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THE GENERIC IDENTITY OF XANTHOSTEMON BRACHYANDRUS C. T. WHITE: LINDSAYOMYRTUS NOVUM GENUS (MYRTACEAE)

B. P. M. HYLAND & C. G. G. J. VAN STEENIS
Queensland Research Station, Forestry & Timber Bureau, Atherton, Queensland / Rijksherbarium, Leiden

Two decades ago the senior author was urged by the West New Guinea Forest Service to name a rather common canopy tree of New Guinea and the Moluccas. Among two dozen collections there was only one in flower, from the island of Ceram. Though the species was certainly new for Malesia, the absence of fruit explained his hesitation to refer it to one of the genera of the *Tristania-Xanthostemon-Metrosideros* complex to which it clearly belonged. It was finally described as *Metrosideros nigroviridis* Steen., the specific epithet alluding to the sepia-coloured twigs and conspicuously green-drying leaves. Finally, about 1960 a fruiting specimen collected by Chr. Versteegh came to hand (BW 4702) which showed by its indehiscent nature and fleshy pericarp that it could not belong to *Metrosideros*, *Xanthostemon*, or *Tristania*. The material was laid apart pending later investigation.

In scanning duplicates from North Queensland in 1970 he found to his surprise among unnamed North Queensland *Myrtaceae* exactly the same species. Asking the judgment of Lindsay Smith the latter pointed out (in litt. 16—6—70) that this had been described from North Queensland as *Xanthostemon brachyandrus* C. T. White. He added that this species 'had always intrigued him because the seedlings, which are often thick on the floor of the rain forest under the parent trees, have the young leaves bluish instead of reddish like most other Myrtaceae.' He also postponed a detailed study 'pending collection of complete material', but it did not appear to him to 'agree with any of the genera described in this group'.

Recently the junior author collected abundant complete material of all stages, including the fruit. This led him independently to question the generic identity from which this joint research resulted. This material opened the opportunity to clarify the status of this widely distributed rain forest tree.

In herbarium facies it closely resembles two *Tristania* species, *T. macrosperma* F. v. M. from Papua and *T. longivalvis* F. v. M. from Papua and Queensland, which also have greenish leaves when dried and dark, terete twigs. By their half-inferior capsules with numerous winged seeds these two species are, however, true *Tristanias*.

Around *Tristania* there are in Malesia several satellite genera, viz. *Kjellbergiodendron* Burret, *Whiteodendron* Steen., and *Basisperma* C. T. White.

All these genera differ from *Tristania* proper in different sets of characters, relating mainly to both androecium and gynoecium, but all have in common a reduction in the number of seeds and simultaneously an increase in seed size, and folded cotyledons.

Whiteodendron Steen., Act. Bot. Neerl. 1 (1952) 436, fig. 1, from Borneo, has the sta-

mens in 5 large connate phalanges, and a 3-celled superior ovary, but a capsule containing only one seed. The pericarp is differentiated in 2 layers, the endocarp being chartaceous. The venation is closed by the presence of a distinct intramarginal vein.

Basisperma C. T. White, J. Arn. Arb. 23 (1942) 84, pl. 1, from New Guinea, has free phalanges, obviously consisting of free stamens (complete flowers are not yet fully known), but the ovary is 2-celled, superior; the capsule is dehiscent and possesses also a differentiated pericarp. Seeds 1—3, basally attached, with a thickish, red testa. It differs from the other genera by axillary inflorescences. The venation is closed.

Kjellbergiodendron Burret, Notizbl. Berl.-Dahl. 13 (1936) 101, fig. 5; Merr., J. Arn. Arb. 33 (1952) 162; Steen., Act. Bot. Neerl. 1 (1952) 440, fig. 2; Blumea 8 (1955) 171 (descr. of fruit), from Celebes and the Moluccas, possesses phalanges distinctly connate into a staminal ring. Its ovary is 2-celled; the indehiscent fruit is inferior, with an undifferentiated fleshy pericarp, and contains only one basally attached large seed. Both species of this genus are very coarse in leaves, twigs and flowers as compared with the other genera mentioned. The venation is closed.

Comparing *Xanthostemon brachyandrus* with the genera mentioned above, it appears that there are considerable differences: it differs from all in the mostly flat cotyledons, and from each of the three genera mentioned in other important characters. This has led us to consider it as related to and possibly derived from the *Tristania* matrix, but sufficiently distinct to accommodate it into a genus in its own right. This we have named in honour of the late Lindsay Smith.

LINDSAYOMYRTUS *gen. nov.*

Planta glabra. Ramuli teretes. Phyllotaxis spiralis. *Inflorescentiae* terminales. Ovarium inferum, apice applanatum, 3-loculare, ovulis numerosis placenta mediana insertis. Receptaculum ovarium haud superans. Calyx indistincte 5-lobus, limbo marginali brevissimo. Petala valde imbricata, albida (in sicco sulfurea). Stamina phalangibus 5 coordinata, multiseriata, basi haud connata, petala haud superantia, aurantiaca. *Fructus* superus, pericarpio carnoso haud differentiato, plerumque haud rumpente, in quoque loculo semen unicum continens, interdum loculis 1 vel 2 abortivis ad nodulos reductis. *Cotyledones* 2, applanati et conchati, vel crassi, forma magnitudineque inaequales et fissurati.

Distribution: East Malesia and North Queensland.

Lindsayomyrtus brachyandrus (C. T. White) Hyland & Steen., *comb. nov.* — **Fig. 1.**

Xanthostemon brachyandrus C. T. White, Proc. R. Soc. Queensl. 53 (1942) 219.
Metrosideros nigroviridis Steen., Act. Bot. Neerl. 2 (1953) 299, fig. 1.

Additional description of the fruit, seed, germination, and seedling:

Fruit variable, sometimes dehiscing longitudinally so that the ovary wall opens out completely and sheds the seed. In other cases the fruit is shed without dehiscing. Fruit frequently one-seeded but occasionally 2- or 3-seeded. Fruit shape variable; one-seeded fruits being more or less flattened ovoid with two small laterally attached lobes near the base; these lobes are the remains of the undeveloped ovary cells. Two-seeded fruits reniform, with a poorly developed median lateral lobe. Three-seeded fruits three-lobed and depressed at the apex, lobes with rounded lateral margins. Three-lobed fruits are the largest: about 2 cm long and 3 cm broad.

Seeds 1—2.3 cm diameter, flattened-ovoid to irregularly circular in outline, attached to

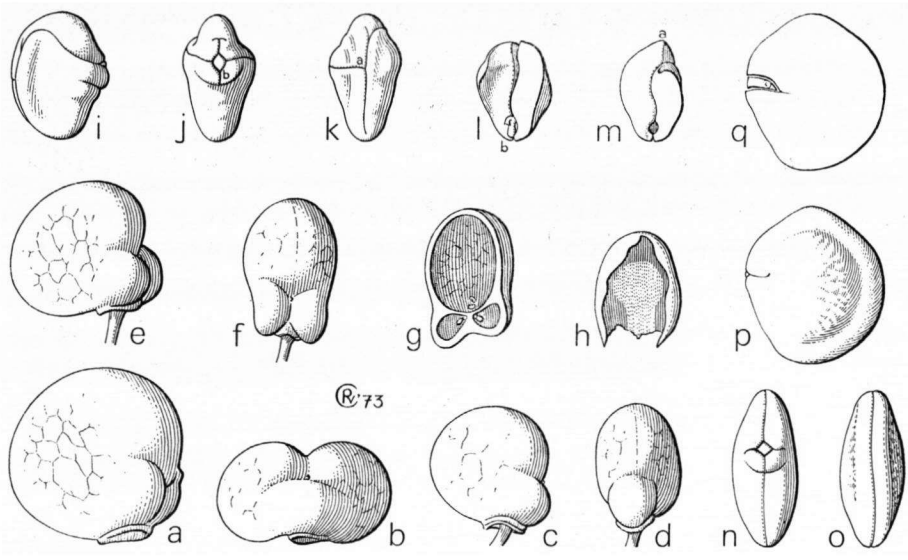

Fig. 1. Fruit and seed structure of *Lindsayomyrtus brachyandrus* (C. T. White) Hyland & Steen. — a, e, f. Fruits with one seed and two aborted locules, sectioned in g. — b and c. Fruit with two seeds and one abortive locule. — d. Fruit with one seed, one abortive locule and the third one suppressed. — h. Seed coat, with a transparent pergamentaceous part over the plumule area. — i—k. Embryo, from three sides, showing the two unequal massive cotyledons, with in j. the small lozenge-shaped tip of the plumule, and the slit in the cotyledons in k. — l and m. The cotyledons separated, both cotyledons showing a slit, the letters *a* and *b* indicating the same situation as in j and k, the rootlet in l hidden in the slit of the cotyledon, the curved appendage being the attachment of the other cotyledon of m. — n—q. Flattened embryo seen towards the plumule; o. the same embryo from the other side; p. ditto, seen from the lateral side; q. cotyledon seen from inside, with obtuse plumule and insertion place of the other cotyledon. — All nat. size (after *Hyland 6607*).

the base of the fruit. Testa smooth, shiny brown at maturity, rather thin and papery on the margins but thicker and more leathery towards the centre. Cotyledons with a marginal horseshoe-shaped ring of smooth tissue almost surrounding a central, sculptured, shallowly pitted, region. Cotyledons marked by numerous oil glands but lacking any obvious venation. Albumen absent; embryo straight, 3—4 mm long, 1.5 mm broad.

As can be observed from the figure there is quite some variation in the detailed shape and structure of the cotyledons. At first it was assumed that this went parallel with the feature whether the fruit contained only one well-developed seed or two, but after opening many fruits there seems to be no regularity. The conchiform cotyledons show hardly any trace of the clefts observed in the massive ones and furthermore they are almost equal in size and shape, which is not the case in the massive cotyledons.

Germination phanerocotylar (epigeal), hypocotyl 2—4 cm long, epicotyl 4—12 cm long. Cataphylls are sometimes produced before true leaves (eophylls). The first eophylls are a pair of opposite leaves which are often closely followed by a spiral of two or three more leaves. The overall effect is a whorl of 4 or 5 leaves and close inspection is required to elucidate the true arrangement.

After germination the cotyledons appear to retain their size and are just sucked out. In

the glasshouse, the cotyledons remain on the seedling for about one month or slightly longer but all are generally shed within two months.

As to the wood structure there seems to be a discrepancy between the Queensland and New Guinea specimens. In all five trees collected in North Queensland the wood has sections of bark included in the wood, a feature which is, according to Mr. H. D. Ingle (Melbourne), also found in and characteristic for four species of the *Eugenia/Syzygium* complex, one of which is even named after this character 'Bark in the Wood' (*Eugenia angophoroides* F. v. M.). These bark inclusions Mr. Ingle did not find in the New Guinean wood samples he had at his disposal. For the present we cannot account for this discrepancy; it may be a variable feature.

A striking feature of this species is the colour of the young leaves. On both seedlings and large trees they are dark bluish purple later turning pink or reddish. The bluish purple colour is quite striking and unknown in other rain forest species in North Queensland.

Distribution. MOLUCCAS (Batjan, Ambon, Buru, Ceram), WEST NEW GUINEA (Steen., l.c. 301, fig. 2), and EAST NEW GUINEA (base of Mt Suckling, *NGF 28688*; Morobe District, *NGF 24275*). — NEW BRITAIN. Talasea Subdistrict, 5°36' S, 150°25' E, *NGF 10951*. — NORTH QUEENSLAND. Cook District: Mossman Gorge, *North Queensl. Natur. Club 292*; *ditto*, 3 miles W. of Mossman, *Schodde 4167*; Harvey Creek, near Babinda, *F. R. Morris* (type in North Queensl. Natur. Club herb. *6440*), 19 Nov. 1939; Harvey Creek, Nov. 1935, *Morris 974*; Atherton, Porn. 62 Alexandra, *Hyland 6358*, *6604*, *6605*, *6607*; Bloomfield, Timber Reserve 146, *Hyland 6783*; Bloomfield River, *L. S. Smith* (in litt.); Stewarts Creek (Daintree), *Dansie AFO 3966*; Gap Creek (Cooktown), *L. S. Smith 10749*.

Notes. In the sterile state this species is easy to distinguish from *Tristania macrosperma* and *T. longivalvis* which possess finely puberulent younger parts.

In Queensland it appears to be confined to a narrow belt of lowland rain forest between Harvey Creek in the south and Mt Amos in the north, i.e. a latitudinal range of 1°30'. This belt of rain forest is the wettest in North Queensland, and where *L. brachyandrus* occurs the annual rainfall generally exceeds 300 cm. The tree appears to be more common along creeks and gullies but is found in other situations as well. The tree produces quite large seed crops and regenerates well, but the seedlings appear to need plenty of sunlight for rapid growth. It could therefore be regarded as a shade-intolerant species which would be favoured by disturbances such as cyclones.