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# Divulgence of morphological characteristics of IUCN red listed *Lindernia Antipoda* (L.) Alston - Linderniaceae

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**Abstract**
*Lindernia antipoda* (L.) Alston was taxonomically revised, described, and illustrated for better understanding of the red-listed plant. This serves as the first report on this plant identified and reported in Thirukkampuliyur village, Karur, Tamil Nadu, India. The plant is a wetland semi-aquatic plant of high medicinal value that is less explored.

**Keywords:** *Lindernia antipoda,* first record, IUCN red listed, taxonomy, illustration

## Introduction
The family Linderniaceae has been diversified from Scrophulariaceae through molecular studies (Rahmanzadeh *et al*., 2005) [9] on several parameters. The family includes the main genus *Lindernia*. The genus consists of 194 species. The genus has been named earlier as *Bonnaya* derived from a single pair of staminodes (Bentham, 1846) [2] they possess. Several taxonomical investigations announced *B. antipoda* (L.) Druce, is the only species found across Asia and Africa to the New World (Lewis, 2000) [5]. The other remaining species have been reported to be distributed from tropical Africa, Madagascar, South-east Asia, and northern Australia (Barker, 1998; Liang *et al*., 2012) [1, 6]. But now several other species of *Lindernia* has been reported (Subramanian and Varghese, 2017; Hooker, 1885; Mukherjee, 1945; Nayar *et al*., 2006; Krishnasamy and Arumugam, 2015) [10, 3, 7, 8, 4] American in India. The genera *Lindernia* a desiccation-tolerant plant as per the phylogenetic analysis Scrophulariaceae (Rahmanzadeh *et al*., 2005) [9] was native to warm regions of the eastern and western hemispheres. The study aims in exploring the unexplored genus *Lindernia antipoda* in Karur for every aspect of the plant.

## Materials and Methods
Frequent trips were made to study *Lindernia antipoda* (L.) Alston. The plant has been investigated for its eidonomical traits. The plant has been photographed using the Nikon D3300 model camera and the habit and its floral parts were hand-drawn and scanned using cam scanner application and were grouped into a photo plate.

## Result and Discussion
The critical examination of the plant specimen helped in identification. Further confirmation has been made by the Botanical Survey of India, Coimbatore, Tamil Nadu, India. The organization authorized the plant with reference no. BSI/SRC/5/23/2016/Tech./137. The genus consists of annual glabrous marshy herb, leaves opposite, entire, ribbed or penninerved, flowers small, axillary and solitary, calyx 5 lobed, deep narrow lobes, corolla bilipped; tube cylindrical, stamens two, upper perfect, lower reduced often glandular-hairy staminodes, multiovary, style slender, stigma bilamellate, fruit an ovoid oblong, seeds numerous, rugose.

### *Lindernia antipoda* (L.) Alston
*Lindernia antipoda* (L.) Alston is a well-known weed found in the rice field of India, Japan, China, and wetlands is one of the least concerned species as per the IUCN 2009 list. The plant is a small decumbent, trailing plant with axes upright at the ends having 15 to 20 cm height and branched. It exhibits a taproot system 4-6 cm length with numerous adventitious fibrous roots at the nodes that are approximately 3-6 in numbers ranging in length between 2-4 cm. The stem is quadrangular and glabrous. First spread on the ground and then straighten at flowering. The stem has no taste and odour. The leaves are simple, face each other, and are chlorophyllous. They are sessile, glabrous with broad petiole. The blade is oblong, lanceolate or elliptical. They have an obtuse or sub-acute apex with a slightly decurrent base corner. Fine and regularly toothed laminal margins with a single central rib. The petiole had pale white color and the midvein was discontinuous. The length of the leaves were 23-26 mm. The flowers are solitary in axil borne on terminal racemes. The pedicel measures 10 to 15 mm. calyx consists of 5 sepals welded in a tube at the base and separated almost to the base. Denticulate margin mark the end of acute lobes. Corolla is 10-12 mm long. It forms a tube that opens into two flattened lips. It is light blue to light purple in pigmentation. Entire or barely bilobed upper lip. The lower lip is largely trilobed. They consist of two linear fertile stamens and 2 hooked staminodes of yellow color. Ovary is superior with axile placentation. The gynoecium was 0.8 mm in length. The fruit was an elongated, tapered capsule of 8 to 15 mm long, twice the length of lasting calyx. The plant bears glabrous purple fruit. The fruit was 25-28 mm length along with the capsule. Seeds were diamond to altered diamond in shape. (Fig.1)

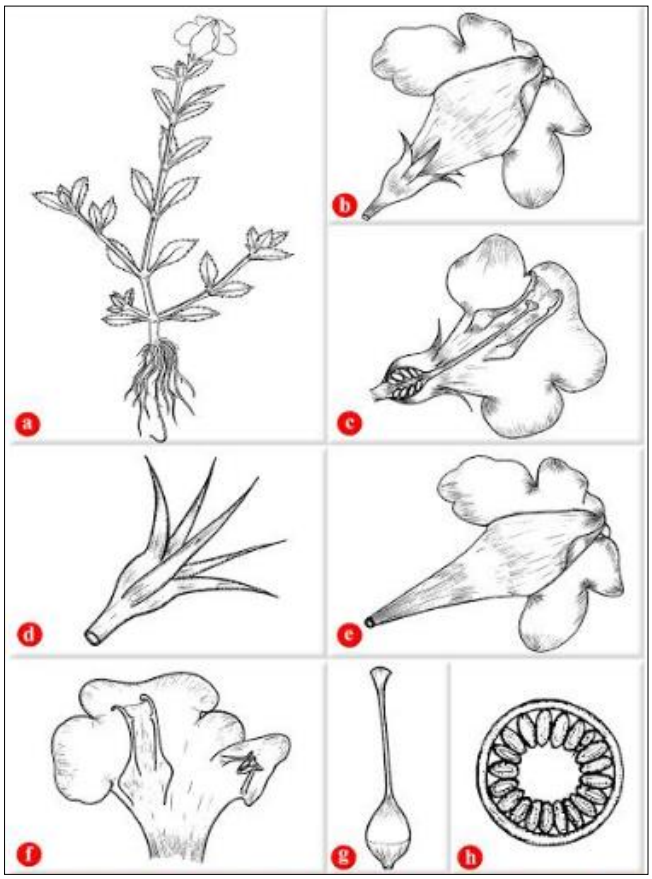

**Fig 1:** Eidonomical architecture of *Lindernia antipoda* (L.) Alston a. Habit ; b. Entire flower; c. L. S. of the Flower ; d. Calyx; e. Corolla ; f. Epipetalous stamen ; g. Gynoecium with stigma ; h. C. S. of the Ovary.

**Flowering and fruiting:** August-October
**Distribution:** Tropical and Subtropical Asia and Australia, Southeast Asia, Indochina, Australia, Polynesia, South and Central China, Japan. Rivers, rice fields and semi wet land are the habitats of *Lindernia antipoda* (L.) Alston.
**Indian distribution:** All Districts near river banks and paddy fields.

## Conclusion

Complete exploration of a plant in morphology is much essential for taxonomy. Thus the red-listed plant has been taxonomically studied to empower basic knowledge on the plant before advanced and applied studies.

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