

THE GENUS BRUGUIERA IN THE SUNDRIBANS

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ABSTRACT

Occurrence of 3 species of *Bruguiera* in the Sundribans is reported in this paper, viz., *B. gymnorhiza*, *B. cylindrica* and *B. parviflora*. *B. gymnorhiza* is frequent all over the Sundribans while the other 2 are rare species in that area and *B. cylindrica* being reported for the first time from Western Sundribans. The distinguishing character, exhaustive synonymy, range of distribution and uses are also given.

In the southern part of the Lower Gangetic Plain lies an extensive mangrove forest known as the Sundribans. Much of this vast forest area is in E. Pakistan and only a small portion of it covers the southernmost part of W. Bengal within Indian Union. The writer visited the Sazinakhali area in the Sundribans lying in W. Bengal in September, 1959 and collected among other things 2 species of *Bruguiera* (Rhizophoraceae) one of which was the common *B. gymnorhiza* (Linn.) Lam. and the other with much smaller flower was found to be *B. cylindrica* (Linn.) Blume (*B. caryophylloides* of F.B.I.). This species was not reported previously from the Sundribans proper, although its find in that area was not unexpected, as it occurs in the tidal forests on the western and eastern coast of Peninsular India and in the coasts south of Chittagong down to Malaya.

Another species of *Bruguiera* is known to occur in the Sundribans, viz., *B. parviflora* (Roxb.) Wight & Arn. ex Griff. This and *B. gymnorhiza* were collected from these forests as early as 1796 by Goodlad (Roxb., 1814) and were described by Roxburgh (1832) as *Rhizophora parviflora* and *R. gymnorhiza*. *Bruguiera gymnorhiza* is found all over the Sundriban forests, but *B. parviflora* is by no means a common plant there. Prain (1903a & 1903b), includes it only on the authority of Roxburgh. Cowan (1928) however reported it from Chakaria, south of Chittagong, closely associated with *B. gymnorhiza*, where he found *B. cylindrica* also. In the Calcutta-herbarium there are specimens of *B. parviflora* collected by S. C. Chatterjee, F. R. in 1915 from Sundribans but no precise locality is mentioned on the sheets.

B. gymnorhiza is a medium sized tree with solitary flowers which are over 3 cm. long and have 10-16 calyx-lobes in each. *B. cylindrica* and *B. parviflora* are short trees or arboreous shrubs, have much smaller flowers, 2-5 together in cymose inflorescences, each with 8 calyx-lobes. In *B. cylindrica* the tube of the calyx is not ridged, equal to the lobes in length and less than 1 cm. in fruit; the calyx lobes are reflexed in fruit and the petals are 4-9 mm. long. In *B. parviflora* the calyx-tube is ridged, about 4 times as long as the lobes and elongates to 2 cm. in fruit, calyx lobes not reflexed in fruit and petals up to 2 mm. long.

There existed much confusion about the nomenclature of different species of *Bruguiera*, particularly of *B. gymnorhiza*. Ding Hou (1958) clears up this confusion and remarks that merely on the basis of literature Merrill has proposed to use *Rhizophora conjugata* Linn. as the basionym for his *Bruguiera conjugata*. But *R. conjugata* Linn. is based on a drawing by Hermann, preserved in British Museum, composed of flowers and fruits of two species of entirely different genera, the specific interpretation of which remains uncertain for the inadequacy of the drawing. This has led in the past to confusion and error.

In the Linnean Herbarium there is further a specimen which according to Savage bears Linnaeus's hand writing. It has not yet been identified. It is neither a *Rhizophora* nor a *Bruguiera*. It does not agree with Linnaeus's description of *R. conjugata*. Ding Hou considers that it has been added to Linnaeus's herbarium after 1753 and it can not serve for more precise typification. Ding Hou therefore rejects the combination *B. conjugata* (Linn.) Merr. in agreement with Art. 65 and 66 of the 1956 code.

The synonymy of the 3 species of *Bruguiera* occurring in the Sundribans are noted below:—

Bruguiera gymnorhiza (Linn.) Lam., Encycl. Meth. Bot. 4: 696, 1798; Bl. En. Pl. Jav. 1: 92, 1827; Miq., Fl. Ind. Bot. 1(1): 586, 1856; Thwaites, En. Pl. Zeyl. 120, 1859; Kurz, For. Fl. Burma 1: 450, 1877; Henslow in Hk.f., F.B.I. 2: 437, 1878; King, J. Asiat. Soc. Beng. 66(2): 314, 1898; Back., Schoolfl. 484, 1911 et Bekn. Fl. Jav. (Em. ed.) 4(b): fam. 102, 7. 1944; Hochr., Candollea 2: 448, 1925; Prain, Beng. Pl. 447, 1903 et Rec. bot. Surv. India. 2: 307, 1903; Cowan, Rec. bot. Surv. India. 11: 212, 1928; Ding Hou, Fl. Males. ser. 1, 5(4): 461, 1958; *B. rheedii* Bl., En. fl. Jav. 1: 92, 1827; Wight, Ic. 1: t. 239A, 1-8, 1839 et Ill. Ind. Bot. 210, 1860; *B. cylindrica* Hance, J. Bot. 18: 10, 1879; Eng., Bot. Jahrb. 6: 63, 1885; *B. conjugata* Merr., Philipp. J. Sci. Bot. 9: 118, 1914; Int. Rumph. 388, 1917, En. Born. Pl. 421, 1921; En. Philip. Fl. Pl. 3: 146, 1923 et Comm. Lour. Fl. Cochinch., 282, 1935; Gamble, Fl. Mad. 3: 458, 1919.

Rhizophora gymnorhiza Linn., Sp. Pl. 443, 1753;

Willd., Sp. Pl. 2(2): 843, 1800; *R. palum* DC. Prod. 3: 33, 1828; *R. rheedii* Steud., Nomencl. 2: 449, 1841.

Distr.: Tropical South and East Africa, Madagascar, Seychelles, Ceylon, Tidal forests of India and Burma, Malaysia to Australia, Micronesia and Polynesia. In the Sundribans it was collected from almost all parts. Cowan collected it in Chakaria and Sinclair in Cox Bazar. It was collected by C. B. Clarke near salt lakes in Calcutta in 1876.

Bruguiera cylindrica (Linn.) Blume, En. Pl. Jav. 1: 93, 1827; Wight & Arn., Prod. 311, 1834; Miq. Fl. Ind. Bot. 1(1): 586, 1855; Merr., Int. Rumph. 388, 1917 et En. Philip. Fl. Pl. 3: 147, 1923; Gamble, Fl. Mad. 3: 458, 1919; Craib, Fl. Siam. 1: 595, 1931; Ding Hou, Fl. Males. Ser. 1, 5(4): 467, 1958. *B. caryophylloides* Bl., En. Pl. Jav. 1: 93, 1827; Miq., Fl. Ind. Bot. 1(1): 589, 1855; Kurz., For. Fl. Burma 6: 450, 1877; Hemslow in Hk.f., F.B.I. 2: 438, 1878; Trin. Fl. Ceyl. 2: 154, 1894; King, *J. Asiat. Soc. Beng.* 66(2): 315, 1878; Haines, Bot. Bihar & Oris. 3: 349, 1922; Cowan, in *Rec. bot. Surv. India.* 11: 212, 1928. *B. malabarica* Ann. Mag. nat. Hist., 1: 319, 1838.

Rhizophora cylindrica Linn., Sp. Pl. 443, 1753.

R. caryophylloides Burm. f., Fl. Ind. p. 109, 1768.

Kanilia caryophylloides Blume Mus. Bot. 1: 141, 1849.

Distr.: Western and eastern coast of India, and eastwards to N. Queensland; in Sundribans it has been discovered in Sazinakhali and in Chakaria south of Chittagong.

Bruguiera parviflora (Roxb.) Wight & Arn. ex Griff., *Trans. Med. Phys. Soc. Cal.*, 8: 10, 1836; Miq., Fl. Ind.

Bot. 1(1): 588, 1855; Kurz., For. Fl. Burma 1: 449, 1877; Hemslow in Hk.f., F.B.I. 2: 438, 1878; King, *J. Asiat. Soc. Beng.* 66(2): 315, 1898; Prain, Beng. Pl., 2: 1275, 1903 et *Rec. bot. Surv. India.* 2: 307, 1903; Merr., En. Born. Pl. 421, 1921 et En. Philip. Fl. Pl. 3: 147, 1923; Cowan, *Rec. bot. Surv. India.* 11: 212, 1928; Craib, Fl. Siam. 1: 596, 1931; Ding Hou, Fl. Males. Ser. 1, 5(4): 464, 1958.

Rhizophora cylindrica Roxb. Hort. Beng. non Linn.; *R. parviflora* Roxb. Fl. Ind. 2: 461, 1832.

Kanilia parviflora Blume, Mus. Bot. 1: 140, f. 30, 1849.

Distr.: Sundribans of India (?) and E. Pakistan, Burma and eastwards to Australia.

The red hard timber of *B. gymnorhiza* is used for firewood and charcoal, and also for poles, house posts and rafters. The leaves and peeled hypocotyls are eaten in the Mouluccas after having been soaked in water and boiled. In Djakarta the starchy central part of the hypocotyl is made into a sweetmeat by treating with sugar.

The other 2 species being of a dwarf size are not put to much use except that the stem and branches are employed as firewoods.

LITERATURE CITED

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2. DING HOU—Fl. Males. Ser. 1, 5(4): 464, 1958.
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4. „ (a)—Fl. Sund. *Rec. bot. Surv. India* 2: 307, 1903
5. ROXB. W.—Hort. Beng. 36, 1814.
6. „ (a)—Fl. Ind. 2: 460-461, 1832.