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First record of *Hibiscus macverryi* (Malvaceae: sect. *Lilibiscus*) in Indian gardens with notes on horticulture, *ex-situ* conservation and propagation

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Abstract

Hibiscus macverryi L.A.J. Thomson & Braglia (Malvaceae), commonly known as ‘Ruby Rose’, is a Critically Endangered species endemic to Fiji. The species belonging to the *Hibiscus* sect. *Lilibiscus*, is reported here for the first time from Indian gardens based on cultivated plants in West Bengal. This communication provides a detailed taxonomic account, notes on its breeding history and horticultural significance, and describes its *ex-situ* conservation at the Acharya Jagadish Chandra Bose Indian Botanic Garden (AJCBIBG), Howrah.

Keywords: AJC Bose Indian Botanic Garden, *Ex-situ* conservation, *Hibiscus macverryi*, malvaceae, wedge grafting

Introduction

The genus *Hibiscus* L. is a flowering plant genus belonging to the mallow family (Malvaceae: Malvoideae), comprising numerous species of herbs, shrubs, lianas, and trees native to warm temperate and tropical and subtropical regions of the world (POWO, 2025) [14]. The genus *Hibiscus* is represented by 437 species worldwide (Dalavi *et al.*, 2025) [7] and is represented in India by 33 taxa belonging to 10 sections (Dalavi *et al.*, 2025) [7]. Owing to their remarkable ornamental value, *Hibiscus* species have been extensively cultivated and hybridized, resulting in more than 24,000 registered cultivars globally (International Hibiscus Society, 2025) [10], of which over 477 cultivars have been registered in India (Swamy *et al.*, 2023; Chakraborty *et al.*, 2023^{a,b,c}, 2024^{a,b}, 2026) [16, 1, 2, 3, 4, 5, 6].

During taxonomic investigations of the *Hibiscus* collection maintained at the Acharya Jagadish Chandra Bose Indian Botanic Garden (AJCBIBG), Botanical Survey of India, Howrah, the authors encountered few cultivated plants in West Bengal characterized by perennial bushy shrubs with heterophyllous leaves, deep pink flowers bearing a conspicuous dark red serrated eye, a prominent rosy-red staminal column with bright yellow anthers, and five velvety crimson stigmas. Detailed morphological examination and comparison with the protologue (Thomson and Braglia, 2019) [18] and relevant literature (Wilcox and Holt, 1913) [19] confirmed the identity of these plants as *Hibiscus macverryi* L.A.J. Thomson & Braglia.

Hibiscus macverryi is a Critically Endangered species endemic to the Fijian islands of Taveuni and Vanua Levu. It belongs to *Hibiscus* sect. *Lilibiscus*, one of the smallest cultivated sections of the genus, represented in India by only three species namely, *Hibiscus clayi* O. Deg. & I.Deg., *Hibiscus rosa-sinensis* L., and *Hibiscus schizopetalus* (Dyer) Hook.f. (Dalavi *et al.*, 2026) [8]. In its natural habitat, the species occurs in tropical moist forests at elevations of 50-300 m (Thomson and Braglia, 2019) [18]. Owing to its extremely restricted distribution, with fewer than 250 mature individuals remaining in the wild, it has been assessed as Critically Endangered (CR) on the IUCN Red List (Thomson and Linsky, 2020) [17].

The present study documents the first record of *Hibiscus macverryi* in Indian gardens, based on cultivated plants maintained in West Bengal. It provides a detailed taxonomic account, notes on its breeding history and horticultural significance, and describes its *ex-situ* conservation and propagation through wedge grafting at the Acharya Jagadish Chandra Bose Indian Botanic Garden. The study contributes valuable information for the conservation, cultivation, and sustainable utilization of this globally threatened ornamental species.

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Materials and Methods

Survey and collection

As part of an ongoing breeding programme aimed at developing new *Hibiscus* cultivars at the Acharya Jagadish Chandra Bose Indian Botanic Garden (AJCBIBG), Botanical Survey of India, Howrah, West Bengal, extensive field surveys were conducted across India during 2022-2026 to collect endemic, and native *Hibiscus* species and their elite ornamental cultivars. During botanical explorations in West Bengal, germplasm and voucher specimens of *Hibiscus macverryi* were collected from Hooghly and South 24 Parganas districts. The collected germplasm was established in the 'Hibiscus Section' of AJCBIBG for further study, conservation, and breeding.

Voucher specimens were processed and prepared herbarium as per the standard herbarium methodology (Jain and Rao, 1976) ^[11] and deposited in the Central National Herbarium (CAL), Botanical Survey of India, Howrah, West Bengal, India. The identity of the specimens was confirmed through detailed morphological comparison with the protologue (Thomson and Braglia, 2019) ^[18] and authenticated using digital images of type and reference specimens available at the South Pacific Regional Herbarium, Suva, Fiji (SUVA).

Propagation

Selection of plant material: Healthy 10-11-month-old saplings of *Hibiscus rosa-sinensis* L. maintained in the AJCBIBG nursery were selected as rootstocks. Newly emerging soft to semi-hardwood shoot tips (2-3 months old) of *Hibiscus macverryi* L.A.J. Thomson & Braglia were collected from healthy mother plants maintained in the *Hibiscus* section and used as scions. Secateurs, grafting knives, razor blades, transparent polythene tape, and polythene caps were used during grafting. Propagation experiments were carried out in the AJCBIBG nursery between 18 September and 15 October 2025.

Wedge grafting: Healthy shoot tips measuring 10 - 15 cm in length and 0.3 - 0.4 cm in diameter, each bearing 3 - 4 leaves, were collected from selected mother plants of *H. macverryi* (Fig. 2a-b). Thirty vigorous *H. rosa-sinensis* rootstocks, measuring 40 - 45 cm in height and 0.4 - 0.7 cm in stem diameter (Fig. 2c), were selected for wedge grafting. The upper portion of each rootstock was removed, leaving 5 - 8 cm of stem above ground level. The basal end of each scion was trimmed into a wedge ('V') shape using a sharp grafting knife and inserted into a corresponding slit made on the rootstock. The graft union was tightly secured with 1.5 - 2.0 cm wide transparent polythene tape to prevent desiccation and ensure close cambial contact (Fig. 2d-f). Each graft was then covered with a transparent polythene cap (Fig. 2g-h) to maintain high humidity and minimize transpiration. The grafted plants were maintained under greenhouse conditions for 2 - 3 weeks until successful graft union and sprouting were observed.

Ex situ conservation

Successfully established grafted plants were maintained in the AJCBIBG nursery for hardening and subsequent

establishment. After acclimatization, healthy saplings were transferred to the *Hibiscus* section and the Endemic and Threatened Plants Section of AJCBIBG, where they are maintained as part of the *ex situ* conservation programme. The propagated plants also serve as valuable germplasm for future breeding, multiplication, and conservation of this Critically Endangered species.

Results and discussion

Taxonomic description

Hibiscus macverryi L.A.J. Thomson & Braglia, Pacific Sci. **73**: 104. 2019. [Fig. 1]

Type: Fiji, Taveuni, Waibula River, 8 June 2016, Lex A. J. Thomson LAJT2 (SUVA!).

Shrubs, up to 150 cm long; branches spreading, green; internodal portion 2.6 - 3.5 cm long. Leaves simple, 1 to 3-lobed, petiolate; petiole 3.5 - 3.8 × 0.2 - 0.3 cm wide; blades broadly ovate, 8.3 - 9.5 × 6.5 - 7.5 cm, cordate at base, crenate along margin, acute at apex, dark green above, light green and pubescent beneath, palmately 5-nerved from the base; stipules linear to lanceolate, 0.6 - 0.7 × 0.1 - 0.2 cm. Inflorescence axillary, solitary; peduncle 3.5 - 4 × 0.1 - 0.2 cm; pedicel 0.5 - 0.7 × 0.2 - 0.3 cm; flower bud pinkish red, 4 - 4.6 × 1.5 - 2 cm. Flowers velvety pink with dark red eye zone, 11.5 - 12.0 cm in diameter. Epicalyx 2.5 - 2.7 cm in diameter, linear to lanceolate, 7-lobed; lobes 0.9 - 1 × 0.4 - 0.5 cm. Sepals c. 2 × 2.5 cm, united below the half, tube 1.3 - 1.4 × 0.4 - 0.5 cm, 5-lobed; lobes ovate-lanceolate, 0.9 - 1 × 0.4 - 0.5 cm, acute to acuminate at apex. Petals 6 - 6.2 × 4 - 4.2 cm, polypetalous, 5 - 6, obovate, cuneate to unequal at base, entire to undulate along margin, rounded at apex, upper surface velvety pink with red eye, lower surface pale pink, veins prominently raised beneath. Staminal column pinkish red, 7 - 7.4 × 0.2 - 0.3 cm; naked zone 5 - 5.3 cm long; anther zone 2 - 2.5 × 1.0 - 1.3 cm; anthers 0.1 - 0.2 × 0.2 - 0.3 cm, kidney shaped, yellowish in colour; filaments 0.3 - 0.6 × c. 0.1 cm. Pistil 4.5 - 5 cm long; ovary cylindrical, 1.0 - 1.2 × 0.4 - 0.5 cm; style 3.5 - 3.6 cm long, 0.1 cm wide, linear; stigma red, 0.2 - 0.8 × 0.3 - 0.9 cm, 5-lobed; lobes 0.2 - 0.3 × 0.2 - 0.3 cm, unequal, densely hairy. Capsules not seen.

Flowering: November - February.

Common names: Di Lutu's 'aute, Jungle *Hibiscus*, Mrs. Hassinger's *Hibiscus*, Ruby Rose.

Specimens examined: India, West Bengal, Hooghly district, Singur village, 22°47'22.5"N, 88°12'05.5"E, 16.10.2025, D. Chakraborty 103998 (CAL); South 24 Pargana, New Tollygunge, Purba Putiary, 22°28'38.8"N, 88°20'57.0"E, 12.11.2025, D. Chakraborty 103999 (CAL).

Propagation: *Hibiscus macverryi* can be propagated through stem cuttings and grafting.

Notes: *Hibiscus macverryi* has been extensively used in hibiscus breeding programmes under the horticultural name 'Mrs Hassinger', particularly during the development of the early Hawaiian hibiscus hybrids. 'Mrs Hassinger' was involved in 34 hybrid combinations, serving.

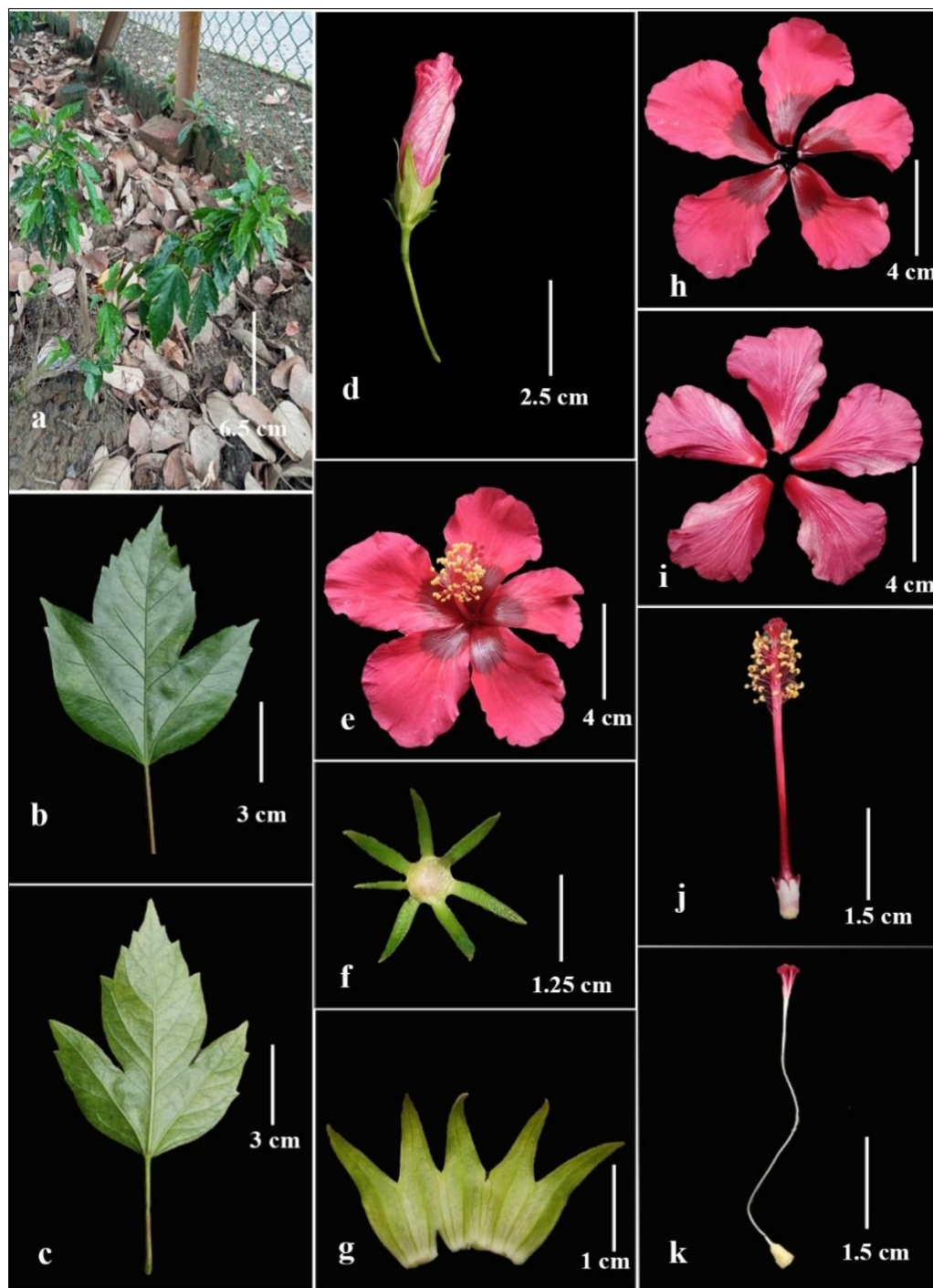


Fig 1: *Hibiscus macverryi* L.A.J. Thomson & Braglia: (a), Habit; (b,c), Leaves in upper and lower surface; (d), Flower bud; (e), A flower; (f), Epicalyx; (g), Calyx; (h), Corolla upper surface; (i), The same from lower surface; (j), Staminal column with pistil; (k), Pistil

as the female parent in 30 of these crosses, and has made a significant contribution to the development of modern tropical hibiscus cultivars (Wilcox and Holt, 1913) ^[19]. More recently, the species has been cultivated in horticulture under the name 'Ruby Rose' in the United Kingdom, Europe, Asia, Hawaii, and the mainland United States before being formally described as *Hibiscus macverryi* L.A.J. Thomson & Braglia (Thomson and Braglia, 2019) ^[18].

According to Thomson and Linsky (2020), *H. macverryi* has an extremely restricted distribution and is currently known from only four localities on the Fijian islands of Taveuni and Vanua Levu. The wild population comprises fewer than 250 mature individuals, with each subpopulation estimated to contain fewer than 50 individuals. The species is

threatened by severe tropical cyclones, flash flooding, invasive weeds, and collection for hybridization with other *Hibiscus* species. It is also susceptible to root rot, dieback, leaf blight, leaf curl disease, and infestation by pests such as mealybugs and red spider mites. These factors continue to drive the decline of the wild population, resulting in its assessment as Critically Endangered [CR C2a(i)] on the IUCN Red List (Thomson and Linsky, 2020) ^[17].

The pathway through which *H. macverryi* was introduced into India remains unknown. The species has been maintained as an ornamental in gardens and private home gardens in West Bengal and is reported here for the first time from Indian gardens. Owing to its attractive deep pink flowers with a prominent dark red eye, the species possesses considerable ornamental and horticultural value.

Consequently, it has excellent potential for commercial nursery production, landscape planting, and future hibiscus breeding programs.

Rootstock-scion compatibility is a critical factor influencing the success of grafting, as poor graft unions may reduce plant vigour, compromise quality, cause graft failure, or even result in premature death (Fallik and Ilic, 2014) ^[9]. Successful graft union depends largely on the compatibility between the rootstock and scion, which is generally associated with their taxonomic proximity (Silva *et al.*, 2019) ^[15]. Although intraspecific grafting usually exhibits higher compatibility than interspecific grafting (Mudge *et al.*, 2009) ^[13], interspecific grafting can effectively exploit desirable traits from related species (Lee *et al.*, 2010) ^[12].

In the present study, interspecific wedge grafting was successfully carried out using *H. macverryi* as the scion and

H. rosa-sinensis as the rootstock, resulting in a 53% graft success rate after 20 days (Fig. 2i-j). The successful graft union demonstrated good compatibility between the two species and facilitated rapid healing and establishment without any visible incompatibility symptoms. This technique enables efficient multiplication while conserving valuable propagules of *H. macverryi*, which would otherwise be required as rootstocks. Furthermore, the use of the widely cultivated *H. rosa-sinensis* as a rootstock may improve adaptability under diverse cultivation conditions. Following successful establishment, the grafted plants were introduced into the 'Hibiscus Section' and the 'Endemic and Threatened Plants Section' of the Acharya Jagadish Chandra Bose Indian Botanic Garden for long-term *ex-situ* conservation, multiplication, and utilization in future breeding programs.



Fig 2: Propagation of *Hibiscus macverryi* L.A.J. Thomson & Braglia grafting procedure (a-h): (a), A portion of twigs; (b), Scion of *H. macverryi*; (c), Root stock of *H. rosa-sinensis*; (d-f), Grafting between root stock and scion through grafting tape; (g-h), Covered with transparent polythene cape; (i-j), Sprouted after successful grafting

Conclusion

This study reports the first occurrence of *Hibiscus macverryi* L.A.J. Thomson & Braglia in Indian gardens and documents its successful cultivation, *ex situ* conservation, and propagation at the Acharya Jagadish Chandra Bose Indian Botanic Garden, Botanical Survey of India, Howrah. Wedge grafting using *Hibiscus rosa-sinensis* L. as the rootstock proved to be an effective propagation technique, achieving a 53% graft success rate. The developed propagation procedure provides a practical approach for the rapid multiplication, long-term conservation, and sustainable utilization of this Critically Endangered ornamental species, thereby contributing to the conservation of global *Hibiscus* diversity.

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