

Rediscovery of *Ophiorrhiza radicans* (Rubiaceae) from the Western Ghats of Peninsular India

Ginu Joseph*, V.S. Hareesh¹, V.B. Sreekumar¹ and T.K. Hrideek

Department of Forest Genetics and Tree Breeding, Kerala Forest Research Institute
Peechi, Thrissur-680 653, Kerala, India

¹Department of Forest Botany, Kerala Forest Research Institute, Peechi, Thrissur-680 653, Kerala, India.

*E-mail: ginujoseph1@gmail.com

Abstract

Ophiorrhiza radicans Gardn. was rediscovered from Shenduruney Wild Life Sanctuary, Western Ghats of Kerala region after a lapse of 120 years. A detailed taxonomic description and illustration of this species is provided for easy identification.

Keywords: Camptothecin, *Ophiorrhiza radicans*, rediscovery, Rubiaceae, Western Ghats

Introduction

The genus *Ophiorrhiza* consists of 31 species and 10 varieties in India (Deb & Mondal, 1997; Mabberley, 2008). While conducting the studies on RET species in Kerala part of the Western Ghats, the authors collected an interesting specimen of *Ophiorrhiza* from Shenduruney Wild Life Sanctuary. After critical studies and comparison with type specimen it is revealed to be *Ophiorrhiza radicans* Gardn., a species thought to be possibly extinct in India by many authors (Nayar & Sastry, 1988; Deb & Mondal, 1997). This species was first described by Gardner in 1864 based on a specimen (C. P. 1706) collected by Thwaites from Sri Lanka. Later M.A Lawson collected this species from "Colatoorpolay" of the present Kulathoorpuzha in Kollam District of Kerala. Deb and Mondal (1997) while revising the genus in India has commented that "it has not been collected in India after 1893, though Kerala and adjoining areas have been fairly well explored in recent years. Possibly it is extinct". Despite intensive botanical exploration in this region during the last several years, this species seems to have escaped the attention of botanists.

Most species of *Ophiorrhiza* are characterized by the presence of a cytotoxic alkaloid, camptothecin, which is the only naturally occurring topoisomerase-1 inhibitor (Martin *et al.*, 2007; Yamazaki *et al.*, 2003). The presence of camptothecin gives great importance to *Ophiorrhiza* species in cancer research and hence this rediscovery has added significance.

Ophiorrhiza radicans Gardn. in Thwaites, Enum. Pl. Zeyl. 139. 1864 (Type: Sri Lanka, Thwaites C.P. 1706 CAL!, BM!); Hook.f., Fl. Brit. India 3: 80. 1880; Trimen, Handb. Fl. Ceylon 2: 321. 1885; Deb & Mondal in Nayar & Sastry, Red Data Book Indian Pl. 2: 227 fig. 1. 1988; Deb & Mondal, Bull. Bot. Surv. India 39: 99. 1997; Sasidharan, Biod. Doc. Kerala Pt. 6: Fl. Pl. 227. 2004; T.S. Nayar *et al.*, Fl. Pl. Kerala-Handb. 532. 2006. **Fig. 1**

Annual creeping herbs, 15–25 cm long, rooting at the nodes; branches densely pubescent; leaves 1.5–3 × 0.8–1.8 cm, ovate to orbicular, obtuse to acute apex, cordate or rounded base, upper surface glabrous, nerves beneath the upper and lower surface pubescent, lateral nerves 5–6 pairs, petiole 0.3–1.2 cm long, pubescent, stipules 1 mm long subulate, pubescent and persistent. Inflorescence terminal corymbose cyme, 0.7–1.8 cm across, few flowered, pubescent, peduncle 2–3.2 mm long, slender, pubescent. Flowers 4–8 mm long, white, bracts and bracteoles similar, puberulous, caducous, linear, 2–3 mm long, hypanthium 0.75–1 × 0.5–0.75 mm, obovoid, puberulous, calyx lobes 1.5–1.75 × 1 mm long, subulate, obtuse, puberulous midrib prominent, corolla 7–8 mm long, infundibuliform, glabrous outside, middle of the corolla tube villous, lobes 1–1.75 mm long, slightly curved inwards, acute at apex, shortly keeled at back; stamens 5, adnate to the middle of the corolla, filaments 0.5–0.75 mm long; anthers 1–1.25 mm long. Ovary 0.5–0.75 × 0.5–0.6 mm, obovoid, disc 0.3 mm long;

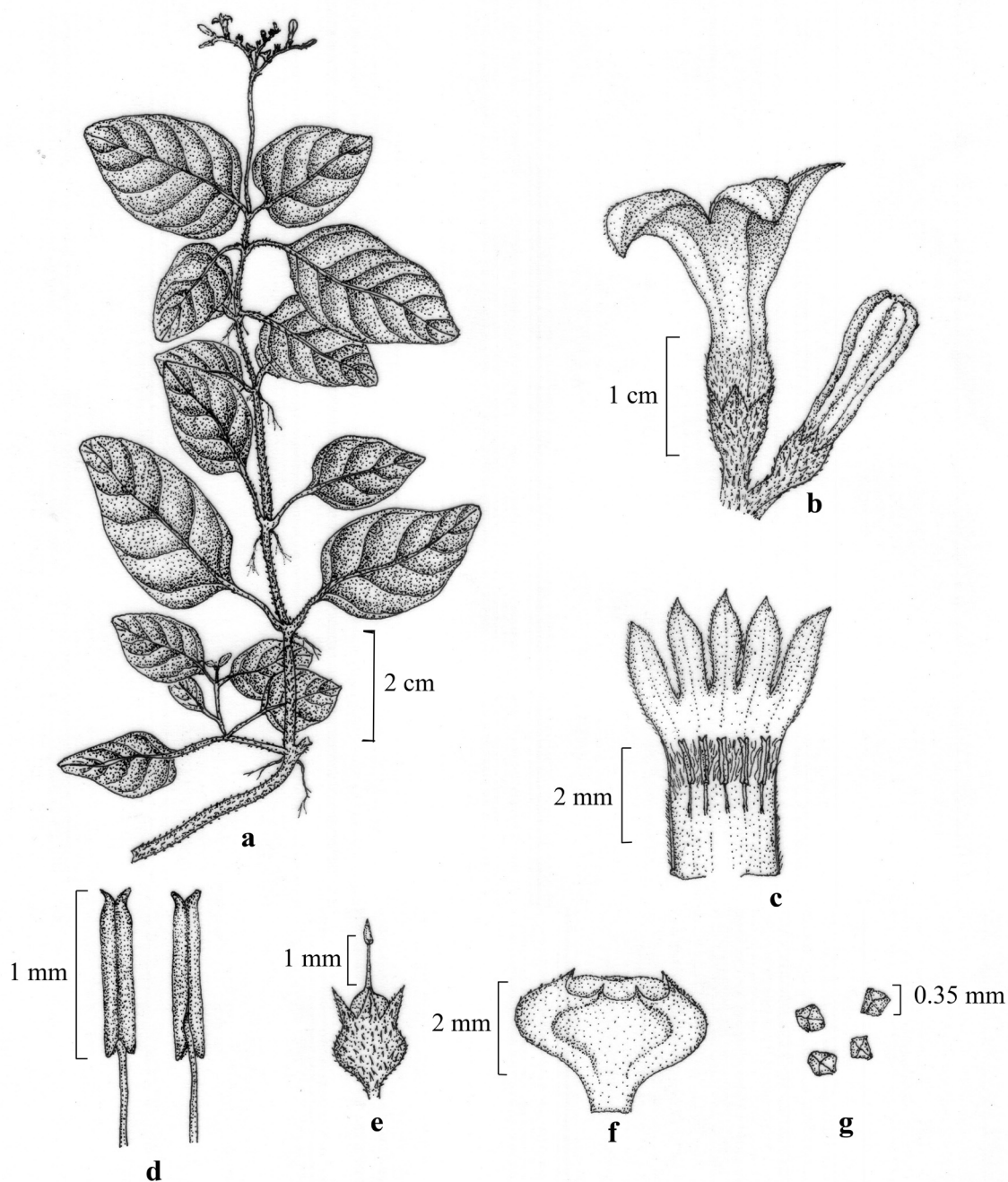


Fig.1. *Ophiorrhiza radicans* Gardn.: **a.** Habit; **b.** Flower and flower bud; **c.** Corolla split opened; **d.** Stamens; **e.** Pistil; **f.** Fruit; **g.** Seeds (all from Jinu Joseph & Hareesh 11076).

style 1–1.5 mm long, glabrous; stigma 0.75–1 mm long, 2-lobed, lanceolate, glabrous. Capsules 2 × 3–4.5 mm, glabrous, locules ovate to oblong with straight tip; seeds 0.3–0.4 × 0.3–0.4 mm, numerous, angular, glabrous, brown.

Flowering: September – November.

Habitat: Evergreen forest, usually in wet shady

places at an elevation above 500 m.

Distribution: India: Kerala, Kollam District.

Specimens examined: INDIA. **Kerala.** Kollam district, Rosemala, 28.09.2012, *Ginu Joseph & Hareesh.V.S.* 11076 (KFRI); *Ginu Joseph & Hareesh.V.S.* 6696 (CALI); “Colatoorpolay”, 28.11.1893, *M.A Lawson* 61 (CAL!).

Acknowledgements

Authors are thankful to the Director, Kerala Forest Research Institute, Peechi, Thrissur, Kerala and Dr. A.K. Pradeep, Assistant Professor, Department of Botany, University of Calicut, Kerala for their constant support and valuable suggestions.

Literature Cited

Deb, D.B. & D.C Mondal 1997. Taxonomic revision of the genus *Ophiorrhiza* L. (Rubiaceae) in Indian subcontinent. *Bull. Bot. Surv. India*. **39**: 99-100.

Mabberley, D.J. 2008. *Mabberley's Plant Book: A portable dictionary of plants, their classification and uses*. Third Edition. Cambridge University Press, Cambridge, UK.

Martin, K.P., Shahanz Beegum, C.I. Zhang,

Slater A., P.V. Madusoodanan 2007. *In vitro* propagation of *Ophiorrhiza prostata* through somatic embryogenesis. *Biologia plantatum* **51** (4): 769-772.

Nayar, M.P. & A.R.K. Sastry (Eds.) 1988. *Red Data Book of Indian Plants*. **2**: 227. Botanical Survey of India, Calcutta.

Yamazaki, Y., Akiko Urano, Hiroshi Sudo, Mariko Kitajima, Hiromitsu Takayama, Mami Yamazaki, Norio Aimi, Kazuki Saito 2003. Metabolite profiling of alkaloids and strictosidine synthase activity in camptothecin producing plants. *Phytochemistry* **62**: 461-470.

Received: 23.11.2012

Revised and Accepted: 23.05.2013