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New distribution record of *Boucerosia diffusa* Wight (Gentianales Apocynaceae) in the Southern Western Ghats, India

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ABSTRACT The presence of *Boucerosia diffusa* Wight (Gentianales Apocynaceae) in the foothills of Southern Western Ghats at Pechiparai, Kanyakumari Wildlife Sanctuary (India) is reported. This succulent asclepiad is frequently treated as *Caralluma diffusa* (Wight) N.E.Br. by many researchers. Present paper is the first record of the occurrence of this species in Kanyakumari Wildlife Sanctuary and the second in the southern Western Ghats.

KEY WORDS Apocynaceae; *Boucerosia diffusa*; *Caralluma diffusa*; Kanyakumari; Wildlife Sanctuary.

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INTRODUCTION

Stapeliads are an attractive group of succulent asclepiads lending aesthetic beauty to rocky crevices and dry hills with assorted and delightfully ornamented flowers (Karuppusamy et al., 2013). They are represented by ca. 30 genera with 400 species of fleshy succulent plants, including several genera among which *Boucerosia* Wight & Walker-Arnott and *Caralluma* Brown. The genus *Caralluma*, commonly known as antiobesity plants was first named by Brown R. (1810) to describe an Indian species, *Caralluma adscendens*, with very characteristic elongated flowering succulent stem. Wight & Walker-Arnott (1834) split the genus and described two new genera *Boucerosia* and *Hutchinia*. In 1892, Brown N.E. compiled all related genera under the genus *Caralluma*. Schuman (1895) tried to divide the genus *Caralluma* into three sections: *Eucaralluma* K. Schum (= *Caralluma*), *Lalacruma* K. Schum and *Boucerosia*. Plowes (1995) believed that the taxonomy of the genus *Caralluma* had full of species in dust-bin and it could not be fitted into other existing genera. He segregated the genus *Caralluma* into 17 different genera. According to Plowes (1995), Indian species of *Caralluma* fall into 4 categories (*Caralluma*, *Cryptolluma* Plowes, *Boucerosia* and *Borealluma* Plowes). Meve & Liede (2002) tried to solve the taxonomic problem of the tribe Ceropegiae using modern tools of molecular phylogeny. They suggested clearly that the Indian genus *Caralluma* can be segregated into four groups: *Boucerosia*, *Caralluma*, *Caudanthera* Meve et Liede and *Apteranthes* Meve et Liede. However, the genus *Boucerosia* has been completely ignored and it has been treated as synonym of *Caralluma* by taxonomists, since the genus is restricted to Southern India, Sri Lanka and Myanmar.

Boucerosia include succulent plants with leafless erect, trailing or decumbent stems, with/without ephemeral vestigial leaves. This genus is different from the genus *Caralluma* mainly due to the presence of umbellate terminal cymes. The genus is represented by 8 species in India. Of these,

Boucerosia crenulata (Wall.) Wight et Arn., *B. diffusa* Wight, *B. indica* (Wight et Arn.) Plowes, *B. pauciflora* Wight, *B. procumbens* (Gravely et Mayur.) Plowes, and *B. truncato-coronata* (Sedgw.) Gravely et Mayur) have been reported from Tamil Nadu state with the exception of *B. lasiantha*, which has been reported only from some localities of Andhra Pradesh and Kerala states, India. While reviewing the literature, the genus *Boucerosia* has been reported to have two species (*B. procumbens* and *B. umbellata*) from Kanyakumari district.

During a floristic exploration of Kanyakumari Wildlife Sanctuary at Pechiparai (N 08° 24.364', E 077°17.960'; altitude 497 ft/151.49 m), we collected a succulent plant with flowers in the terminal umbel belonging to the genus *Boucerosia* (tribe Ceropegiae, subfamily Asclepiadoideae and family Apocynaceae). After critical study and matching with available herbarium specimens, it was identified as *B. diffusa* (Fig. 1). Even after repeated explorations we could locate only one population of this species in the study area. The population has only 5 patches and the total area of occurrence was approximately 0.2 ha. As far as we are aware, none of the published literature (Sukumaran & Jeeva, 2008; Samuel et al., 2008; Sukumaran et al., 2008; Karuppusamy, 2011; Brintha et al., 2012) on the plant diversity of Kanyakumari district reported the occurrence of this species. Therefore, it is reported here with details such as distribution, brief description, habitat, phenological data, specimens examined in other Herbaria and biotic association. The voucher specimens are deposited at the Herbarium of Scott Christian College, Nagercoil, Tamil Nadu, India.

Boucerosia diffusa Wight

Boucerosia diffusa Wight, Icon. Pl. Ind. Orient. 4: 14, 1599, 1850. Hooker f. Fl. Brit. India, 4: 78, 1885. Plowes in Haseltonia, 3: 59, 1995. Meve & Liede in Plant Syst. Evol., 234: 200, 2002. Karuppusamy et al., *Caralluma*, 79-85, 2013. *Caralluma diffusa* (Wight) N. E. Br. in Gard. Chron., 12: 369, 1892. Gamble & Fischer, Fl. Pres. Madras, 2: 862, 1923. Gravely & Mayuranathan in Bull. Madr. Govt. Mus. n.s. N.H., 4: 25-26, 1931. S.R. Srinivasan in Henry et al., Fl. Tamil Nadu Analy, 2: 81, 1987. Gilbert in Bradleya, 8:16, 1990. Jagtap & Singh in Fasc. Fl. India, 24: 200, 1999. Ramachandran et al., in J. Threatened Taxa, 3: 1622, 2011. Kumar et al., 2013 in Ind. Forester, 139: 425-428.

Examined material. India, Tamil Nadu, Kanyakumari district, Pechiparai forest, 12.IV.2013, coll. S. Sukumaran and S. Jeeva #1220 (SCCH - Herbarium of Scott Christian College, Nagercoil). Specimen consulted. The collected succulent was matched with authentic herbarium specimens available at CAL, Kolkata, C.E.C. Fischer 2258, Coimbatore district, Kalpatti Atamalai slope, 1850 ft, 28.IX.1910; MH, Coimbatore, C.P. Sreemadhavan 136, slope of Anamalai, 650 m, 31.VIII.1962; Slope of Karupparayan Hills near Coimbatore, 31.X.1963, C.P. Sreemadhavan 957 m (MH); SKU, Ananthapur. Ugraiah (31752), Thiruvannamalai district, Arthanaareeswarar Sacred Hill, 4.VIII.2008.

Description. Stems fleshy, branched; branches erect, stout, 75 cm tall, four-angled, nearly equal thickness throughout; internodes 6-12 mm long and 5-15 mm in thickness, glabrous. Leaves absent, leaf scars present, appendage like growth at nodes on angle portions. Flowers many, terminal, in umbellate cymes, usually 30-35-flowered; bracts ca. 1.5 mm long and 1.0-1.5 mm in diam., glabrous. Calyx 5-lobed, divided up to base, surface of the lobes hairless, but the dark streaks are minutely papillose, lobes ca 3 × 1 mm, lanceolate, apex acute, glabrous. Corolla campanulate, ca 2.5 mm dia.; corolla tube ca 5 mm long; lobes 5, ca 3 × 2 cm, ovate, apex acute, margin ciliate, glabrous. Corona staminal, biseriate; outer annular, arising from the base of stamens, closely intact, five lobed, ca 2.5 × 1.5 mm, with two horn-like appendages widely separated from each other; inner variable, ca 1 mm long, linear, arising from the inner side of outer corona, overlapping anther-lobes. Stamens 5, ca. 2.5 mm long; pollinia masses solitary in each anther cell, yellow, waxy, with pellucid layer attached by a light-brown caudicles and dark-brown corpuscle. Gynostegium ca 1.5 mm long. Follicles paired, linear-lanceolate, tapering towards apex, glabrous. Seeds glabrous, 7-10 × 3-3.5 mm, oblong, base rounded, margin dark brown, coma silky, 3-5 cm long.

Distribution. In India, *Boucerosia diffusa* has so far been reported from the southern state of Tamil Nadu alone. It is distributed in Madukkarai Hills of Coimbatore (Ramachandran et al., 2011) and Thiruvannamalai districts of Tamil Nadu (Karuppusamy et al., 2013). Recently, Kumar et al. (2013) reported this species from the Chinnar Wildlife Sanctuary in the Western Ghats of Kerala. Our collections record its presence for the first time in the southern Western Ghats of Kanyakumari district. These findings imply that our knowledge of a

plant's distribution, i.e. 'endemism' is prone to change when more and more botanical explorations are undertaken at the regional/national level. So far, this species had been known to be endemic in Coimbatore and Thiruvannamalai district; because of its recent report from the Chinnar Wildlife Sanctuary, Kerala and also from the far end of southern Western Ghats, i.e. Kanyakumari Wildlife Sanctuary, the species may be stated as endemic to Tamil Nadu and Kerala states of south India.

BIOLOGY. *B. diffusa* is found to grow as lithophyte on the rocky slopes of fragmented hillocks situated inside forest patches converted into rubber plantation. Biotic association: *B. diffusa* is associated with species such as *Catharanthus pusillus* (Murray) G. Don., *Cissus quadrangularis* L., *Drynaria quercifolia* (L.) J. Sm., *Eulophia graminifolia* Lindl., *Sansevieria roxburghiana* Schult. et Schult.f., etc. Pollination: this species is generally pollinated by small scadophagous, dipterans and perhaps also by beetles (Stevens, 1976). Flowering and fruiting: April-September.

ETYMOLOGY. The species was first collected by Robert Wight, and named by him as *Boucerosia diffusa*, from Coimbatore in 1850. In Latin '*diffusa*' means loosely spreading; the branches of the plants are found to be loosely spreading on the ground. The vernacular name is: Paarai Kalli (Rock growing cactus) in Tamil.

REMARKS. Conservation: Gamble & Fischer (1923) gave the distribution of *Caralluma diffusa* as Deccan, arid rocky hills near Coimbatore at an elevation of about 600 m. Henry et al. (1979) stated that 'No specimens of *Caralluma diffusa* had been deposited in MH'. It is one of the endemic species occurring in Coimbatore district. Srinivasan (1987) also indicated in Flora of Tamil Nadu that its distribution is only from Coimbatore district in Tamil Nadu and its status mentioned as 'rare and threatened'. Nadu et al. (1999) considered this species to be endemic to Tamil Nadu. Rao et al. (2003) indicated its status to be 'indeterminate'. This species is now under heavy biotic pressure, since it is present in a hillock situated in the forest area converted into rubber plantation; it is doubtful whether the existing population will survive, as the species possesses economic and ethnobotanical importance too. Ex situ conservation of this vulnerable endemic taxon in rockery, greenhouses and gardens, besides its re-introduction into the wild in similar habitats is the need of the hour. The other issues to be prioritized are inventorying and monitoring of plant diversity in unexplored areas, assessment of conservation status of species and roles of species in ecosystems.

Figure 1. *Boucerosia diffusa* Wight.

Economic importance: the succulent stem of this species is used as sustenance of an indigenous community. It is often eaten in many different forms: cooked with salt and spices as an everyday vegetable, utilized in preserves like pickles and chutneys and eaten raw. The local people of Madukkarai hills use the sap of young stems to treat obesity. Moreover, the genus is medicinally important as it shows diverse medicinal properties like analgesic, anthelmintic, antiarthritic, antigastric ulcer, antiatherosclerotic, antibacterial, antihyperglycemic, anti-inflammatory, antinociceptive, antitrypanosomal, antirheumatic, antitumour, appetite suppressant, antiobesity, antioxidant, cytoprotective, immunostimulating.

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