

Two nearly mature females 10 inches long, and two young from the Bay of Bengal, 123 fathoms. The differences between this species and the preceding are too numerous to support the opinion that they are only different sexes of the same species.

At the same station a specimen of (9.) *Dysomma bucephalus* was dredged.

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*On some Indian Species of Canarium.*—By GEORGE KING, M. B., LL. D.,  
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With Plates X, XI, XII, and XIII.

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In Sir Joseph Hooker's Flora of British India eighteen species of *Canarium* are described. Of these, twelve are Indo-Malayan, two have hitherto been collected only in the Andaman Islands, and two are confined to Ceylon. The remaining two, *viz.*, *C. strictum*, Roxb., and *C. bengalense*, Roxb. are natives of British India proper, and were both originally published by Roxburgh in his Flora Indica. *C. strictum* is a native of Southern India, and was originally described from specimens received by Roxburgh from the Forests of the Tinnivelli district in the extreme South of the Peninsula. It has since been collected in the Anamalli and Bababudin Hills, in the Concan, and in other parts of the Forests of the Western Ghats. *C. bengalense*, on the other hand, is known only from Sylhet and Assam. The distribution of the two species is therefore very different. All the species of *Canarium* known to me are large trees with tall clear stems, bearing branches, (and consequently flower and fruit), only at their apices. Botanical specimens are therefore not easily obtained, and the various species are poorly represented in most collections, and are therefore but imperfectly understood by Botanists. The species indigenous to British India proper do not in these respects form any exception; for, in spite of the existence for the last five and twenty years of a large and well-organised Forest Department, we do not appear to know more to-day about them than we did when Roxburgh originally described two of them eighty years ago. With the view of directing the attention of forest officers to their study, I venture to submit to the Society descriptions of the two already recognised Indian species, a description of what appears to me to be a new species from Sikkim, and some notes on specimens which appear to belong to two species hitherto unrecognised and undescribed.

## CANARIUM, Linn.

Tall resiniferous trees. Leaves alternate, unequally pinnate, stipulate or exstipulate. *Flowers* bracteate, in panicles or racemes, dimorphous, those with fertile stamens and rudimentary ovaries being smaller but in larger inflorescences, those with fertile ovaries and rudimentary stamens being larger but in smaller inflorescences. *Calyx* campanulate, with 3 valvate lobes or teeth. *Petals* 3, imbricate, longer than the calyx. *Stamens* 6, the filaments united in their lower part to form a tube. *Ovary* 3-celled, ovules 2 in each cell. *Style* cylindric, or stigma sessile and capitate. *Drupe* ellipsoid, more or less distinctly trigonous, with a 1-3-celled, 1-3-seeded, stone; cotyledons often partite.\*

1. *C. BENGALENSE*, Roxb. Hort. Beng. 49: Fl. Ind. III., 136. Young branches glabrous. *Leaves* 1 to 2 feet long (in young trees considerably more); leaflets 11 to 21, oblong-lanceolate to ovate-oblong, entire, acute, or very shortly acuminate, the base rounded or slightly narrowed; both surfaces glabrous; the main nerves 10 to 20 pairs, sub-horizontal, curving at their tips, distinct on the lower surface when dry; length 3 to 7 in., breadth 1.25 to 2.5 in.; stipules subulate, pubescent, deciduous. *Inflorescence* glabrous as to the rachises, the pedicels of the flowers puberulous; the male flowers in racemose panicles, the lateral branches of which are pedunculate few-flowered rather lax cymules. *Calyx* about one-third of the length of the corolla, campanulate, its mouth with 3 shallow broad teeth. *Petals* coriaceous, oblong, concave, glabrous. *Staminal-tube* about the same length as the free part of the filaments and anthers; free part of filament slightly shorter than the narrowly ovate anthers. *Disc* none; rudimentary ovary depressed, deeply lobed, hispid at the apex. *Female flower* (fide Roxburgh) like the male; the ovary ovoid, tapering gradually into the style, the stigma 3-cleft. *Ripe drupe* oblong; the style sub-persistent, tapering to each end, smooth, 1.5 to 1.75 in. long and .7 to .8 in. in diam. Hook. fil. Fl. Br. Ind. I, 534; Engler in DC. Monog. Phan. IV, 118.

Assam and Sylhet; Griffith No. 1144. (Kew Distrib.), Simons, S. E. Peal, Mann.

A tall tree like *C. strictum* but, unlike that species, almost entirely glabrous, and having leaves with smaller and more numerous leaflets. According to Mr. S. E. Peal, who has resided and observed in Assam for five and twenty years, its vernacular name in the Sibsagar district of that province is *Neribi*. From wounds in the

\* There is no true disc in any of the species here described. What some writers refer to as a disc is merely the tube formed by the union of the dilated lower part of the filaments.

bark a clear amber-like resin exudes which is used for a variety of purposes, but chiefly to be burnt as incense.

Plate X, *C. bengalense*, Roxb.—1. Two leaflets. 2. inflorescence. 3. ripe fruit; *of natural size*. 4. calyx. 5, 6, 7. petals. 8. staminal column. 9. rudimentary ovary; *enlarged*. 10. two stamens; *much enlarged*.

2. *C. STRICTUM*, Roxb. Hort. Beng. 49: Fl. Ind. III, 138. Young branches rufous-tomentose. *Leaves* 1 to 1½ feet long (in young trees up to even 4 feet); leaflets 7 to 9, ovate to elliptic, minutely serrate or crenulate when young, entire or sub-entire when adult, shortly acuminate, the base rounded or slightly cordate and sometimes sub-oblique; when young tomentose on both surfaces; when adult the upper surface glabrous and shining, the lower more or less tomentose with the 11 to 16 pairs of spreading rather straight main nerves bold and prominent and the intermediate nerves distinct and parallel; length 3 to 6 in., breadth 1·5 to 2·5 in., petiolule ·25 or ·3 in., that of the terminal leaflet two or three times as long. *Inflorescence* more or less deciduously rusty-tomentose, that of the staminiferous flowers a narrow racemose panicle 6 to 9 in. long, its lateral branches being shortly peduncled few-flowered cymes. *Male flowers* ·35 in. long. *Calyx* tubular, with 3 shallow, broad, sub-acute teeth. *Petals* coriaceous, oblong, concave and pubescent outside in the upper two-thirds, glabrous inside. *Staminal tube* equal in length to the free part of the filaments and the anthers; free part of the filaments dilated towards the base, half as long as the ovate apiculate anthers. *Disc* none. *Rudimentary ovary* short, depressed, lobed, hispid. *Female flowers* ·5 in. long, in few-flowered racemes 4 or 5 inches long. *Calyx* wider than in the male. *Staminal tube* also as in the male, but shorter and the anthers with little or no pollen. *Ovary* ovoid-cylindric, tapering into the short thick style; stigma conical. *Ripe drupe* ellipsoid, tapering more to the apex than to the base, slightly trigonous, glabrous, 1·5 in. long, and ·75 in diam. Wight and Arnot Prodr., 175: Dalz. and Gibs. Fl. Bombay, 52: Beddome Fl. Sylvat. I, t. 128; Hooker Fl. Br. Ind. I, 534; Engler in DC. Monog. Phan. IV, 118. *Pimela stricta*, Blume Mus. Bot. Lugd. Bat. I, 226.

Peninsular India, in the moist Forests of the Western Ghats up to elevations of 4,000 to 4,500 feet.

A very tall tree, the young leaves of a beautiful red colour, those of young trees or of young shoots of old trees being much larger than the measurements given above. According to Col. Beddome, the flowers have occasionally 4 petals and 8 stamens. The tree is known to Europeans in Southern India (Beddome Fl. Sylv., 128) as "black dammar." Its Tamil name, says the same authority, is *Karupu Kungu-*

liam; but it is also known as *Googal* and *Dhup*, two words which in the Eastern Himalaya are conjoined as the name of the species which I below name *C. sikkimensis*. In S. Canara *C. strictum* is known as *Manda Dhup*. The resin, which is obtained by the barbarous and destructive method of cutting gashes in the lower part of the stem and then setting it on fire, is an article of trade in Southern India. It is used in the manufacture of bottling-wax, varnishes, &c., and is known by a variety of names of which the commonest are *Dhup*, *Googal*, and *Black dammar*.

Plate XI, *Canarium strictum*, Roxb.—1 and 2. leaflets. 3. inflorescence of male flowers. 4. inflorescence of female flowers. 14. drupe; of natural size. 5. calyx of male flower. 6. the three petals of the same. 7. side view of a petal. 8. staminal tube laid open. 12 and 13, pistils; enlarged, 10 and 11. front and back view of stamens; much enlarged.

3. *C. SIKKIMENSE*, King, n. sp. Young branches very thick and (like the petioles, petiolules, and under surfaces of leaves) densely rusty-tomentose. *Leaves* 15 to 13 inches long; leaflets ovate or elliptic to oblong, minutely crenate-serrate, shortly acuminate, the base rounded or emarginate, slightly oblique; upper surface (when adult) glabrous, shining; the lower softly tomentose, the 13 to 20 pairs of spreading, rather straight main nerves bold and prominent; length 4 to 7.5 in., breadth 2 to 3.5 in., petiole .1 to .25 in. *Male inflorescence* a racemose panicle 9 to 15 in. long, the lateral branches being shortly-stalked few-flowered cymes. *Flowers* .3 in. long. *Calyx* tomentose outside, glabrous inside, campanulate, cut for one-third of its length into 3 broad, obtuse teeth. *Petals* twice as long as the calyx, oblong, obovate, coriaceous, concave and pubescent externally in the upper two-thirds, glabrous within. *Staminal tube* about half as long as the free part of the filaments and anthers, puberulous inside; free part of the filament nearly as long as the linear-ovate anther. *Rudimentary ovary* depressed, hirsute, lobed. *Disc* none. *Female flowers* unknown. *Ripe drupe* narrowly cylindric, ellipsoid, slightly obovoid, glabrous, sub-trigonus, 1.75 in. long and .7 in. in diam. *C. bengalense*, (not of Roxb.) Gamble List of Trees of Darjeeling District, 15.

Sikkim, in tropical valleys at elevations of from 1,000 to 3,000 feet.

This is named *Googal Dhup* by the Nepalese, and *Nar-ok-pa* by the Lepchas. It is a very tall tree, and was once very common on the lower hill-forests; but now, alas! it is rare. According to Mr. Gamble (l. c. 15) the wood is white, open-grained and soft, with large medullary rays, and has a low specific gravity. It yields a resin which is burnt as incense by the Lepchas. This much resembles the Southern Indian *C.*

*strictum*, Roxb., but differs in having broader leaflets more tomentose beneath, a narrower drupe, and shorter branchlets.

Plate XII. *Canarium sikkimense*, King. 1. Leaflet. 2. inflorescence of male flowers. 3. ripe drupe; of natural size. 4. calyx. 5,6, & 7. petals, 8. staminal tube. 9. rudimentary ovary; enlarged. 10. stamens; much enlarged.

Besides the foregoing species, of which pretty full materials exist in the Calcutta Herbarium, there are imperfect materials of another species from Assam, viz:—

*C. REZINIFERUM*, Brace MSS. in Herb. Calc. A large tree 6 or 8 feet in girth, with leaflets resembling those of *C. sikkimense* in shape and size, but having their under surfaces covered with much less and much minuter tomentum, and with the rachises on which they are inserted almost glabrous. The male inflorescence is a panicle of cymes 12 to 16 in. long, the female inflorescence being racemose and only half as long, and both being rufous-puberulous. Drupe ovoid, 1.5 in. long, and nearly 1 in. in diam. when ripe, glabrous. Male and female flowers unknown. Assam and Khasia Hills, G. Mann.

This is the *Dhoona*, or *Dhua*, tree of Assam, and is a species apparently well enough known by its vernacular name and probably common in that province. It yields a resin which is used to make torches. Fruiting specimens of it were collected by Mr. Gustav Mann at Nangpoo and at other places in the Khasia Hills. Male inflorescences with a few worm-eaten flowers accompany other specimens sent to the Calcutta herbarium by the same indefatigable collector. Leaf-specimens collected at Jota Bhor (near Jorhat) in the year 1845 by Mr. Masters, (a collector sent from the Garden,) also exist in the Calcutta Herbarium. But perfect specimens of flowers of both kinds are still wanting. Will no Forest officer now collect them?

Plate XIII. *C. reziniferum*, Brace. 1. Leaflet. 2. inflorescence of male flowers. 3. ripe fruit; of natural size. 4. calyx. 5,6, & 7. petals. 8. staminal tube. 9. rudimentary ovary; enlarged. 10. two anthers; much enlarged.

There also exist in the Calcutta Herbarium specimens in fruit of a species from Arakan with glabrous oblong leaflets 6 or 7 inches long and about 3 inches broad, with minutely serrate edges, acuminate apices and broad emarginate bases, and drupes like those of *C. strictum*, Roxb. The nearest allies of this are apparently (1) *C. bengalense*, which has however smaller leaflets and much narrower drupes; and (2) *C. euphyllum*, Kurz, a species of which the drupe is as yet unknown.