpa* Ridl. Holttum (1950 p. 160) accepts this as a possibility but rejects the name on the grounds that the plant cannot be recognized with certainty.

5. Zingiber sylvestre Gaertn., De Fruct. & Sem. 34, tab. 12 (1788).

This name has never been taken into general use. Gaertner cites under it "Cardamomum zeylanicum sylvestre, aquaticum, acre, sapore calami aromatici, Herm. mus. zeyl. 96. Burm. fl. zeyl. 54?" It might therefore be expected to be a Ceylon plant.

The fruit and seeds illustrated and described by Gaertner are quite unlike those of any Zingiberaceae indigenous to Ceylon. The species that they agree with most closely is the Abyssinian cardamom, *Amomum korarima* Pereira (1847, 1850), now known as *Aframomum korarima* (Pereira) Engler. Pereira came to know this plant merely by its fruits, which used to be an article of commerce carried down from the Ethiopian highlands to the Red Sea, and thence exported to India. Baker (1898, p. 311) reports that such fruits had been sent to Kew from Bombay. It is therefore quite possible that they reached the markets of Ceylon.

Both *Zingiber sylvestre* and *Aframomum korarima* are names that were given to isolated fruits. Whether they can be satisfactorily linked to the plants known in the herbarium is a difficult problem. It is in the hands of Dr J. M. Lock (University of Ghana), who is revising the genus *Aframomum*.

The plant mentioned by Hermann and by Burman was said to grow commonly in marshy areas outside Colombo, but this may have been just market-talk. Such a plant still awaits recognition. In any case it is clear that the name *Zingiber sylvestre* must be typified by the fruits and seeds that Gaertner studied, and it is highly improbable that these came from a plant native to Ceylon.

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