

## ORIGINAL ARTICLE

# TAXONOMIC AND ECOLOGICAL APPRAISAL OF *IXORA JOHNSONII* HOOK.F. (RUBIACEAE)

<sup>1</sup>Sreekumar, K.R., <sup>2</sup>Joby Paul, and <sup>3</sup>Rogimon P. Thomas

## Introduction

Johnson collected a shrub from Wennamala, near Cochin on 13<sup>th</sup> February 1865, with a collection number 1066/62. Ramaswamy also collected same species with collection number 1560, without date and locality. Both collectors were never published their collection but subsequently their specimens reached KEW herbarium. Later, during his magnificent work on Indian floristics, Hooker (1880) described the Johnson's collection as *Ixora johnsonii* in his Flora of British India, 3:139. Gamble (1921), Mohanan (1984) and Hussain and Paul (1989) also reported the species from midlands of Kerala state. Dan *et al.* (1997) conducted a scrutiny and cleared the taxonomic equivocalness concerning the identity of this species and Sasidharan (1998) reported from the Periyar Tiger reserve. Recently, the conservation status and distribution range of *I. johnsonii* was analysed by Prasanthkumar and Sujanalpal (2008). However, due to many misidentified specimens, the taxonomic and nomenclature ambiguity on this species still exists and nothing on the population structure known. We conducted a scrutiny along the midland regions of the state and found this shrub in the rubber plantations of Kooropada, Kottayam district. The habitat and ecology of this critically endangered species were discussed in this paper. A short description, citation and nomenclature notes of this species also appended.

## Description

*Ixora johnsonii* Hook. f., Fl. Brit. India, 3: 139. 1880; Gamble, Fl. Pres. Madras, 630, (444). 1921; Mohanan, Fl. Quilon Dist., 212. 1984; Hussain &

Paul, *J. Econ. Tax. Bot. Addl. Ser.*, 6: 131. 1989; Dan *et al.*, *Rheedea*, 7: 73. 1997; Sasidharan, Fl. Periyar Tiger Reserve, 177. 1998.

**Type:** India, Cochin, Wennamala, 13.02.1865, Johnson 1066/62 (barcode / id K000031341) (K).

Perennial under shrub, 20–60cm tall, stem erect. Roots stoloniferous. Leaves simple, opposite, decussate, entire, petiolate; petiole 2.5–10mm long, green to reddish-brown; lamina 8–25 × 4–13cm, elliptic–obovate, base cuneate, apex mucronate, lateral veins 9–12 pairs, prominent on the adaxial side, greyish-white patches radiate from the midrib; stipules interpetiolar, 5–6.5mm long, laterally joined at the base forming a tube, broadly triangular with a central cusp with dense golden, brownish hairs on the inner side. Inflorescence subsessile, peduncle 4–10mm long, puberulous, bright red, with branchlets and pedicels articulated at ramifications; each unit a corymb of 10–30 flowers. Flowers sessile to shortly pediceled; pedicel 1–5mm long, puberulous, reddish-brown; bracts 5mm long, reddish-brown, bracteoles 4mm long, reddish-brown; calyx lobes 4, linear–triangular, acute, puberulous, reddish-brown; corolla white, tubular, slender, glabrous, 15–30mm long; lobes 4, 4.5–9mm long, oblong; stamens 4, attached at the mouth, alternating with corolla lobes; filaments short 2.5–3mm long; anthers linear, 4–5.5mm long, beaked, bifid, creamy-white; ovary 2 celled, ovules 1 per locule, axillary; style slender, 15–30mm long, bright red; stigma bifid, 3.5–4.5mm long, bright red. Fruit berry, green, bright red when ripe, 5.6–6.5mm diameter, accrescent calyx; 2 seeded.

**Specimen examined:** India, Kerala, Kottayam District, Kooroppada, 70 m, 24 May 2013, Sreekumar 112, 131 (CMS).

**Nomenclature notes:** The correct nomenclature of this species is very much confusing due to incorrect citations in the various floras and taxonomic revisions. Our scrutiny on the nomenclature of this species also agreed with The Plant list (2013) and IPNI (2013), and the correct name of the species is *Ixora johnsonii* Hook.f. even though Hooker named '*johnsoni*' as the specific epithet. This change has made by IPNI and can be seen in the

record history; which was according to the Saint Louis Code: Article 60 C1(b) of ICBN (2103, Electronic version).

**Endemism:** Endemic to Southern Western Ghats.

**Status:** Critically endangered CR B1 + 2C

### Habitat and ecology

*I. johnsonii* grows as perennial under-shrub in rubber and mixed plantations of Southern Western Ghats. The distribution of the species has restricted to the midland regions of Kerala districts such as Ernakulam, Kottayam, Kollam, Idukki and Pathanamthitta, especially in 30–70m MSL. World Conservation Monitoring Centre and IUCN have listed this species as ‘Critically Endangered’ and its conservation status is CR B1 + 2C; ver. 2.3 (1998). The present investigation encountered healthy population of *I. johnsonii* in bloom along small tracts of rubber and mixed plantations the Kooroppada Panchayath, Kottayam district. The population assessment indicated that, there are 14-20 individuals of ca. 40cm height found in two sites. The species prefers laterite soil with high moisture content and medium shade for sustenance. Since the seed setting and germination of this species was probably low, stoloniferous mode of regeneration observed, where underground root produces new individuals and the roots persists and supports further growth of each individuals. The associated flora includes *Abrus precatorius*, *Adiantum latifolium*, *Blepharis maderaspatanensis*, *Canthium angustifolium*, *Chromolaena odorata*, *Cyathula prostrata* and *Mikania micrantha*. The flowering and fruiting season is January to June where sunny climate probably initiate flowering. Similar to many *Ixora* species, the flowering time is 8-11 AM and blooms persists up to 2-4 days. Changes in the landuse pattern, habitat alteration and modernization of agricultural practices like application of chemical weedicides, mechanical removal of shrub layer by earthmovers, cutting machines, introduction of cover crops and weed infestation have created an increased pressure on the environment and existing natural vegetation, especially for the surviving population of this critically endangered species. The narrow distributional range and occurrence of unprotected areas have pushed this species to the

brink of extinction. Hence urgent steps need to be taken to conserve this critically endangered species.

### **Plantation ecosystem biodiversity**

The state of Kerala is a treasure trove of biodiversity which is scattered throughout the state. Kerala is unique in its urban, homestead, domestic and plantation biodiversity. The plantations across the state support a variety of flora and fauna with notable conservation measures. Several endangered and vulnerable species of plants like *I. johnsonii* and animals are associated with the plantations in Kerala. Though, monoculture plantations are against ecological resilience and stability, the plantations in Kerala state are of mixed crop pattern and hence the epitome of biodiversity. As Kerala is bestowed with small holder ecosystems, the diversity and density will be much higher. Each small holder ecosystem is considered peculiar and exclusive in terms of biodiversity which is evident from the Peoples Biodiversity Registers (PBR) at the Panchayath level. So *in situ* method of conservation of *I. johnsonii* is suggested and it requires efforts and supports from government and non-government agencies.

### **References**

- Dan, M., Santhosh Kumar, E.S. and Thomas, J. 1997. On the identity of *Ixora johnsonii* (Rubiaceae) - A less known endemic plant of Southern Western Ghats, India. *Rheedea* 7: 73-76.
- Gamble, J.S. 1921. *Flora of the Presidency of Madras* 2: 630. Adlard & Son Ltd. London.
- Hooker, J.D. 1880. *Flora British India* 3: 139. L. Reeve, London.
- Husain, T. and Paul, S.R. 1989. Taxonomic studies on Indian species of the genus *Ixora* L. (Rubiaceae) *Journal of Economic and Taxonomic Botany: Additional Series* 6: 131.
- ICBN, 2013. Saint Louis Code: Electronic version. Available at: <http://www.bgbm.org/iapt/nomenclature/code/SaintLouis/0065Ch7OaGoNSec1a60.htm> Downloaded on 23 June 2013.
- IPNI, 2013. Available at: <http://www.ipni.org/ipni/idPlantNameSearch.do;jsessionid=DB0F>

- B0453A410FCFA732E711DF624EE1?id=754073-1&back\_page=&show\_history=true. Downloaded on 23 June 2013.
- Mohanan, C.N. 1984. *Studies on the flora of Quilon district, Kerala* 212. Botanical Survey of India, Coimbatore; University of Madras.
- Prasanthkumar, K.G. and Sujanapal, P. 2008. Conservation status and distribution range of *Ixora johnsonii* Hook. f. (Rubiaceae). *Current Science* 95(8): 1004 -1005.
- Sasidharan, N. 1998. *Flora of Periyar Tiger Reserve* 177. Kerala Forest Research Institute, Peechi.
- The Plant List, 2013. <http://www.theplantlist.org/tpl/record/kew-103607> Downloaded on 23 June 2013.
- World Conservation Monitoring Centre 1998. *Ixora johnsonii*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 09 June 2013.

**<sup>1</sup>II. M. Sc. Student**

Department of Botany, C.M.S. College, Kottayam, Kerala-686001

**<sup>2</sup>Research Associate**

Community Environmental Resource Center, ATREE,  
Alappuzha, Kerala-688 001

**<sup>3</sup>Assistant Professor**

Department of Botany, C.M.S. College, Kottayam, Kerala-686001  
Corresponding author: [sreekumarvineeth004@gmail.com](mailto:sreekumarvineeth004@gmail.com)