

FASCICLES OF FLORA OF INDIA

FASCICLE 6

PITTOSPORACEAE

M. P. NAYAR AND G. S. GIRI



**BOTANICAL SURVEY OF INDIA
P. O. BOTANIC GARDEN
HOWRAH-711103**

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PITTOSPORACEAE†

R. Br. in Flinder's Voy. Terr. Austr. 2, App. 3 : 542. 1814 (Pittosporeae).

M. P. NAYAR* AND G. S. GIRI*

Trees, shrubs or sometimes climbers, usually with lenticels and often with spines. Leaves simple, alternate or verticillate, crowded at the ends of branches, petiolate, rarely sessile, exstipulate. Inflorescence terminal, pseudoterminal or lateral, paniculate, umbellate, subumbellate or corymbose, bracteate. Flowers bisexual, rarely functionally unisexual, pedicellate. Sepals 5. Petals 5, free, rarely the lower portion connivent into a tube. Stamens 5, free, alternating with the petals; filaments filiform or subulate; anthers basifixed, introrse, loculi parallel, opening by longitudinal slits or rarely by apical pores. Ovary unilocular, sometimes completely or incompletely 2-5 locular due to the projection of placentas; placentas 2-5, parietal or basal, rarely axile; style simple; stigma thickened or lobed; ovules 2 to many, anatropous. Fruits capsules or berries usually containing viscous pulp. Seeds 2 to many, erect, rarely winged; endosperm hard; embryo minute.

9 genera and *ca.* 350 species in the tropical and subtropical regions of the world. 8 genera endemic to Australasia. Only genus *Pittosporum* with 11 species in India.

The family has been treated under Pittosporeae by Bentham and Hooker f. (Gen. Pl. 1 : 130. 1862), under Rosales by Engler (Syll. der Pflanzenfam. 124. 1898) and Cronquist (Evoln. & Classif. Fl. Pl. 229. 1968), under Pittosporales by Hutchison (Evoln. & Phyl. Fl. Pl. 193. 1969) and Dahlgren (Bot. Not. 128 : 127. 1975), under Saxifragales by Takhtajan (Flowering plants: Origin and Dispersal 222. 1969).

Several species, cultivated in the gardens are handsome shrubs or trees with fragrant flowers. In India such species are : *Pittosporum rhombifolium* A. Cunn, *P. viridiflora* Sims., *P. undulatum* Vent., *P. tobira* (Thunb.) Aiton, *Hymenosporum flavum* (Hook.) F. V. Muell. and *Bursaria spinosa* Cav. var. *incana* Benth.

† Editor for Fam. Pittosporaceae : K. THOTHATHRI, Botanical Survey of India, Howrah-711103.

* Botanical Survey of India, Howrah-711103.

PITTOSPORUM

Banks ex Gaertn. Fruct 1 : 286. f. 59. 1788; Benth. & Hook. f. Gen. Pl. 1 : 131. 1862; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 198. 1872; Pritzel in Engl. & Prantl, Nat. Pflanzenfam. ed. 2. 18a : 273. 1930. Gowda in J. Arn. Arb. 32 : 263. 1951; Hutchinson, Gen. Fl. Pl. 2 : 296. 1967.

Erect trees, shrubs or undershrubs, sometimes epiphytic, branching forked or verticillate. Leaves simple, alternate or verticillate, often crowded in pseudo-whorls towards the ends of branches, exstipulate. Inflorescence terminal, pseudoterminal or lateral. Flowers bisexual, at times functionally unisexual. Sepals 5, free or connate below. Petals 5, free or connivent up to or beyond the middle, segments recurved and spreading. Stamens 5, free, alternating with the petals, anthers opening by longitudinal slits. Ovary unilocular or incompletely 2-5 locular with parietal placentas or rarely with placentas intruding the middle. Fruits capsules, bivalved or trivalved, valves thin or woody of varying thickness. Seeds 2 to many, embedded in pulp, irregularly angular, reddish or blackish.

Distrib. : ca. 300 species in the tropics, subtropics and temperate regions of the Old World. PAKISTAN, INDIA, SRI LANKA, BURMA, CHINA, JAPAN, MALESIAN ISLANDS, THAILAND, VIETNAM, POLYNESIA, AUSTRALIA, NEW ZEALAND, AFRICA, MADAGASCAR, CANARY ISLANDS. 11 species in India.

The distribution of genus *Pittosporum* in India indicates two main centres *viz.* the Himalayan and the Deccan regions. The species occurring in the Himalayan region are allied to the Chinese while species occurring in the Peninsular India are mainly relict species excepting *P. tetraspermum* and *P. napaulense*.

Ecol. : In India the genus is characteristic of rain forest, occurring in the substage rain forest usually in altitudes between 500 to 2800 m.

Indian species of the genus can be usefully planted in gardens and parks as they are small trees or shrubs with handsome foliage, scented flowers and orange red fruits.

Pollen : Tricolpate, grain-size 15 to 50 microns, roundish to oblongish; germ-pore in the middle of the germ-furrows; exine coarsely reticulate through faintly reticulate to almost smooth (inconspicuously reticulate). (Gowda in J. Arn. Arb. 32 : 278. 1951).

- 1a. Capsules 3 valved ...9. **P. podocarpum**
- 1b. Capsules 2-valved :
- 2a. Inflorescence glabrous :
- 3a. Leaves alternate, loosely crowded at the ends of branches, ovate to broadly elliptic or oblanceolate, apex obtuse to acuminate. Inflorescence paniculately umbellate or sometimes simple racemes :
- 4a. Leaf-apex obtuse or rounded. Peduncles equal to or longer than the subtending leaves ...2. **P. ceylanicum**
- 4b. Leaf-apex acute or acuminate. Peduncles shorter than the subtending leaves ...8. **P. neelgherrense**
- 3b. Leaves verticillate, 3-nate towards the ends of branches, linear-lanceolate, apex attenuate. Inflorescence simple umbellate ...1. **P. anamallayense**
- 2b. Inflorescence puberulous or tomentose :
- 5a. Valves of capsules thin and coriaceous. Funicles basal or suprabasal :
- 6a. Inflorescence many-flowered; flowers 10 to 50 or more per inflorescence:
- 7a. Leaves small, $3-7 \times 0.8-1.2$ cm, narrowly lanceolate. Ovary glabrous ...6 **P. humile**
- 7b. Leaves large, $5-20 \times 2-8$ cm, elliptic-oblong or elliptic-lanceolate or oblong-lanceolate. Ovary pubescent ...7. **P. napaulense**
- 6b. Inflorescence few-flowered; flowers usually less than 10 in each inflorescence ...10. **P. tetraspermum**
- 5b. Valves of the capsule thick and woody. Funicles distributed upto the middle of the placenta:
- 8a. Stem and leaves rusty tomentose:
- 9a. Flower buds oblong, 8-9 mm long. Sepals triangular or ovate-lanceolate:
- 10a. Leaves elliptic or elliptic-lanceolate, $5-14 \times 2-3$ cm, broad at the middle ...3. **P. dasycaulon**

- 10b. Leaves broadly obovate-oblong, oblanceolate-oblong, 6-18×3-5 (-9) cm, broad above the middle ...4. *P. eriocarpum*
- 9b. Flower buds ovate, 4-6 mm long. Sepals narrowly lanceolate ...5. *P. ferrugineum*
- 8b. Stem and leaves glabrate ...11. *P. viridulum*

1. *Pittosporum anamallayense* Nayar et Giri sp. nov.

Figs. 1-5

Affinis *P. tetraspermo* Wt. & Arn., sed foliis verticillatis laminis foliorum lineari-lanceatis, nervis transversis 19 vel 20 paribus, horizontalibus, lobis calycinis longioribus acuminatis differt.

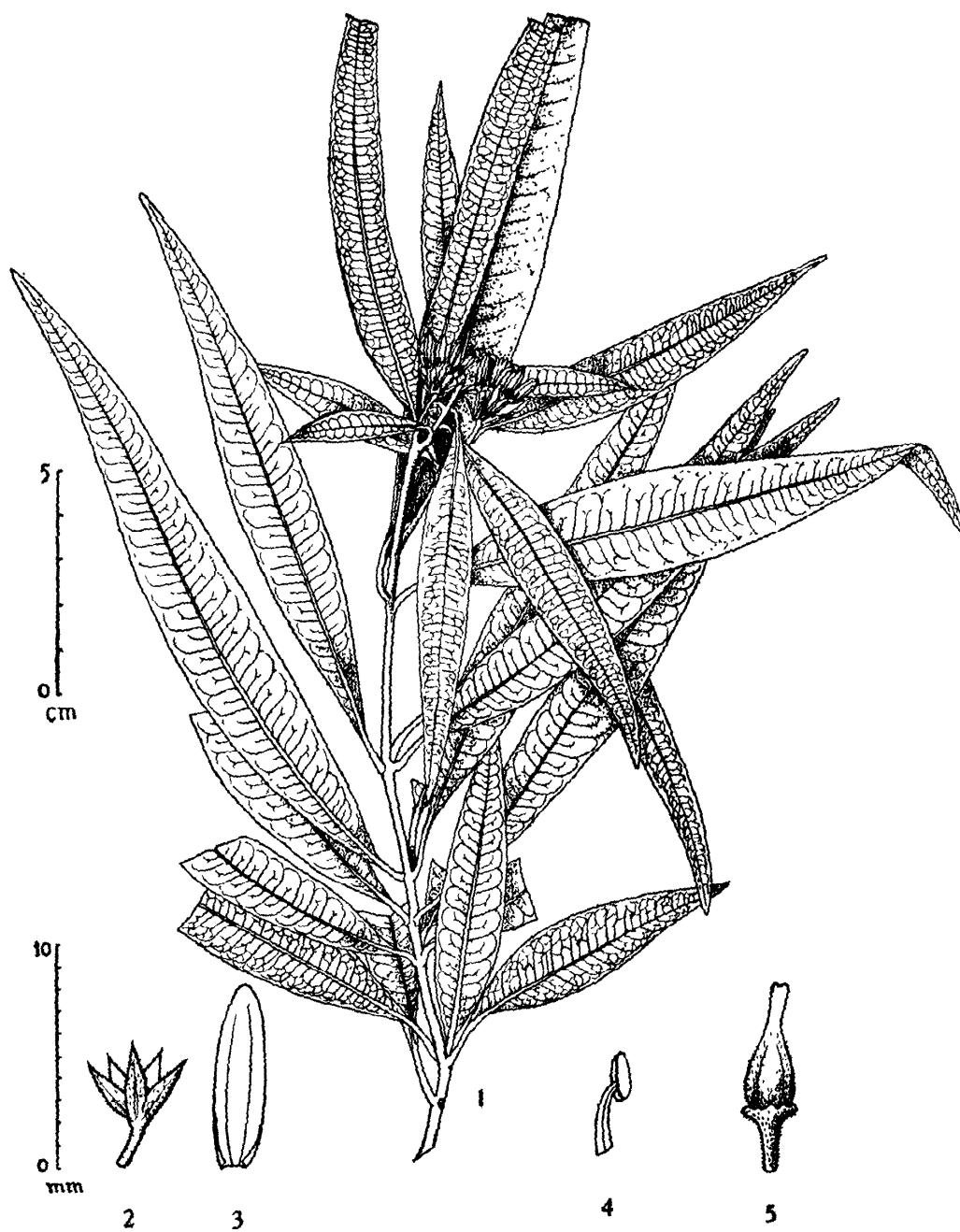
Shrubs. Leaves verticillate, 10-20×1.5-2.3 cm, linear-lanceolate, apex attenuate, base cuneate, margin entire, glabrous, membranous, transverse veins 19 or 20 pairs, distinct on the undersurface; petioles 8-12 mm long. Inflorescence terminal, umbellate. Flower buds 4-6 mm long, glabrous; pedicels 5-8 mm long, minutely puberulous or glabrate; bracts 4-5 mm long, linear, puberulous. Sepals 5, free, 3.0-3.5×1.0 mm, ovate-lanceate, apex acuminate. Petals 5, 8.0-8.5×1.5-2.0 mm, oblong, apex obtuse or rotund. Stamens 5, filaments 3 mm long, anthers 2 mm long. Ovary 2 mm in diam., densely tomentose; style minutely puberulous; stigma inconspicuously 2-fid. Capsules not known.

Type : India : Tamil Nadu, Anamalai, 1500 m, R. H. Beddome s.n. (Holo and Isotypes MH).

Distrib. : INDIA : Southern W. Ghats, Tamil Nadu; endemic to Anamalai hills.

Notes : It is allied to *P. tetraspermum* Wt. & Arn., but differs in having linear-lanceolate leaves in whorls of three, 19 to 20 pairs of lateral veins horizontal to the midrib and longer calyx lobes with acuminate apex. *P. anamallayense* may be superficially confused with *P. podocarpum* var. *angustatum* Gowda, because of the linear-lanceolate leaves. However in *P. podocarpum* var. *angustatum* the side veins of leaves are ascending, sepals connate at the base and flowers are polygamo-dioecious.

- 2. *P. ceylanicum* Wt., Illustr. Ind. Bot. 1 : 173. 1839; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 199. 1872; Gowda in J. Arn. Arb. 32 : 324. 1951.**



Pittosporum anamallayense Nayar et Giri.
 Figs. 1-5 : 1. Branch with flowers. 2. Calyx. 3. Petal,
 4. Stamen. 5. Gynoecium.

Shrubs or small trees. Leaves $4.8 \times 1.0-2.5$ cm, oblong-elliptic or oblanceolate, base cuneate, margin entire, glabrous; petioles 5-18 mm long. Inflorescence terminal or pseudo-terminal; peduncles 4.0-6.5 cm long. Flower buds 5-8 mm long; pedicels 5-8 mm long. Sepals $3.0 \times 1.0-1.5$ mm, ovate-lanceolate, apex acute, margin minutely ciliate. Petals $8-10 \times 2.0$ mm, linear-oblong, apex obtuse. Stamens: filaments 5 mm long, anthers 1.0-1.5 mm long, oblong. Ovary 3 mm in diam., densely brownish tomentose; style 4-5 mm long, glabrous. Capsules 5-8 mm in diam., globose, valves woody. Seeds 6-8, angular.

Type : Ceylon (Sri Lanka), March 1835, *Herb. Wight* (K).

Fls. : Mar.-Apr.; *Frts.* : May-June.

Distrib. : INDIA : Nilgiri mountains of W. Ghats, Tamil Nadu; SRI LANKA.

Notes : One specimen in CAL collected in 1861 cited as "Dodabetta", probably Mt. Dodabetta of Nilgiris in Tamil Nadu, is without any flower and fruit.

3. **P. dasycaulon** Miquel, *Analecta Bot. Ind.* 3 : 5. 1850; Hook. f. & Thoms. in Hook. f. *Fl. Brit. Ind.* 1 : 199. 1872; Cooke, *Fl. Pres. Bomb.* 1 : 58. 1901 (Repr. ed. 1 : 62. 1958); Talbot, *For. Fl. Bomb. Pres. Sind* 1 : 82, f. 54. 1909; Gamble, *Fl. Pres. Madr.* 1 : 55. 1915 (Repr. ed. 1 : 40. 1957); Gowda in *J. Arn. Arb.* 32 : 324. 1951.

Boogri (Kan.); *Gapsundi* (Mar.)

Small trees, young branches densely tomentose. Leaves coriaceous, apex acute, base cuneate, margin entire; petioles 8-18 mm long, puberulous. Inflorescence terminal or pseudoterminal, umbellate densely brownish tomentose. Sepals $2-3 \times 1$ mm, tomentose. Petals $10-12 \times 2.0-2.5$ mm, oblong, yellow. Stamens: filaments 6-7 mm long, anthers 2 mm long. Ovary 3 mm long, densely tomentose; style 4-5 mm long, glabrous. Capsules 8-10 mm in diam., globose, woody. Seeds 4-6, blackish pink.

Type : India : Karnataka, Hoobli, *Metz* 775 (L, Photo!).

Fls. & Frts. : Sept. -Feb.

Distrib. : INDIA : Maharashtra, Karnataka, Kerala; endemic to Western Ghats.

Uses : An extract of the stem bark shows antibacterial and anti-fungal properties (Bhatnagar *et al.* in *Indian J. Med. Res.* 49 : 799. 1961).

4. **P. eriocarpum** Royle, Illustr. Bot. Himal. 1 : 77. 1834; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 199. 1872; Brandis, For. Fl. Ind. 19. 1874; Duthie, Fl. Upper Gang. Pl. 1 : 61. 1903 (Rep. ed. 1 : 58. 1960); Gowda in J. Arn. Arb. 32 : 325. 1951.

Garsilug, *Garshuma*, *Meda tumri* (Hindi); *Kakria* (Nep.).

Shrubs or small trees, branches densely tomentose. Leaves coriaceous, apex acute to acuminate, base cuneate, margin entire; petioles 15-20 mm long, tomentose. Inflorescence paniculately corymbose; peduncles 2-4 cm long. Flowers yellow. Sepals 2×1 mm, pilose. Petals $9-10 \times 2.0-2.5$ mm, oblong. Stamens: filaments slender, 5 mm long, anthers 2.0-2.5 mm long. Ovary 2 mm long, ovoid, densely tomentose; style 3 mm long; stigma capitate. Capsules large, 12-15 mm in diam., densely pilose-tomentose. Seeds many, blackish red.

Type : "From above Sandsadhara to Mussoree or from 3000 to 6700' of elevation of $30\frac{1}{2}^\circ$ of northern latitude", Royle s.n. (CAL!, K).

Fls. : Mar.-May; *Frts.* : Apr.-Oct.

Distrib. : INDIA : Uttar Pradesh; endemic to Garhwal-Kumaon Himalayan region.

Uses : The bark, aromatic when freshly cut is said to possess narcotic properties and is used locally in chronic bronchitis.

5. **P. ferrugineum** Aiton, Hort. Kew ed. 2 : 27. 1811; Sims, Bot. Mag. 46 : t. 2075. 1819; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 199. 1872; Brandis, Indian Trees 43. 1906; Gowda in J. Arn. Arb. 32 : 321. 1951.

Trees, 10-20 m tall, young branches densely rusty-tomentose. Leaves $5-8(10) \times 2.0-3.5$ cm, apex acute to acuminate, base acute, margin entire, young leaves rusty-tomentose, adult leaves usually glabrescent, lateral veins 8-10 pairs; petioles 8-15 mm long. Inflorescence subumbellate or umbellate, densely rusty puberulous. Sepals free, apex acuminate, puberulous. Petals 4.0-5.5 mm long, lanceolate. Stamens: filaments 2-3 mm long, anthers 1 mm long. Ovary 2 mm long, densely tomentose; style 1.0-1.5 mm long, glabrous. Capsules 6-8 mm in diam., densely tomentose. Seeds 8-24, 3-4 mm long, pinkish black.

Type : Based on a plant cultivated in the Royal Botanic Gardens, Kew (K).

Fls. : Feb.-Aug.; *Frts.* : Mar.-Dec.

Distrib. : INDIA : Nicobars; MALAYSIA, SUMATRA, JAVA, BORNEO, LESSER SUNDA ISLANDS, CELEBES, MOLUCCAS, NEW GUINEA, PHILIPPINES, MELANESIAN ISLANDS, AUSTRALIA.

Ecol. : From sea-shores of oceanic islands and mangrove swamps to secondary forests up to 2800 m.

Uses : The leaves and fruits are used as fish poison.

6. **P. humile** Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 198. 1872; Kanjilal *et al.* Fl. Assam 1 : 96. 1934; Gowda in J. Arn. Arb. 32 : 328. 1951.

Small bushy shrubs, 1-2 m tall, branchlets lenticellate, glabrescent. Leaves 3-7×0.8-1.2 cm, apex acute or acuminate, base cuneate, margin entire, recurved, glabrous; petioles 5-10 mm long. Inflorescence terminal or axillary, puberulous; bracts 5-7×1.0-1.5 mm, lanceolate, pubescent. Flower buds 4-5 mm long. Sepals 2.5-3.5×1.0-1.5 mm, broadly lanceolate. Petals 6-7×2 mm, oblong, apex recurved, yellowish green. Stamens: filaments 3 mm long; anthers 2 mm long. Ovary glabrous; style 3 mm long, glabrous. Capsules subglobose, 4-6 mm in diam. Seeds 6-9, reddish black.

Type : India : Khasia Hills, "banks of Borpani river, alt. 5000 ft." Hooker f. and Thomson (CAL!, K).

Fls. : Mar.-June; *Frts.* : Apr.-Dec.

Distrib. : INDIA : Meghalaya; endemic to Khasia hills.

7. **P. napaulense** (DC.) Rehder & Wilson, Pl. Wilson. 3 : 326. 1916; Gowda in J. Arn. Arb. 32 : 330. 1951. *Senacia napaulensis* DC. Prodr. 1 : 347. 1824. *Celastrus verticillatus* Roxb. Hort. Beng. 18. 1814, nomen nudum. *C. verticillata* Roxb. Fl. Ind. 2 : 391. 1824. *Pittosporum floribundum* Royle, Illustr. Bot. Himal. 1 : 77. June 1834 (non Wt. & Arn.). *P. floribundum* Wt. & Arn. Prod. Fl. Pen. Ind. Or. 1 : 154. Sept. 1834 (non Royle); Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 199. 1872; Cooke, Fl. Pres. Bomb. 1 : 58. 1901. (Repr. ed. 1 : 61. 1958); Duthie, Fl. Upper Gang. Pl. 1 : 60. 1903. (Repr. ed. 1 : 58. 1960); Gamble, Fl. Pres. Madr. 1 : 55. 1915. (Repr. ed. 1 : 40. 1957); Haines, Bot. Bih. Or. 2 : 39. 1921 (Repr. ed. 1 : 41. 1961); Kanjilal *et al.* Fl. Assam 1 : 95. 1934; Gowda in J. Arn. Arb. 32 : 332. 1951. *P. densiflorum* Putterl. Synop. *Pittosporum* 9. 1839. *P. napaulense* var. *rawalpindiense* Gowda l.c. 1951.

Dieng-mulo Shi-ing (Asm.); *Bagh-muta*, *Kisan* (Hindi); *Adusoka*, *Tammatta* (Kan.); *Dieng Duma* (Kh.); *Yekkuddy*, *Yekadia*, *Vikhari* (Mar.); *Kattu sampangi*, *Nangundai* (Tam.); *Rakamuti* (Tel.); *Debosundu* (Or.).

Shrubs or small trees. Leaves 5-20 × 2-8 cm, apex acute to acuminate, margin entire or slightly wavy, glabrous; petioles 1-2 (-3) cm long. Inflorescence pubescent. Flowers 6-8 mm long. Sepals 1.5-2.5 mm long, broadly ovate or oblong, ciliate. Petals 6-7 × 2 mm, narrowly oblong, apex obtuse. Stamens: filaments 3 mm long, anthers 1.5 mm long. Ovary brownish pubescent; style glabrous. Capsules 6-8 mm in diam., globose. Seeds 4 to 8 per capsule.

Type : Nepal : Based on a plant cultivated in the Calcutta Botanic Garden (G).

Fls. : Feb.-May; *Frts.* : Apr.-Dec.

Distrib. : INDIA : Throughout India except Rajasthan; PAKISTAN, NEPAL, BHUTAN, TIBET, MADAGASCAR.

Uses : The bark has ginger like smell when freshly cut and hence called "Ginger-tree". The decoction of bark is used for skin-diseases and chest infections (Krishna & Badhwar in J. Sc. Industr. Res. 6(3) : Suppl. 41. 1947). Wood yields useful timber.

Notes : This is a variable species in the nature of the size and shape of leaves and inflorescence. The number of seeds (4 to 8) in each capsule is also variable and the attachment of funicles is basal to suprabasal. There are intermediate forms and it is considered that *P. floribundum* and *P. napaulense* var. *rawalpindiense* are synonymous with *P. napaulense*.

8. *P. neelgherrense* Wt. & Arn. Prod. Fl. Pen. Ind. Or. 1 : 154. 1834; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 198. 1872; Gamble, Fl. Pres. Madr. 1 : 55. 1915 (Repr. ed. 1 : 40. 1957); Gowda in J. Arn. Arb. 32 : 326. 1951.

Kuhimavu (Kan.)

Shrubs or small trees. Leaves 3-8 × 2.0-4.5 cm, margin entire, glabrous, coriaceous; petioles 5-15 mm long. Inflorescence subumbellate; peduncles 2.0-2.5 cm long. Flowers pale yellow, fragrant; pedicels 8-15 mm long. Sepals 1.5-2.0 × 1 mm, subulate. Petals 8-9 × 1.5-2.0 mm, oblong-lanceolate, apex obtuse or rounded, pale yellow. Stamens : filaments 3-4 mm long, slender; anthers 1-2 mm long. Ovary densely brownish

tomentose, hairs 1-2 mm long; style glabrous, 3 mm long. Capsules 6-8 mm in diam., valves thick; funicles basal to suprabasal. Seeds 4-8 per capsule.

Type : Peninsular India, *Wight* 141 (K, Photo!)

Fls. : Feb.-May; *Frts.* : Apr.-June.

Distrib. : INDIA : Southern W. Ghats, Karnataka, Tamil Nadu, Kerala; SRI LANKA.

Notes : Cufodontis (Fedde, Rep. 55 : 31. 1952) indicated that *P. neelgherrense* is allied to *P. goetzei* Engl., a species endemic to the mountains of Tanganyika in East Africa.

9. ***P. podocarpum*** Gagnepain, Not. Syst. 8 : 211. 1939; Gowda in J. Arn. Arb. 32 : 293. 1951. *P. glabratum* auct. non. Lindley (1846) : Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 198. 1872; Kanjilal *et al.* Fl. Assam 1 : 95. 1934.

Shrubs 1-3 m tall. Leaves glabrous, coriaceous; petioles 5-16 mm long. Inflorescence subumbellate or single-flowered. Flowers polygamodioecious. Sepals 1-3 mm long, ovate. Short stamened flowers: usually solitary. Petals 8-16 mm long, filaments 4-5 mm long; anthers shrivelled. Ovary globose, densely tomentose; style 3.5-4.5 mm long; stigma capitate. Long stamened flowers : subumbellate. Petals 8-13 mm long; filaments 8.5-9.5 mm long; anthers 2.5 mm long, oblong. Ovary linear-oblong, densely tomentose; style 3.5-5.0 mm long; stigma inconspicuous. Capsules 2.0-3.5 × 1.5 cm, valves wrinkled and not woody. Seeds 8 × 5 mm, reddish.

Dieng-thyllong, Dieng sanyar-um, Dieng-lo-shiring synrang, Dieng-soh-tylluh (Kh.).

Leaves 5-16 × 2.0-3.5 cm, oblanceolate or elliptic lanceolate

...var. ***podocarpum***

Leaves 6-22 × 1.0-2.5 cm, linear lanceolate

...var. ***angustatum***

var. ***podocarpum***

Type : W. China, *Wilson* 3231, *Ducloux* 6709 (Syntypes P, Photo!)

Fls. : Mar.-June; *Frts.* : Aug.-Dec.

Distrib. : INDIA : Eastern Himalayas, Assam, Arunachal Pradesh, Meghalaya, Manipur, Nagaland; BURMA, CHINA, VIETNAM.

var. angustatum Gowda in J. Arn. Arb. 32 : 295. 1951.

This variety is allied to *P. glabratum* var. *neriifolium* Rehder et Wilson which is restricted to China, but differs in having densely tomentose ovary.

Type : China: Yunnan, Mengtze, alt. 7000 ft. Henry 10545 (CAL!, A)

Fls. : Mar.-June; *Frts.* : June -July.

Distrib. : INDIA : Meghalaya, Manipur, Nagaland; BURMA, CHINA.

- 10. *P. tetraspermum*** Wt. & Arn. Prod. Fl. Pen. Ind. Or. 1 : 154. 1834; Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1 : 198. 1872; Brandis, Indian Trees 42. 1906; Gamble, Fl. Pres. Madr. 1 : 55. 1915 (Repr. ed. 1 : 40. 1957); Gowda in J. Arn. Arb 32 : 337. 1951.

Kuyimavu (Kan.); *Kachapatta*, *Kaccapatta* (Mal.); *Sunari* (Tam.).

Shrubs or small trees. Leaves 4-8×1.5-4.0 cm, margin entire, puberulous in juvenile state, glabrate later on; petioles 4-10 mm long. Inflorescence umbellate or subumbellate, few flowered, 4 to 8 flowers in each inflorescence, puberulous. Flower buds oblong, 8-10 mm long. Sepals 2-3×1.0 mm, subulate, pubescent. Petals 6-10×2.5 mm, linear oblong. Stamens : filaments 2.5-3.0 mm long, anthers 1.5-2.0 mm. Ovary densely tomentose; style 1.0-1.5 mm long, glabrous. Capsules 7-10 mm diam.; funicles basal. Seeds 4 per capsule.

Type : S. India. Wight 142 (K, Photo!)

Fls. : Feb.-Apr.; *Frts.* : Mar.-Dec.

Distrib. : INDIA : Southern W. Ghats, Kerala, Tamil Nadu, Karnataka; SRI LANKA, CHINA, VIETNAM.

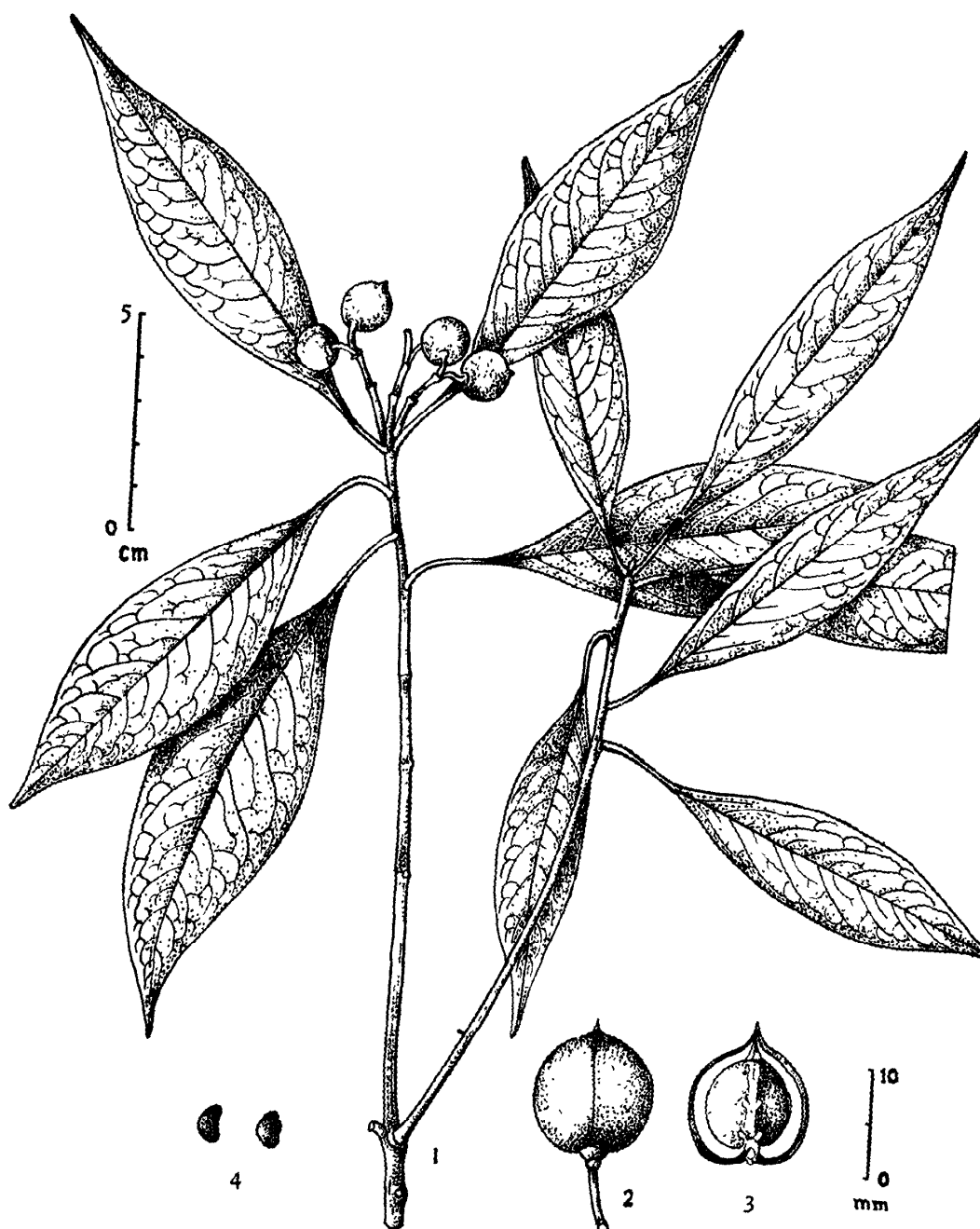
Uses : The bark is used as paste in inflammatory and rheumatic swellings and is reported to possess narcotic properties.

- 11. *P. viridulum*** Nayar, Giri et Chandrasekaran sp. nov.

Affinis *P. dasycaulo* Miquel, sed ramis foliisque glabris, foliis in sicco viridibus, capsulis glabris differt.

Figs. 1-4

Small trees. Leaves 8-12×2-4 cm, elliptic or elliptic-lanceolate, apex acuminate, base cuneate, margin entire, transverse veins 9-12 pairs,



Pittosporum viridulum Nayar, Giri *et* Chandrasekaran

Figs. 1-4 : 1. Branch with capsules. 2. Capsule. 3. Valve of the capsule showing funicles. 4. Seeds.

distinct on the under-surface; petioles 10-28 mm long, glabrous, canaliculate. Infructescence terminal, umbellate or pseudo-umbellate, puberulous. Capsules 9-13 mm in diam., slightly compressed with short mucronate beak, pitted outside, valves yellowish green, thick, attachment of funicles 4 at the base and 4 at the middle. Seeds 6-8, irregularly angled, reddish brown, glabrous.

Type : India : Tamil Nadu, Nilgiri, Nadugani forest, Kozhipalam, 825 m, 19-9-1980, *Chandrasekaran* 69264 (Holotype CAL; Isotypes CAL, MH); Ibid., *Chandrasekaran* 64100 (Paratype CAL).

Distrib. : INDIA : Southern W. Ghats, Tamil Nadu.

Notes : The species is allied to *P. dasycaulon*, but differs in having: glabrous branches, leaves and capsules; leaves remaining greenish on drying; capsules with 1.5-3.0 mm long mucronate beak.

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SIMAROUBACEAE	4	April 1980
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ORCHIDACEAE (GENUS COELOGYNE)	5	June 1980