

Additions to the Flora of South Indian States

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Received: July 29, 2015; **Revised:** August 7, 2015; **Accepted:** August 10, 2015.

Abstract: Four species namely *Cylindropuntia ramosissima* (Engelm.) F.M. Knuth (Cactaceae), *Hypoestes sanguinolenta* Hook. (Acanthaceae), *Solanum sisymbirifolium* Lam. (Solanaceae) and *Sphagneticola trilobata* (L.) Pruski (Asteraceae) are reported here as new records to the following South Indian states Kerala, Tamil Nadu, Karnataka and Andhra Pradesh respectively. Detailed description with color photographs and notes are provided for easy identification.

Keywords: Acanthaceae, Asteraceae, Cactaceae, Solanaceae, South Indian states, New records.

Introduction

During the field surveys between 2010 and 2015 in South India the first author has collected some invasive and introduced species found growing luxuriantly in the protected areas, wastelands, along the streams and canals. Further, it is also noted that they have the capability of replacing the native species in their habitat. A perusal of literature (Gamble, 1915-36; Sharma *et al.*, 1984; Henry *et al.*, 1987; Pullaiah & Alimoulalu, 1997; Reema Kumari, 2004; Sasidharan, 2004; Nayar *et al.*, 2006; Sudhakar Reddy *et al.*, 2009; Nayar *et al.*, 2014) and consultation of available herbarium specimens at BSI, BSID, MH, KFRI, TBGT & RHT shows that they are additions to the South Indian states, i.e. *Cylindropuntia ramosissima* (Engelm.) F.M. Knuth (Cactaceae) to Kerala, *Hypoestes sanguinolenta* Hook. (Acanthaceae) to Tamil Nadu, *Solanum sisymbirifolium* Lam. (Solanaceae) to Karnataka and *Sphagneticola trilobata* (L.) Pruski (Asteraceae) to Andhra Pradesh. The detailed description, distribution, important notes, specimen examined and color photographs of these four species are provided for easy identification.

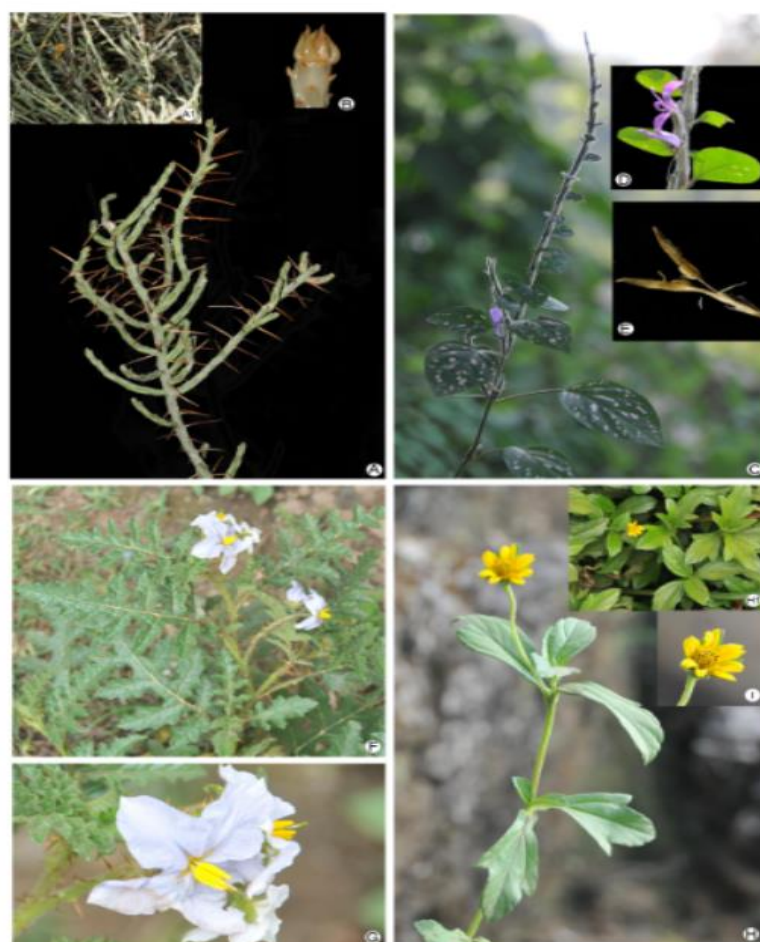


Figure 1. A, A1. *Cylindropuntia ramosissima* (Engelm.) F.M. Knuth habit; B. Flower close up. C. *Hypoestes sanguinolenta* Hook. habit; D & E. Close ups of flower & fruit. F. *Solanum sisymbirifolium* Lam. habit; G. Flower close up. H, H1. *Sphagneticola trilobata* (L.) Pruski habit; I. Flower close up.

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1. *Cylindropuntia ramosissima* (Engelm.) F.M. Knuth in Backeb. & F.M. Knuth, Kaktus-ABC 122. 1935; Backeb., Cactaceae 1: 167. 1958; K. Ramamurthy in N.C. Nair & A.N. Henry, Fl. Tamil Nadu 1: 176. 1983. *Opuntia ramosissima* Engelm. in Amer. J. Sci. Arts ser. 2, 14: 339. 1852; K.M. Matthew, Fl. Palni hills 1: 548 & Suppl. Ill. Fl. Palni hills t. 993. 1998.

Local names: English: *Pencil Cactus*, *Diamond Cholla*. Tamil: *Velikalli*. Malayalam: *Surai Mullu*

Subshrub, profusely branched, branches scandent at times, up to 1.6 m tall; branchlets segmented, rope-like, cylindric, green; tubercles rhombic, ultimately flattened, 6-7 x 3-4 mm; areoles subcircular, 3 x 1 mm. Spines yellowish brown, 0-3 per areole, one at maturity, 1.5-4.5 cm long, sheathed with brown papery layer, surrounded by tuft of bristles at base. Flowers on short lateral shoots, in axils of tubercles, 1.5-3 x 1-1.2 cm; tepals many, outer ones ovate, 5.5 x 3 mm, acuminate, greenish; inner ones obovate, 6 x 3 mm, acute or attenuate, red to rose with darker midstripe. Stamens many; filaments 2-3 mm, greenish; anthers yellow; style 9 mm, whitish, rose-pink at times; stigma 7-lobed, whitish. Fruits ellipsoid, 2-2.5 x 1-1.3 cm, tuberculate, areolate, with bristly spines; seeds circular or angular, 3.5-4 mm in diam., yellow or grayish.

Fl. & Fr.: December – February

Habitat: Scrub jungles, open and wastelands.

Distribution: India: Kerala (Malappuram; Palakkad) and Tamil Nadu. Mexico and USA.

Note: It is an invasive cactus plant introduced from south western USA to India might be as a garden plant. It is now escaped, naturalized and widely spreading due to its vegetative propagation. This plant is also used as hedge plant by the farmers to protect crops from grazing as it possesses very long spines.

Specimen examined: India: Kerala, Palakkad district, Attapadi foot hills, on the way to Mannarkad, 70 m, 21.01.2013, J.V. Sudhakar 126379 (MH). Malappuram district, Vettathur, 50 m, 21.01.2013, J.V. Sudhakar 126380 (MH).

2. *Hypoestes sanguinolenta* Hook., Bot. Mag. 91: t. 5511. 1865.

Local name: English: *Freckle face*

Herbs, 30-40 cm high; stem tetragonal, jointed, puberulous to pubescent; internodes 2.5-6 cm long; branchlets compacted with persistent bracts. Leaves opposite, laminae equal or unequal at each node, 1.5-5 x 1-3 cm, ovate to elliptic, acute, cuneate at base, entire at margin, acute at apex, variegated, usually dark green or purple with white to pinkish dots; petiole 0.5-4 cm long, puberulous. Flowers axillary or terminal; bracts 4 or 5-lobed, compacted with axis, unequal in size, 1-1.3 x 0.1-0.3 cm, hirsute, dark green or brown. Sepals 5, tubular, 5-6 mm long, lobed at apex, lobes lanceolate, 2-2.5 mm long, pale white, hirsute. Petals pink, tubular, narrow at base, dilated and bilipped at apex, 1.2-1.5 cm long, lowerlip shallowly 3-lobed, lobes obtuse, upper lip 2-lobed, one straight, other one curved, pubescent without. Stamens 2, 4-6 mm long, filaments 2-3 mm; anthers oblong, lobes 1.6-2.5 mm long, white or yellowish. Ovary oblong, 1.5-2 mm, tip pointed, glabrous; ovules 4; style 1.4-1.6 cm long, stigma acute or slightly bifid. Fruit capsule, elongated, 1-1.3 cm long, puberulous to pubescent, with persistent sepals at base; seeds 4, oblong, oblique at base, obtuse, truncate at apex, 1.4 x 0.7 mm, glabrous without, puberulous within.

Fl. & Fr.: December – March

Habitat: Foot hills, slopes and along the roadsides.

Distribution: India: Kerala and Tamil Nadu (Coimbatore-Anamalai hills; Nilgiris-Nilgiri hills; Dindigul-Palani hills; Salem-Shevaroy). Madagascar and North America.

Note: It is a native of Madagascar introduced in India as ornamental plant. It is now escaped and naturalized in reserve forests of Kerala and Tamil Nadu. It can be easily identified in the field based on colorful variegated leaves with the dots of white, pink, green and red.

Specimen examined: India, Tamil Nadu, Coimbatore district, Anamalai hills, Valparai, Sirukundra, way to Cinkona, 1130 m, 14.01.2015, J.V. Sudhakar 120045 (MH).

Nilgiris district, way Coonoor to Ooty, Wellington, 1880 m, 11.07.2015, J.V. Sudhakar 120055 (MH).

3. *Solanum sisymbriifolium* Lam., Encycl. 4: 307. 1797; Dunal in DC., Prodr. 13(1): 326. 1852; Gamble, Fl. Madras 2: 938. 1923; Fyson, Fl. South Indian Hill St. 2: t. 359. 1932; Chithra in A.N. Henry et al., Fl. Tamil Nadu 2: 111. 1987; Sasidh., Biodiv. Doc. Kerala 6. Fl. Pl.: 317. 2004.

Local names: English: *Sticky nightshade*. Hindi: *Jangli bhatta*. Tamil: *Thoolthakkali*

Herbs or undershrubs, up to 1 m high, prickly throughout, stellate-pubescent; prickles 0.5-2 cm long, straight or recurved, base bulbous yellow, apex narrowly acute, reddish orange; stems and branches terete, green, hollow on mature; internodes 4-7 cm long. Leaves simple, alternate, lanceolate to linear-ovate, deeply bipinnate; pinnae 8-13, oblique or truncate at base, serrate at margin, acute-acuminate at apex, prickly on both surfaces; petioles 1.5-5 cm long. Inflorescence a raceme, extra-axillary, 3-10-flowered, up to 12 cm long; peduncles ca 4 cm long. Flowers regular; pedicels ca 1.5 cm long. Calyx cupular, 1-2 cm long, 5-lobed; lobes triangular-ovate, acute, 0.6-0.8 cm long, stellate-pubescent, prickly. Corolla rotate, white to purple, 5-lobed; lobes elliptic or ovate, 0.8-1 x 0.4-0.7 cm, puberulous. Stamens 5, equal; filaments ca 2 mm long, epipetalous for ca 1 mm; anthers oblong, 0.7-1 mm long. Disc annular. Ovary subglobose, ca 2 mm in diam., 3 or 4-loculed; style ca 2 mm long; stigma capitate. Berries globose, 1-1.5 cm in diam., glabrous, red; fruiting calyx accrescent, 1.5-2.5 cm long; seeds ca 90 in each berry, discoid, 2-2.5 mm long, pale brown.

Fl. & Fr.: Almost throughout the year

Habitat: In wastelands, Evergreen, semi-evergreen forests and borders of sholas of high altitude.

Distribution: India: Gujarat, Karnataka, Kerala, Maharashtra, North-East India, Tamil Nadu, Uttar Pradesh and West Bengal. America, Asia and Africa.

Note: It is native of South America, naturalized in tropical countries. Pharmacognostic and phytochemical studies

(Prajapati et al., 2013; Vinod Kumar Gupta et al., 2014) revealed that all plant parts contain high medicinal value.

Specimen examined: India, Karnataka, Chamarajanagar district, Bandipur National Park, on the way from Mudumalai, near Bandipur, 1012 m, 28.8.2012, J.V. Sudhakar 126333 (MH). Mysore district, Mysore, J.P. Nagar, near nursing home, 28.06.2009, P. Thimme Gowda s.n. (MH).

4. *Sphagneticola trilobata* (L.) Pruski in Mem. New York Bot. Gard. 78: 114. 1996. *Wedelia trilobata* (L.) A.S. Hitchc. in Rep. Missouri Bot. Gard. 4: 99. 1898; Shivarajan & Pradeep in Ind. J. For. 11: 161-162. 1988; H.J. Chowdhery in P.K. Hajra et al., Fl. India 12: 426. 1995. *Silphium trilobatum* L. Syst. ed. 10: 1232. 1759.

Local names: English: *Creeping daisy*, *Singapore daisy*, *Yellow dots*.

Herbs, perennial, prostrate or diffuse, rooting at basal nodes; stem terete, puberulous or glabrous, green. Leaves simple, opposite-decussate, subsessile, elliptic-obovate or broadly ovate, 3-7 x 2.5-5 cm, usually with 3 (-5) angular lobes with toothed margins, sometimes upper ones unlobed, acute at apex, basally cuneate, forming a short petiole, slightly encircling the stem at the nodes, scabrid above, puberulous to glabrous beneath; 3-nerved at base, lateral nerves 2-3 pairs. Heads usually in upper axils of leaves, solitary with long peduncles, yellow, 1.5-2 cm in diam.; peduncles, ebracteate, 5-15 cm long, strigose. Involucre green; involucre bracts lanceolate or oblong, 0.9-1.1 cm long, acute or obtuse, ciliate. Ray florets 5-9, unisexual (female); corolla yellow, 0.9-1.5 x 0.4-0.5 cm, 3-4-denticulate at apex. Ovary trigonous; style exerted; stigma bilobed, slightly hairy. Pappus connate into a spathiform, fimbriate cup at apex, without awns. Disc florets many, bisexual; corolla yellow; tube 5-9 mm long, 5-lobed; lobes deltoid, densely ciliate within. Anthers syngeneis, included, usually black. Ovary oblong, biconvex; style bifid, flattened, pubescent at margins. Achenes crowned with the persistent pappus cup, 3-4 x 5-6 mm, strongly warty, blackish, dimorphic, trigonous and mostly sterile of ray florets, lenticular and fertile of disc florets.

Fl. & Fr.: Almost throughout the year

Habitat: Along streams, canals and river banks, also in gardens.

Distribution: India: Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. Tropical America, Mexico and Neotropics.

Note: Introduced as ornamental garden plant and now runs wild causing threats to native flora. It's a creeping, evergreen and perennial herb with luxuriant growth forming mats along streams, canals, river banks and foot hills. Pharmacognostic study (Govindappa *et al.*, 2011) proved that this plant contains antimicrobial, antioxidant and anti-inflammatory activities.

Specimen examined: India, Andhra Pradesh, East Godavari District, Mareduhilli, behind Vanavihari Eco-tourism complex, 25 m, 3.8.2010, J.V. Sudhakar 122928 (MH); Sakshinetipally Mandal, Rambag, along the canals, near Antervedi, 2 m, 1.11.2011, J.V. Sudhakar 122974 (MH).

Acknowledgements

The authors are grateful to the Director, Botanical Survey of India, Kolkata for providing facilities. Mr. G. Gnanasekaran, Botanical Assistant, BSI, SRC, Coimbatore duly acknowledged for his suggestions to improve the manuscript. We are thankful to Mr. V. Ramesh, Photographer, BSI, SRC for the photo plate.

References

1. Bailey LH. 1924 & 1949. Manual of Cultivated Plants. New York.
2. Brummit RK and Powell CE. 1992. Authors of Plants Names. Whitstalde Litho hid., Kew.
3. Govindappa M, Naga Sravya S, Poojashri MN, Sadananda TS, Chandrappa CP, Gustavo S, Sharanappa P and Anil Kumar NV. 2011. Antimicrobial, antioxidant and in vitro anti-inflammatory activity and phytochemical screening of water extract of *Wedelia trilobata* (L.) Hitchc. J. Med. Plants Res. Vol. 5(24): 5718-5729.
4. Henry AN, Kumari GR & Chithra, V. 1987. Flora of Tamil Nadu Series I: Analysis. Vol. 2. BSI, Calcutta.
5. Gamble JS. 1915 – 1936. Flora of the Presidency of Madras. 11 Parts. (Parts 1 – 7 by Gamble & 8 – 11 by C.E.C Fischer). Adland & Son. London.
6. Nayar TS, Rasiya Beegam A, Mohanan N and Rajkumar G. 2006. Flowering Plants of Kerala A Handbook. TBGRI, Thiruvananthapuram.
7. Nayar TS, Rasiya Beegam A, and Sibi G. 2014. Flowering Plants of the Western Ghats India. JNTBGRI, Thiruvananthapuram.
8. Prajapati RP, Karkare VP, Kalaria MV, Parmar SK, and Sheth NR. 2013. Pharmacognostic and phytochemical evaluation of the *Solanum sisymbriifolium* leaf. Afr. J. Biotechnol. Vol. 12 (42): 6133-6139.
9. Pullaiah T and Alimoulalu D. 1997. Flora of Andhra Pradesh. Vol. 2. Scientific Publishers, Jodhpur.
10. Reemakumari, M. 2004. A Taxonomic Revision of the Indian Solanaceae. Ph. D. Thesis, Bharathiar University, Coimbatore, India (unpublished).
11. Sasidharan N. 2004. Biodiversity Documentation for Kerala Part 6: Flowering Plants. KFRI, Peechi.
12. Sharma BD, Singh NP, Raghawan RS and Deshpande UR. 1984. Flora of Karnataka Analysis. BSI, Howrah.
13. Sudhakar Reddy C, Reddy KN and Vatsavaya S Raju. 2009. Supplement to Flora of Andhra Pradesh India. Deep Publications, New Delhi.
14. Vinod Kumar G, Aritra S, Manish T, Kashinath B and Amit Roy. 2014. Phytochemical contents, antimicrobial and antioxidative activities of *Solanum sisymbriifolium*. Journal of Applied Pharmaceutical Science Vol. 4 (3): 075-080.

Source of support: Nil

Conflict of interest: None Declared