



Pentatropis R.Br. ex Wight & Arn. (Apocynaceae), a new generic record for Kerala, India

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The Genus *Pentatropis* R.Br. ex Wight & Arn. (Apocynaceae) comprises six species, with a distribution ranging from Africa & Madagascar through Arabia, India, Pakistan, Sri Lanka, to Australia (Jagtap & Singh 1999). In India it is represented by two species, viz., *P. capensis* and *P. nivalis*. The generic name *Pentatropis* is derived from Greek words *penta* meaning 'five' and *tropis* meaning 'a keel', referring to the shape of the corona (Jagtap & Singh 1999). The genus is characterized by slender twining herbs or undershrubs, semi succulent leaves, small purplish flowers with rotate corolla and corona of five erect laterally compressed processes with an upcurved spur at base (Gamble & Fischer 1936). *Pentatropis capensis* is highly medicinal and the whole plant is used as antifungal, antiseptic, coolant and useful in skin diseases (Pandey et al. 2005).

During the floristic survey of Palakkad Gap, Western Ghats, Kerala, the authors came across a population of *Pentatropis* near Kozhinjampara, Palakkad, Kerala, which lies on the eastern front of the Palakkad Gap. Specimens were collected in flowering and the identity of specimen was confirmed as *Pentatropis capensis* (L.f.) Bullock using pertinent literature and consultation of specimens available at global biodiversity information

facility (<https://www.gbif.org/>) and Kew science (<https://specimens.kew.org/>). The taxon was previously known in India from Karnataka, Tamil Nadu, Andhra Pradesh, Odisha, Maharashtra, and Gujarat (Matthew 1983; Pandey et al. 2005; Rao et al. 2016) but not reported from the state of Kerala (Vajravelu 1990; Sasidharan 2013). It is reported here as a new record for the state of Kerala. The description is given with notes and keys for easy identification.

Key to the *Pentatropis* in India

Flowers 3–4 per umbel, buds subglobose, corolla lobes 3.5–6 mm long, deltoid, not tailed; corona lobes acute at base, which curves outwards
..... *P. capensis*
Flowers 5–7 per umbel, buds acuminate, corolla lobes 8–13 mm long, with linear tail; corona lobes rounded at base *P. nivalis*

Pentatropis capensis (L.f.) Bullock, Kew Bull. 10(2): 284. 1955; Matthew, Fl. Tamil. Carn. 1: 955. 1983; Sharma et al., Fl. Karnataka 168. 1984; Singh, Fl. East. Karnataka 1: 414. 1988. *Cynanchum capense* L.f., Suppl. Pl. 168. 1781. *Pentatropis microphylla* (Roth.) Wight &

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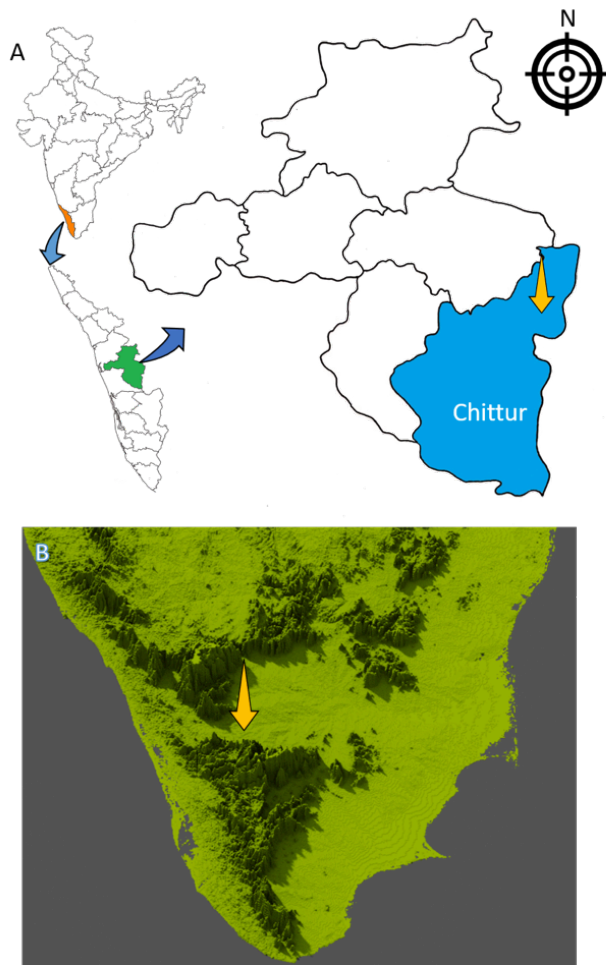


Image 1. a—Line map of the district showing the location of sighting *Pentatropis capensis* in the Chittur Taluk (Blue Shaded area). b—topographical map of south India showing the location of sighting *Pentatropis capensis* at the mouth of Palakkad Gap (Arrow).

Arn. in Wight, Contrib. 52. 1834; Hook.f., Fl. Brit. India 4: 20. 1883; Gamble, Fl. Pres. Madras 2: 587. 1957 (Repr. Ed.); Prain, Bengal plants 2: 512. 1963 (Repr. Ed.); Cooke, Fl. Pres. Bombay 2: 218. 1967 (Repr. Ed.). *Asclepias microphylla* Heyne ex Roth, Nov. Pl. Spec. 177. 1821. *Colostephanus capensis* (L.f.) Harv., Gen. S. Afr. Pl. 417. 1838. *Vincetoxicum capense* (L.f.) Kuntze, Revis. Gen. Pl. 2: 424. 1891. *Cynanchum acuminatum* Thunb., Observ. Cynanch. 5. 1821. *Cynoctonum capense* (L.f.) E. Mey., Comm. Pl. Afr. Austr. (Meyer) 216.

Herbaceous twiners. Stem slender, glabrous, greenish-purple. Leaves simple, opposite, ovate, 1–3.5 × 0.5–2.5 cm, base rounded or cordate, margin entire, apex obtuse mucronate, glabrous, semi-succulent, petiole 4–7 mm long. Flowers in axillary umbels, 3–4 flowers per umbel, greenish-purple colour, buds subglobose; pedicel filiform, 1.7 cm long. Calyx 5-partite, lobe elliptic-lanceolate, 1.5 mm long, hyaline at margin, acute at apex,



Image 2. *Pentatropis capensis*: a—Habit | b—Calyx | c—Flower LS | d—Pollinia | e—Ovary CS. © V. Suresh.

glabrous. Corolla rotate, lobes deltoid, 3.5–6 mm long, recurved at margin, apex acute, hairy, purple. Corona single, 5 erect laterally compressed processes with an upcurved spur at base. Pollinia pendulous, obovate, ca. 0.2 mm long, pollen-masses waxy, opaque without pellucid margin, glabrous, brown (Image 2; Figure 1). Follicles 3-angled, 6.5 cm long, lanceolate, beaked at apex, persistent with calyx. Seeds many, ovoid, 5 mm long, whitish at margin, end silky hairy, 2 cm long.

Specimen examined: Suresh GVCP-SV339 (Image 2) 14 October 2019, Kozhijampara, Chittur, Palakkad district, Kerala state, India, 10.738°N, 76.820°E, 172m (Image 1, GVCH! Government Victoria College Herbarium - acronym submitted, not yet accepted).

Additional specimens examined: *Pentatropis capensis* (L.f.) Bullock:- BM001014189, January 1774, India, 22.883°N, 79.6162°E, Koenig s.n. (Isotype BM!); MO100951520, 14 September 1956, Yanam, Andhra Pradesh, 16.733°N, 82.213°E, Wagh 3863 (MO!); S10-25878, October 1981, Madras, near the Qutar minaret, Tamil Nadu, Fagerlind 9516 (S!).

Phenology: Flowering and fruiting: September to January.

Ecology: *Pentatropis capensis* is found growing on

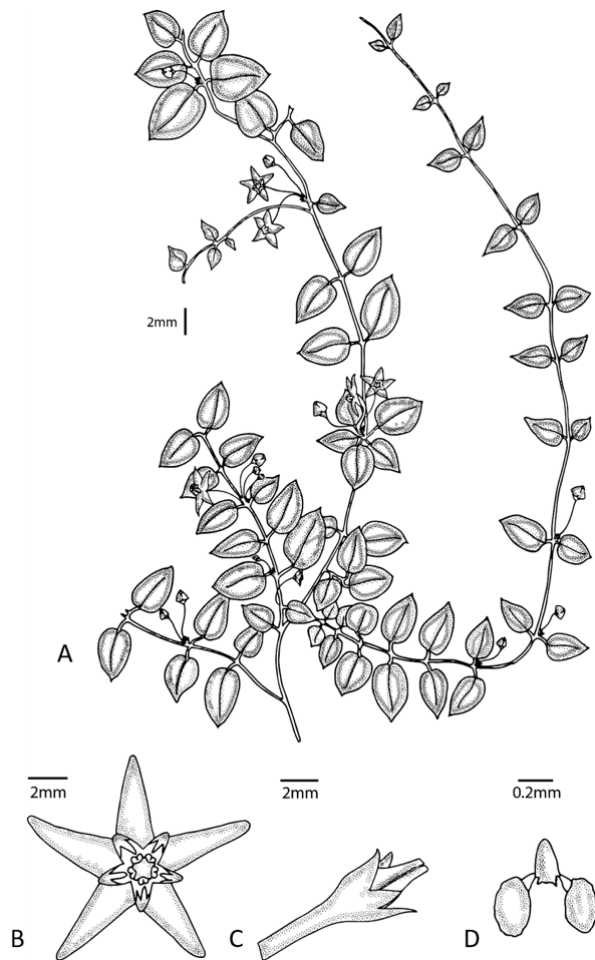


Figure 1. Illustration of *Pentatropis capensis* and its floral parts: **A—Habit** | **B—Flower** | **C—Pedicel with Calyx and Gynoecium** | **D—Pollinia.**

road sides in association with *Abutilon indicum* (L.) Sweet, *Calotropis procera* (Aiton) Dryand. and *Cardiospermum halicacabum* L. The species is well adapted to the arid climate of the Deccan and northwestern India.

Distribution: Bangladesh, India, Pakistan, Sri Lanka,

and Vietnam (POWO 2021); India (Karnataka, Tamil Nadu, Andhra Pradesh, Odisha, Gujarat (Pandey et al. 2005; Rao et al. 2016), and Kerala (Chittur, Kozhinjampara, reported here).

This species is widely distributed in arid to semiarid belts of central and peninsular India. It is a therophyte (therophytes are annual but this species is perennial) according to life form classification by Raunkiaer and it thrives in arid climate by bearing unfavourable dry seasons in dormant form (Raunkiaer 1934; Kambhar & Kotresha 2012).

In this report, a therophytic perennial species of *Pentatropis* genus (*P. capensis*) belonging to the family Apocynaceae was reported as a new record for the state of Kerala from the eastern part of the Palakkad Gap.

References

- Gamble, J.S. & C.E.C. Fischer (1936).** *Flora of the Presidency of Madras*. Adlard & Son Ltd, London, 834–835pp.
- Jagtap, A.P. & N.P. Singh (1999).** *Fascicles of Flora of India: Fascicle 24*, pp. 38–39. Botanical Survey of India, Kolkata.
- Kambhar, S.V. & K. Kotresha (2012).** Life-forms and biological spectrum of a dry deciduous forest in Gadag District, Karnataka, India". *Research and Review Journal of Botany* 1(1): 1–28.
- Matthew, K.M. (1983).** *The Flora of Tamil Nadu Carnatic*. The Rapinat Herbarium, St. Joseph's College, Tiruchirapalli 3(1): 925, 928, 955 pp.
- Pandey, C.N., B.R. Raval, S. Mali & H. Salvi (2005).** Medicinal plants of Gujarat- Species Description and Medicinal Uses: Chapter-XIV. Gujarat Ecological Education and Research Foundation, Gandhinagar, Gujarat, 233 pp.
- POWO (2021).** "Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <http://www.plantsoftheworldonline.org/> Retrieved 30 October 2021."
- Rao, K.S., R.A. Singh, D. Kumar, R.K. Swamy & N. Page (2016).** Digital Flora of Eastern Ghats. <http://flora-peninsula-indica.ces.iisc.ac.in/EasternGhats/herbsheet.php?id=487&cat=4>
- Raunkiaer, C. (1934).** *Life forms of plants and statistical plant geography*. Calderon Press, Oxford. (English translation of collected papers by C. Raunkiaer 1903).
- Sasidharan, N. (2013).** Flowering plants of Kerala CD-ROM (Version 2). Kerala Forest Research Institute, Peechi, Kerala.
- Vajravelu, E. (1990).** *Flora of Palghat District including Silent Valley National Park, Kerala*. Botanical Survey of India, Calcutta.



Polycarpaea palakkadensis (Caryophyllaceae), a new species from Kerala, South-West India

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Abstract

Polycarpaea palakkadensis, a new species of Caryophyllaceae from the hillocks of Palakkad District (Kerala, India) is described and illustrated. *P. palakkadensis* is morphologically similar to *P. rangaiahiana* from which differs in having fused ovate bracts, capilliform bracteoles, linear stipules, ovate-cordate petals, filaments much shorter than anther, capsule with 1–2 ovoid elliptical seeds.

Keywords: Caryophyllales, Western Ghats, Palakkad gap

Introduction

The genus *Polycarpaea* Lamarck (1792: 3) (Caryophyllaceae Juss.) comprises of approximately 50 species which are mostly distributed in the tropics and subtropics of Old World, whereas few taxa in the New World tropics (Dequan & Gilbert 2001, Mabberley 2008). The genus is represented in India by six species according to Geethakumary *et al.* (2015).

During the field investigations carried out as part of the floristic studies of Kerala region (south-western India), several specimens of a morphologically distinct *Polycarpaea* taxon were collected from the hillocks of Palakkad district (northern Kerala). On the basis of critical examination of collected specimens, comparison with those deposited in various herbaria, and through detailed analysis of the relevant literature, we found that the specimen cannot be assigned to any currently known species. Hence we propose it as a species new to Science.

Material and methods

Field surveys were carried out during the monsoon season (June–September) of 2019–2021. Plants collected were deposited in the Herbaria UCBD and TBGT; further specimens were examined from the Herbaria E, MH, K and TBGT (acronyms according to Thiers 2021 [continuously updated]). Relevant literature were analyzed (Wight 1843, 1850, Dunn 1915, Majumdar 1993, Edgeworth & Hooker 1874, Daniel *et al.* 2000, Venu *et al.* 2001, Daniel 2005, Mastakar 2015). A total of 50 flowers and 40 fruits were studied to confirm the consistency of traits in the collected specimens.

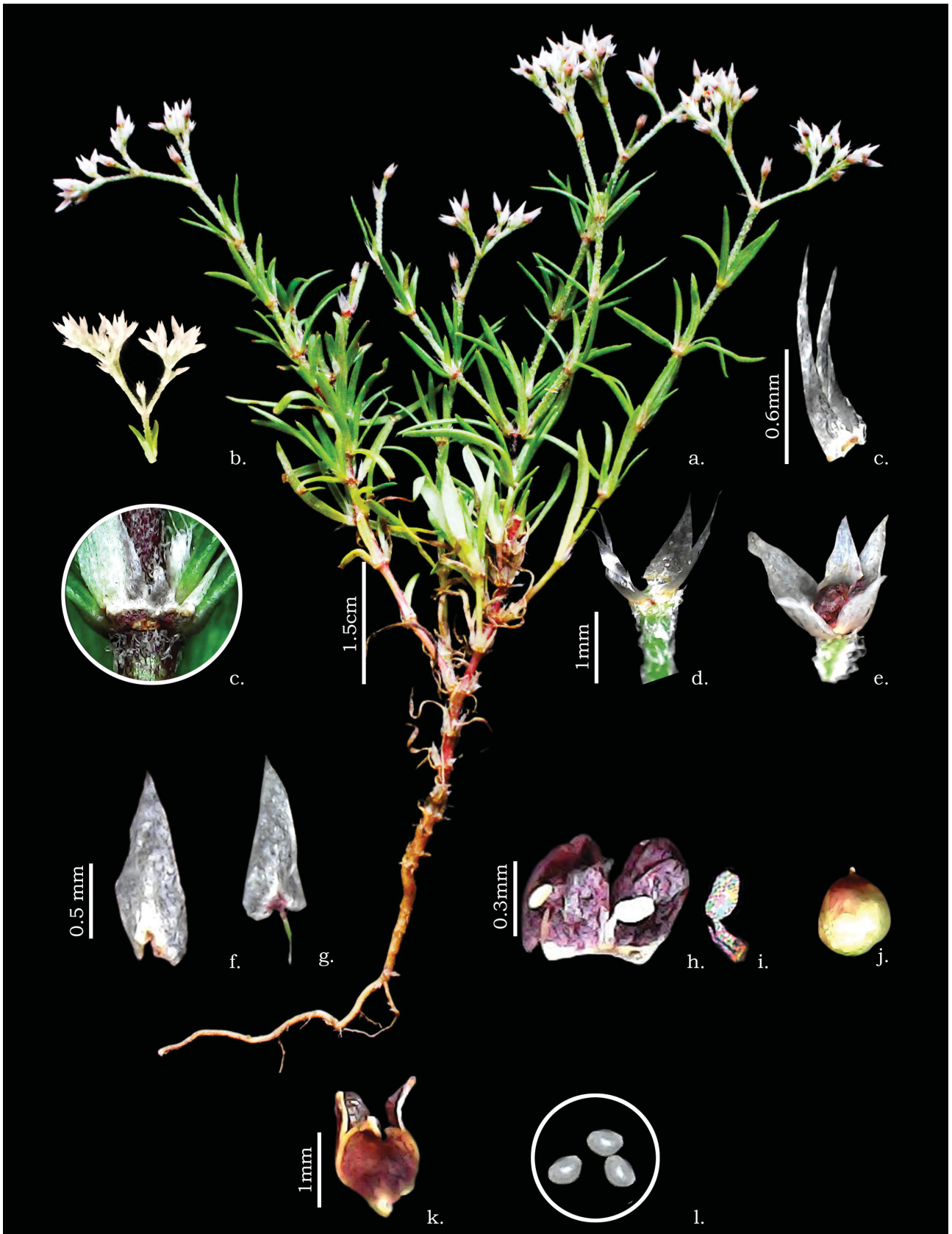


FIGURE 1. *Polycarpaea palakkadensis* a. habit; b. inflorescence; c. stipules; d. bract; e. flower f. & g. sepals; h. petal; i. stamen; j. gynoecium; k. fruit; l. seed (pictures by A. Sindhu).

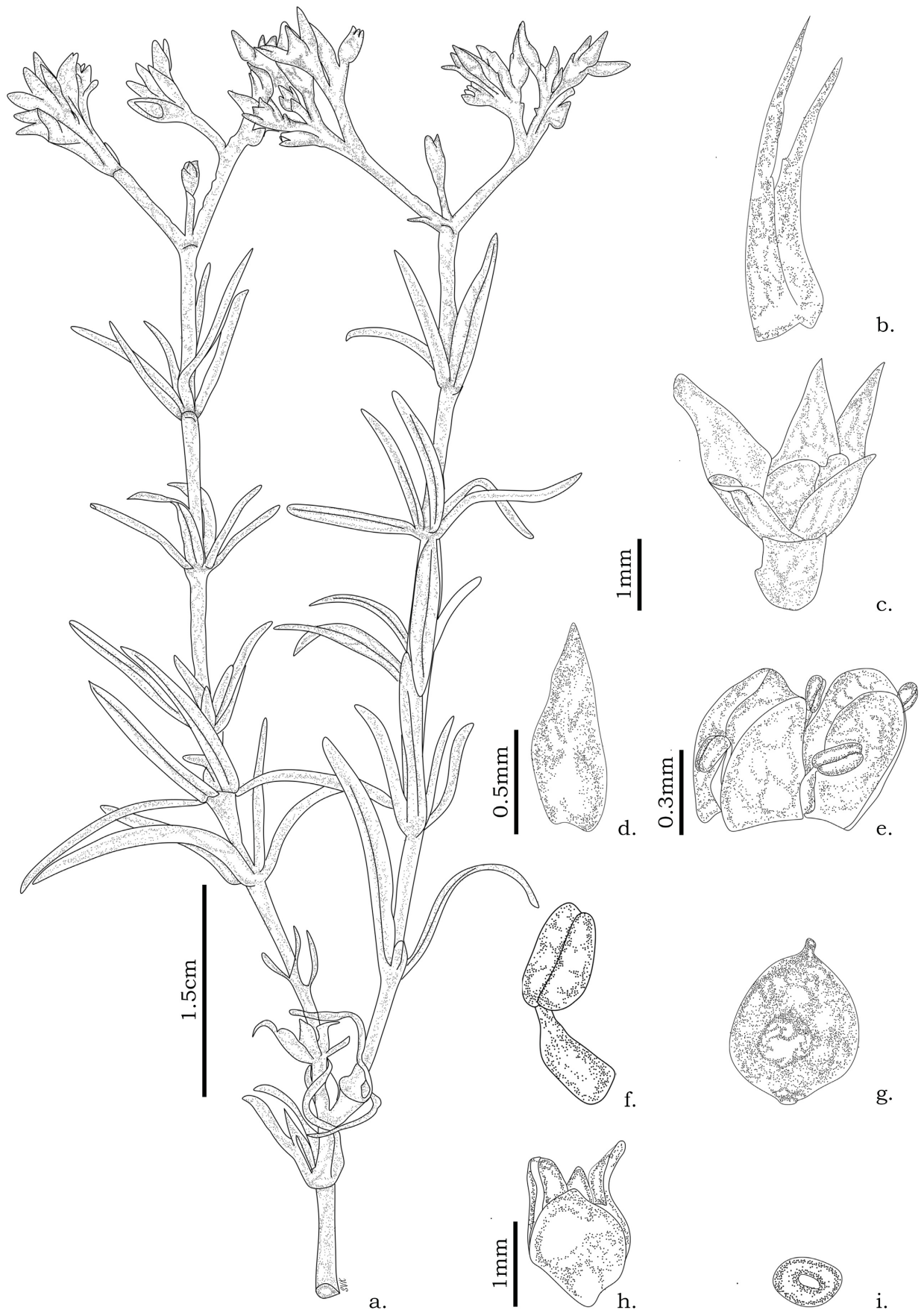


FIGURE 2. *Polycarpaea palakkadensis* illustration **a.** habit; **b.** stipules; **c.** flower; **d.** bract; **e.** petal; **f.** stamen; **g.** gynoecium; **h.** fruit; **i.** seed (drawings by V. Suresh).

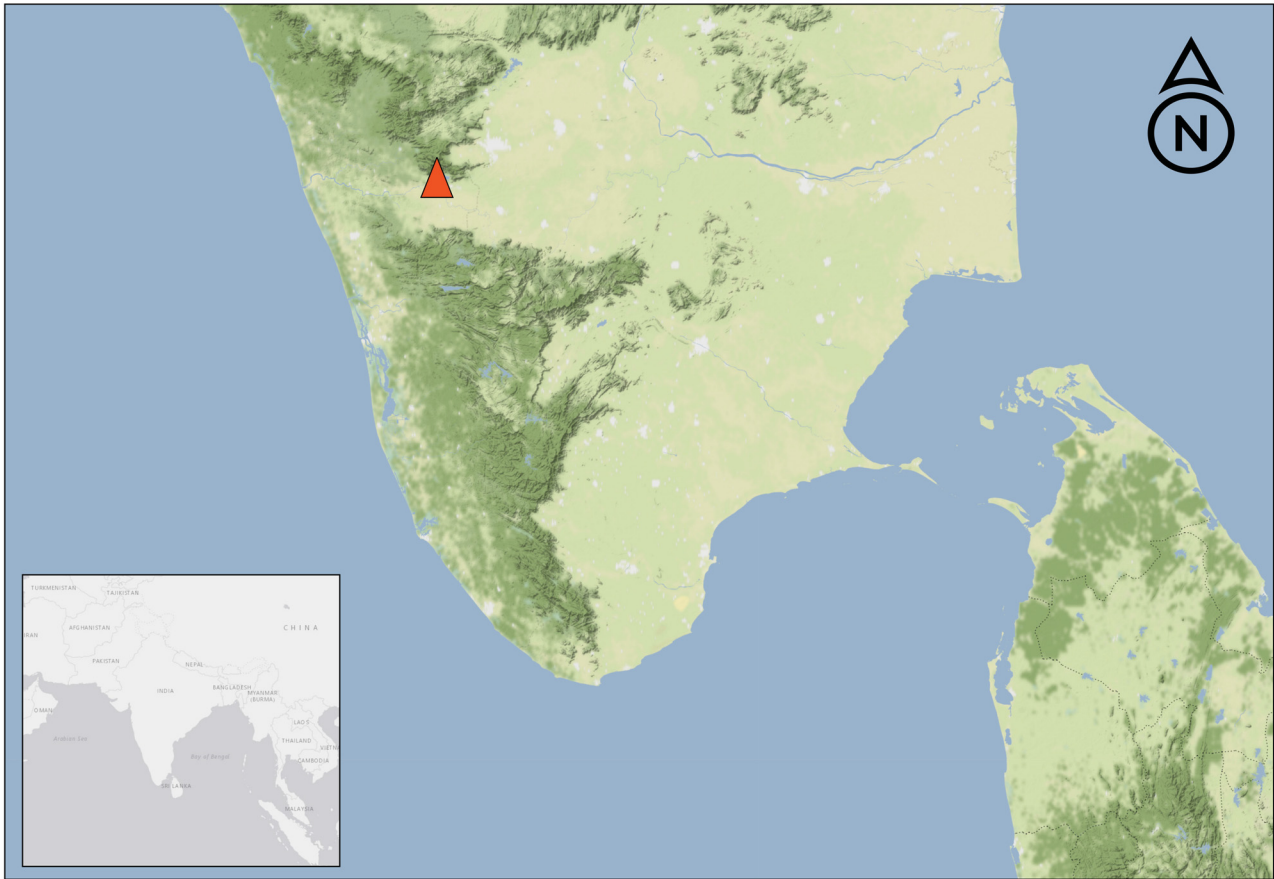


FIGURE 3. Distribution map of *Polycarpaea palakkadensis*.

Taxonomic treatment

Polycarpaea palakkadensis V.S.A Kumar, S.Arya & Suresh *sp. nov.* (Fig 1a).

Type:—INDIA. Kerala: Palakkad district, Malampuzha, 160 m, 10°50'07.7"N 76°40'44.5"E, 20th October 2019, *Suresh & Arya 564* (holotype UCBD!, isotype UCBD!).

Diagnosis:—*Polycarpaea palakkadensis* is morphologically similar to *Polycarpaea rangaiahiana* Geethakumari *et al.* (2015: 182) sharing reddish stem nodes that are villous but it differs with respect to arrangement of leaves (verticillate in *P. palakkadensis* vs. pseudoverticillate in *P. rangaiahiana*), shape and length of stipules (linear-lanceolate with acute apex and 1 mm long vs. ovate lanceolate with acuminate apex and 4 mm long), shape of bract (linear-lanceolate fused in pairs vs. ovate lanceolate not fused in pair, free), bracteoles (pappus or thread-like vs. ovate-lanceolate), shape and colour of sepals (ovate-obovate, acute at apex, white with red spot on the base vs. ovate lanceolate, acuminate apex, bright orange), shape, length, and colour of petals (ovate, 0.3 mm long, mucronate at apex, dark-brown vs. elliptical, 0.8–1.0 mm long, acute at apex, dark-red), length of stamen (filament 0.1 mm long, shorter than the anthers vs. filament 0.5 mm long as long as the anthers), shape of ovary (oblate spheroidal vs. prolate), shape of capsule (spheroidal-ellipsoidal, style not persistent, tips curved vs. ovoid, style persistent, tips not curved), and number, colour, and shape of seeds [1(–2), whitish yellow, ovate with no striations vs. 3–5, brown, subreniform with striations]

Description:—Annual herbs, erect or suberect, branched at base, ca. 7.5 cm high. *Stem* terete or angular, densely villous, nodes reddish swollen, internodes ca. 2 cm long. *Leaves* verticillate, sessile, linear, green, 1.0–2.5 cm long, base cordate, margin wavy, apex acute, surface glabrous, blade 1-veined, prominent on abaxial side; stipules scarious, linear-lanceolate, associated with narrow filamentous structures (1.2–2.0 × ca. 0.5 mm), margin entire, acute not nerved, yellowish at the base, white above. *Inflorescence* in terminal branched cyme, ca. 1.5 cm long; bracts paired, fused at base, linear-lanceolate, entire along the margin, acuminate, white, ca. 1 mm long. *Flowers* 1.1–2.4 mm long; bracteoles capillaceous and holding the bracts in position, 1–1.5 mm; pedicels 1.5–1.8 mm long, green villous. *Sepals*

5, fused at base, ovate-oblong (1.1–1.2 × ca. 0.9 mm), entire at the margin, acute at apex, white with a red spot on base, base mucronate, midrib prominent. *Petals* 5, ovate-oblong often cordate (0.4–0.6 × 0.3–0.5 mm), margin entire, oblong to round at apex, enclosing the ovary, 1/3–1/2 as short as sepals, dark red. *Stamens* 5, forming a ring with petals and encircling the ovary, ca. 0.1 mm long; anthers yellow, oblong, basifixed. *Ovary* 1-loculed, shortly stipitate, oblate spheroidal, 0.2–0.4 × 0.2–0.3 mm, glabrous, placentation free central; style 0.10–0.15 mm, shorter than the ovary, slender; stigma capitate. *Capsule* spheroidal (1.2–1.5 × ca. 0.4 mm), shortly stipitate, 4-valved, breaks along the suture, brownish, scarious along margin. *Seeds* (1–)2, ovoid (0.1–0.2 × 0.1–0.2 mm), white-yellow with no striations.

Phenology:—Flowering and fruiting times July–October.

Habitat and distribution:—*Polycarpaea palakkadensis* grows on the hillock terrains in Palakkad district (Kerala granite outcrop in the northern side of Palakkad gap, the largest break in western Ghats having an arid climate with seasonal fires). One of the common species that emerges after the initial rains is members of the genus *Polycarpaea*, especially *P. aurea* (Wight 1850: 44) Dunn (1915: 65). *P. palakkadensis* is also seen in a similar habitat. The associated taxa include *Indigofera linnaei* Ali (1958; 549) and *I. uniflora* Buchanan-Hamilton ex Roxburgh (1814: 57).

Conservation status:—Since *Polycarpaea palakkadensis* could occur in further sites in SW-India (and India as a whole), we think that further data are required to ascertain the conservation status of the new taxon. As a consequence, the new species is here assessed as DD (Data Deficient) according to the IUCN criteria (IUCN 2021).

TABLE 1. Morphological comparison between *Polycarpaea palakkadensis* and the similar species *P. aurea* and *P. rangaiahiana*.

	<i>P. palakkadensis</i>	<i>P. rangaiahiana</i>	<i>P. aurea</i>
Leaves	Pseudoverticillate	Pseudoverticillate	Opposite-decussate
Stipules	Linear-lanceolate, entire margin, 1 mm, short acute, creamy white, not nerved	Ovate-lanceolate, fimbriate along margin, 4 mm, long-acuminate, reddish at the base, white above, prominently nerved	Lanceolate, entire at margins, acuminate at apex, ca. 3 mm long, colourless or yellowish-brown, slightly silvery, not nerved
Inflorescence	Irregular, dense cyme	Regular (cymes), dense	Regular lax cymes
Bract	Ovate-oblong entire margin, fused at the base, creamy white	Ovate-lanceolate, fimbriate along the margin, not fused at base, white	Ovate-lanceolate, entire at margins, not fused at base, grey with a faint brownish tinge
Bracteole	Capillaceous, not prominent	Ovate-lanceolate prominent	Ovate-lanceolate, prominent
Sepal	Ovate-oblong, entire margin, acute or blunt apex, white	Ovate-lanceolate, entire at the margin, acuminate at apex, bright orange.	Ovate-lanceolate, acute-acuminate at apex, scarious, bright orange-reddish.
Petal	Ovate-cordate, fimbriate margin, round to mucronate at apex, dark brown	Elliptic, margin entire, acute at apex, dark-red	Oblong-obovate, margin entire, obtuse at apex, yellowish-brown
Stamens	0.1 mm, filament very short	0.5 mm, filament as long as anther	1 mm, filament as long as anther
Gynoecium	Oblate spheroid	prolate	conical
Capsule	Style not persistent, smooth, tips not recurved after dehiscence, 1 or rarely 2 seeded	Style persistent, finely lined, tips not recurved after dehiscence, 3–10 seeded	Style persistent smooth, shining, glabrous, tips recurved after dehiscence, 5-many seeded
Seed	1–2 Ovoid-elliptical creamy white	(6–)10, sub-reniform brown	3–5, reniform brown

Taxonomic notes:—The proposed new species is closely allied to *Polycarpaea rangaiahiana*, occurring in Kannur district (Kerala), but it is distinct with respect to the floral traits (Table 1). In Kerala, *P. corymbosa* (Linnaeus 1753: 205) Lamarck (1797: 129) has a wide distribution and *P. palakkadensis* resembles *P. corymbosa* with respect to verticillate, linear leaves and dense cyme, but differs with respect to shape of stipules (ovate lanceolate, 2–4 mm in *P. corymbosa* vs. linear lanceolate, 1.2–2.0 mm in *P. palakkadensis*), sepals (hyaline, lanceolate, free vs. nonhyaline ovate-oblong, fused at base), petals (broadly ovate, whitish-reddish vs. ovate oblong or cordate, dark brown-dark red), bracteole (lanceolate vs. capillaceous), ovary (ovate vs. oblate-spheroidal), capsule (3-valved, ovoid vs. 4-valved,

spheroidal), and seeds (5–15 flat with prominent reticulate surface ornamentation vs. 1–2 ovoid with smooth surface). The new species also resembles *P. aurea* with respect to brown colour of the petals but it differs by various characters, as reported in Table 1. A key to demarcate the new species from the other six species found in India is given below.

- | | | |
|----|--|-------------------------|
| 1. | Leaves basal and cauline, flowers in spike, capsule thin walled..... | <i>P. spicata</i> |
| 1. | Leaves only cauline, flowers in dense or lax cyme, capsule thick walled | 2 |
| 2 | Petal pinkish-purple, plant glabrous | <i>P. diffusa</i> |
| 2 | Petals pinkish-yellow, plant densely tomentose | 3 |
| 3 | Stem with greyish hairs, petal lightly coloured, leaves set with green slender node | <i>P. corymbosa</i> |
| 3 | Stem with white hairs, petal brightly colored, leaves set with reddish swollen node | 4 |
| 4 | Plants not stunted, sepals bright white-reddish, petals yellow-brown..... | 5 |
| 4 | Plants stunted, sepals hyaline, petals violet..... | <i>P. majumdariana</i> |
| 5 | Leaves opposite-decussate, anthers white-cream, stamen 1/2 as long as the petal | <i>P. aurea</i> |
| 5 | Leaves pseudoverticillate at red villous nodes, anthers bright-yellow stamen 1/4 as long as the petal..... | 6 |
| 6 | Sepals ovate-oblong, petals ovate-cordate, with apex rounded, gynoeceium oblate-spheroidal, capsule 1–2 seeded, each seed ovoid..... | <i>P. palakkadensis</i> |
| 6 | Sepals lanceolate, petals ovate-lanceolate, apex acute, gynoeceium prolate, capsule 3–10-seeded, each seed sub-reniform..... | <i>P. rangaiahiana</i> |

Additional specimens examined (Paratypes):—*Polycarpaea palakkadensis*. INDIA: Kerala: Palakkad District, Malampuzha, Navodaya, 115 m, 10°49'37.9"N 76°40'29.8"E, 26 September 2021, *Suresh & Alen 1055* (UCBD), Rock Garden Premise, 120 m, 10°49'30.9"N 76°41'15.5"E, 26 September 2021, *Suresh & Arya 1056* (UCBD), Anakkal Road, 120 m, 10°49'20.7"N 76°41'59.0"E, 27 September 2021, *Suresh & Ambika 1058* (UCBD).

Polycarpaea aurea. INDIA. (K000723268), *s.d.*, *Wight 114* (K!); Andhra Pradesh: Mahabubnagar district, (L1709181), 12 February 1978, *Rodenburg 272* (L!); Karnataka: Bellary district: Jouk Hills, (E00179729, E00179730) *s.d.*, *Wight 2443* (E!); Kerala: Malappuram district: Calicut University campus, (CALI131211), 16 July 1984, *Vanaja 2604* (CALI!); Calicut University campus, (CALI131213), 10 November 1970, *Sivarajan 768* (CALI!); Calicut University campus, (CALI160543), 28 April 2003, *Smitha s.n.* (CALI!).

Polycarpaea rangaiahiana. INDIA. Kerala: Kannur District, Taliparamba, ± 56 m, 17 September 2016, *Geethakumary & Deepu 84391* (TBGT!); Palakkad district: Malampuzha, *Arya & Suresh 1062* (UCBD!).

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Reference

- Ali, S.I. (1958) Revision of the genus *Indigofera* L. from West Pakistan and North West Himalayas. *Botaniska Notiser* 111: 543–577
- Daniel, P. (2005) *The Flora of Kerala*, vol. 1. Botanical Survey of India, Kolkata, 312 pp.
- Daniel, P., Venu, P., Muthukumar, S.A., Thiagaraj, G.J. & Malathi, C.P. (2000) A taxonomic reassessment of the genus *Polycarpaea* Lam. (Caryophyllaceae) in India. *The Swamy Botanical Club* 17: 3–12.
- Dequan, L. & Gilbert, M.G. (2001) *Polycarpaea* Lamarck. In: Wu, Z. & Raven, P.H. (Eds.) *Flora of China* (Caryophyllaceae–Lardizabalaceae), vol. 6. Science Press and Missouri Botanical Garden Press, St Louis, pp. 1–113.
- Dunn, S.T. (1915) Ranunculaceae to Opiliaceae. In: Gamble, J.S. (Ed.) *Flora of the Presidency of Madras*, vol. 1. Allard & Son, London, pp. 1–200.
- Edgeworth, M.P. & Hooker, J.D. (1874) Caryophyllaceae. In: Hooker, J.D. (Ed.) *The Flora of British India*, vol. 4. L. Reeve & Co., London, pp. 212–246.
- Geethakumary, M.P., Deepu, S., Viji, A.R. & Pandurangan, A.G. (2019) A new species of *Polycarpaea* (Caryophyllaceae) from India. *Phytotaxa* 414 (4): 181–186.

<https://doi.org/10.11646/phytotaxa.414.4.4>

- IUCN (2021) *Guidelines for using the IUCN Red List Categories and Criteria*. Version 11. Prepared by the standards and petitions subcommittee. Available from: <http://www.iucnredlist.org/documents/RedListGuidelines.pdf> (accessed 12 September 2021)
- Lamarck, J.-B. (1792) Sur le nouveau *Policarpaea*. *Journal d'Histoire Naturelle* 2: 3–9.
- Mabberley, D.J. (2008) *Mabberley's plant-book: a portable dictionary of plants, their classifications, and uses*. Cambridge University Press, Cambridge, 1021 pp.
- Majumdar, N.C. (1993) Caryophyllaceae. In: Sharma, B.D. & Balakrishnan, N.P. (Ed.) *Flora of India*, vol. 2. Botanical Survey of India, Calcutta, pp. 502–595.
- Mastakar, V.K., Lakshminarasimhan, P. & Modak, M. (2015) A report on the extended distribution of *Polycarpaea aurea* (Caryophyllaceae), An endemic herbaceous species to Chota Nagpur Plateau, Jharkhand, India. *Journal of Threatened Taxa* 7 (12): 7950–7952.
<https://doi.org/10.11609/JoTT.o4268.7950-2>
- Roxburgh, William (1814) *Hortus Bengalensis or a catalogue of the plants Growing in the Honourable East India Company's Botanical Garden at Calcutta*, 57 pp.
- Thiers, B. (2021 [continuously updated]) *Index Herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available from: <https://sweetgum.nybg.org/ih> (accessed 13 September 2021)
- Venu, P., Muthukumar, S.A. & Daniel, P. (2001) *Polycarpaea majumdariana* (Caryophyllaceae)—a new species from Tamil Nadu, India. *Nordic Journal of Botany* 21 (6): 577–579.
<https://doi.org/10.1111/j.1756-1051.2001.tb00813.x>
- Wight, R. (1843) *Icones Plantarum Indiae Orientalis*, Vol. 2. J. B. Pharoah, Madras, 33 (explanations) + 417 (plates) pp.
- Wight, R. (1850) *Illustrations of Indian Botany*, vol. 2. American Mission Press, Madras, 230 pp.