APPENDIX – PUBLICATIONS

1. Research papers published: 2


2. Research paper in press: 1


3. Research papers communicated: 6

1. Viswanathan, M. B., E.H. Prem Kumar and N. Ramesh. Ethnomedicines of the Kanis in the Kalakkad - Mundanthurai Tiger Reserve (KMTR) of Tamil Nadu in India. *Fitoterapia*

2. Viswanathan, M. B., E.H. Prem Kumar and N. Ramesh. Ethnomedical documentation of medicinal plants of the Kanis inhabiting the Kalakkad - Mundanthurai Tiger Reserve (KMTR) of Tamil Nadu, India. *J. Ethnopharmacology*

3. Viswanathan, M. B., E.H. Prem Kumar and N. Ramesh. Medicines new to the recorded literature from the Kanis in the Kalakkad - Mundanthurai Tiger Reserve (KMTR) of Tamil Nadu in India. *Int. J. Tropical Medicinal Plants*

4. Viswanathan, M. B., E.H. Prem Kumar and N. Ramesh. Contribution of new medicines to the recorded literature from the Kanis of the Kalakkad-Mundanthurai Tiger Reserve (KMTR) in India. *J. Ethnobiology*

5. Prem Kumar, E.H., M. B. Viswanathan- and N. Ramesh. New medicines to the recorded literature from the Kanis of Tamil Nadu in India. *J. Herbs Spices Medicinal Plants*

6. Prem Kumar, E.H., M. B. Viswanathan and N. Ramesh.. New medicines to the recorded literature on antidotes for poisons, rheumatism and stomach problems from the Kanis in the Kalakkad-Mundanthurai Tiger Reserve (KMTR) from Peninsular India. *Botanical Bull. Academia Sinica*
27. REDISCOVERY OF *WENDLANDIA ANGUSTIFOLIA* WIGHT EX HOOK. F. (RUBIACEAE), FROM TAMIL NADU, A SPECIES PRESUMED EXTINCT

(*With eleven text-figures*)

*Wendlandia angustifolia* Wight ex Hook. f., Family Rubiaceae, was first described by Hook. f. (1880) based on Wight's manuscript who collected it from Courtallum. Later, Rangachari collected it from Kannikatti in 1917. Deb and Maiti who revised the genus opine that the species is presumed extinct, and efforts should be made to relocate it in the river beds at low altitudes, to introduce it in botanic gardens to conserve the species. However, the species was rediscovered after a lapse of 81 years, in its known habitat at Inchikuzhi near Kannikatti during an inventory of threatened plants of the Kalakkad Mundanthurai Tiger Reserve (KMTR), Tirunelveli district, Tamil Nadu, in 1998. The species is described and illustrated.


Shrub or tree, up to 4 m high. Leaves ternately whorled, linear-lanceolate, alternate at base, entire at margin, acute at apex, 4-11 x 0.5-1.8 cm, coriaceous; lateral nerves 6-8 pairs; petioles up to 1 cm long; stipules triangular-ovate, subulate or cuspidate at apex, 3-5 x 0.8-1 mm. Inflorescence at terminal branches, in panicles; panicles slender, pyramidal, leafy below; flowers densely crowded; bracts ligulate, hastate at base, acuminate at apex. 0.7-0.9 x 0.3-0.5 mm. Calyx tube turbinate, 4 to 6 lobed, c. 0.9 x 1 mm; lobes subulate, subequal, triangular ovate in outline, subulate at apex, c. 0.6 x 0.2 mm. Corolla white, salverform, 4 to 6 lobed, c. 4 x 1.2 mm; lobes orbicular, obtuse or slightly notched at apex, c. 1.1 x 1.1 mm. Stamens 4-6, epipetalous, between corolla lobes...
MISCELLANEOUS NOTES

exserted; filaments 0.75 x 0.8 mm; anthers pale yellow, oblong-ovate, dorsifixed, c. 1 x 0.6 mm. Ovary inferior; style linear, 4.5-5.8 x 0.15-0.2 mm; stigma 2-lobed, clavate, c. 0.8 x 0.6 mm. Fruits globose, rugose, many-seeded, c. 2 mm across; seeds brown, irregularly oblong-trigonal or trigonous, c. 0.3 x 0.2 mm.

Note: According to Hook.f. (1880) and Gamble (1921), flowers are either 4- or 5-merous. But the flowers in the recent collection show 4- or 6-merous conditions. Anther colour yellow is recorded for the first time. Sporadic populations can be seen along the stream and river beds between Inchikuzhi and Mundanthurai in the KMTR.


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June 14, 1999

M.B. VISWANATHAN
E. HARRISON PREMKUMAR
N. RAMESH

Sri Paramakalyani Centre for Environmental Sciences,
Manonmaniam Sundaranar University,
Alwarkurichi 627 412,
Tamil Nadu,
India.

28. LACTUCA GRACILIFLORA DC. (ASTERACEAE) — AN ADDITION TO THE FLORA OF HIMACHAL PRADESH

During a systematic survey of the flora of Kulu district (Himachal Pradesh) in 1988-1992, 930 species of spermatophytes were gathered. Out of these, 32 species were found to be additions to the flora of Himachal Pradesh (Sharma and Dhaliwal 1997). Meanwhile, a specimen collected from the district was identified at Kew Herbarium as Lactuca graciliflora DC. A perusal of Chowdhery and Wadhwa (1984) and subsequent reports (Sharma and Dhaliwal 1997) revealed that this taxon has not been reported from the State. Further, in the most recent work on the Asteraceae of India, Mamgain and Rao (1995) mention the distribution of this species from Uttar Pradesh, West Bengal and Sikkim. Earlier, Hooker (1881) had recorded it from Central and Eastern Himalaya. Apparently, our record is a westward extension of the species. Information about the specimens collected is given below.


Description: Glabrous or minutely hairy annual or biennial herb, 0.8-1.5 m tall. Leaves 5-15 x 2-5 cm, membranous; lower triangular, pinnatifid or pinnate, narrowed to a slender petiole; uppermost ovate or lanceolate, sessile. Inflorescence a terminal panicle, 30-60 cm long. Heads 1-1.3 x 0.1-0.2 cm, pink or pinkish-purple, drooping, with small slender peduncles. Outer
Novelties in *Balanophora indica* (Arn.) Griff. (Balanophoraceae) from Peninsular India

M. B. Viswanathan, E.H. Prem Kumar and N. Ramesh
Sri Paramakalyani Centre for Environmental Sciences,
Manonmaniam Sundaranar University, Alwarkurichi, Tamil Nadu - 627 412, India

Abstract

Two new varieties of *Balanophora indica* (Arn.) Griff. namely, var. *agastyamalayana* and var. *tirunelveliensis*, collected from the Kalakkad-Mundanthurai Tiger Reserve of the Southern Western Ghats of India, are described and illustrated.

INTRODUCTION

The genus *Balanophora* Forster & Forster f. has 15 species distributed from Madagascar to Japan, South and Southeast Asia to Australia and Polynesia (Hansen, 1972). In India, the genus is represented by 7 species. *B. indica* (Arn.) Griff. var. *indica* is distributed in the evergreen subtropical forests between 500 and 2500 m elevation in the north-eastern states of Assam and Manipur and in the Western Ghats of Maharashtra, Karnataka, Kerala and Tamil Nadu in India. In addition, it is distributed in Sri Lanka, Bangladesh, Myanmar, Southwest China, Vietnam, Thailand and Malaysia to Australia. Another variety namely, *B. indica* (Arn.) Griff. var. *minor* Eichl. is restricted to the Nilgiri hills of Tamil Nadu in Peninsular India, and Thailand.

*Balanophora indica* (Arn.) Griff. var. *agastyamalayana* Viswanathan, Prem Kumar & Ramesh, var. nov. (Fig.1).

*Balanophora indica* (Arn.) Griff. var. *indica* foliis late ellipticis et oblongo-lanceolatis, distincte cucullatis et generatim magnioribus; bracteis longioribus, pedicellis brevioribus, synandrio obllongo-elliptico, ad 3.5 mm lato et pistilis parvioribus, ad 1 mm longis differt.

Types: India, Tamil Nadu, Kalakad-Mundanthurai Tiger Reserve, 8°20' - 8°53' N and 77°10' - 77°35' E, Poongulam R.F., ± 1200 m, 24 May 98, Viswanathan, Prem Kumar & Ramesh 2156 (Holo - MH; Iso - SPKCES).

Plants dioecious, brick-red, 9-13 cm long from the point of fusion with host root to the top of inflorescence; tubers single or branched at base, subspherical, stellately warty.
Fig. 1. *Balanophora indica* (Arn.) Griff. var. *agastyamalayana* Viswan., Prem Kumar et al Ramesh: a-h, Male plant and floral parts: a. Habit; b. Flower; c. Synandrium; d. Bract - dorsal view; e. Bract - ventral view; f. Tepals - dorsal view; g. Tepals - ventral view; h. Pollen grains; i-m. Female plant: i. Habit; j. Leaf; k. Spadicle and pistils; l. Spadicle; m. Pistil.
Novelties in *Balanophora indica*

single tuber 4-9 cm wide. Leaves 10-20, spirally arranged in 6 rows, greenish yellow, broadly elliptic, elliptic, oblong-elliptic or oblong-lanceolate, 1.5 x 1.5-2.8 cm, cucullate. Male flowers: spadices ellipsoid, c. 3.6 x 4.3 cm; pedicels fleshy, terete, broadened upwards, immersed in cavities lying above the fleshy bracts, 3-4 x c. 3 mm; bracts one for each flower, fleshy, 5-angular, truncate; angles dissimilar. Flowers actinomorphic, elongated laterally, 4 or 5-merous, c. 7 x 4 mm for unopened ones, c. 7 x 7 mm in opened ones. Tepals 4 or 5, oblong-elliptic, c. 7 x 2.5-2.7 mm, cucullate, fleshy, truncate at base, entire at margin, obtusely acute or subacute at apex, prominently 1-ridged outside, faintly 3-ridged inside. Torus terete, c. 2 x 1.5 mm. Synandrium oblong-elliptic, 16-20 ridged, 4-5 x 3.25-3.5 mm; ridges obsolete just below apex, button-shaped at apex, obtusely mucronate-topped; pollen grains yellow, 3-porate, spheroidal, triangular with aperture membranes semicircularly curved in polar view. 10-20 μ in diameter; exine granular in equatorial region, 1.25-2 μ thick. Female flowers: spadices globose, 4-5 x 4-5 cm. Spadicles black, 1250-1275 μ long; lower part terete, 200-275 x 100-225 μ; upper part oblong-obovate, truncate or obtuse at apex. 975-1075 x 500-575 μ; cuticular ridges of top cells conspicuous, 5-10 μ thick. Pistils around spadicles, 425-550 μ long; stipe pale yellow, terete, 75-125 μ long; ovary pale yellow, spindle-shaped, 125-175 x 100-150 μ; style yellow to black upwards, 175-250 μ long; stigma terminal.

*Balanopha indica* var. *agastya*malayana differs from var. *indica* in the leaves being broadly elliptic to oblong-lanceolate, distinctly cucullate and generally larger, longer bracts, shorter pedicels, oblong-elliptic synandrium up to 3.5 mm wide and smaller pistils up to 1 mm long.

*Habitat:* Southern tropical wet evergreen forest, about 1200 m.

*Host:* *Euonymus dichotomus* Heyne ex Roth

*Associated plants:* *Alpinia abundiflora*, *Embelia basaal* and *Mallotus aurea-punctatus*.

*Flowering:* January - May.

*Balanophora indica* (Am.) Griff. var. *tirunelveliensis* Viswanathan, Prem Kumar & Ramesh, var. nov. (Fig.2).

*Balanophora indica* (Am.) Griff. var. *indica* tuberibus parvioribus, 2-10 cm latis; foliis, latioribus, 2-2.8 cm latis, numeris pluris; spadicis magnioribus, 7-14 x 3-7.5 cm, bracteis longioribus, ad 13 mm longis, pedicellis longioribus, ad 2 mm longis et synandrio oblongo-elliptico, magnioribus differt.

*Types:* India, Tamil Nadu, Kalakkad-Mundanthurai Tiger Reserve, 8°20' - 8°53' N and 77° 10' - 77°35' E, Upper Kodaiyar, ± 1,200 m, 23 Jan. 1999, Viswanathan 3232 (Holo - MH; Iso - SPKCES); Poongulam R.F., ± 1,200 m, 25 May 1998, Viswanathan, Prem Kumar and Ramesh 2176 (Para - SPKCES).
Fig. 2. *Balanophora indica* (Arn.) Griff. var. *tirunelveliensis* Viswan., Prem Kumar et Ramesh: a-i. Male plant and floral parts: a. Habit; b. Leaf; c. Flower and bract; d. Bract - dorsal view; e. Bract - ventral view; f. Tepals - dorsal view; g. Tepals - ventral view; h. Flower; i. Pollen grains; j-n. Female plant and floral parts: j. Habit; k. Leaf; l. Spadicle and pistils; m. Pistil.
Novelties in *Balanophora indica*

Plants dioecious, yellowish-red, 20-26 cm high from the point of fusion with host root to the top of inflorescence; tubers in mass, branching from base; tubers single or branched from base, subspherical, finely granular with scattered stellate warts; single tuber 2-10 cm wide. Stems slender, 10-12 x 2-2.5 cm. Leaves 21-27, spirally arranged, scale-like, suborbicular to orbicular, 2-3 x 2-2.8 cm, cucullate, broad at base, accrescent upwards, entire at margin, obtuse at apex. Male flowers: spadices fleshy, ovoid, obovoid or ellipsoid, creamish yellow-red, 7-14 x 1.3-7.5 cm; bracts golden yellow, one each for a flower at base, truncate, 6-angled, concave ventrally, 7.5-13 x 5-8 mm; pedicels golden yellow, fleshy, straight or arcuate, broadened upwards, immersed in cavities lying above the fleshy bracts, 10-22 x 2-4 mm. Flowers 5- or 6-merous, actinomorphic, 6-9 x 4-6 mm. Tepals 5, oblong-elliptic, c 7-10 x 2.5-4 mm, decurved in flowering, entire at margin, obtuse at apex, cucullate, thickened towards apex. Torus terete, 1-2 x 2-3 mm. Synandrium oblong-elliptic, creamish white, 4.5-7 x 3-4 mm; anthers horseshoe-shaped, 16-22-ridged; ridges obsolete just below apex, button-shaped at apex, obtusely mucronate-topped; pollen grains yellow, 3-porate, spheroidal, triangular with aperture membranes semicircularly curved in polar view, 17.5-22.5 μ in diameter; exine granular in equatorial region, 1-2 μ thick. Female flowers: spadices subglobose, c. 3.5 x 5 cm. Spadicles golden yellowish brown, 1025-1350 μ long; lower part terete, 325-600 x 125-200 μ; upper part obconical, obtuse or truncate at apex, 550-750 x 450-650 μ; cuticular ridges of top cells conspicuous, 10-20 μ thick. Pistils around spadicles, 1475-1725 μ long; stipe pale yellow, terete, 250-325 μ long; ovary pale yellow, spindle-shaped, 275-300 x 250-275 μ; style yellow to black upwards, 900-1150 μ long; stigma terminal.

*Balanophora indica* var. *tirunelveliensis* differs from var. *indica* in having smaller (2-10 cm wide) tubers; numerous broader (2-2.8 cm) leaves; larger (7-14 x 1.3-7.5 cm) spadices; larger (13 cm) bracts; longer pedicels up to 2 mm long and in oblong-elliptic and larger synandrum.

Habitat: Southern tropical wet evergreen forest, about 1200 m.

Host: *Euonymus dichotomus* Heyne ex Roth

Associated plants: *Alpinia abundiflora, Embelia basaal, Mallotus aurea-punctatus, Ochlandra travancorica* and *Sonerila travancorica*.

Flowering: January - May.

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Literature cited