

# *Ipomoea purga* (Convolvulaceae): a new record for Asia from southern India

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**Abstract:** *Ipomoea purga* (Wender.) Hayne considered a narrow endemic species of Mexico, is reported here for the first time for Asia from the southern Western Ghats of India. Detailed description and distribution of the species are provided along with colour photographs.

**Keywords:** *Convolvulaceae*, *Ipomoea purga*, new record to India, Mexico.

## Introduction

*Ipomoea* L. is the largest genus of the Convolvulaceae family comprises approximately 635-800 species, depending on its circumscription (Mabberley, 2017; Wood *et al.*, 2020, POWO, 2024). It is distributed predominantly in pantropical regions and absent in Mediterranean areas and temperate climates (Staples & Brummitt, 2007). In India, the genus is represented by 63 taxa` (Shimpale *et al.*, 2014), of which 41 are reported from the Western Ghats (Nayar *et al.*, 2014).

Various species of *Ipomoea* had medicinal uses and the seeds of several species are known for their hallucinogenic properties *viz.*, *I. alba* L., *I. corymbosa* (L.) Roth, *I. purpurea* (L.) Roth and *I. tricolor* Cav. (Steiner & Leistner, 2018). The roots of several species have been used as a purgative and marketed under the name “jalapa” after the original source *Ipomoea jalapa* Nutt. (Meira *et al.*, 2012) documented many actual

and potential medical uses of *Ipomoea* species. *Ipomoea purga* (Wender.) Hayne is the best-known species used for this purpose but others such as *I. simulans* D. Hanb., *I. orizabensis* (G. Pelletan) Ledeb. ex Steud. and *I. jalapa* (L.) Pursh are sometimes reported as having similar properties, although their medical value requires confirmation (Wood *et al.*, 2020).

During floristic explorations in Kotagiri vegetation ranges of Nilgiris district of Tamil Nadu, the author observed the blooming of an unknown *Ipomoea* species at an altitude of 2245 m above the sea level. After consulting relevant literature and herbarium specimens, the identity of the specimen was established as *Ipomoea purga* (Wender.) Hayne, a species typically distributed in Mexico and North America (Austin, 1978; Austin & Huáman, 1996; McDonald, 1991; Wood *et al.*, 2020; POWO, 2024). A thorough review of the literature revealed that this species has not previously been recorded from any part of India or Asia (Choisy, 1845; Hooker, 1834, 1885; Clarke, 1883; Prain, 1894; Cooke, 1905; Gamble, 1921; Austin, 1975, 1980; Austin & Ghazanfar, 1979; Fang & Staples, 1997; Biju, 1997, 2002; Staples & Yang, 1998; Chowdhery & Debta, 2009; Shimpale *et al.*, 2012, 2014, Singh *et al.*, 2015; Kattee, 2019; Kattee *et al.*, 2019a,b). Therefore, this report constitutes a new distributional record for *I. purga* in the flora of Asia, specifically in the Western Ghats of India. While the occurrence of *I. purga*

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in the interior forests of Nilgiris, Tamil Nadu may be an introduction, the exact means by which this species reached southern India remains unknown.

## Materials and Methods

The live specimens were collected from the Kotagiri areas of Nilgiris district, Tamil Nadu during September 2024. Micro morphological characters were examined by using Leica S8 APO stereo microscope. Abbreviated author citations were given by following Authors of Plant Names (Brummitt & Powell, 1992), and acronyms of Herbaria were provided according to Index Herbariorum (Thiers, 2024, continuously updated). The specimens of appropriate size with relevant plant parts were collected from the field and the herbarium specimens were prepared by following wet method (Forman & Bridson, 1998) and were deposited in the herbarium of CSIR-National Botanical Research Institute (LWG) for future reference. The distribution map of the collected species was generated by using QGIS (QGIS Development Team, 2023).

## Taxonomic Treatment

***Ipomoea purga*** (Wender.) Hayne, Getreue Darstell. Gew. 12: 5. 1833. *Convolvulus purga* Wender., Pharm. Central-Blatt 1: 457. 1830. *Exogonium purga* (Wender.) Benth., Pl. Hartw. 46. 1840. *Batatas purga* (Wender) Peterm., Pflanzenreich, ed. 1: 497, t. 132, fig. 750. 1838–1845. *Lectotype* (designated by McDonald, 1987): MEXICO, **Veracruz**, Chiconquiaco, *Schiede s.n.* (NY [NY00318915] digital image!; isolecto BM [BM000832683], GH [GH00054289], K [K000465257], P [P00607315]).

*Ipomoea jalapa* Nutt. in Coxe, Journ. Am. Med. Sci. 5: 305. 1829 [pub.1830] *nom. illeg.* non *Ipomoea jalapa* (L.) Pursh (1813). *Lectotype* (designated by Wood *et al.*, 2020): Plant from Xalapa [Veracruz], cultivated in the United States, t. 1 (p. 306A) in Coxe (1830).

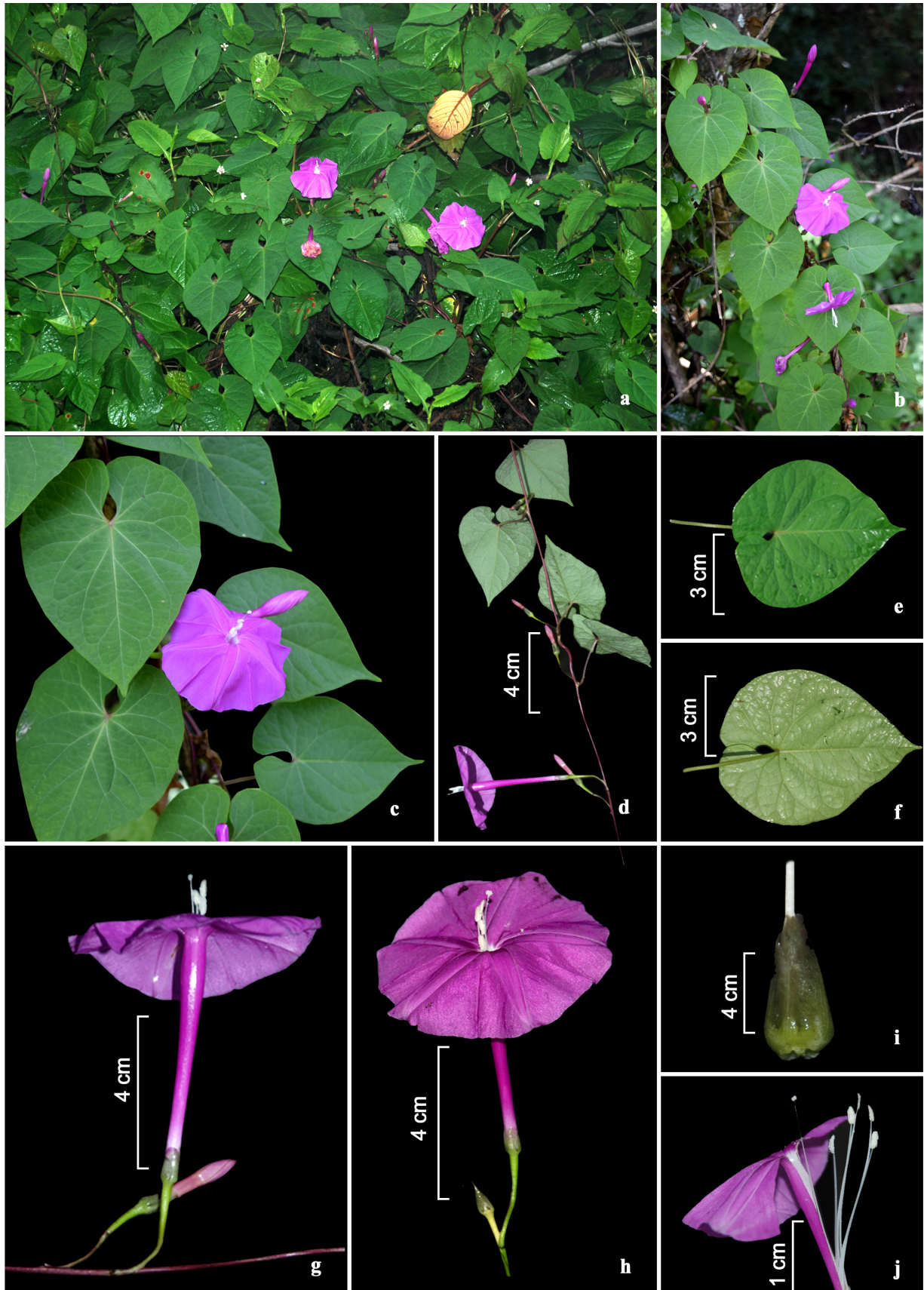
*Convolvulus officinalis* Pelletan, J. Chim. Méd. 10: 6. 1834. *Type*: MEXICO, **Veracruz**, Orizaba, *Le*

*Danois s.n.* (P [P00607314] digital image!). **Fig. 1**

Perennial twining or trailing herbs, 5–7 m long; roots tuberous, latex present. Stems, dark-red coloured, glabrous. Leaves petiolate; petioles terete, 3.5–5.5 cm long, dark-red, glabrous; lamina ovate to broadly ovate, 3.8–8.5 × 3.6–5.8 cm, base cordate to sagittate with a narrow to wide sinus and rounded prominent auricles, margins entire, apex narrowly acuminate, glabrous on both surfaces; veins prominent on both surfaces. Inflorescence solitary to rarely paired (2–3) axillary flowers; peduncle 4–6.5 cm long, terete, glabrous; bracteoles ovate-lanceolate, 1.8–2 × c. 0.3 mm, acute to shortly acuminate at apex, persistent, glabrous; pedicels 1.2–1.6 cm long, thickened upwards, glabrous. Sepals ovate, sub-equal; inner sepals slightly larger, margins scarious, apex obtuse to rounded, glabrous; outer sepals 5.5–6 × 3–3.5 mm, inner sepals 7.5–8.5 × 3.5–4 mm. Corolla hypocrateriform, 6.2–7.4 cm long, widened from the cylindrical base at about half way, pink, glabrous; limb 4.5–5.2 cm diam., undulate, deep pink, glabrous. Stamens 5, exerted up to 1.2 cm; filaments unequal, glabrous, three long, 2.6–3.2 cm long, two shorter, 1.5–1.8 cm. Ovary ovoid, glabrous; style exerted up to 1.2 cm, glabrous; stigma biglobose. Capsules conical, 7–8 mm long, glabrous.

**Flowering & Fruiting:** Flowering and fruiting from September to November.

**Habitat:** It grows in montane pine and oak forest around 2000 m (Wood *et al.*, 2020). In India, this species was found only in the evergreen forest margins of Kotagiri area in Nilgiris district of Tamil Nadu, a part of southern Western Ghats, India (Figure 2). Even though, the plant was collected from the roadsides of Kotagiri, the area is totally undisturbed and evergreen. We have not found any other species of *Ipomoea* grown along or within this forest. The tuberous roots of this species were much valued in the past as a “safe” purgative.



**Fig. 1.** *Ipomoea purga* (Wender.) Hayne: **a.** & **b.** Habit; **c.** & **d.** Flowering twig; **e.** Leaf-adaxial view; **f.** Leaf-abaxial view; **g.** Solitary flowers; **h.** Paired flowers; **i.** Calyx; **j.** Corolla split-side view showing the dissimilar stamens (Photos K.M. Prabhukumar).



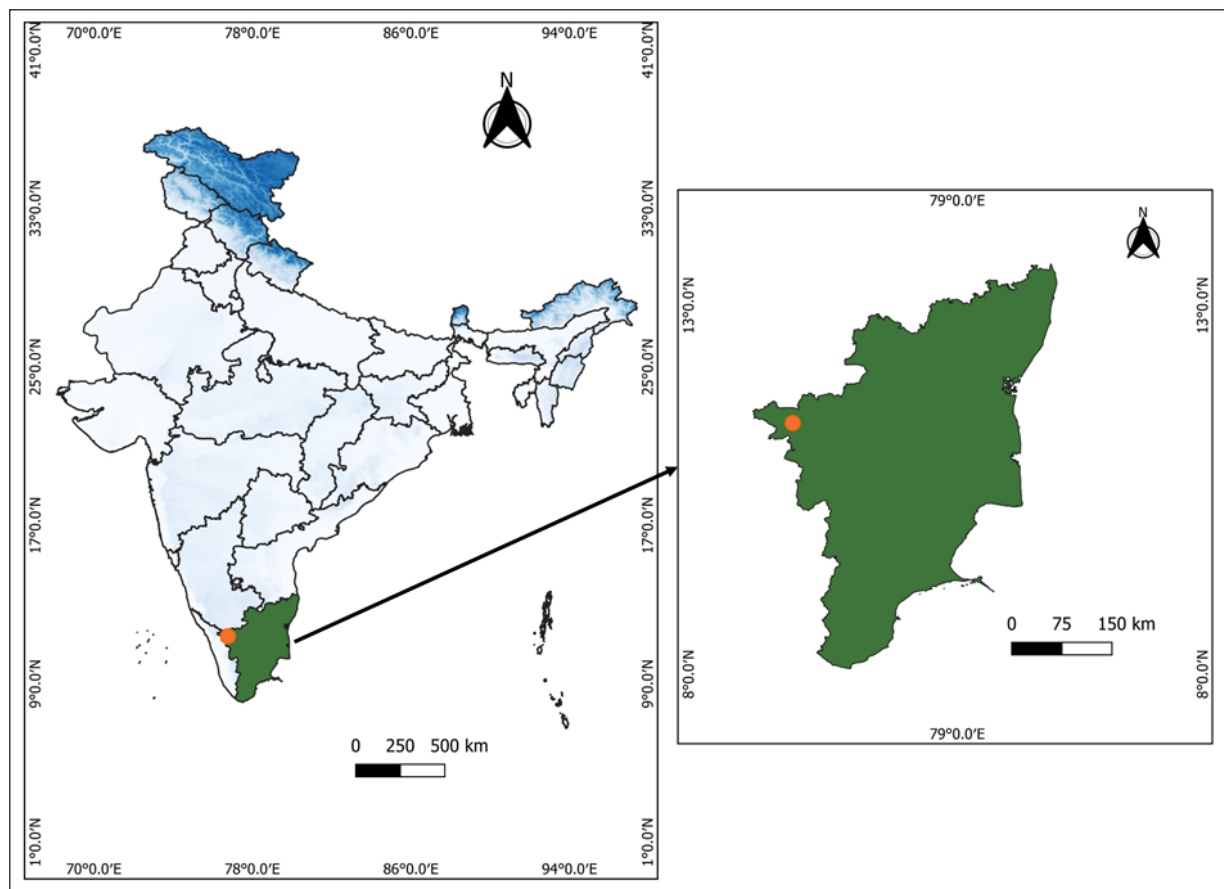


Fig. 2. Showing the distribution of *Ipomoea purga* in India (generated using QGIS, 2023).

**Distribution:** North America (Mexico) and Asia (India-present collection). In Mexico, the taxon is a local endemic centred on where Hidalgo, Puebla and Veracruz meet.

**Specimen examined:** INDIA, **Tamil Nadu**, Nilgiris District, Way to Kotagiri,  $\pm 2245$  m, N  $11^{\circ} 24' 28.1664''$ , E  $76^{\circ} 46' 13.8756''$ , 23.09.2024, K.M. Prabhukumar 357379 (LWG).

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### Literature cited

- AUSTIN D.F. 1975. Convolvulaceae. In: WOODSON R.E. & SCHERY R.W. (eds), *Flora of Panama*. *Annals of the Missouri Botanical Garden* 62: 157–224.
- AUSTIN D.F. 1978. Realignment of the species placed in *Exogonium* (Convolvulaceae). *Annals of the Missouri Botanical Garden* 64(2): 330–339. <https://doi.org/10.2307/2395341>
- AUSTIN D.F. 1980. Convolvulaceae. In: DASSANAYAKE M.D. & F.R. FOSBERG (eds.), *A revised handbook of the flora of Ceylon*, Volume I. CRC Press, New Delhi. pp. 288–363.
- AUSTIN D.F. & S. GHAZANFAR 1979. Convolvulaceae. In: NASIR E. & S.I. ALI (eds.), *Flora of West Pakistan*. University of Karachi, Karachi, Pakistan pp. 1–64.
- AUSTIN D.F. & Z. HUÁMAN 1996. A synopsis of *Ipomoea* (Convolvulaceae) in the Americas. *Taxon* 45(1): 3–38. <https://doi.org/10.2307/1222581>.

- BIJU S.D. 1997. *Taxonomic and morphological studies in family Convolvulaceae of southern Peninsular India*. Phd. Thesis (Unpublished), University of Calicut, Malappuram.
- BIJU S.D. 2002. *Ipomoea parasitica* (Kunth.) G. Don (Convolvulaceae): A new record for India. *Rheedea* 12(1): 77–79.
- BRUMMITT R.K. & C.E. POWELL 1992. *Authors of Plant Names: A List of Authors of Scientific Names of Plants, with Recommended Standard Forms of Their Names, Including Abbreviations*. Royal Botanic Gardens, Kew.
- CHOISY J.D. 1845. Convolvulaceae. In: CANDOLLE AP DE (ed.), *Prodromus Systematis Naturalis*. Volume 9. Fortin, Masson & Co, Paris. pp.323–462.
- CHOWDHERRY H.J. & M.R. DEBTA 2009. A new species of *Ipomoea* L. (Convolvulaceae) from India. *Indian Journal of Forestry* 32(1): 119–121.
- CLARKE C.B. 1883. Convolvulaceae. In: HOOKER J.D. (ed.), *Flora of British India*. Volume 4. L. Reeve & Co., London. pp. 196–216.
- COOKE T. 1905. *The Flora of the Presidency of Bombay*. Volume 2. Taylor & Francis, London. p. 261.
- FANG R.C. & G. STAPLES 1997. Convolvulaceae. In: WU Z. & RAVEN P.H. (eds.), *Flora of China, Volume 16. Gentianaceae through Boraginaceae*. Science Press, Beijing & Missouri Botanical Garden, St Louis, pp.271–325.
- FORMAN, L. & BRIDSON, D. 1998. *The Herbarium Handbook*. Royal Botanic Gardens, Kew.
- GAMBLE J.S. 1923. *Flora of the Presidency of Madras*. Volume 2. West, Newman & Adlard, pp. 911–919.
- HOOKE J.D. 1885. Additions and corrections. In: HOOKER J.D. (ed.), *Flora of British India*. Volume 4. L. Reeve & Co., London. pp. 733–734.
- HOOKE W.J. 1834. *Ipomoea rubrocaerulea*. Reddish-blue *Ipomoea*. *Botanical Magazine* 61: t. 3297.
- KATTEE A.V. 2019. Revision of the genus *Ipomoea* L. (Convolvulaceae) for India. Ph.D. thesis (unpublished), Shivaji University, Kolhapur,
- KATTEE A.V., DALAVI J.V., PATIL C.R. & V.B. SHIMPALE 2019a. *Ipomoea fulvicaulis* (Convolvulaceae), a new record for India. *Rheedea* 29(3): 227–231. <https://dx.doi.org/10.22244/rheedea.2019.29.3.07>
- KATTEE A.V., PATIL C.R., PATEL S.L., KAHALKAR V.I. & V.B. SHIMPALE 2019b. Notes on the occurrence of *Ipomoea acanthocarpa* and *Ipomoea laxiflora* (Convolvulaceae) in India. *Rheedea* 29: 209–214. <https://doi.org/10.22244/rheedea.2019.29.3.03>
- LINNAEUS C. 1753. *Species plantarum*. Volume 1. Salvius, Stockholm. 159.
- MABBERLEY D.J. 2017. *The Plant-Book: A portable dictionary of plants, their classification and uses*. Third Edition. Cambridge University Press, Cambridge.
- MCDONALD J.A. 1987. Revision of *Ipomoea* section *Exogonium* (Choisy) Griseb. (Convolvulaceae). *Brenesia* 28: 41–87.
- MCDONALD J.A. 1991. Origin and diversity of Mexican Convolvulaceae. *Anales del instituto de Biología de la Universidad Nacional Autónoma de México, serie Botánica* 62: 65–82.
- MEIRA M., PEREIRA DA SILVA E., DAVID J.M. & J.C. DAVID 2012. Review of the genus *Ipomoea*: Traditional uses, chemistry and biological activities. *Revista Brasileira de Farmacognosia* 22(3): 682–713. <https://doi.org/10.1590/S0102-695X2012005000025>
- NAYAR T.S., M. SIBI & A.R. BEEGAM 2014. *Flowering Plants of the Western Ghats, India*. Volume 1: Dicots. JNTBGRI, India. pp. 293–99.
- POWO 2024. *Plants of the World Online*. Facilitated by the Royal Botanic Gardens, Kew. Available from: <http://www.plantsoftheworldonline.org> (Accessed on 06.11.2024).
- PRAIN D. 1894. Noviciae Indicae VIII. Some additional species of Convolvulaceae. *Journal of the Asiatic Society of Bengal* 63(2): 83–115.
- PURSH F. 1813. *Flora Americae Septentrionalis*. Volume 1. White, Cochrane & Co, London. p.146.
- QGIS Development Team 2023. QGIS Geographic Information System, Open Source Geospatial Foundation Project, Version 3.30.1 “s-Hertogenbosch” Available at: <http://qgis.osgeo.org> (Accessed on 06.11.2024).
- SHIMPALE V.B., KARE M.A., LONDHE D.K. & A.S. BHUKTAR 2014. On the occurrence of *Ipomoea tenuipes* (Convolvulaceae) in India. *Rheedea* 24(2): 117–119.
- SHIMPALE V.B., KSHIRSAGAR P.R. & N.V. PAWAR 2012. *Ipomoea ochracea* (Convolvulaceae): A new record for India. *Rheedea* 22(2): 99–102.

- SINGHP.,KARTHIGEYANK.,LAKSHMINARASIMHAN P. & S.S. DASH 2015. *Endemic Vascular Plants of India*. Botanical Survey of India, Kolkata. p.144.
- STAPLES G.W & BRUMMITT R.K. 2007. Convolvulaceae. In: HEYWOOD V.H., BRUMMITT R.K., CULHAM A. & O. SEBERG (eds.), *Flowering plant families of the World*. Royal Botanic Gardens, Kew. pp.108–110.
- STAPLES G.W. & S.Z. YANG 1998. Convolvulaceae. In: HUANG T.C. et al. (eds.), *Editorial Committee of the Flora of Taiwan, Flora of Taiwan*. Second edition. Volume 4. Epoch Publishing Co., Taipei. pp. 341–384.
- STEINER U. & E.W. LEISTNER 2018. Ergot Alkaloids and their hallucinogenic potential in Morning Glories. *Planta Medica* 84(11): 751–758. <https://doi.org/10.1055/a-0577-8049>.
- THIERS B. 2024. *Index herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden's virtual herbarium. Available at: <http://sweetgum.nybg.org/ih>. (Accessed on 13.11.2024)
- WOOD J.R., MUNOZ-RODRIGUEZ P., WILLIAMS B.R.M. & R.W. SCOTLAND 2020. A foundation monograph of *Ipomoea* (Convolvulaceae) in the new world. *PhytoKeys* 143: 1–823. <http://doi.org/10.3897/phytokeys.143.32821>