

Comments on the identity of “Niirvala” and Typification of *Crateva tapia* L.

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Abstract

Crateva tapia L. (Sp. Pl. 1: 444. 1753), a medicinal plant, is a spreading deciduous tree with distribution ranging from Mexico to Argentina and lesser Antilles (New World). In the original protologue of this name, Linnaeus mixed two different elements namely American (Plukenet, Commelin, Sloan, Raj.) element and ‘Niirvala’, an Indian (Rheede) element.

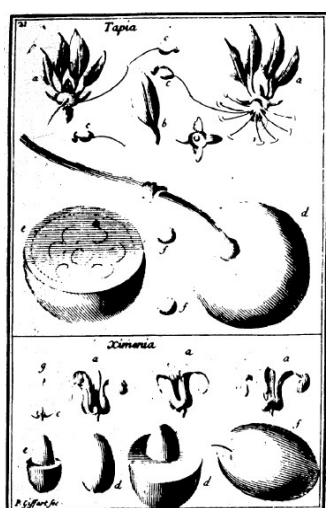
In the present paper the author has tried to establish the correct name for Rheede’s ‘Niirvala’ and designate the type for the same.

Key words: Identity, *Niirvala*, *Crateva niirvala*, Typification

Crateva tapia L. (Capparaceae) is a spreading deciduous tree ranging from Mexico to Argentina and lesser Antilles (New World). **In the original protologue of this name, Linnaeus mixed two different elements namely American (Plukenet, Commelin, Sloan, Raj.) element and Indian (Rheede) element.**

[*Crateva tapia* L. Sp. Pl. 1: 444. 1753; Fl. Zeyl. 94 (no. 211). 1747; Hort. Cliff. 484. 1738; Pluk. Almag. 34. T. 137. F. 7. 1692; Commelin Hort. 1: p. 129. t. 67; Sloan Jam. 208. Hist. 2. p. 169.; Raj. Dendr. 79; ‘Niirvala’, Rheede, Hort. Mal. 3: p. 49- 50. t. 42. 1682.]

Linnaeus published the generic concept of *Crateva* in Gen. Pl. ed. 1, 1737. ‘*Tapia*’ (Figure 1) was proposed by Plumier (1703) as “*Tapia arborea triphylla*” (Plumier Gen. 22).



T A P I A.

726. 21. **T**apia est plantæ genus flore A polypetalo, andmalo, ex quatuor scilicet petalis sursum erectis constante. Pistillum autem C surgit e medio calycis, longo pediculo affixum; abique deinde in fructum D globosum, carnosum, in quo nidulantur E semina plurima, fere reni formia F.

Tapia unicam vidi speciem.
Tapia arborea, triphylla.
Tapia est nomen Americanum. G. Pifo. lib. 4. cap. 17.

Figure 1. ‘Tapia’- “*Tapia arborea triphylla*” (Plumier Gen. 22)

Linnaeus (1753. 444) based *C. tapia* on “*Apioscorodon f. Arbor America triphyllos, alluodore, pome ferens*” Plukenet Phytographia t 137, f. 7, 1692 (Figure 2).

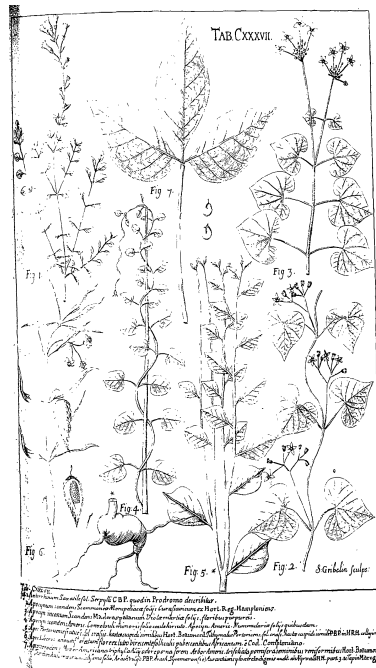


Figure 2. Plukenet, Phytographia: t 137, f. 7, 1692 – the type of *Crateva tapia* vide Al-Shehbaz *et al.*

The name *Crateva tapia* L. is lectotypified on Plukenet, Phytographia: t 137, f. 7, 1692 vide Al-Shehbaz in Jarvis *et al.*, *Regnum Veg.* 127: 39. 1993 and Jarvis in “Order out of Chaos (456.2007)” accepts this typification.

The diagnostic characters of *Crateva tapia* L. (sensu Plukenet, Commelin, Sloan, Raj.) are:

- Tree in full foliage during anthesis; leaves having **Garlic smell**
- Leaves trifoliate, leaflets ovate–lanceolate, taper pointed; petioles long, often with dark coloured base and top
- Inflorescence dense, many flowers open at the same time; **inflorescence and infructescence stalk is furfureus**
- Flowers in terminal corymb, 5 cm - 7 cm in diameter. **Petals** 4–13 mm, limb 6–17 x 1–7 mm, **ovate**; sometimes the upper pair larger than lower pair, greenish white, turning cream coloured
- Stamens upto 50, on androphore, pink, upto 7 mm long
- Berries on a gynophores, rough, globose to elongated

The voucher specimens referred by Linnaeus (now kept at various herbaria) agreeing with the above mentioned description are L 0224232, G00088000, LINN 619.2 belong to the American element of *Crateva tapia* L.

The voucher number G00088000 (collected in 1842-43 by Linden, J. J. no. 1370), labelled as the ISOTYPE (Figure 3b) of *Crateva tapia* L. is stored in Conservatoire et Jardin Botaniques de la Ville de Geneve (G).



Figures 3. a, b & c: Vouchers of *Crateva tapia* studied by Linnaeus deposited at Rikjs Herbarium(L), Jardin Botaniques de la Ville de Geneve (G) and at LINN respectively.

Rheede's '*Niirvala*'

The Indian element described by Rheede as "*Niirvala*" differs from the above in the following characters:

- Leaves **without garlic smell**
- Leaflets longer than its breadth**
- Petals narrower**
- Inflorescence and infructescence stalk **glabrous**

According to the understanding of the present author the two elements, namely Indian and American are different. It is doubtful if Linnaeus got a chance to examine “*Niirvala*” while describing *C. tapia*, which is exclusively Indian.

The specimens which Linnaeus had studied while naming *Crateva tapia*, have **many scaly/flaky particles on the flowering stem and petals are broader than length**. The presence of scaly particles on the stem and inflorescence and shape of the petals are two of the diagnostic characters of the plants described by Linnaeus as supported by the descriptions he provided in the following citations:

Crateva tapia L. Sp. Pl. 1: 444. 1753; Fl. Zeyl. 94 (no. 211). 1747; Hort. Cliff. 484. 1738; Pluk. Almag. 34. T. 137. F. 7. 1692; Commelin Hort. 1: p. 129. t. 67; Sloan Jam. 208. Hist. 2. p. 169.; Raj. Dendr. 79.

In contrast to this observation, the Indian element ‘*Niirvala*’ does not have any scales on the stem and inflorescence and petals are broader than its length. **Moreover, Linnaeus examined *Crateva tapia* from America** (as understood from the protologues and voucher specimens deposited at various herbariums mentioned above) **and not from India.**

Hence, *Crateva tapia* L. is rightly lectotypified by the American element, Plukenet, Phytographia: t 137, f. 7, 1692 vide Al-Shehbaz in Jarvis *et al.*, Regnum Veg. 127: 39. 1993 **Now, the question remains, what is the identity of Indian element ‘*Niirvala*’ and what is its type?**

N. Burman in 1768 (Fl. Ind. 109) retained the American (Pluk., Commelin, Sloan) and Indian (Rheede) element of *Crateva tapia* L. under the same name and not only that he also believed that its distribution is “*India Utraque*”, i.e., found both in India and America.

In 1797, Willdenow (Sp. Pl. ii. 853) separated the Indian element ‘*Niirvala*’ from ‘*tapia*’ of Brazil but it united with *Crateva religiosa* G.Forst.

Crateva religiosa G.Forst. (African element) has smaller and shorter leaves and the fruit is also small - the size of a plum and globular. Hence, it differs from Rheede’s ‘*Niirvala*’. The leaf has the smell of Garlic in African species which is absent in that of Rheede’s.

In 1827, **Francis Hamilton** (Trans. Linn. Soc. XV: 121 – 122) in his **Commentary on the Hortus Malabaricus, introduced the name *Crateva niirvala*** and accepted *Crateva tapia sensu* Burman (Fl. Ind. 109) and Linn. *Species Plantarum* in the synonymy but, excluded all American elements from these names. Hence, **Hamilton is the first person who segregated the Indian element from American and named the Indian element as *Crateva nurvala* and his plant must be typified by an Indian specimen.**

In *Flora of British India* (1872), J.D. Hooker and Thomson accepted *C. religiosa* G.Forst. for the Indian plant. He classified *C. religiosa* G.Forst. in two varieties, namely, var. *nurvala* (fruit ovoid) and *roxburghii* (fruit globose). Blatter did not recognize these varieties and considered both these varieties as one.

Almeida (Fl. Maharashtra 1: 51 – 52. 1997) mentions that ‘Burman was the first author to use the name *C. tapia* for Indian material and hence, *C. tapia* should be typified by Indian material’. **N. Burman (Fl. Ind. 109.1768) did not distinguish between the Indian and American element and he kept both the elements united.**

According to the understanding of the present author, **the Indian element depicted by Rheede belongs to *Crateva nurvala* Ham.** (Trans. Linn. Soc. XV: 121 – 122. 1827). Almeida (Fl. Maharashtra 1: 51) recognizes *C. nurvala* Ham. as synonym of *Crateva tapia* L. ssp. *odora* (Jacob) Almeida.

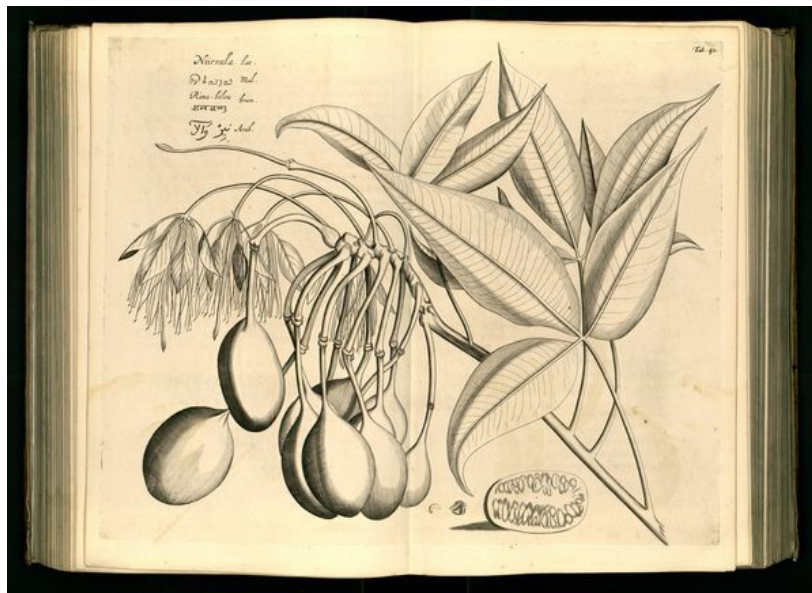


Figure 5. ‘Niirvala’ Hort. Mal. 3: p. 49 - 50. t. 42. 1682 – the Lectotype of *Crateva nurvala* Ham. (designated here)

Hamilton mentions in Trans. Linn. Soc. (XV: 121 – 122. 1827) that the fruit is elongated (as observed in ‘Niirvala’ and not globose) but, in *C. tapia* ssp. *odora* (Jacob Almeida) it is globose.

M. Jacob designated Plumier, Nova Pl. Amer. Gen. (1703) 22, descri. T.21 (Blumea 12(2): 189. 1964) as type of the species *Crateva* L. as there is no extant material. Al-Shehbaz argued that Plumier’s reference is not a part of the original protologue and designated “*Apioscorodon* f. *Arbor America triphyllos, alluodore, pome ferens*” Plukenet Phytographia t. 137, f. 7, 1692 as type in 1993 by Al-Shehbaz in Jarvis *et al.*, Regnum Veg. 127: 39. 1993. Jarvis accepts the typification of Al-Shehbaz (Order out of Chaos: 456. 2007).

Based on the above discussion, the correct identity of ‘Niirvala’ (Rheede, Hort. Mal. 3: p. 49 - 50. t. 42. 1682) is *Crateva nurvala* Ham. in Trans. Linn. Soc. XV: 121 – 122. 1827.

Rheede’s plate, ‘Niirvala’ Hort. Mal. 3: p. 49 - 50. t. 42. 1682 (Figure 5) is designated here as the Lectotype of *Crateva nurvala* Ham.

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