

HETEROCENTRON SUBTRIPLINERVIUM (MELASTOMATACEAE) – THE FIRST REPORT OF NATURALISATION OF A POTENTIAL INVASIVE ALIEN SPECIES IN ASIA FROM INDIA

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Heterocentron subtripplinervium (Link et Otto) A. Braun et C. D. Bouche, a potential invasive alien species is reported here for the first time for Asia from the Western Ghats of India. The plant is probably introduced deliberately into gardens for ornamental purpose from where it escaped and become naturalised in the Western Ghats. This species is a potential weed, which quickly conquers areas wherever introduced displacing the indigenous flora. A detailed description, illustration, photograph and relevant notes are provided for easy identification in the field.

Key words: *Heterocentron*, India, invasive plant, Western Ghats

INTRODUCTION

The genus *Heterocentron* was established by Hooker and Arnott in 1841 with a brief description of *H. mexicanum* collected from Mexico during the great voyage of Captain F. W. Beechey. *Heterocentron* today comprises about 29 species (The Plant List 2013) originally distributed in Neotropics. The genus is closely related to *Tibouchina* Aubl. in its capsular fruits, the ovary free from the hypanthium, ventral stamen appendages and cochleate seeds, but differs by its exclusively tetramerous flowers, penninerved leaves and anther morphology (Todzia 1999). While exploring the flowering plants of Munnar Hills of Western Ghats in southern India, the authors came across some interesting specimens of a melastome with penninerved leaves, a distinctive character unusual in Indian Melastomataceae. Critical studies revealed the distinctness of the species from all other known members of Indian Melastomataceae. Therefore, the details of the material was sent to Dr Susanne S. Renner, Ludwig-Maximilians-University of Munich, Germany, for her comments. Dr Susanne identified it as *Heterocentron subtripplinervium* (Link et Otto) A. Braun

et C. D. Bouche and this was further confirmed with relevant literature (Whiffin 1972) and consultation with the virtual herbaria of BM, K, MNHN and NY. *H. subtripplinervium* is an ornamental melastome popularly known as 'pearl flower', native to Mexico and Guatemala (Motooka *et al.* 2003). The plant is probably introduced deliberately into gardens for ornamental purpose during the period of the British Raj in India (1858–1947) or even later by the native garden plant growers, from where it escaped and become naturalised in the Munnar Hills of the Western Ghats. The plant is introduced and naturalised in Australia, New Zealand and South Africa and is reported to be a rapidly spreading invasive horticultural plant, which quickly conquers areas wherever introduced displacing the indigenous flora (Barker *et al.* 2004, Heenan *et al.* 2004, Henderson and Wilson 2017, Meyer and Medeiros 2011, Staples *et al.* 2000). The species is a prolific seeder and the seeds are spread mainly by birds. The plant mostly inhabits mesic to wet sites along roadsides and is a threat to wet and moist forest areas and wastelands in hill stations (Wagner *et al.* 1999). This plant is rapidly spreading in the Munnar Hills and it may become a serious threat to the native flora especially in the high altitude hills of the Western Ghats, one of the biodiversity hotspots in India. The naturalised distribution of genus *Heterocentron* has not been reported from any Asian countries and hence the present report constitutes a new genus record to India as well as to Asia. A detailed description, illustration, photographs, etc. are provided here for precise identification and further control in the field.

Heterocentron subtripplinervium (Link et Otto) A. Braun et Bouche
Linnaea 25(3): 299 (1853)
(Figs 1–2)

Basionym: *Melastoma subtripplinervium* Link et Otto, Icon. Pl. Rar. [Link & Otto], p. 47, t. 24 (1829). ≡ *Heteronoma subtripplinervium* (Link et Otto) DC., Not. sur. Pl. Rar. Geneve, pp. 9–12 (1830)

Erect suffrutescent shrub. Stem and branches distinctly quadrangular, narrowly winged at angles, sparsely covered with smooth pale hairs of 0.5–1 mm long. Leaves of a pair essentially equal in size; petioles 4–6 mm long, sparsely hairy; lamina elliptic-obovate, 4.0–7.5 × 1.8–3.5 cm, acute at apex, acute or attenuate to slightly decurrent at base, chartaceous, sparsely appressed pilose above, densely so beneath along the veins, margins ciliate; veins pinnate, 3–5 pairs, raised beneath. Flowers 2–2.5 cm across, in terminal, simple or compound cymes or terminal on lateral branches; bracts foliaceous, ovate, 2.0–5.0 × 1.0–2.0 mm, acuminate at apex, margins ciliate, persistent; pedicels 5–7 mm long, pilose. Hypanthium (at anthesis) 4–6 × 3–4 mm, campanulate, green, copiously pubescent with spreading hairs. Calyx lobes 4, narrowly tri-

angular, 10–12 × 3.0–4.0 mm, acuminate-aristate at apex, margins revolute. Petals 4, white, obovate, 10–12 × 8–10 mm, subacute at apex, shortly clawed at base, margins glandular-ciliolate, caducous. Stamens 8, markedly dimorphic. Large (antesepalous) stamens: filaments 7–8 mm long, glabrous, 'S' shaped; anther 4.0–5.0 mm long, sagittate, ± horizontal to somewhat ascending, white; connective prolonged 5–6 mm below the anther, modified ventrally at the filament insertion into a bifid appendage of 2–3 mm long. Small (antepetalous) stamens: filaments 4–5 mm long, glabrous; anther *ca* 3 mm long, erect, yellow; connective prolonged below the thecae *ca* 0.20 mm and modified ventrally into a bifid appendage. Ovary elliptic, *ca* 4 × 2 mm, crowned by 4 bristly hairs; style 7–8 mm long, declined to one side of the flower opposing the larger stamens, glabrous; stigma pointed. Fruiting hypanthium campanulate, 6–8 × 5–6 mm with a somewhat muriculate-tuberculate surface formed by the enlarged hair bases. Seeds many, 0.4–0.5 × 0.3 mm, cochleate and tuberculate, pale brown.



Fig. 1. *Heterocentron subtripplinervium* (Link et Otto) A. Braun et C. D. Bouche. – 1 and 2 = plant; 3 = infructescence (taken by Anoop P. Balan)

Flowering and fruiting: May–August.

Habitat and ecology: This species mostly inhabits mesic to wet sites along roadsides and open degraded forest areas of high altitude hill stations, growing in association with alien weeds like *Ageratina adenophora* (Spreng.) R. M. King and H. Rob., *Ageratum houstonianum* Mill., *Lantana camera* L., *Phytolacca octandra* L., etc. in the Western Ghats. in disturbed areas. The plant is a

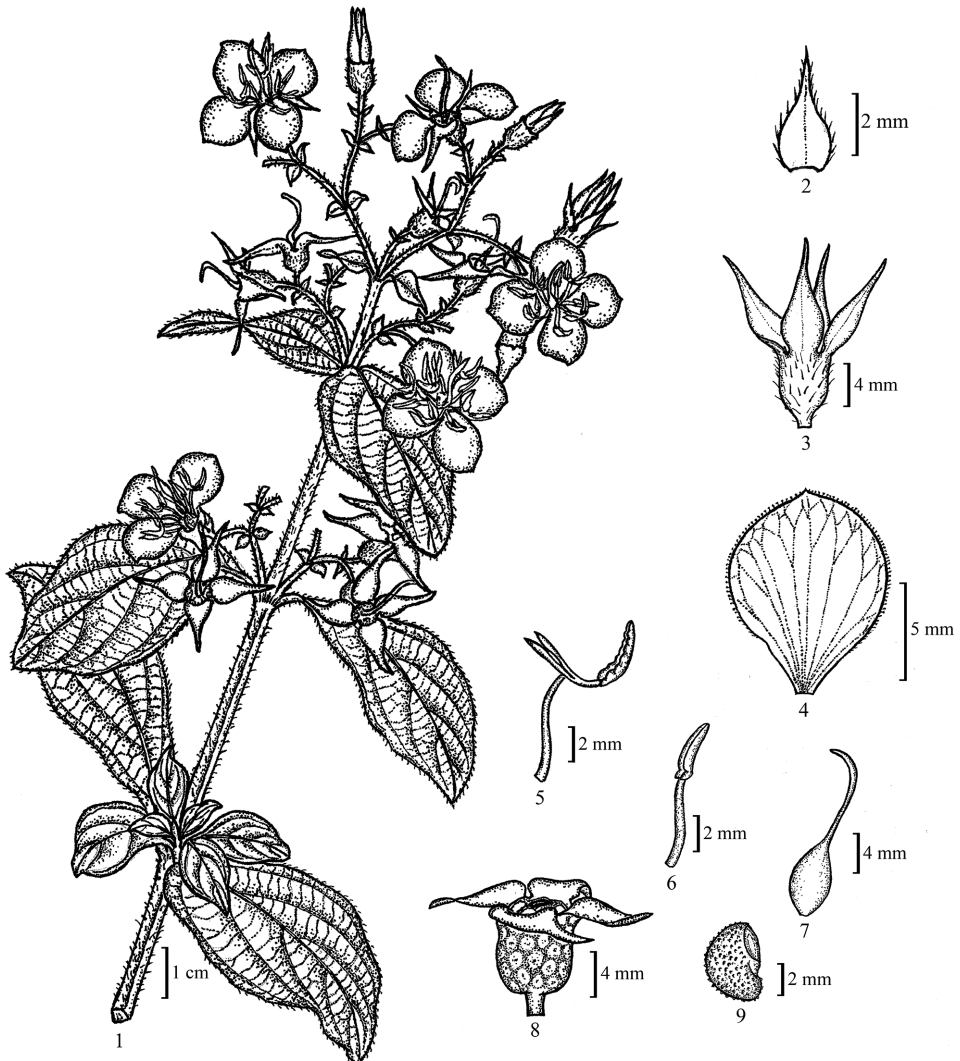


Fig. 2. *Heterocentron subtripplinervium* (Link et Otto) A. Braun et C. D. Bouche. – 1 = habit; 2 = bract; 3 = hypanthium; 4 = petal; 5 = antisepalous stamen; 6 = antipetalous stamen; 7 = pistil; 8 = fruit; 9 = seed (drawn by Anoop P. Balan)

prolific seeder and often forms dense tangled understory growth. The plant is located in the margins of Anamudi Shola National Park, a protected forest area in South India and is a potential threat to the highly endemic herbaceous flora of the national park.

Local distribution: We could locate 3 populations of *H. subtripplinervium* with about 62 mature individuals within an extent of occurrence of < 30 km² in the Munnar Hills. Extensive field surveys are required to estimate the actual range of invasion of this alien species in the Western Ghats.

General distribution: Australia, Belize, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mauritius, Mexico, New Zealand, Nicaragua, Panama, South Africa and United States; now in India.

Specimens examined: INDIA: Kerala, Idukki district, Munnar Hills, ±1,800 m, coll.: Anoop P. Balan (16245), 17 July 2018; coll.: Anoop P. Balan and A. J. Robi (16300), 20 October 2018 (MBGH, MH).

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REFERENCES

- Barker, J., Randall, R. and Grice, T. (2004): *Weeds of the future? Threats to Australia's grazing industries by garden plants*. – Meat and Livestock Australia Limited, North Sydney, 105 pp.
- Heenan, P. B., de Lange, P. J., Cameron, E. K., Ogle, C. C. and Champion, P. D. (2004): Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: additional records 2001–2003. – *New Zealand J. Bot.* **42**: 797–814. <https://doi.org/10.1080/0028825x.2004.9512931>
- Henderson, L. and Wilson, J. R. U. (2017): Changes in the composition and distribution of alien plants in South Africa: an update from the Southern African Plant Invaders Atlas. – *Bothalia* **47**(2): a2172. <https://doi.org/10.4102/abc.v47i2.2172>
- Meyer, J. Y. and Medeiros, A. C. (2011): *Melastomes*. – In: Simberloff, D. and Rejmanek, M. (eds): *Encyclopedia of biological invasions*. University of California Press, Berkeley, 765 pp.
- Motooka, P., L. Castro, L., Nelson, D., Nagai, G. and Ching, L. (2003): *Weeds of Hawai'i's pastures and natural areas; an identification and management guide*. – College of Tropical Agriculture and Human Resources, University of Hawaii, Mānoa, 184 pp.

- Staples, G. W., Herbst, D. R. and Imada, C. T. (2000): Survey of invasive or potentially invasive cultivated plants in Hawai'i. – *Bishop Mus. Occas. Pap.* **65**: 1–31.
- The Plant List (2013): Version 1.1. – Published on the Internet; <http://www.theplantlist.org/> (accessed October 2018)
- Todzia, C. A. (1999): *Heterocentron chimalapanum* (Melastomataceae): a new species from Oaxaca, Mexico. – *Lundellia* **2**: 142–145. <https://doi.org/10.25224/1097-993x-2.1.142>
- Wagner, W. L., Herbst, D. R. and Sohmer, S. H. (1999): *Manual of the flowering plants of Hawai'i*. Revised ed. – University of Hawai'i Press, Bishop Museum Press, Honolulu, 1919 pp.
- Whiffin, T. (1972): *A systematic study of the genus Heterocentron (Melastomataceae)*. – PhD Diss., University of Texas, Austin.