

CINNADENIA Kosterm.
GENUS NOVUM LAURACEARUM

A. J. G. H. KOSTERMANS

Arbores foliis alternantibus, floribus paniculatis vel subracemosis axillaribus exinvolucratis bisexualibus vel dioecis, tepalis 6, staminibus 9-12 omnibus glandulosis, antheris magnis quadrilocellatis introrsis, floribus femineis staminodiiis numerosis glandulosis, ovario sessili; fructus cupula plana incrassata impositus.

SPECIES UNICA : *C. paniculata* (Hooker f.) Kostermans

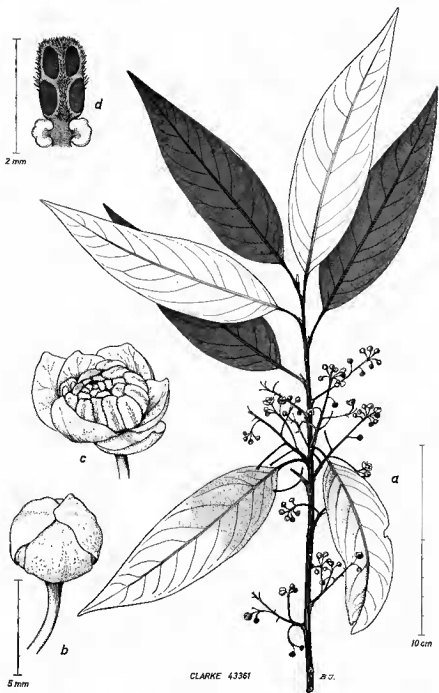
HOOKEr f., who described *Dodecadenia paniculata* in 1886, expressed already his doubts about its generic status. His assumption, that the young inflorescence should have involucreting bracts like those of *Dodecadenia grandiflora*, proved to be wrong. Although no bracts have been observed in the material at hand, the very small scars are evidence for this. The paniculate inflorescence, the general composition of the flower and the slightly thickened fruit pedicel with a small cupula, places this genus near *Cinnamomum*, from which it differs, however, by the very large anthers, the dioecious flowers and the large number of glands. The genus could eventually be included into *Ocotea*, but the presence of large staminodes prevents this. *Ocotea veraguazensis* has also numerous glands, an exception in *Ocotea* and this species is quite different in general appearance from *Pleurothyrium*, where a large number of glands is the rule.

C. paniculata is apparently dioecious, but apart from female flowers with stipe like stamens and male flowers with a slender ovary, complete with style and stigma, I found that one specimen had anthers in the female flowers, although these were smaller than those of male flowers; it could not be ascertained whether they contained pollen.

LIou Ho created the subgenus *Octolitsea* for his *Litsea liuyingii*, a synonym of *C. paniculata*, to accommodate this species.

***Cinnadenia paniculata* (Hooker f.) Kosterm., comb. nov.**

— *Dodecadenia paniculata* HOOKEr f. (basionym), Fl. Brit. India 5 : 181 (1886); GRIFFITH, Itiner. Notes : 113 (1848) (*Tetranthera*); GAMBLE, Man. Ind. Timbers, ed. 2 : 574



Pl. I. — *Cinnadenia paniculata* (Hook. f.) Kosterm. : a, Flowering branch; b, Unopened male flower; c, Young male flower; d, Young stamen.

- (1902); BRANDIS, Indian Trees : 53t (1906); KANJILAL et al., Fl. Assam 4 : 93 (1940); KOSTERMANS, Bibl. Laur. : 478 (1964). — TYPUS : *J. D. Hooker s.n.*, Sikkim (K); SYN-TYPUS : *Clarke s.n.* (= 3436) (K, LE), *Griffith 2472* (BM, K), Bhotan 2 Sasse.
— *Tetranthera chartacea* var. β *areolata* MEISSNER ex HOOKER f., l. c.; KOSTERMANS t. c. : 1384.
— *Tetranthera chartacea* auct. (non WALLICH), MEISSNER in DC., Prodr 15 (1) : 186 (1864), p.p. *quoad specim. J. D. Hooker*, Sikkim, fr. (K.).
— *Litsea liuyingii* LIOU HO, Bull. Soc. Bot. France 80 : 566, fig. t (1933); ALLEN, Ann. Missouri Bot. Gard. 25 : 380 (1938); WU CHEN I, List Spermatoph. Yunnan 1 : 23 (1959) (Chinese); KOSTERMANS, Bibl. Laur. : 842 (1964). — TYPUS : *Henry 12839* (E, NY).

EMENDED DESCRIPTION :

Tree, 15-30 m high, glabrous in most of its parts; top of branchlets and end bud slightly, minutely silky. Leaves spirally arranged, coriaceous, elliptic to subovate-elliptic, or narrowly ovate-elliptic, $3,5 \times 10-5,5 \times 18-8 \times 20$ cm, gradually acutish, base rounded or shortly acute, both surfaces smooth (looking pitted under the high power lens), upper one glossy, midrib flat, slightly impressed, laterals fillform, slightly impressed, lower one pale, practically glabrous, glaucous; (under the lens eroded), midrib prominent, laterals 8-12 pairs, slender, prominulous, erect-patent to somewhat steep, arcuate, often forked. Petiole 1,5-2,5 cm long.

Male panicles many-flowered, up to 7 cm long, slightly, minutely appressed pilose towards the apices of the racemose branchlets. Pedicels 3-6 mm long, slender. Flower buds depressed globose. Tepals ovate, acutish, 3 mm long. Stamens 9-12 (up to 32), filament slender, anthers oblong or oblong-truncate, large, with large, introrse cells; inner ones (or all) provided with glands; ovary very narrow with style and discoid stigma or none. Female and bisexual (?) flowers in 3-5 cm long, few-flowered panicles; pedicel up to 8 mm long, filaments shorter than in the male flowers, ovary glabrous, ellipsoid-ovoid with short style and inconspicuous or peltate stigma. The perianth drops as a whole (a ring).

Fruit club-shaped, 13×25 mm, obtuse; cup 2-4 mm high, fleshy, 5-8 mm diam. at the apex, pedicel 1 cm long, slightly thickened towards the apex.

ANATOMY:

The following anatomical investigation was carried out at the Leiden Rijks Herbarium by Mr. BAAS (*N.L. Bor 42*, Naga Hills, Assam).

The leaf. Adaxial epidermis composed of unspecialized cells with slightly undulating anticlinal walls. Unspecialized cells of abaxial epidermis with strongly undulated anticlinal walls and low dome-shaped periclinal outer walls. Cuticle of abaxial epidermis warty. Stomata confined to lower surface, paracytic. Unicellular hairs with thick walls and a much narrowed base sparsely distributed on lower surface. Mesophyll composed of 2 layers of adaxial palisade cells and spongy tissue, interspersed with oil cells. Petiole and midrib supplied by a single flattened and broad vascular strand. Minor and major veins vertically transcur-

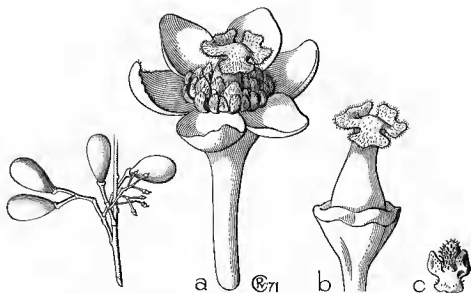


Fig. 2. — *Cinadennia paniculata* (Hook. f.) Kosterm. (Bar 42, K): left, inflorescence and fruit $\times 1$; a, female flower $\times 20$; b, ovary $\times 20$; c, staminode $\times 20$.

rent by sclerenchymatous girders. Brachysclereids present in ground tissue of petiole. Minute prismatic to needle-shaped crystals present in mesophyll, particularly in vicinity of veins.

Young twig (c. 4 mm in diameter). Cork superficial. Perivascular sclerenchymatous ring composed of fibre groups and stone cells with unilateral (adaxial) wall thickenings. Secondary phloem with only very few fibres differentiated in it. Secondary xylem transversed by narrow 1- or 2-seriate heterogeneous rays. Vessels solitary and in short radial multiples. Perforation plates simple but a few scalariform with a low number of bars. Intervessel pits alternate. Vessel-ray pits large and simple, horizontally elongated. Parenchyma very scanty diffuse and paratracheal. Pith homogeneous, composed of thin-walled lignified cells.

The description of the vegetative anatomy given above agrees very well with the general account given for *Lauraceae* by METCALFE and CHALK (1950), *Anatomy of the Dicotyledons*. Oxford.

DISTRIBUTION : Bhutan, Assam, Burma.

SPECIMENS EXAMINED : CHINA (Yun Nan) : Szemao, fl. *Henry 12839* (P.); BHUTAN : Chukka Dimper, alt. 1 300 m, tree 10 m, Oct., buds, *Cooper 4929* (BM). — ASSAM : Jowai, fl. male, *Griffith s. n.* (BO, K, L); *ibid.*, buds, *wing's Coll. s. n.* (BM, K); Naga Hills, Jakkama, alt. 1 600 m, young fr., *Bor 2825* (B0) and Nov., fl. (male), *Bor 42* (BO, K);

ibid., small tree, March, buds, *Bor 6368* (K); Kehrima, alt. 1 700 m, tree 17 m, March, hermaphr. fls., *Bor 2825* (K); ibid., Nov., fls. cream, *Kingdon Ward 12508* (BM); Zakhoma, 2 000 m alt., rather common, Nov., fl., *Kingdon Ward 19060* (BM); Manipore, Moa, alt. 1 800 m, Oct., male fls., *Clarke 43361* (BM, K); SIKKIM, Mik, alt. 1 000 m, tree 33 m spreading, April, fr. pink, *Clarke 27565 A* (K). — BURMA : locality not indicated, *Forest Ranger s. n.* (BO), stouter panicles, fewer laterals nerves.

Herbarium Bogoriense.

BOGOR. INDONESIA.