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RESEARCH ARTICLE

TAXONOMIC IDENTITY AND ECOLOGICAL STATUS OF TWO RARE ORCHIDS FROM SOUTHERN WESTERN GHATS, INDIA

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ABSTRACT

An assessment has been made to identify the rare, endemic and threatened species in the Velliangiri hills of Southern Western Ghats, India. During field explorations, two rare species of terrestrial saprophytic orchids were collected. On critical appraisal and authentication of herbarium specimens, they were identified as *Aphyllorchis montana* Rchb. f. and *Epipogium roseum* (D. Don) Lindl. The present paper deals with their correct taxonomic identity, distribution and ecological status.

Keywords: Saprophytic orchids, *Aphyllorchis montana*, *Epipogium roseum*, Western Ghats

1. INTRODUCTION

Orchidaceae is one of the most ecologically and morphologically diverse families of flowering plants. It is the second largest family of flowering plants in the world, comprising of about 779 genera and 22,500 species [1]. They have diverse habits with variously modified vegetative and floral structures. Based on their varying habits, orchids are classified as holomycotrophic or saprophytic (growing on dead and decaying matter), terrestrials (growing on ground) and epiphytic (growing on trees or shrubs). They are very sensitive to habitat degradation and fragmentation.

The Indian subcontinent has diverse climatic regimes, forest types and habitat conditions that provide a favourable environment for accommodating diverse life forms and species [2]. Geologically, the drifting of the Indian subcontinent from the Gondwanaland through various latitudes lead to immigration and extinction of species which are engraved in the present day floristic composition [3]. The orchid diversity is represented by 1,331 species belonging to 186 genera in India [4].

The endemism in the flora of a country or geographical region provides an important insight into the biogeography of that region and also to the centers of diversity and adaptive evolution of the floristic components of that region. A large concentration of endemic species is found in the tropical moist deciduous and tropical semi-evergreen patches of Western Ghats and to a much lesser degree in Eastern Ghats [5].

The Western Ghats possess a high percentage of endemic species, about 48% of 4000 species occur in this region [6]. It is on the brink of endemic plant collapse, about 1500 species have a highly fragmented population and at least 50 endemic species have not be relocated after repeated surveys [7]. The present study is an attempt made to identify the rare, endemic and threatened species in the Velliangiri hills of Southern Western Ghats, India.

2. STUDY SPECIES

2.1. Aphyllorchis montana Reichb. f. (Fig. 1)

Aphyllorchis Blume is a leafless terrestrial orchid genus with total of 30- species is known to exist in various parts of the world [8]. Of which three species *viz*., *A. alpina* King & Pantl., *A. gollanii* Duthie and *A. montana* Rchb. f. have been reported from India. *Aphyllorchis montana* Rchb. f. is a terrestrial mycoheterotrophic orchid species [9] which grows in low and midland broadleaved forests of India, Sri Lanka, Malaysia, Borneo, the Philippines, southern Japan, southern China, Vietnam and Taiwan [10].

On an authentication of the specimen in the Madras Herbarium (MH), a collection of M.H.

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Lawson from Nilgiris (South India) and of C.A. Barber from Cadamonay, Mysore (South India), both of which have misidentified as *Pogonia carinata* Lindl. are actually *Aphyllorchis prainii* Hook. f. Similarly a collections of E. Vajravelu from silent valley (Kerala), A.N. Henry from Kanyakumari (Tamil Nadu) and S.R. Srinivasan from Ramanathapuram (Tamil Nadu), all of which have wrongly been identified as *A. prainii* Hook. f. The species *A. prainii* Hook. f. is very much allied to *A. montana* of Sikkim and Ceylon (which are possibly different species), differing in the winged claw of the lip [11].

The species *A. montana* Rchb. f. was also reported by P.C. Radhakrishnan from Ramanathapuram (Tamil Nadu), G.R. Rao from Karnataka and A. Nageswara Rao from Andhra Pradesh. The present collection revealed that the species was recollected from the Coimbatore district after 1921 which forms its extending distribution. The species is categorized as a *Data deficient* orchid of conservation concern in India and is enlisted in the RET plant list of India [12,13, 14].

Fig. 1. *Aphyllorchis montana* Reichb. f.

2.2. Epipogium roseum (D. Don) Lindl. (Fig. 2)

The genus *Epipogium* S. Gmelin *ex* Bork. is a curious leafless mycotrophs orchid widely distributed in temperate regions of Europe and Asia and also in tropical Africa [15]. It is represented by 2 – 5 species preponderance in tropical regions of the world [16]. On critical examination and authentication of herbarium at MH, Botanical Survey of India, Coimbatore, the collected species were identified as *Epipogium roseum* (D. Don) Lindl. and is poorly represented in MH. The locality from where this saprophytic orchid has been collected of dense semi-evergreen forest and only five individuals could be spotted.

A scrutiny of literature and specimens in the herbarium revealed that the species *E. roseum* (D. Don) Lindl. hitherto not recollected/ reported after the collection of C.E.C. Fischer in the year 1927 from the Bolampatti hills, Coimbatore district. About a century, the present collection from the Velliangiri hills in the Southern Western Ghats of Coimbatore district form its rediscovery. Hajra [17] reported it to be threatened and Henry et al [18] stated as rare plant.

Fig. 2. *Epipogium roseum* (D. Don) Lindl.

3. TAXONOMIC IDENTITY, DISTRIBUTION AND ECOLOGICAL STATUS

3.1. Aphyllorchis montana Reichb. f. in Linnea 41: 57. 1876; Hook. f., Fl. Brit. India 6: 116. 1890; King & Pantl. in Ann. Roy. Bot. Gard. (Calcutta) 8: t. 349. 1898; C.E.C. Fischer in Gamble, Fl. Madras 3: 1019. 1957 (repr. ed.). *A. prainii* Hook. f., Fl. Brit. India 6: 117. 1890 & in Hooker's Icon. Pl. t. 2192. 1894; Vajravelu & Rathakrishnan in Bull. Bot. Surv. India 10 (1): 99. 1968; Joseph, Orchids Nilgiris 15. 1982.

Saprophytic, leafless, achlorophyllous, erect herb of 40-60 cm long. Rhizome short,

creeping; roots spreading, stout, tuberous, branched, 3-8 cm long. Stem with many membranous sheaths; proximal sheaths tubular, 0.5-2 cm; sterile bracts 1-1.5 cm. Inflorescence terminal, in lax raceme, elongate, 20-30 cm long. Bracts 1.3-1.5 cm long, much shorter than pedicel and ovary, linear-lanceolate, acuminate, recurved. Flowers spreading, yellow with pinkish margin, pedicellate, bracteates, 3-3.5 cm long. Sepals ± 1 cm long, linear-oblong, acute, 3-nerved; dorsal one concave. Petals slightly shorter but broader than sepals, oblong, rounded at apex, 3-nerved. Lip shorter but broader than sepals and petals, ovate, concave, narrowed towards the obtuse apex; side lobes rounded; claw with 2 short, erect, parallel, triangular, acute wings facing towards the column. Column about 6 mm long. Ovary with the short pedicel, 2.4 cm long, slightly curved. Fruits not known.

Flowering & Fruiting: June – September

Habitat: Found in grasslands and semi-evergreen forests.

Ecological status: Rare in habitat at an altitude of 1600 m.

Distribution: India, Sri Lanka, Malaysia, Borneo, the Philippines, Japan, and Taiwan.

Specimen examined: Tamil Nadu: Velliangiri hills, V. Aravindhan 8213 (23.06.2012); Ramanathapuram, S.R. Srinivasan 65990 (22.07.1980); Kanyakumari, A.N. Henry 100446 (03.08.1977); Ramanathapuram, P.C. Radhakrishnan 50720 (18.08.1967). Andhra Pradesh: A. Nageswara Rao 65078 (28.06.1986).

3.2. Epipogium roseum (D. Don) Lindl. in J. Proc. Linn. Soc. Bot. 1: 177. 1857; Seidenf. in Dansk. Bot. 32 (2): 171. 1978. *Limodorum roseum* D. Don, Prodr. Fl. Nep. 30. 1825. *Galera nutans* Bl. Bijr. 416. t. 3. 1825. *Epipogium nutans* Reichb. f. in Bonplandia 5: 36. 1836. *Podananthera pallida* Wight, Ic. t. 1759. 1851; Hook. f. Fl. Brit. India 6: 124. 1890; Fischer in Gamble, Fl. Pres. Madras 3: 1021. 1957 (repr. ed.). Ansari and Diwakar in J. Econ. Taxon. Bot. Addl. Ser. 11: 127. 1995.

Saprophytic, unbranched leafless, tuberous herb, 50-60 cm high; tubers oblong-ovoid, globose or ellipsoid, 5-6 cm, brownish-black. Stems straw-coloured, hollow, often sheathed; sheath 5-7, inflated, 0.8-1 × 0.5-0.6 cm, truncate. Inflorescence a raceme, 20-25 cm long. Flowers 30-45, in terminal, usually white often flushed with pink, pendulous with prominent ovary; bracts large, oblong-lanceolate, ca.1.5×0.5, membranous, acute at apex. Sepals and petals sub-equal, free, narrow, 1-1.3 cm long, adhering to linear; lip entire, 1-1.5 × 0.5-0.6 cm, ovate, trilobed, concave with erect side margins and short apiculum having a small dorsal oblong swelling on it, margin irregularly erose beyond the base, 2- crested lamellae one on each side of the median nerve. Spur seroliform, 0.2-0.5 cm long, adhering to ovary, disk with two glandular ridges; anther thick, dorsally 2-celled. Ovary 1-1.2 cm long, swollen. Pollinia 2, each with a long and filiform caudicle.

Flowering & Fruiting: April – July.

Habitat: Found in semi-evergreen forest and growing in dead and decaying, shady places.

Ecological status: Rare in habitat at an altitude of 1400 m.

Distribution: West Africa, Indo-Malaysia.

Specimen Examined: India: Anamalai Hills, Coimbatore district (C.A. Barber – 29.04.1903 – MH: 50727); Bolampatti Hills, Coimbatore district (C.E.C. Fischer – 09.01.1927 – MH: 50724); Yanaikundhi Shola, Coimbatore district (J. Joseph – 29.01.1962 – MH: 51044); Ouchterlong Valley, Nilgiri district (J.L. Ellis – 29.01.1971 MH: 51056); Nilgiri West slopes (V. Chitra – 02.03.1976 – MH: 51068). Velliangiri Hills, Coimbatore district, (V. Aravindhan, 21.07.2012 – MH: 173550).

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