



American species of *Lindernia dubia* (L.) Pennell – occurrence in India

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ABSTRACT: *Lindernia dubia* (L.) Pennell American species so far reported in North America, Central America, South America, Taiwan, China, Serbia, Bulgaria, Japan, Canada, Mexico, Cuba, Jamaica, Coata Rica, Panama, Colombia, Bolivia, Venezuela and Brazil. First time reported in India from the Western Ghats of Coimbatore in Tamil Nadu. A detailed description and photograph are provided to facilitate its easy identification.

Keywords: *Lindernia dubia*, New record, Western Ghats, Coimbatore, India.

INTRODUCTION

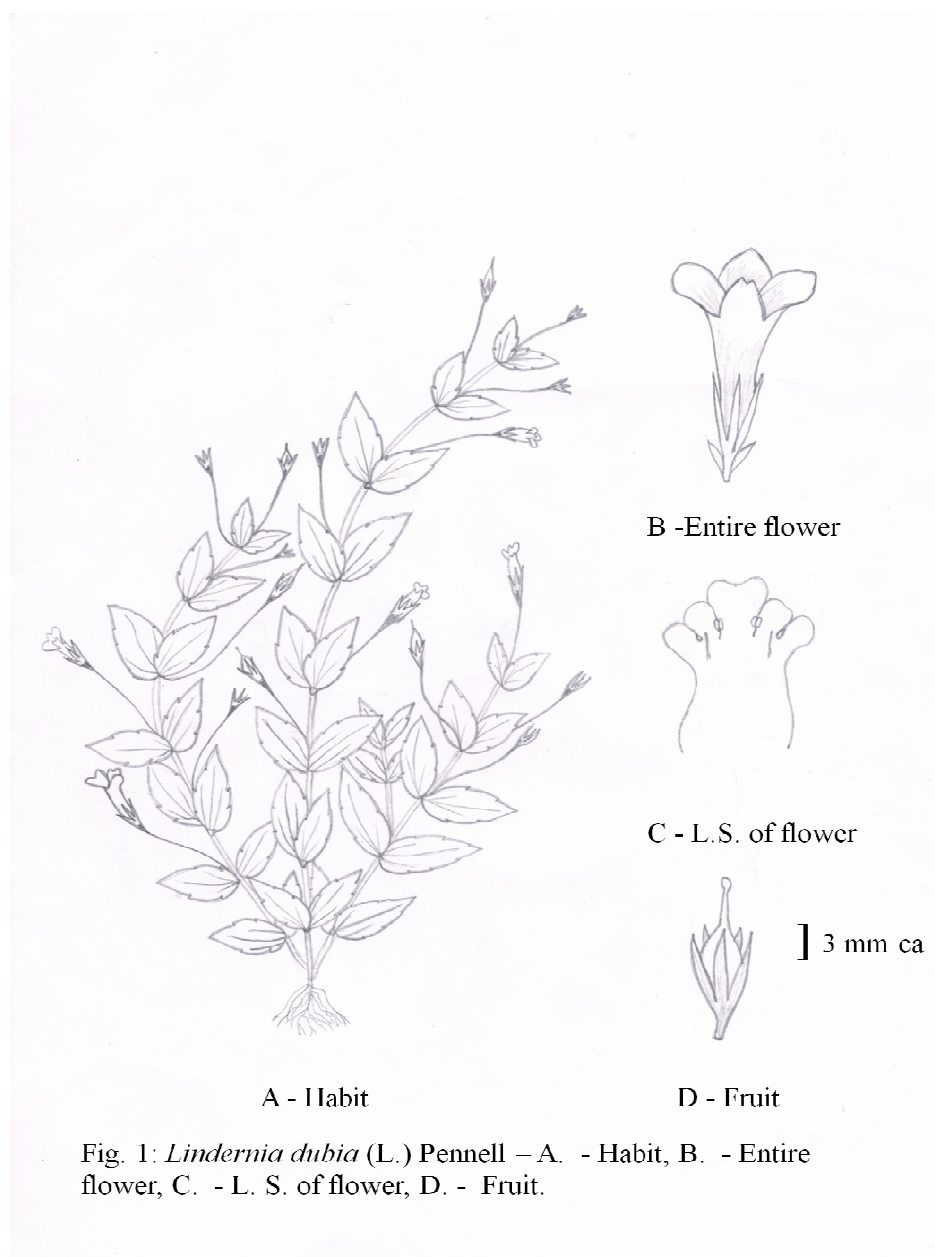
The genus *Lindernia* Allioni (1766:178, t5) comprises about 100 species (Fischer, 1999), distributed almost throughout the tropical and temperate regions of both the old and new world (Lewis, 2000). The centers of diversity of *Lindernia* are situated in Africa (Fischer, 1992) and South East Asia. They fall in 3 main geographical groups, the largest in Asia followed by those in Africa and the Americas (Philcox, 1968).

This genus was originally placed in the Scrophulariaceae (s. l.) based on molecular studies by Rahmanzadeh *et al.* (2005). A total of 28 species of *Lindernia* are reported from Indo-Burma and 30 taxa reported from India (28 species, 1 subspecies and 1 variety), among them 25 are known from South India (Mukherjee 1945, Sivarajan and Mathew, 1983, Murugan *et al.*, 2002, Tandyekkal and Mohanan, 2010, Ratheesh *et al.*, 2012). A checklist of angiosperms of Kerala possesses 18 species of *Lindernia* (Nayar *et al.*, 2006).

Frequent field trips were conducted to study the aquatic flora in and around the Southern Western Ghats of Coimbatore in Tamil Nadu. A few specimens of the genus of *Lindernia* were collected. In order to check the identity, a thorough scrutiny of pertinent floras and published research articles literature (Gamble, 1925-1936; Nair and Henry, 1983; Subba Rao and Kumari, 1981; Mathew, 1991) were referred and also concluded that the species was unrecorded so far from the entire region of the India.

PLANT DESCRIPTION

Lindernia dubia (L.) Pennell, in Acad. Nat. Sci. Phil. Monogr. 1: 141. 1935; Ou, in Bull. Exp. Forest. Natl. Chung Hsing Univ. 8: 19. 1987; Liu, Fl. Taiwan. (2nd ed). 4:605. 1998. *Gratiola dubia* L. Sp. Pl. 17. 1753. Herb, 5-20 cm long, much-branched near base, glabrous, erect to ascending, often rooting at lower nodes; stem green, section quadrate. Leaves sessile, elliptical, subspathulate, occasionally lanceolate, ca. 5-25(-30) mm long, 7-14 mm wide, largest leaves near base, middle of stem, palmately 3-5-nerved, apex acute, base cuneate to attenuate, occasionally obtuse, margin 3 or 4 (5) pairs crenate, occasionally 3 or 4 (5) pairs subserrate, glabrous. Flowers solitary, axillary. Pedicel typically shorter than subtending leaves, occasionally approximately equaling or slight longer, 0.6-1mm in diameter, ca. 5-25(-35) mm long, section quadrate. Calyx actinomorphic, 3-5 mm long, sepals basally connate, lobes lanceolate, linear, surface asperate or gibbous. Corolla white in colour with pale-purple tint, ca. 6.5- 9 mm long; androecium 4; anterior pair of staminodes, linear, ca. 7 mm long, apex free, 0.46-1.1 mm long, anthers 2-locule, coherent, included, posterior filament 1.1-1.9 mm long; style 2.6-4 mm long, often presenting until fruit dehiscence; stigma 2-parted; disk small, at ovary bottom, yellow. Fruit a capsule, ovate to oblong, apex acute, equaling or slightly longer than persistent calyx, ca. 3-4.3 mm long. Seeds numerous, oblong, 0.37-0.5 mm long, 0.12-0.22 mm wide, seed-coat smooth (Fig. 1 & 2).



Fl. & Fr.: Sep. – Dec.

Ecology: Rare. Occur in only wetland areas with sandy soil.

Distribution: North America, Taiwan, China, Central America, South America, Serbia, Bulgaria, Japan, Canada, Mexico, Cuba, Jamaica, Costa Rica, Panama,

Colombia, Bolivia, Venezuela, Brazil, Argentina and India.

Specimen examined: India: Tamil Nadu, Coimbatore District, Perur, 09. 11. 2013. Jothimani & Rajendran. The voucher specimen has been deposited in the Bharathiar University Herbarium (BUH- 006240) for future reference and consultations.



Fig. 2: *Lindernia dubia* (L.) Pennell.

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REFERENCES

- Fischer, E. (1992). Systematic der afrikanischen Lindernieae (Scrophulariaceae). *Tropische and Subtropische Pflanzenwelt* **81**: 1-365.
- Fischer, E. (1999). Two new species of *Lindernia* (Scrophulariaceae) from East and South-East Africa and taxonomic remarks on the *Lindernia rotundifolia* – complex. *Bulletin du Jardin Botanique National de Belgique*, **67**: 361-370.
- Gamble, J.S. (1915–1936). *Flora of the Presidency of Madras*. Vols. I-III. Adlard & Sons Ltd., London.
- Gamble, J.S. (2011). *Flora of the Presidency of Madras*. Vols. I-III. Adlard & Sons Ltd., London.
- Lewis, D.Q. (2000). A revision of the New World species of *Lindernia* (Scrophulariaceae). *CASTENEA* **65(2)** 93-122.
- Matthew, K.M. (1991). *An excursion flora of Central Tamil Nadu, India*. Oxford & IBH Publishing Co., Pvt. Ltd., New Delhi.
- Mukherjee, S.K. (1945). Revision of Indo-Burmese species of *Lindernia* All. *J. Ind. Bot. Soc.* **24** 127–134.
- Murugan, C., Sivalingam, R., Benniamin, A. and Kannan, S.G.D. (2002). *Lindernia srilankana* Cramer & Philcox (Scrophulariaceae) - A new record for India. *Rheedea* **12(2)** 155–157.
- Nair, N.C. and Henry, A.N. (1983). *Flora of Tamil Nadu, India: Analysis I, II & III*. Botanical Survey of India, Coimbatore.
- Nayar, T. S., Beegam, A. R., Mohanan, N., and Rajkumar, G. (2006). *Flowering plants of Kerala – A Handbook*. Tropical Botanic Garden and Research Institute, Palode, Thiruvananthapuram, Kerala, India.
- Pennell FW. (1935). The Scrophulariaceae of eastern temperate North America. *Acad. Nat. Sci. Phil. Monogr.* 1137-59.

- Philcox D. (1968). Revision of the Malaysian species of *Lindernia* All. (Scrophulariaceae). *Kew Bull* **22**: 1-72.
- Rahmanzadeh, R., Muller, K., Fischer, E., Bartels, D. and Borsch, T. (2005). The Linderniaceae and Gratiolaceae are further lineages distinct from the Scrophulariaceae (Lamiales). *Pl. biol.* **7**: 67-78.
- Ratheesh Narayanan, M.K., Sunil, C.N., Nandakumar, M.K., Sujana, K.A., Jayesh P.J. and Anilkumar, N. (2012). *Lindernia madayiparens* (Linderniaceae) - A new species from Kerala, India. *Int. J. Plant, Animal and Environmental Sciences* **2**(3): 59-62.
- Sivarajan, V.V. and Mathew, P. (1983). The genus *Lindernia* All. (Scrophulariaceae) in India. *J. Bombay Nat. Hist. Soc.*, **80**: 131-140.
- Subba Rao, G.V. and Kumari, G.R. (1981). Some interesting plants common to Western Ghats and Eastern Ghats. *Botanical Survey of India* **23**(1-4): 30 - 37.
- Tandyeckal, D. and Mohanan, N. (2010). *Lindernia ciliata* subsp. *sivarajanii* subsp. nov. (Scrophulariaceae) from India. *Nordic J. Bot.* **28**: 202-205.