L. L. NARAYANA* & Digamber RAO*: Contributions to the floral anatomy of Linaceae 5

L. L. ナラヤナ*・D. ラオ*: アマ科の花部解剖学的研究 5

Present paper, the fifth in the series deals with the floral morphology and anatomy of *Philbornea magnifolia* (Stapf.) Hall. f.

Material and Method The herbarium material of the flower buds was obtained from Dr. Anwari Dilmy, Indonesia. The material was processed for microtomy as described previously (Narayana, 1964). Sections cut at between 9-12 microns of thicknesses were stained in crystal violet and counterstained with erythrosin.

Morphology of the flower The flower is pedicellate, pentacyclic, pentamerous, heterochlamydeous, regular, bisexual and hypogynous (Figs. 1, 8, 18, 19). The unequal, free sepals are quincuncial (Figs. 6-8). The free petals show contorted aestivation (Figs. 9, 17-19). The prominent extrastaminal disc is completely adnate to the base of the staminal tube (Figs. 1, 12, 15, 16). The androecium consists of ten stamens of two different heights, the antipetalous being shorter (Figs. 1, 18, 19). The anthers are dorsifixed and introrse (Figs. 1, 18, 19). The ovary is tricarpellary, syncarpous, trilocular, with two pendulous, anatropous, bitegmic ovules in each loculus (Figs. 1, 13-15) ; it becomes unilocular above. The styles are basally connate and terminate in the capitate, bilobed stigmas with glandular hairs (Fig. 1).

Floral anatomy The stele of the pedicel shows a ring of ten to fifteen closely placed, discrete, vascular bundles (Fig. 2). Higher up the stele it becomes a closed ring (Fig. 3). The bases of the five quincuncial sepals become evident even before the demarcation of their vascular supply (Fig. 3). The sepal traces arise at different levels (Figs. 4-6) and the lateral traces of adjacent sepals arise conjointly. The petals are single traced and the traces arise independently from the main stele (Fig. 7). At a level where the petals separate from the receptacle, ten staminal traces arise in

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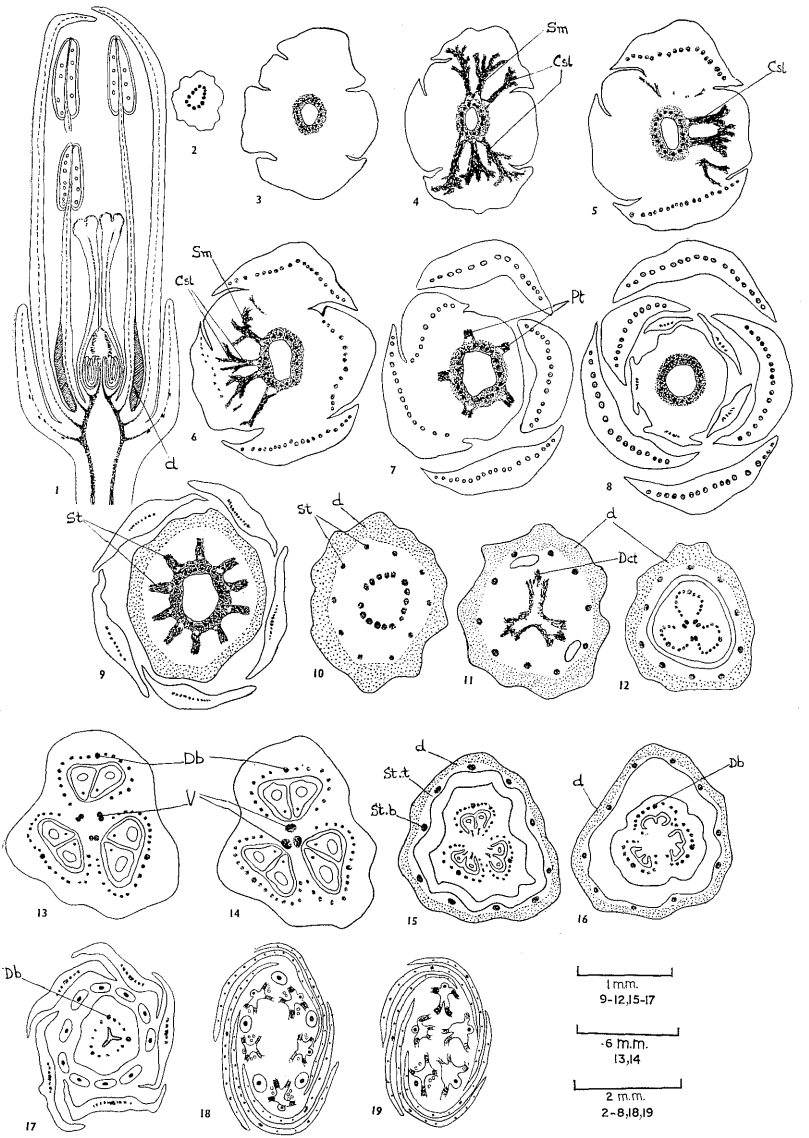

Figs. 1-19: *Philbornea magnifolia*. 1: Diagrammatic L. S. of flower showing the course of vascular bundles in the different floral parts. 2-19: Serial transverse sections of flower showing the origin and distribution of the traces to the different floral parts. For explanation see text.

Abbreviations d: disc, Sm: Sepal midrib, Csl: Common sepal laterals, Pt: Petal trace, St: Staminal trace, Dct: Dorsal carpellary trace, Db: Dorsal bundle, St. t: Staminal tube, St. b: Staminal bundle.

one whorl (Fig. 9) and after emerging out arrange in the form of a ring near periphery of the thalamus (Fig. 10). The part of the thalamus external to the staminal traces represents the disc (Figs. 1, 10). At a higher level the staminal tube and the disc separate as one unit (Figs. 11, 12).

After the emergence of the staminal traces the main stele becomes a closed ring, from which the three dorsal carpellary traces arise (Fig. 11). Next, three pairs of centrally placed bundles are organised from the main stele (Figs. 12, 13). The rest of the stele supplies the ovary wall (Figs. 12–16). These central bundles opposite the loculi form inversely oriented ventral bundles of the respective carpels (Figs. 12–14); they are used up for the ovular supply (Figs. 14, 15). In the ovary wall (Figs. 12–16) the dorsal carpellary traces are more prominent than the rest. While the bundles in the ovary wall fade away towards the top of the ovary, the dorsal carpellary bundles extend into the styles and terminate below the stigma (Fig. 1).

Conclusions Basic plan of the flower is pentacyclic and pentamerous. The unequal, quincuncial, free sepals are three traced and the laterals of adjacent sepals arise conjointly. The sepal traces arise at different levels from the main stele, indicating their spiral ancestry. The whorled condition in the other genera studied (Narayana, 1964; Narayana and Rao, 1966, 1969, 1971, 1972 a, b) seems to be a derived condition in the family. The free, contorted petals are single traced.

In the possession of an extra-staminal disc *Philbornea magnifolia* resembles *Ctenolophon parvifolius* and *C. philippinensis* (Narayana & Rao, 1971); while it differs from *Ixonanthes icosandra, Ochthocosmus africanus* (Narayana & Rao, 1966) and *Lepidobotrys staudtii* (Narayana & Rao, 1972a) which have an intrastaminal disc.

The monadelphous androecium consists of ten stamens of two different heights, the antipetalous being shorter. All the staminal traces arise at the same level as in *Indorouchera griffithiana, Ixonanthes icosandra* (Narayana & Rao, 1966), *Lepidobotrys staudtii* (Narayana & Rao, 1972a) and *Sarcotheca glauca* (Narayana & Rao, 1972b).

The tricarpellary, trilocular ovary shows two ovules in each loculus; the carpels are three traced and the placentation is axile. The basally connate styles are traversed by the dorsal carpellary bundles and these terminate at the base of the glandular stigmas.

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Philbornea magnifolia の花を解剖学的に観察した。基礎的には 5 輪 5 数性。萼片は 3 葉跡性であるが，側脈跡は隣接する萼片のそれと結合して生じる。萼の葉跡は異ったレベルで出現するので，祖型はラセン配列ではないかと思わせる。研究した限りの同科の他属では輪生であるが，これは後生的のものであろう。花弁は 1 葉跡。雄ずい筒の外側の花盤の存在は *Ctenolophon parvifolius, C. philippinensis* と同様に同科の他属が内側であるのと異なる。雄ずい筒は 10 個の雄ずいからできていて，対花弁位置のものの方が短かい。すべての雄ずい跡が同一のレベルで現われるのは既に観察した諸属と同様である。3 心皮，3 室の子房は各室に 2 個の中軸性の胚珠をもつ。心皮は 3 葉跡。花柱の管束は心皮の背側管束の連続である。

□日本林業技術協会編，倉田悟著：**原色日本林業樹木図鑑**Ⅳ (1973) 地球社刊，定価 1 万円。本誌 **46** : 315 で紹介した Ⅰ-Ⅲ のつづきで，今までにもれた高木と小高木，低木の図 52 枚が載っている。みごとな図である。新名関係次のとおり：新品種**フジウメモドキ** *Ilex serrata* Thunb. f. *glabrifolia* Kurata，またイヌウメモドキをウメモドキの品種に下げて *I. s.* f. *argutidens* (Miq.) Kurata としている。 (伊藤 洋)