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Novelties from High Wavy Mountains, Southern Western Ghats, Theni District, Tamil Nadu, India

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Abstract

Intensive botanical studies were conducted at High Wavy Mountains which have resulted in the finding of seven new taxa of plants viz., *Nothopegia vajravelui* (Anacardiaceae), *Syzygium sriganesanii* (Myrtaceae), *Syzygium zeylanicum* var. *megamalayanum* (Myrtaceae), *Sonerila parameswaranii* (Melastomataceae), *Schefflera maduraiensis* (Araliaceae), *Hedyotis shettyi* (Rubiaceae) and *Anisochilus henryi* (Lamiaceae). They are described here with descriptions, illustrations, notes, etc.

INTRODUCTION

The High Wavy Mountain (Pachakumachi hill) is a complex of several hill estates located in the southern Western Ghats of Theni District (earlier under Madurai District) of Tamil Nadu. It is adjoined by Palani hills in the north, Sethur and Sivagiri hills in the south, Cardamom hills and Kerala State in the west and a spur of hill ranges towards northeast called Varushanadu hills. Towards southwest it is surrounded by Thekkadi hills. It lies between 9° 35' to 9° 45' north latitude and 77° 15' to 77° 27' east longitude. It has a total area of about 10,000 acres of which around 2000 acres are under cultivation of plantation crops such as tea, coffee and cardamom interspersed with several pockets of evergreen forests. The altitude from foothill to the highest Brooke peak ranges from 600 to 2000 M, inhabiting forest types ranging from Scrub jungles to Evergreen, Montane forests and Sholas surrounded by Grasslands. Two major rivers in the district viz., Vaigai and Suruliyaru originate from Pachakumatchi hill ranges.

Blatter and Hallberg (1918) with a team of botanists from Bombay were the pioneers who botanised High Wavy Mountains which resulted in finding of 4 new taxa of orchids by Blatter (1927). D' Almeida (1926) described a new species of fern collected from this hill. This region also forms the type locality of *Ixora monticola* Gamble and *Ardisia blatteri* Gamble. Govindarajalu (1970 - 1991) described around 18 new species of Cyperaceae from this hills range. Ravikumar & Lakshmanan (1989) published a new variety in Oleaceae namely, *Chionanthus ramiflorus* var. *peninsularis* and Ravikumar *et al* (1990) described a new grass *Dimeria balakrishnaniana* from these hills. Rajasekaran (1986) described a new species of Loranthaceae, *Elytranthe pseudopsilantha* from High Wavy Estate.

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Intensive botanical studies were conducted during 1984 to 1991. This area forms the type locality of about 28 species of angiosperms (including one new fern). The further collection of 7 more new taxa (presented in this paper) takes up the total number of new taxa from these hills to 35, out of 1520 species of dicot collections which explicit the rich diversity of the area. Plantations and further extensions have considerably reduced the primeval habitats of many endemic and new taxa. However, recently WWF in collaboration with Meghamalai Wildlife and Environment Association (MWEA) and Forest Department of Tamil Nadu is undertaking studies to declare it as a protected area is an important step in providing legal protection to this hot spot of Western Ghats.

Nothopegia vajravelui Ravikumar & Lakshmanan *sp. nov.* (Fig. 1)

Nothopegia vajravelui sp. nov. *N. racemosa* (Dalz.) Ramam. affinis, sed racemis curtioribus; floribus magnioribus; pedicellis distinctis et articulatis; sepalis et glabris; staminibus petalis curtioribus; filis ad basim hirsutis; drupis magnioribus et ad apicem acutis differt.

Trees, 4-10 m tall; bark smooth, ashy brown; branchlets terete, glabrous. Leaves alternate, usually obovate, rarely elliptic - oblong to oblanceolate, 6-16 x 1.5-5 cm, acute to obtuse at base, obtusely acuminate at apex, entire and wavy along margins, thick - coriaceous, glabrous, dark green above, pale green and glaucous below; petioles 0.6 - 1.3 cm long, twisted, thick, canaliculate; cross-veins 15-30 pairs, indistinct above, distinct, impressed and reticulate below. Racemes simple, axillary, up to 2 cm long, 7-12 - flowered (rarely 1-or 2-flowered); peduncles stout, up to 2 cm long, 4-5-angled, rusty-hairy. Flowers unisexual (male) and bisexual. Male flowers: Bracts 1 or 2, ovate, ca 1 mm long, hirsute without, glabrous within. Bracteoles 1, lanceolate, ca 3 x 1 mm long, hirsute without, glabrous within, fleshy. Pedicels 2-3 mm long, 4-5-angled, articulated, enlarged at apex, sparsely hirsute; joints of pedicels with 4-5, small, ovate lobes. Sepals 4 or 5, lobes free from base, ovate or triangular, ca 1 mm long, fleshy, glabrous, greenish yellow. Petals 4 or 5; lobes imbricate, free from base, oblong, ca 5.5 x 2 mm, acute at apex, fleshy, glabrous, veined, margins folded inside, hooded when young, entire and erect when mature, greenish yellow. Stamens 4-5, alternate to petals; filaments equal or rarely subequal, ca 2 mm long, flattened, fleshy, broadened at base, pilose up to 3/4 of its length, greenish yellow; anthers basifixed, oblong, ca 2 x 1 mm, broadened at base, 2-celled, yellow. Disc annular, ca 2 mm across, 4-5-lobed. Bisexual flowers: Bracts, Bracteoles, Pedicels, Sepals, Petals, Stamens and Disc as in male flowers. Ovary globose, ca 2.5 mm across, 4-5 - celled, glabrous, green; styles cylindric, ca 1.5 mm long, stout; stigma simple, capitate. Drupes 1-4 in a peduncle, globose or ovoid, ca 2.2 x 1.2 cm, acute at both ends, glabrous, vertically striate, shiny, green turning purplish brown; fruiting stalk 0.6-1.4 cm long, stout; seed 1, ovoid to globose, ca 1 cm across, pale yellow.

Type: India, Tamilnadu, Theni District. Holotype: *Lakshmanan* 91063 (CAL) and Isotypes: *Lakshmanan* 91063 (MH) were collected near Field No. 29, on the way to Vellimalai from Upper Manalar on 27.5.1989, at an alt. of \pm 1550 m. Paratypes: *Lakshmanan* 88943 (MH), Kudamparai Estate, Megamalai, Pachakumatchi hills, on 21.7.1988, at an alt. of \pm

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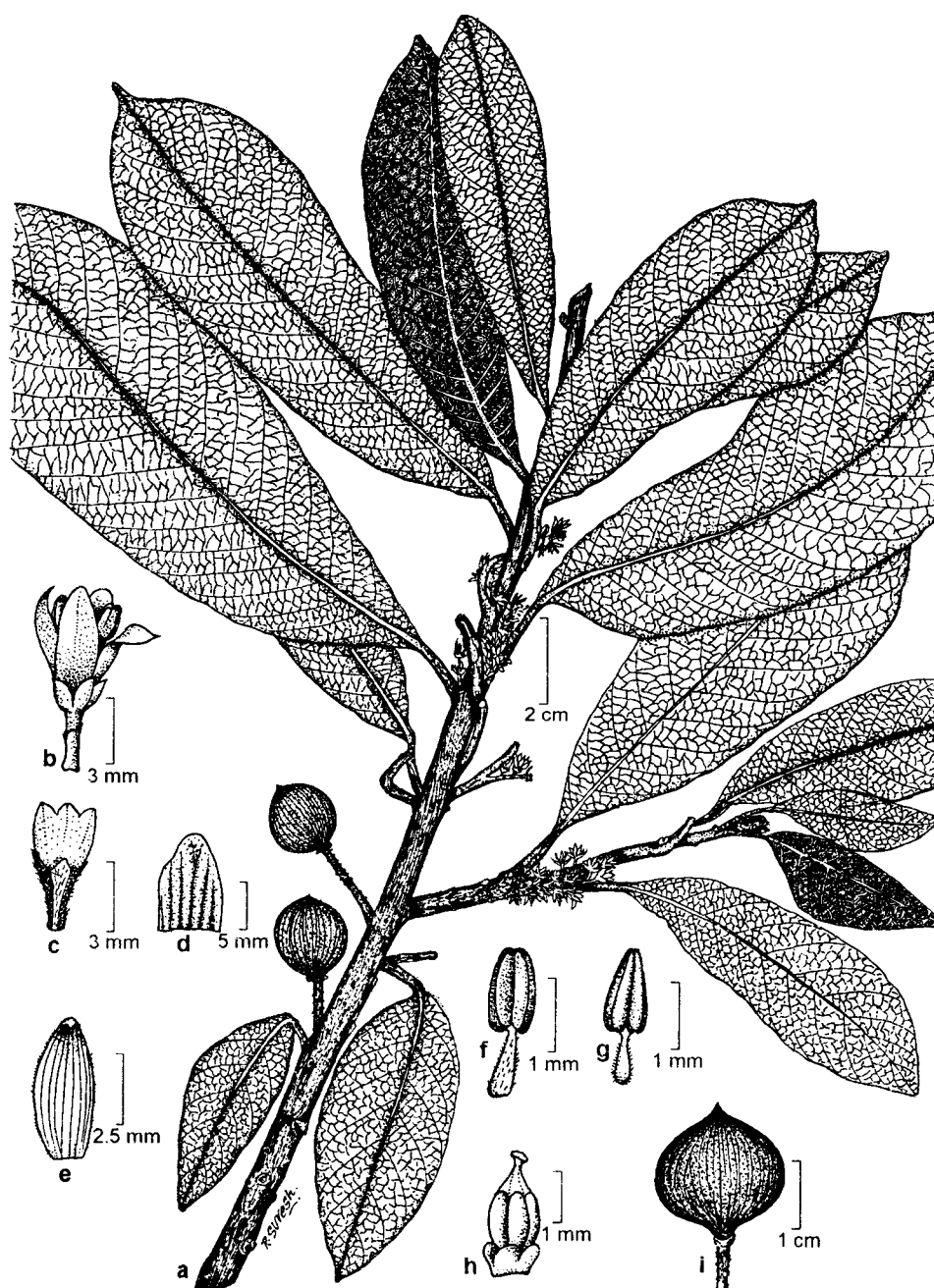


Fig. 1. *Nothopegia vajravelui* Ravikumar & Lakshmanan *sp. nov.* : a. Twig; b. Flower; c. Articulated pedicel; d. Sepal; e. Petal; f. Stamen of a male flower; g. Stamen of a bisexual flower; h. Pistil; i. Fruit.

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1450 m and *Lakshmanan* 95298 (MH), Kardana Estate, Western slopes, on the way to Pachakumatchi hills, on 17.7.1992, at an alt. of \pm 1500 m.

Fl. & Fr. : April - July.

Local name (Tamil) : *Paal vellayil*, *Mullai maram*.

This new species is allied to *N. racemosa* (Dalz.) Ramam. (*N. dalzelli* Gamble *nom. illeg.*) but markedly differs by the characters as shown below.

S.No.	<i>Nothopegia racemosa</i> (Dalz.) Ramam.	<i>Nothopegia vajravelui</i> sp. nov.
1.	Inflorescence 3-10 cm long.	Inflorescence below 2 cm long.
2.	Flowers in branched racemes, ca 3 mm across.	Flowers in simple racemes or rarely 1-2, ca 7 mm across.
3.	Pedicels absent or very short, not articulated.	Pedicels distinct, 1-3 mm long, articulated.
4.	Sepals sparsely hirsute without.	Sepals glabrous.
5.	Matured petals reflexed, ca 3 x 1.5 mm, sparsely hirsute to rarely glabrous without.	Matured petals erect, ca 5.5 x 2 mm, always glabrous.
6.	Stamens equal to petals.	Stamens shorter than petals.
7.	Filaments glabrous below, longer than anthers at anthesis.	Filaments hirsute below, shorter or equal to anthers at anthesis.
8.	Drupes ca 1 cm across, depressed at apex.	Drupes ca 1.8 cm across, acute at apex.

Notes : This new species has been located in 3 different places in Pachakumatchi hills, ranging up to a distance of about 45 km radius. It is predominantly seen along the slopes of dense evergreen forests, especially near perennial streamlets. In Kardana Estate and Kudamparai Estate, it is found in cardamom and coffee plantations and has long been known by local people by its local names. Shade logging and further extension of estate area causing a serious threat to the existence of this species and so conservation of this rare tree is very essential. Earlier workers stated that the flowers are tetramerous, but in the present study it is observed that they are tetra to pentamerous. It is found to grow along with *Clausena indica*, *Syzygium myhendrae*, *Myristica dactyloides*, *Phoebe wightii*, *Diospyros ovalifolia*, *Meliosma* spp., etc.

This new species is named to honour Dr. E. Vajravelu, Retd. Joint Director, Botanical Survey of India, for his remarkable contributions towards the field of angiosperm taxonomy.

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Syzygium sriganesanii Ravikumar & Lakshmanan *sp. nov.* (Fig. 2)

Syzygium sriganesanii *sp. nov.* *S. lanceolatum* (Lam.) Wight & Arn. affinis, sed ramis distincte 4-angulosis; foliis semper oppositis, sessilibus vel subsessilibus, oblongo - ellipticis, raro ovatis vel suborbicularibus, obtusis ad raro ad apicem breviter acutis; cicatris foliorum conspicuis; tubis longioribus et fructibus obconicalibus differt.

Trees, up to 20 m tall; bark smooth, grey; branchlets distinctly 4-angled, glabrous. Leaves opposite, sessile in upper portion or subsessile in lower portion, oblong-elliptic, rarely ovate or suborbicular, 3.5-8 x 1.5-3 cm, obtuse to rarely shortly acute at apex, entire to deflexed along margins, coriaceous, glabrous, shiny; leaf scars distinct and conspicuous; petioles ca 1 mm long, twisted; midrib depressed above, raised below; nerves obscure, close-set, many. Cymes 3-5 cm long, 1-3 - flowered. Flowers in terminal trichasial corymbose cymes, ca 1 cm across. Calyx-tube obconical, 1-2 cm long, glabrous, grooved and truncate at apex, green; tooth 5, triangular, ca 1 x 1 mm, glabrous. Petals suborbicular, ca 8 mm across, white. Stamens many, subequal, slender, pale pink to white. Styles ca 1 cm long, simple, slender, pale pink. Ovary oblong, ca 1 mm long. Berries obconical, ca 2 x 1 cm, cuneate at base, with hollow depression at apex, orange-yellow when mature; seed 1, obconical, ca 1.8 cm long, fibrous, white.

Type : India, Tamilnadu, Theni District, Holotype : *Lakshmanan* 91066 (CAL) and Isotypes : *Lakshmanan* 91066 (MH) collected near field No. 29, Upper Manalar to Vellimalai Way, ± 1500 m, 27.5.1989. Paratypes : *Lakshmanan* 89029 (MH), Hospital Valley, High Wavy's Estate, ± 1700 m, 23.11.1988; *Lakshmanan* 89178 (MH), near Brooke peak, on the way to Upper Manalar to Vattaparai Field No. 27, Pachakumatchi hills, ± 1800 m, 24.5.1989; *Lakshmanan* 89194 (MH), Suruli river down, High Wavy's Estate, ± 1400 m, 25.5.1989; *Lakshmanan* 93622 (MH), Hospital Valley, High Wavy's Estate, ± 1600 m, 20.8.1990; *Lakshmanan* 94309 (MH), Suruli river down, High Wavy's Estate, ± 1550 m, 24.8.1990; *Lakshmanan* 95141 (MH), Hospital Valley, High Wavy's Estate, ± 1650 m, 20.11.1990; *Lakshmanan* 95202 (MH), Kardana Estate River side, Megamalai, ± 1500 m, 24.11.1990; *Lakshmanan* 97202 (MH), Vathalakundu Chettiyar Kaadu, Kardana Estate, ± 1600 m, 18.7.1991; *Lakshmanan* 99516 & 99533 (MH), near Brooke Peak, Upper Manalar Estate, ± 2000 m, 13.5.1992.

Fl. & Fr. : April - November.

Local Name (Tamil) : *Navvaa maram*.

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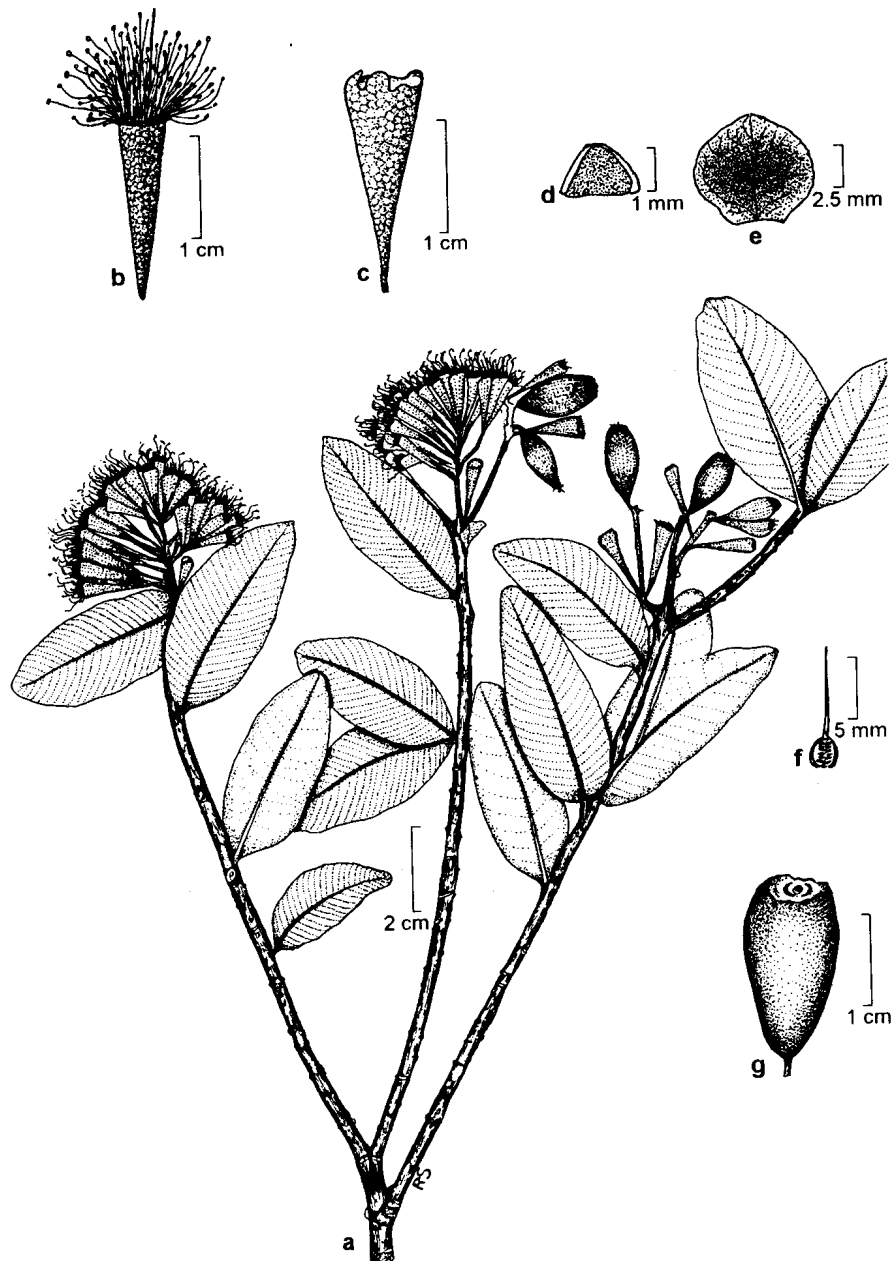


Fig. 2. *Syzygium sriganesanii* Ravikumar & Lakshmanan *sp. nov.*: a. Twig; b. Flower; c. Calyx-tube; d. Calyx-tooth; e. Petal; f. Pistil; g. Fruit.

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Syzygium sriganesanii is allied to *S. lanceolatum*, but differs by the characters given below.

S.No.	<i>Syzygium sriganesanii</i> sp. nov.	<i>S. lanceolatum</i> (Lam.) Wight & Arn.
1.	Branchlets distinctly 4 - angled.	Branchlets terete.
2.	Leaf scars conspicuous.	Leaf scars inconspicuous.
3.	Leaves always opposite, sessile or subsessile, oblong - elliptic, rarely ovate or suborbicular, 1.5-8 x 1.5-3 cm, obtuse to rarely cuneate at base, obtuse or rarely shortly acute at apex.	Leaves opposite, subopposite or alternate, petiolate, elliptic to elliptic - lanceolate, 5-12 x 1.5 - 4.5 cm, acute at base, abruptly acuminate at apex.
4.	Flowers always in terminal cymes.	Flowers in axillary or rarely in terminal cymes.
5.	Calyx-tube 1.5 - 2 cm long.	Calyx-tube 1-1.5 cm long.
6.	Fruits obconical, ca 2 x 1 cm.	Fruits ellipsoid, ca 1 x 0.5 cm.

Notes : Common in dense evergreen forests, especially along perennial streamlets. The trunk and upper branches usually covered with plenty of epiphytes such as lichens, mosses, *Medinilla beddomei*, *Eria reticosa*, *Oberonia* spp., *Impatiens jerdoniae*, *Lycopodium* spp. etc. The other associated trees are *Alseodaphne semecarpifolia*, *Croton lacciferus*, *Bhesa indica*, *Diospyros ovalifolia*, *Ligustrum* spp., *Michelia nilagirica*, *Strobilanthes* spp. and *Pygeum wightianum*. Heaps of fallen fruits are seen washed away by the running streams. Fruits eaten by local people.

The specific epithet is to honour Dr. T. Sriganesan, Retd. Professor of Botany for his contribution towards the field of Systematic Botany.

***Syzygium zeylanicum* (L.) DC. var. *magamalayanum* Ravikumar & Lakshmanan var. nov. (Fig.3)**

Syzygium zeylanicum (L.) DC. var. *megamalayanum* Ravikumar & Lakshmanan var. nov.
S. zeylanicum (L.) DC. var. *lineare* (Duthie) Alston affinis, sed foliis et petiolis curtioribus, inflorescentiis ca 2 cm long; paucifloribus et congestis et tubis calyci truncatis vel obscure 4-dentatis differt.

Trees, up to 25 m tall; bark smooth, brown; branchlets glabrous, stiff, erect, pale pink. Leaves usually opposite, rarely subopposite to alternate, narrow-lanceolate or rarely oblong-lanceolate, 1.5-3.5 x 0.4-0.9 cm, acute to cuneate at base, acuminate at apex, entire along margins, chartaceous, glabrous, shiny, dark green above, pale green below; petioles ca 2 mm long; nerves 8-12 pairs, obscure. Cymes ca 2 cm long, 3-5-flowered; peduncles up to 3 cm long. Flowers in

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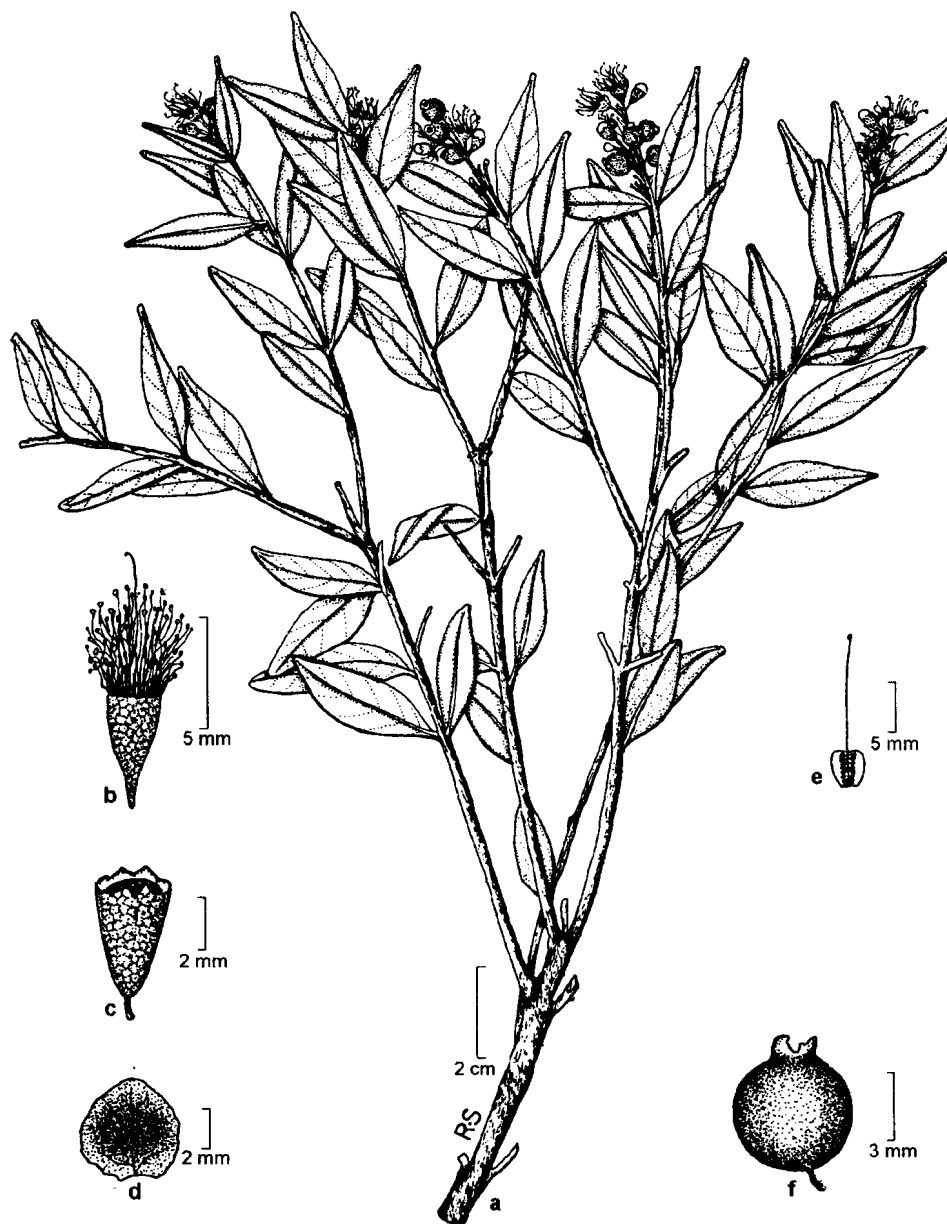


Fig. 3. *Syzygium zeylanicum* (L.) DC. var. *megamalayanum* Ravikumar & Lakshmanan *sp. nov.*
a. Twig; b. Flower; c. Calyx-tube; d. Petal; e. Pistil; f. Fruit.

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terminal panicle cymes, pedicellate, congested, ca 6 mm across; pedicels 1-3 mm long, terete. Calyx-tube 3-4 mm long, bugleshaped, truncate or obscurely 5-toothed with many glandular dots, glaucous, green. Petals 5, suborbicular to obovate, ca 5 mm across, white. Stamens many, subequal, pale pink to white; filaments ca 1 cm long, slender; anthers 2-celled, ca 0.5 mm across, yellow. Ovary globose; styles ca 1.2 cm long, straight or curved, slender, white; stigma simple, pink. Berries obliquely globose, ca 6 mm across, sparsely puberulous, deeply grooved at apex with persistent calyx-rim, greenish yellow to pale pink; seed 1, globose, white.

Type : India, Tamilnadu, Theni District, Holotype: *Lakshmanan* 93688 (CAL) and Isotypes: *Lakshmanan* 93688 (MH), Megamalai Tea Estate, Pachakumatchi hills, \pm 1500 m, 22.8.1990. Paratype: *Lakshmanan* 95295 (MH), Megamalai Tea Estate, Pachakumatchi hills, \pm 1550 m, 17.7.1991.

Fl. : April-May., Fr. : July -September.

The new variety is allied to *S. zeylanicum* var. *lineare* but distinctly differs by the characters shown in the table.

S.No.	<i>Syzygium zeylanicum</i> (L.) DC. <i>megamalayanum</i> var. <i>nov.</i>	<i>S. zeylanicum</i> (L.) DC. var. <i>lineare</i> (Duthie) Alston
1.	Lofty trees, 10-25 m tall.	Small trees, 4-5 m tall.
2.	Leaves narrow-lanceolate, rarely oblong-lanceolate, 1.5-3.5 x 0.4-0.9 cm.	Leaves linear - lanceolate, 4 - 8.5 x 0.5 -1.2 cm.
3.	Petioles ca 2 mm long.	Petioles 2-8 mm long.
4.	Inflorescence ca 2 cm long.	Inflorescence 5-10 cm long.
5.	Flowers few, congested.	Flowers many, lax.
6.	Calyx-tube truncate or obscurely 4 -toothed.	Calyx-tube distinctly 4-toothed.

Notes : Less common; a few isolated trees are seen along streamlets in evergreen to moist deciduous forests. Orchids form the major epiphytic flora. Expansion of estates is a possible threat to this species. The associated trees are *Cuppressus* sp., *Michelia nilagirica*, *Trichilia connaroides*, *Turpinia malabarica*, *Elaeocarpus* spp., etc.

***Sonerila parameswaranii* Ravikumar & Lakshmanan sp. nov. (Fig. 4)**

Sonerila parameswaranii Ravikumar & Lakshmanan sp. nov. *S. travancorica* Bedd. affinis, sed foliis ovato - lanceolatis ad oblongo - lanceolatis, ad basim obliquis, ad marginem serrulatis;

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petiolis, tubis calycis, filamentis et stylis longioribus; petallis ovato-ellipticis; antheris lineare-lanceolatis et fructibus pedicellis curtioribus praecipue differt.

Shrubs, erect, up to 1.5 m tall; stems terete to subterete, branched, pinkish villous. Leaves opposite, ovate - lanceolate or oblong-lanceolate, 1.6 - 9.2 x 0.7 - 3.9 cm, oblique at base, acuminate at apex, serrulate-ciliate along margins, appressed villous on both sides, especially on nerves beneath; lateral nerves 3-5 pairs; petioles 0.7-5.8 cm long, slender, densely pinkish villous. Peduncles up to 2.5 cm long, densely villous. Flowers 3-6, in terminal or rarely axillary scorpioid cymes, ca 3 cm across; pedicels up to 1.8 cm long, densely villous. Calyx-tube campanulate to suburceolate, 8-11 x 3-4 mm, 6-nerved, densely villous when young; lobes 3, triangular, each ca 1 x 1 mm across, villous without, glabrous within. Petals 3, ovate-elliptic, ca 1.6 x 1 cm, venose, midrib conspicuous with pubescent hairs, purplish pink. Stamens 3, yellow; filaments 8-10 mm long, slender, glabrous; anthers linear - lanceolate, 1-1.3 cm long, ca 1.5 mm broad at base, 2-lobed, attenuate at apex, dorsifixed, dehiscing by apical pores. Ovary oblongoid, ca 5 x 2.5 mm, glabrous; styles 1.5 - 1.8 cm long, slender, glabrous, yellow; stigma capitate. Capsules campanulate to suburceolate, 8-11 x 4-6 mm, subglabrous, distinctly 3-ridged, with 3 indistinct ridges in between; seeds many, oblongoid, ca 5 x 1 mm, tuberculate, with raphe forming a lateral appendage.

Type: India, Tamilnadu, Theni District, Holotype: *Lakshmanan* 97714 (CAL) and Isotypes: *Lakshmanan* 97714 (MH), Hospital Valley, High Wavy's Estate, Pachakumatchi hills, \pm 1600 m, 22.1.1988. Paratypes: *Lakshmanan* 91061 (MH), field No. 29, on the way to Vellimalai from Upper Manalar, Pachakumatchi hills, \pm 1550 m, 27.5.1989.

Fl. & Fr.: December-May.

Sonerila parameswaranii is allied to *S. travancorica*, but distinctly differs by the characters shown in the table:

S.No.	<i>S. parameswaranii</i> sp. nov.	<i>S. travancorica</i> Bedd.
1.	Leaves ovate, ovate-lanceolate or oblong-lanceolate, oblique at base, acuminate at apex, serrulate, often ciliate along margins, membranous, 3-5-nerved.	Leaves elliptic, acute to cuneate at base, acute at apex, entire along margins, chartaceous, 1-3-nerved.
2.	Petioles above 3 cm long.	Petioles below 3 cm long.
3.	The hairs on pedicels, peduncles, calyx-tubes and the midribs of the petals are not gland-tipped.	Those are gland-tipped.
4.	Calyx-tubes campanulate to suburceolate, ca 4 mm across, densely villous.	Calyx-tubes hypocrateriform, narrow, 1-2 mm across, sparsely hirsute.

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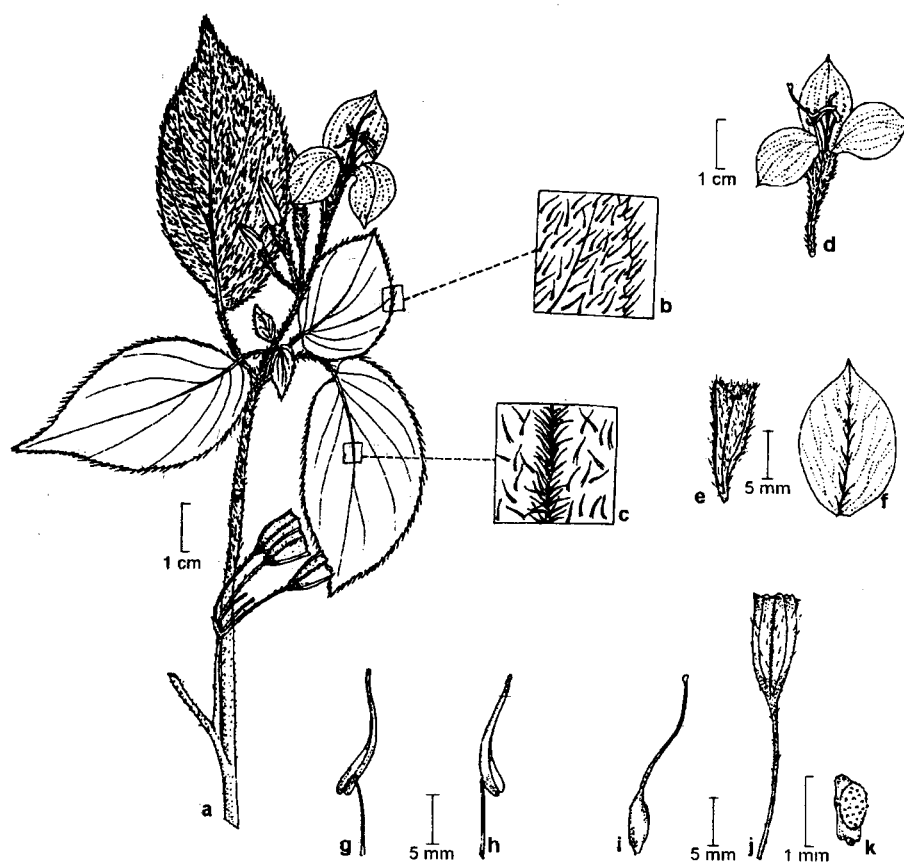


Fig. 4. *Sonerila parameswaranii* Ravikumar & Lakshmanan *sp. nov.* : a. Twig; b. A portion of leaf margin enlarged (x100); c. A portion of midrib enlarged (x100); d. Flower; e. Calyx; f. Petal; g & h. Stamens ventral and dorsal views; i. Pistil; j. Fruit; k. Seed.

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5.	Petals ovate-elliptic, shortly apiculate at apex.	Petals obovate to subround, rounded to mucronate at apex.
6.	Filaments above 5 mm long; anthers linear - lanceolate, 10-15 mm long.	Filaments below 5 mm long; anthers oblong, 5-8 mm long.
7.	Styles 1.5-1.8 cm long.	Styles 0.8-1 cm long.
8.	Fruits shorter than pedicels.	Fruits longer than pedicels.

Notes : Occasional, in dense evergreen forests, especially around water - falls, along perennial streamlets and in moist shady places on humus rich soils. The associated plants are *Polygala arillata*, *Impatiens* spp., *Polygonum chinense*, *Osbeckia aspera* var. *wightiana*, *Mussaenda bellila*, *Symplocos cochinchinensis* subsp. *laurina*, *Syzygium tamilnadensis*, *Tetrastigma* spp., etc. Scarce and thin populations were noted in 4 different localities in Pachakumatchi hills. The flowers very attractive and draw immediate attention in the field.

The specific epithet is in the honour of Dr. M. P. Nayar, Ex-Director, Botanical Survey of India for his valuable contributions to Angiosperm Taxonomy.

***Schefflera maduraiensis* Ravikumar & Lakshmanan sp. nov. (Fig. 5)**

Schefflera maduraiensis Ravikumar & Lakshmanan sp. nov. *S. bourdillonii* Gamble affinis, sed foliis ellipticis ad oblanceolatis, marginibus ad dimidium superum dentalis, apicibus curte acuminatis et basim sparse glanduliferis; stipulis persistentibus et amplificatis differt. *S. chandrasekharanii* Ramam. & Rajan affinis, sed ramis scandentibus; foliis 3-6, marginibus ad dimidium superum dentalis et revolutis; petiolis et pedicellis longioribus differt.

Shrubs, scandent, up to 5 m tall; branchlets glabrous with permanent semicircular leafscars and circular lenticels. Stipules persistent below the inflorescence axis, ovate, ca 1 x 1 cm, acute at apex, scarious and hyaline along margins, pale pink. Petioles 4-8 cm long, terete, stout, straight, dilated at base; petiolules unequal, 0.5-2 cm long, articulated. Leaflets usually 3 to 6, rarely 1-2 and 7, elliptic-oblanceolate, 3-7 x 1-3.5 cm, cuneate at base, acute to shortly acuminate at apex, entire to wavy and revolute along margins with 1-2 pairs of serration at upper half, coriaceous, glabrous, shiny with few scattered round, glands below; nerves 2-4 pairs, reticulate, distinct, united along the margins. Inflorescence a compound umbellules, ca 6 x 4 cm across; umbellules ca 15-flowered. Peduncles up to 2 cm long, densely white-stellate; pedicels 4-5 mm long, densely white-stellate. Flowers unisexual, ca 3 mm across. Calyx truncate, ca 2 x 1.5 mm, not lobed, stellate-hairy without. Petals 4-5, ovate, ca 1.5 x 1 mm, hooded and acuminate at apex, with one distinct central vein which sometimes bifurcates towards middle or at apex and 2 indistinct lateral veins, purplish brown. Stamens not seen. Ovary turbinate, ca 2 x 2 mm, 5-6-loculed. Drupes globose, 3-6 mm across, distinctly 5-6-angled, glabrous, shiny, pinkish brown when ripe; seeds 5-6, ca 3 x 2 mm, slightly clavate, hemispheric, compressed, glabrous, smooth, pale yellow.

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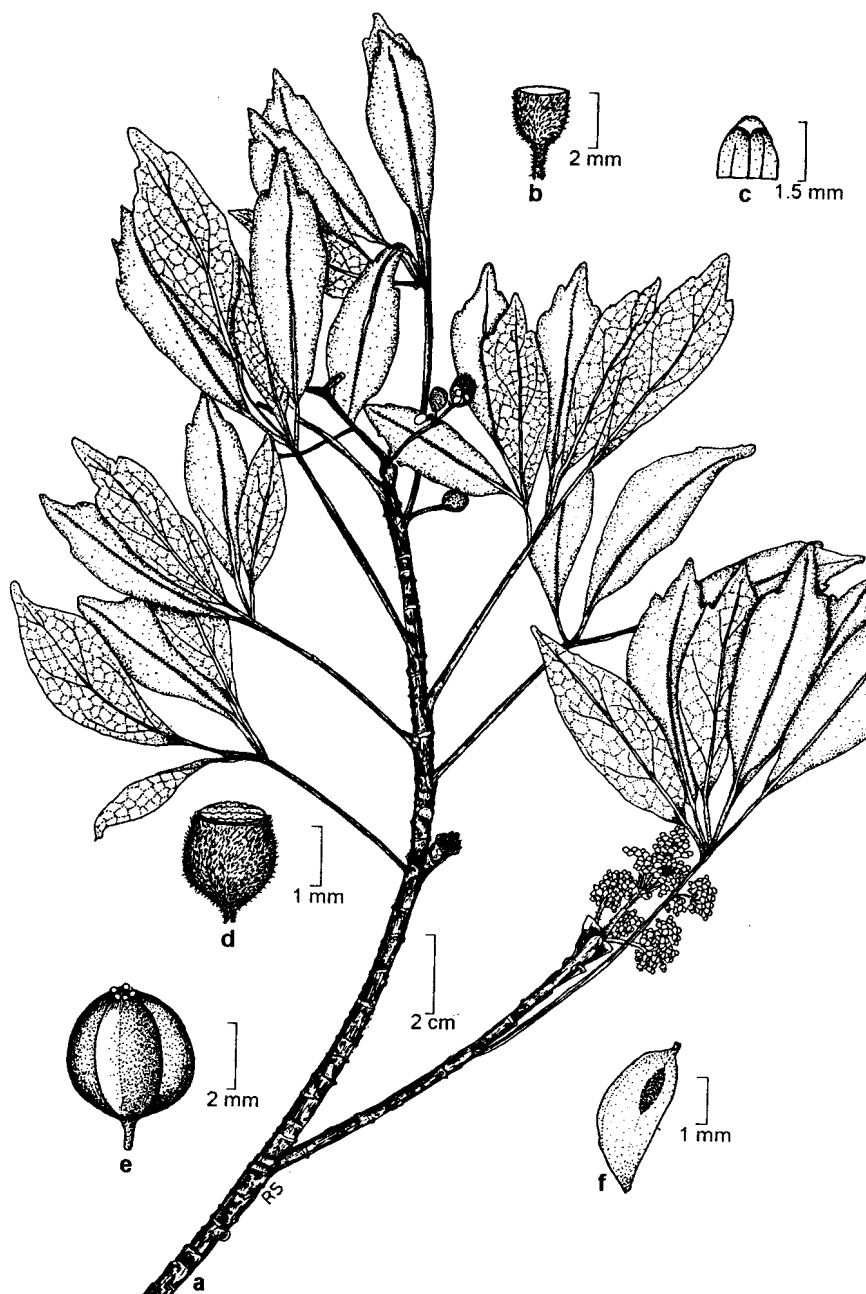


Fig. 5. *Schefflera maduraiensis* Ravikumar & Lakshmanan *sp. nov.* : a. Twig; b. Calyx-cup; c. Petal; d. Ovary; e. Fruit; f. Seed.

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Type: India, Tamilnadu, Theni District, Holotype: *Lakshmanan* 91005 (CAL) and Isotypes: *Lakshmanan* 91005 (MH) were collected near Suruli falls forests, High Wavy's Estate, Pachakumatchi hills, at an alt. of \pm 1250 m on 25.5.1988.

Fl. & Fr. : April-June.

This new species is an intermediate species between *S. bourdillonii* Gamble and *S. chandrasekharanii* Ramam & Rajan (in J. Bombay Nat. Hist. Soc. 79(1): 163-164. 1982) but distinctly differs from both by the characters given in the table.

S.No.	<i>S. Chandrasekharanii</i> Ramam. & Rajan	<i>S. maduraiensis</i> sp. nov.	<i>S. bourdillonii</i> Gamble
1.	Trees, up to 8 m tall.	Scandent shrubs, up to 5 m tall.	Epiphytic shrubs, up to 4 m tall.
2.	Petioles 1.5-3.5 cm long.	Petioles 4-8 cm long.	Petioles ca 6 cm long.
3.	Leaves 1-2 -foliolate.	Leaves 3-6-foliolate.	Leaves 5-7-foliolate.
4.	Leaflets obovate, 5-10 x 1.5 - 3 cm, apiculate at apex, entire and wavy along margins; margins not revolute.	Leaflets elliptic-oblongate, 3-7 x 1-3.5 cm, acute to shortly acuminate at apex, entire to wavy and revolute along margins and serrated at upper half.	Leaflets obovate, 4-5 x 1-2 cm, obtuse to emarginate at apex, entire and revolute along margins.
5.	Leaf sheath present.	Leaf sheath present.	Leaf sheath absent or narrow
6.	Stipules caducous.	Stipules persistent and enlarged below the axis of inflorescence.	Stipules caducous.
7.	Inflorescence ca 8 x 8 cm across.	Inflorescence ca 6 x 4 cm across.	Inflorescence ca 7 x 7 cm across.
8.	Pedicels 1-2 mm long.	Pedicels 4-5 mm long.	Pedicels 3-4 mm long.
9.	Petals 5.	Petals 4-5.	Petals 5.
10.	Flowers bisexual.	Flowers unisexual.	Flowers unisexual.
11.	Fruits not seen.	Fruits globose, 3-6 mm across.	Fruits not seen.

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Notes : It is found near perennial streamlets, along the edges and in central regions of dense evergreen forest. It has been located in 3 different localities in Pachakumatchi hills in a radius of about 40 km with rather thin population. Due to its scandent habit and easily brittle stems it is found to be broken during heavy wind. One of the allied species, *S. bourdillonii* itself is an insufficiently known (fruits not described) taxon which is endangered and endemic to Chemungi, near Thiruvananthapuram in Kerala state and is represented by only one type specimen collected by T.F. Bourdillon (No. 576) in Apr. 1875 and has so far not been collected after type collection. This new species was critically studied with authentic specimens of *S. chandrasekharanii*, which was confirmed at Kew.

The specific epithet is named based on the type collection district, Madurai (now bifurcated and comes in Theni district).

Hedyotis shettyi Ravikumar & Lakshmanan *sp. nov.* (Fig. 6)

Hedyotis shettyi Ravikumar & Lakshmanan *sp. nov.* *Hedyotis fruticosa* L. *affinis*, sed ramis teres, foliis lanceolatis, curtioribus, supra glandulosa pubescentibus, ad apicem aggregatis; petiolis ad 2 mm longis; bracteis floralis integribus; floribus sessilibus; calycibus tubulosis, 4-dentalis; calycibus dentibus triangularibus, ad 1 mm longis, integribus; costis minus prominentibus; nervis lateralibus abscentibus; fructibus, curvatis, fructibus, calycibus tuberum curtioribus distincte differt.

Shrubs, up to 1.5 m tall, stout, woody; branchlets terete, glabrous with persistent leaf and interpetiolar scars; scars round to oblique. Internodes up to 1.5 cm long, usually short and congested at apices. Stipules triangular, ca 5 x 4 mm, glabrous, thick, truncate at base with 2 glands on either side, margins dark brown, lacinate, central lacinations longer than the laterals. Leaves lanceolate, 2.2-5.2 x 0.6-1.6 cm, acute to cuneate at base, acute at apex, subcoriaceous, entire, glandular pubescent above, glabrous beneath, shiny, yellowish green, crowded at the apices of branchlets; lateral nerves 2-4 pairs; petioles up to 2 mm long, glabrous. Inflorescence a solitary, mostly terminal, rarely axillary and interrupted heads, ca 1.5 cm across; peduncles 0.5-2.5 cm long, 4-angled, glabrous. Flowers ca 8 x 1 mm. Calyx tubular, 3-5 x 0.5-1 mm, shiny, 4-toothed; teeth triangular, ca 1 mm, acute at apex, fleshy, sparsely pubescent, pale green, with less prominent midrib. Corolla tubular, 4.5-5.5 mm long, densely hairy within, glabrous without, 4-lobed; lobes pink, ovate-oblong, ca 2 x 1 mm, entire, deflexed, glabrous, fleshy, hooded at apex, with a prominent central vein. Stamens 4, attached at the corolla throat, subequal, erect, exerted; anthers oblong, 2-loculed, ca 1.5 mm long, dorsifixed, brown, dehiscing longitudinally; filaments flattened, 1.5-2 mm long, fleshy, glabrous, shiny, swollen at base. Ovary 2-loculed, brown; styles up to 2 mm long, fleshy, slender; stigma 2, ca 1 mm long, lineate, with many globose, gland-tipped projections. Capsules oblongoid, 2-3 x 1-1.5 mm, included in the persistent calyx-tube, dehiscing septicidally into 2-cocci, 30-40 seeded. Seeds oblongoid or ovoid, ca 1 mm long, obscurely 3-angled, reticulate, brown with many white membranous scales along margins.

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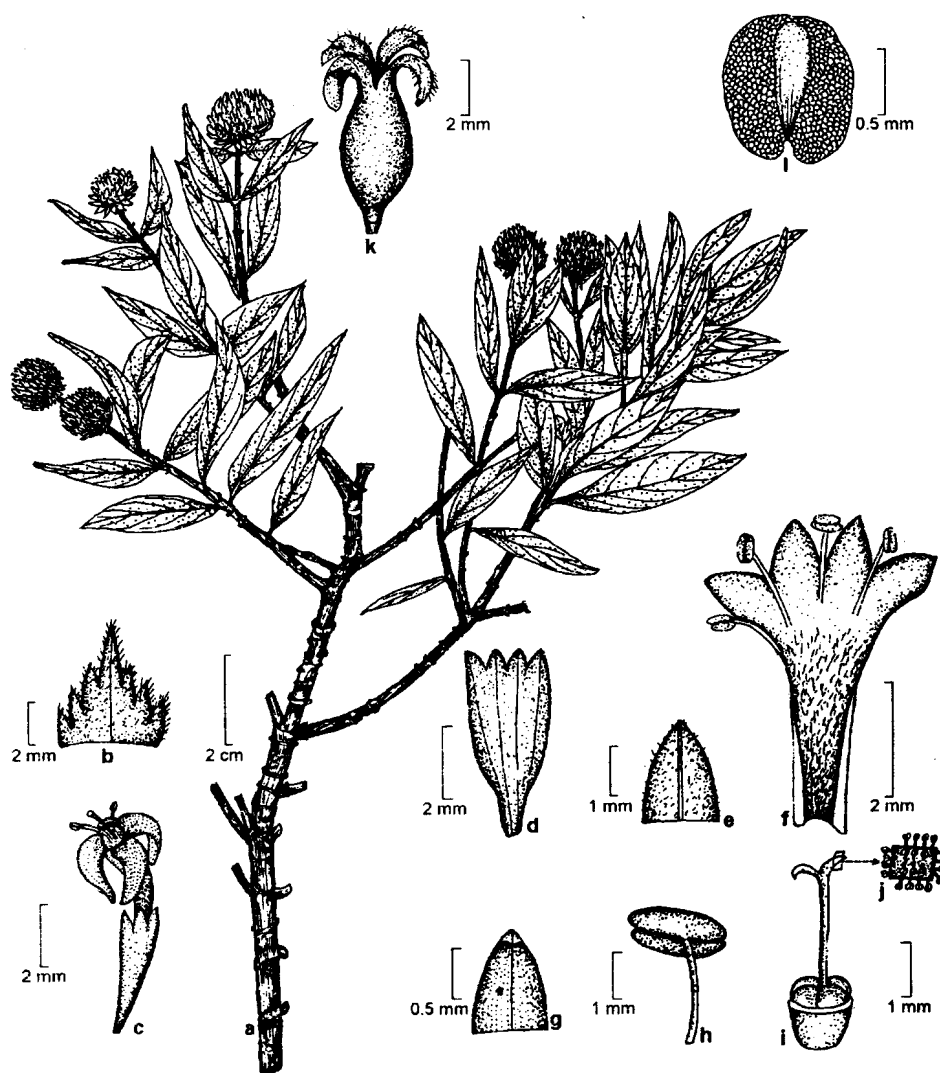


Fig. 6. *Hedyotis shettyi* Ravikumar & Lakshmanan *sp. nov.* : a. Twig; b. Stipule; c. Flower; d. Calyx; e. Calyx-tooth; f. Corolla split-open; g. Corolla-lobe; h. Stamen; i. Pistil; j. A portion of stigma enlarged (x100); k. Fruit; l. Seed.

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Type: India, Tamilnadu, Theni District, Holotype: *Lakshmanan* 93625 (CAL) and Isotypes: *Lakshmanan* 93625 (MH), Jacob Estate, Megamalai, alt. \pm 1600 m, 21.8.1990. Paratypes: *Lakshmanan* 95188 (MH), Vathalakundu Chettiar Kaadu, on the way to Megamalai, alt. \pm 1525 m, on 22.11.1990; *Lakshmanan* 95300 (MH), l.c. on 17.7.1991.

Fl. & Fr. : July - September.

This new species can easily be differentiated from the allied *Hedyotis fruticosa* by the characters given below.

S.No.	<i>Hedyotis fruticosa</i> L	<i>Hedyotis shettyi</i> sp. nov.
1.	Branches obscurely 4-angled.	Branches terete.
2.	Internodes 2-5 cm long.	Internodes 0.3-1.5 cm long, usually congested.
3.	Foliar and stipular scars not prominent.	Foliar and stipular scars prominent.
4.	Leaves oblong-lanceolate, 6.5 - 12.5 x 1-2.3 cm, glabrous, green, not crowded at the apices of the branchlets; lateral nerves 7-10 pairs.	Leaves narrow-lanceolate, 2.2-5.2 x 0.6-1.5 cm, glandular pubescent above, yellowish green, crowded at the apices of the branchlets; lateral nerves 2-4 pairs.
5.	Petioles 3-10 mm long.	Petioles up to 2 mm long.
6.	Flowers pedicellate.	Flowers sessile.
7.	Flowers in corymbose, ca 5-rayed cymes.	Flowers in dense solitary heads.
8.	Floral leaves ciliate along margins at least for half the length.	Floral leaves entire along margins.
9.	Calyx-limb produced above.	Calyx-limb not produced above.
10.	Calyx 4 - lobed; lobes linear- lanceolate, above 2 mm long, ciliate along margins, with prominent mid and lateral veins.	Calyx tubular, 4 - toothed; teeth triangular, up to 1 mm long, entire with less prominent midvein and lateral veins absent.
11.	Fruits equal to calyx-tube.	Fruits shorter than calyx-tube.

Notes : Seen along the inaccessible eastern grassy slopes towards wind-ward side near evergreen forest in Megamalai Estate. Species like, *Vernonia divergens*, *Osbeckia gracilis*, *Smithia* spp.,

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Asyneuma fulgens, *Sopubia delphiniifolia*, *Themeda* sp., etc. are the common associated plants. The related *H. fruticosa* L. is also a rare species reported only from S.W. Ghats of Kerala state.

This species is named in honour of Mr. B.V. Shetty, former Indian Liaison officer at Kew, Botanical Survey of India, Coimbatore in recognition of his valuable contributions to angiosperms taxonomy of India.

***Anisochilus henryi* Ravikumar & Lakshmanan sp. nov.** (Fig. 7)

Anisochilus henryi Ravikumar & Lakshmanan sp. nov. *A. robustus* Hook.f. affinis sed caulibus principalibus ca 6 cm diam.; foliis orbicularibus ad suborbicularibus, ad apicem obtusis ad retusis, carnosus, ad apicem aggregatis, crenis ca 2 mm longis; petiolis 0.2-1 cm longis; bracteis subulatis, ca 2 x 1 mm, caducis; fasciculis florum densis et spicis fructuum ad 10 cm longis differt.

Shrubs, robust, 2-3.5 m tall; stems woody, ca 6 cm diam.; branchlets terete below, 4-angled and grooved above, slightly twisted, rusty tomentose, with prominent congested circular leaf scars, green to pale pink. Leaves orbicular to suborbicular, 5.5-11 x 4-10.5 cm, obtuse at base, obtuse or retuse at apex, crenulate and often ciliate along margins, thick, succulent, sparsely scabrous-pubescent and dark green above, densely silky tomentose with globose, shiny, reddish glands and pale green below, crowded at apices; crenations up to 2 mm long, mucronate at apex; petioles 0.2-1 cm long, stout, densely white-tomentose; nerves 9-13 pairs, impressed above, prominent and protruding below, densely silky tomentose. Spikes in axillary and terminal panicles, 8-25 cm long, stout, erect to subpendent; peduncles 4-angled, sulcate, tomentose. Bracts subulate, ca 2 x 1 mm, acute at apex, caducous. Flowers sessile, 5-23 in each clusters; cluster dense. Calyx-tube ventricose, inflated below the middle, ca 2 x 1 mm, 2-lipped, softly hirsute, with shiny reddish glands; upper-lip 3-toothed, erect or deflexed, not concealing the mouth, tooth acute, lower-lip 2-toothed, reflexed. Corolla 2-lipped; tube bent in middle, inflated above, ca 8 mm long, sparsely hirsute, greenish yellow; upper-lip hooded, with 4 unequal teeth; lower-lip deflexed, boat-shaped, acute at apex. Stamens 4, declinate, didynamous; filaments slender, ca 6 mm long, subfleshy, free, white; anthers globose, ca 0.5 mm, yellow. Ovary 4-lobed; styles slender, ca 8 mm long, white; stigma shortly 2-fid. Nutlets ovoid to subglobose, ca 3 mm long, black, enclosed by calyx-tube, densely hirsute. Seeds 4, ovoid, ca 1 mm, brownish white.

Type: India, Tamilnadu, Theni District, Holotype: *Lakshmanan* 91078 (CAL) and Isotypes: *Lakshmanan* 91078 (MH) were collected near Varaiyaatumottai peak, Venniar Estate, Pachakumatchi hills, ± 1800 m, 28.5.1989. Paratypes: *Lakshmanan* 91198 (MH), *l.c.*, 16.8.1990; *Lakshmanan* 97206 (MH), Vathalakundu Chettiyar Kaadu, Kardana Estate, on the way to Pachakumatchi hills, ± 1500 m, 18.7.1991.

Fl. : June-July. *Fr.* : Throughout the year.

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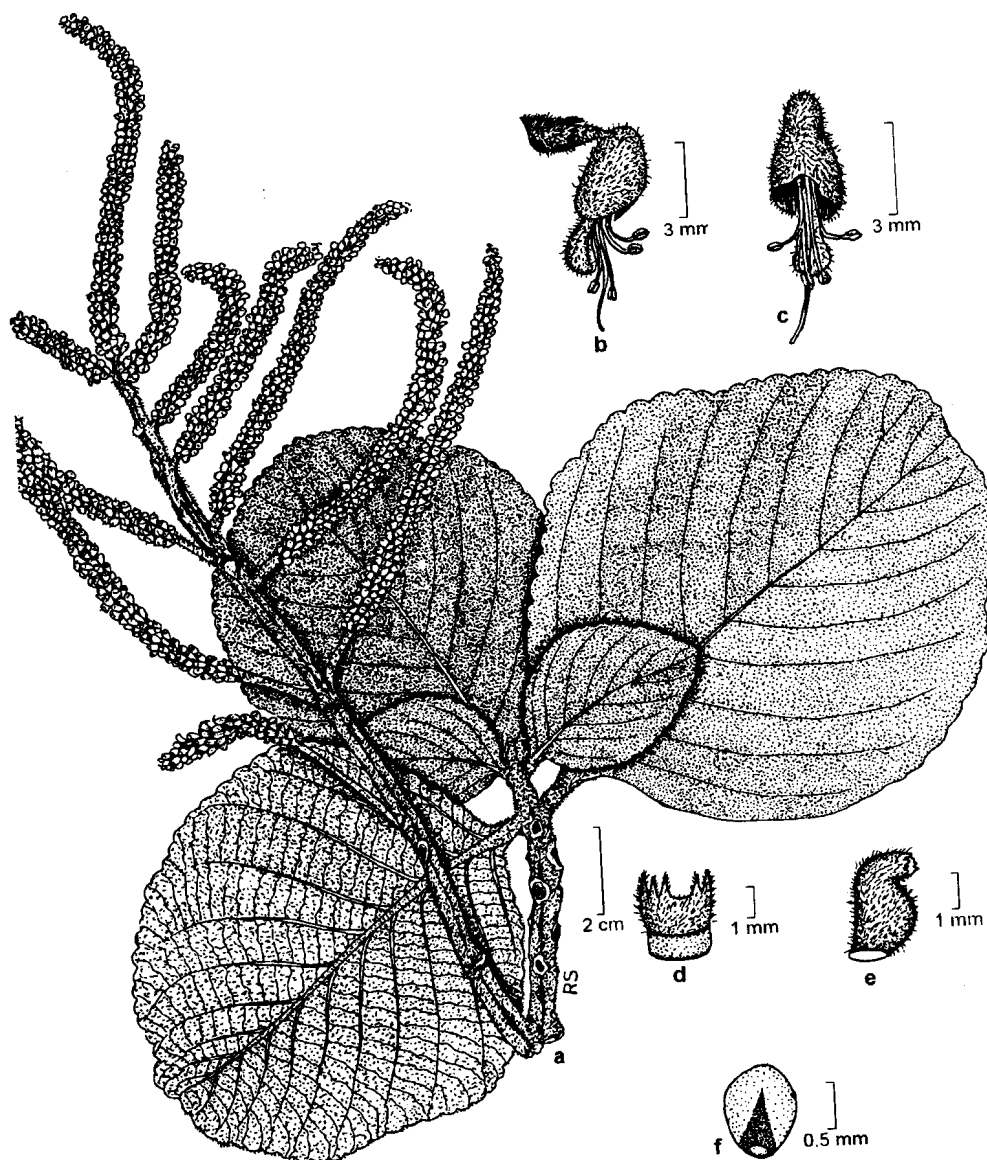


Fig. 7. *Anisochilus henryi* Ravikumar & Lakshmanan sp. nov. : a. Twig; b. Flower lateral view; c. Flower dorsal view; d. Calyx-tube; e. Fruit; f. Seed.

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Anisochilus henryi is allied to *A. robustus* Hook.f. but markedly differs by the characters given below:

S.No.	<i>A. robustus</i> Hook.f.	<i>A. henryi</i> sp. nov.
1.	Lower stems ca 1 cm diameter.	Lower stems ca 6 cm diameter.
2.	Leaves ovate to ovate-lanceolate, 11-37 x 4.2-21 cm, acuminate at apex, chartaceous, not crowded at apices; crenulations ca 10 mm long.	Leaves orbicular to suborbicular, 5.5-11 x 4-10.5 cm, obtuse or retuse at apex, succulent, crowded at apices; crenulations ca 2 mm long.
3.	Petioles 2-9 cm long, sparsely pubescent.	Petioles 0.2-1 cm long, densely pubescent.
4.	Flowering clusters lax.	Flowering clusters dense.
5.	Bracts prominent, narrow-lanceolate, ca 10 x 2 mm, acuminate at apex.	Bracts caducous, subulate, ca 2 x 1 mm, acute at apex.
6.	Fruiting spikes above 10 cm long.	Fruiting spikes below 10 cm long.

Notes : Sporadically occurs along inaccessible western grassy slopes of Varaiyaatumottai peak and around perennial water - falls in dense evergreen forests in Kardana Estate. In general, they are uncommon and have so far collected only in 3 localities in the study area with very few scattered populations. The branchlets are very brittle and the leaves mildly aromatic. Expansion and selective felling of trees posing a serious threat to the existence of this new taxon. It is allied to *A. robustus*, described by J.D. Hooker (in Fl. Brit. India 4: 629. 1885) based on Robert Wight's collection from Courtallam hills, which itself a rare species, endemic to S.W.Ghats of Tamil Nadu and old specimens are in MH collected from Kanniyakumari and Tirunelveli districts between 1899 to 1980.

This species is named to honour Dr. A.N. Henry, Retd. Joint Director, Botanical Survey of India, Coimbatore, for his remarkable and valuable contribution towards the field of angiosperm taxonomy.

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