

Short Communication

Astraea lobata (L.) Klotzsch (Euphorbiaceae) -A new addition to the flora of Assam, India

Rohit Kumar Verma^{1*}, Baleshwar Meena¹, Sushma Tamta², Lal Babu Chaudhary¹

¹Plant Diversity, Systematics and Herbarium Division, CSIR-National Botanical Research Institute, Rana Pratap Marg, Lucknow–226 001, Uttar Pradesh, India

²Department of Botany, Kumaon University, Nainital–263 001, Uttarakhand, India

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ABSTRACT

Astraea lobata (L.) Klotzsch (Euphorbiaceae) is reported here for the first time from Assam State (Dima Hasao District). Earlier this species was known only from Maharashtra (Solapur), Tripura (Agartala) and West Bengal (Darjeeling) in India. Detailed description, relevant taxonomic information, field data, photographs, distribution map and image of herbarium specimen of the species are provided here for easy identification.

Key words: : Assam, *Astraea lobata*, Dima Hasao, Euphorbiaceae, New record, North-East India.

INTRODUCTION

Astraea Klotzsch, one of the seven genera of Euphorbiaceae under the tribe Crotonae, comprises of ca. 13 species worldwide (Silva & Cordeiro, 2020). Earlier it was treated under the genus *Croton* L., however, the recent phylogenetic studies have established *Astraea* Klotzsch as a valid genus (Berry *et al.*, 2005; Caruzo *et al.*, 2014). Morphologically *Astraea* Klotzsch is identified by following characters: leaves usually deeply lobed, lacking basilaminar or acropetiolar nectaries; inflorescence spiciformis with bisexual cymules at base and staminate cymules toward apex; staminate flowers with imbricate calyx, petals bearing dense moniliform trichomes at the basal portion of their margins, stamens 11–15; pistillate flowers with a segmented nectary and with slender cylindrical multifid styles and seeds with rugulose testa, conspicuously carunculate, usually tetragonal in cross section (Silva *et al.*, 2019; Silva & Cordeiro, 2020). *Astraea lobata* (L.) Klotzsch is a weedy species that is widely distributed throughout the Neotropical region but has also been reported from Paleotropical regions as an alien species (Caruzo *et al.*, 2014).

In India, *Astraea lobata* (L.) Klotzsch was first reported by (Gaikwad *et al.*, 2012) from Maharashtra State (Solapur District). However, this species was treated under *Croton* L. (*C. lobatus* L.) by (Chakrabarty & Balakrishnan, 2012). Subsequently, it was further reported from Tripura State (Agartala District) (Das *et al.*, 2016) and W. Bengal State (Darjeeling District) (Biswas & Ghosh, 2019).

During a field survey, *Astraea lobata* (L.) Klotzsch was collected from Dima Hasao District of Assam State in North-East India, which forms a new record for the State as it has not been previously reported from here (Kanjilal *et al.*, 1940; Dutt *et al.*, 1974; Chakrabarty & Balakrishnan, 1997; Bora & Bhattacharyya, 2017). The identity of the species was confirmed with the help of some recent works (Webster, 1993; Gaikwad *et al.*, 2012; Das *et al.*, 2016;

Biswas & Ghosh, 2019; Silva *et al.*, 2019; Silva & Cordeiro, 2020). The detailed description along with relevant taxonomic information, ecological notes, field photographs, distribution map and image of herbarium specimen is provided to facilitate easy identification and authentication of the plant species.

MATERIALS AND METHODS

During a field survey, conducted during October 2018 in Dima Hasao district of Assam (North-East India), the plants of *Astraea lobata* (L.) Klotzsch were collected from the roadsides near Manderdisa village area which is located in Maibang Tehsil between 25°44.499'N and 93°08.334'E at 118 m elevation. The photographs were taken, and GPS location data were recorded using Garmin instrument (eTrex 10). For the preparation of herbarium specimens, the techniques outlined by Lawrence, (1951) and Jain & Rao, (1977) were followed. The voucher specimens of the species have been deposited at LWG for future record. The plants were examined under the stereo zoom dissecting microscope (Leica S8 APO) to record the morphological characters.

RESULTS

Astraea lobata (L.) Klotzsch, Arch. Naturgesch. (Berlin) 7: 194. 1841; Gaikwad *et al.*, *Rheedea* 22(2): 131. 2012; Das *et al.*, *Pleione* 10(2): 392. 2016; Biswas & Ghosh, *Pleione* 13(2): 422. 2019; Silva & Cordeiro, Pl. Syst. & Evol. 306: 41, figs. 17–19. 2020. *Croton lobatus* L., Sp. Pl. 2: 1005. 1753 'lobatum'; Chakrabarty & Balakrishnan in Balakrishnan *et al.*, Fl. India 23: 504. 2012. (Figures 1, 2)

Annual erect herbs or subshrubs up to 75 cm tall, branched, androgynous or bisexual. Stem ribbed, cylindrical or rounded with stellate white hairs. Stipules linear-lanceolate or filiform to subulate, slightly pubescent, ca. 5 mm long. Leaves simple, alternate, occasionally opposite; petiole 4.5–12 cm long, with 2 glands and glandular hairs at base; leaf blade 3.5–11 x 2–8.5 cm,

*Corresponding Author's E-mail: rohityash.verma2@gmail.com



Figure 1. *Astraea lobata* (L.) Klotzsch: A. Habit; B. Closeup of a twig; C. Closeup of inflorescence; D. Closeup of young fruits; E. Microscopic image of a mature seed.

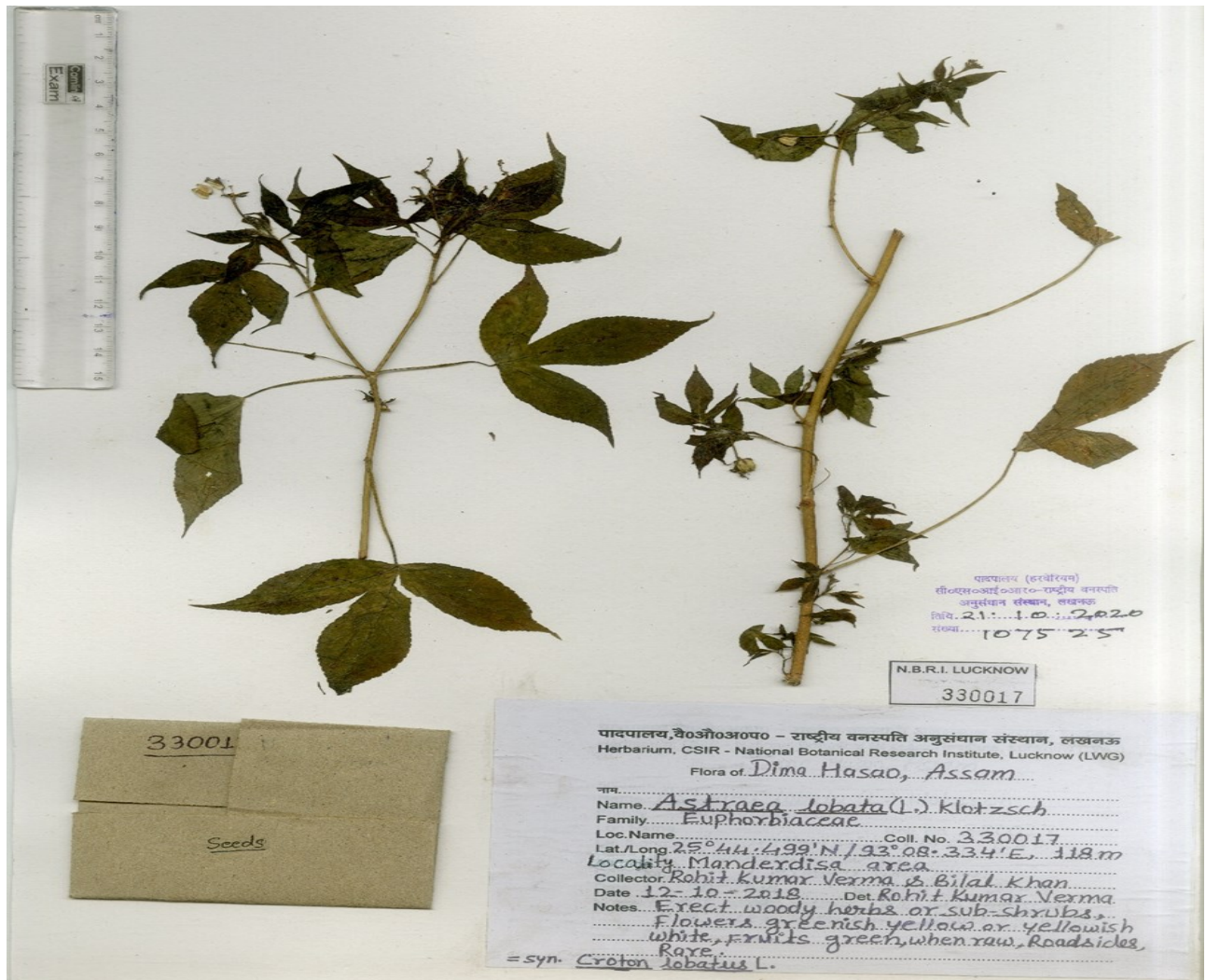


Figure 2. *Astraea lobata* (L.) Klotzsch: Image of an herbarium specimen.

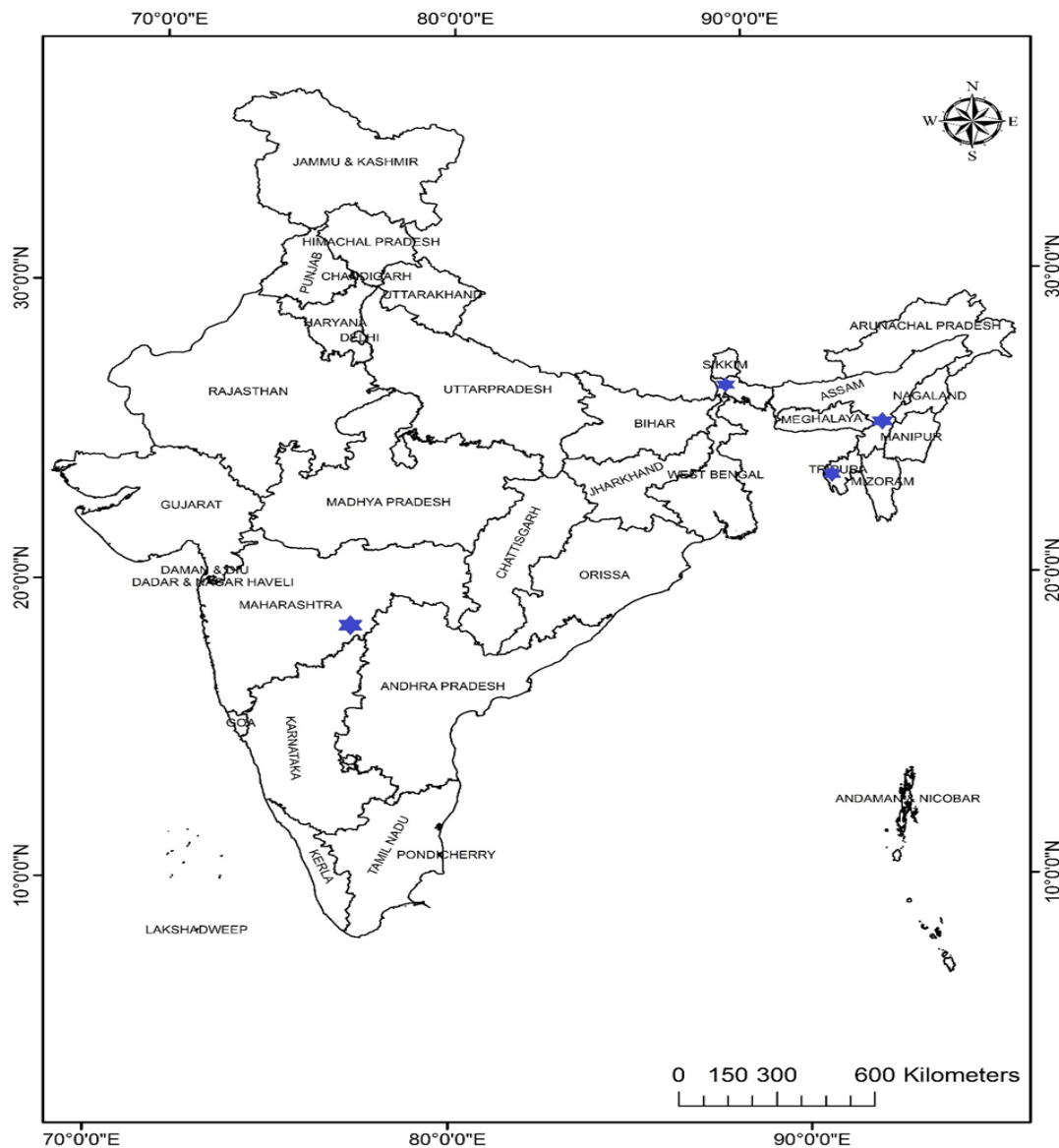


Figure 3. Map showing distribution of *Astraea lobata* (L.) Klotzsch in India

usually deeply 3-lobed, sometimes 3–5-lobed, rarely unlobed, central lobe elliptic to oblanceolate or oblanceolate to obovate, rounded to truncate at base, crenate-serrate at margins with glandular tips, acuminate at apex, 3–5-nerved at base, sparsely stellate-hairy, glabrous or slightly hairy on upper surface, pubescent on lower surface, Inflorescences 4–12 cm long, usually terminal or axillary raceme, slender, male and female flowers separately arranged, sometimes intermixed and both are present together on same rachis. Flowers pentamerous, actinomorphic, incomplete, unisexual, regular, greenish yellow or yellowish white. Male flowers 3–16; bracts filiform, 1–1.3 mm long; buds globular; pedicels 1.5–2 mm long, slender, slightly hairy or glabrous; sepal 5, 1–1.5 mm long, unequal, ovate-oblong, obtuse at apex, free, green with purple-tinge, ciliate; petals 5, hyaloid, 1.5–2 mm long, obovate-oblong; stamens 10–13, basally connate; filaments ca. 2 mm long; anthers 2-celled. Female flowers 1–6; bracts ca. 1 mm long, linear-lanceolate, subulate, hairy; pedicels 1–1.5 mm long, stout; sepals 5, 4.5–8 x 1–1.5 mm, green, persistent, oblanceolate to spatulate, connate at base, acute at apex, dentate and glandular pubescent at margins; corolla may be reduced to a hair; ovary superior, trilocular, reddish,

usually stellate-hairy, rarely glabrous; styles 2.5–5 mm long, 3-fid, each one divided into 2–4 linear branches. Fruits 5–8 mm in diameter, 3-lobed, ovoid-oblong, smooth or slightly pubescent. Seeds 3, 4.5–6 × 2.5–3.5 mm, ellipsoid, thick, rugulose, ash grey colour with dull brown spots; caruncle conical or reniform-peltate, yellowish.

Flowering & Fruiting: July–November.

Habitat: Found along roadsides in open areas, near human settlements and associated along with other herbaceous plants like *Abutilon indicum* (L.) Sweet, *Achyranthes aspera* L., *Amaranthus viridis* L., *Croton bonplandianus* Baill., *Cynodon dactylon* (L.) Pers., *Malvastrum coromandelianum* (L.) Garcke, *Phyllanthus amarus* Schumach. & Thonn., *Sida acuta* Burm. f., *Tridax procumbens* L., etc.

IUCN Red List Status: Not evaluated (IUCN 2022).

Local Conservation Status: Rare in local areas, very small population was found only at one place in the Dima Hasao district. Since, it is considered as an invasive alien plant species, its proper management is very

much required (Dogra *et al.*, 2010; Mandal, 2011).

Distribution: It is native to South America and West Indies; but also naturalized in other parts of the world (Senegal, Eritrea, Ethiopia, Arabian Peninsula, Bangladesh, India).

Distribution in India: Maharashtra, Tripura, West Bengal and now in Assam (**Figure 3**).

Specimen Examined: INDIA, Assam, Dima Hasao district, Manderdisa, 25°44.499' N & 93°08.334' E, 118 m, 12.10.2018, Rohit Kumar Verma & Bilal Khan 330017 (LWG).

DISCUSSION

Astraea lobata (L.) Klotzsch is a widespread weedy species occurring throughout the Neotropical region, mostly in disturbed environments, such as anthropic areas or secondary vegetation (Silva *et al.*, 2019; Silva & Cordeiro, 2020). However, it has been introduced and naturalized outside of its native range in Paleotropics as an alien invasive species (Khan & Khan, 2002; Schmelzer, 2007; Gaikwad *et al.*, 2012; Caruzo *et al.*, 2014). It seems that the species has great capacity to proliferate and dominate local flora in new areas. In India, this species was first reported in 2012 from Maharashtra State (Gaikwad *et al.*, 2012) and subsequently from Tripura (Das *et al.*, 2016) and West Bengal (Biswas & Ghosh, 2019) in 2016 and 2019 respectively and now here from Assam State. These States are widely located from each other in different parts of India. It reflects that this alien species is gradually spreading in India and in near future it may badly affect the local flora due to its invasive nature. Therefore, attention must be given towards the management of the species and its eradication before it creates havoc to the local biodiversity (Schei, 1996; Bhowmik, 2005).

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