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An Ethnobotanical Study Of Orchids In Anamalai Hill Range, Southern Western Ghats, India

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Abstract

In the present investigation, diversity of orchids in Anamalai hill range was studied which recorded 20 genera with 25 species with their medicinal importance. The study observed the rapid depletion of orchid species due to destruction of natural habitat by deforestation, upper layer soil erosion, overgrazing, etc. Their disappearance indicates a change in the quality of soil and air of the region. Therefore, adequate management actions including both *in situ* and *ex situ* conservation measures need to be undertaken.

Keywords: Orchids, Diversity, Uses, Anamalai, India.

Introduction

The Western Ghats, for its many protected areas, wild locations and beautiful scenery, is one of the well-known wildlife centres in India. It is also one of the richest areas in the world in terms of biodiversity, making it the one-among the 25 Hotspots of the world [1]. The uniqueness of this bio-geographical area are high endemism, possibly yet-to-be discovered flora and fauna and probably that unknown species still await discovery. This region is the richest storehouse of orchids.

Orchidaceae, is the second largest family of flowering plants in the world which comprising of about 779 genera and 22,500 species [2]. They have diverse habits with variously modified vegetative and floral structures. Based on their varying habits, orchids are classified as holo-mycotrophic 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.

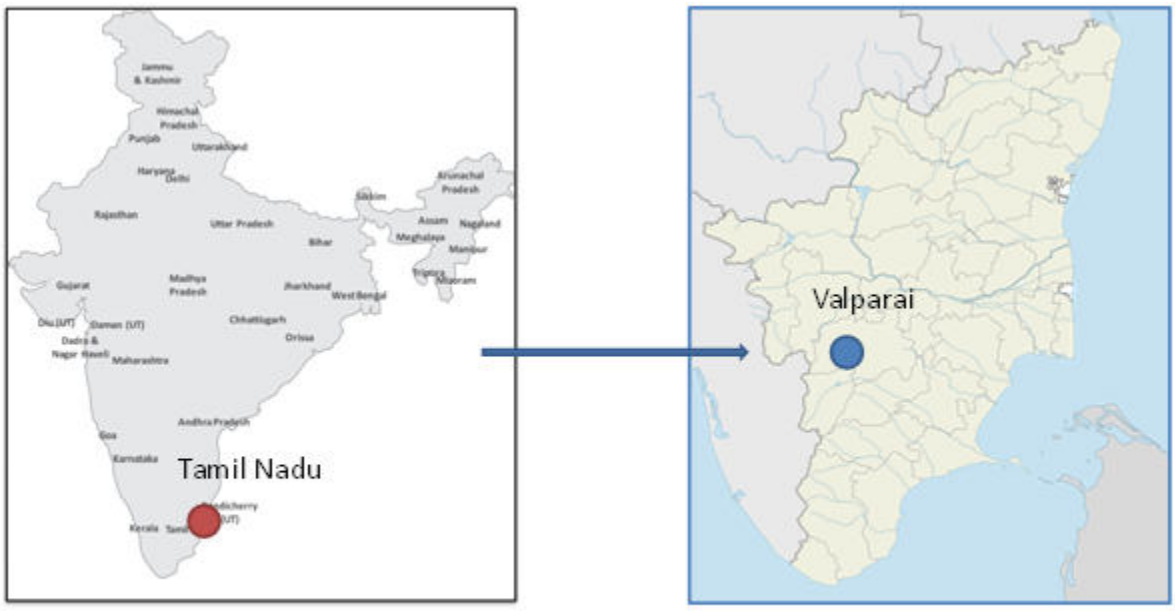
Valparai is one of the important hill stations located 3,500 feet above sea level on the Anamalai hill range of the Western Ghats and lies at 10.37 N 6.97 E in Coimbatore district of Tamil Nadu, India (Map 1). It is a well known place of tourist interest for its colorful natural greenery. It has an average elevation of 1193 metres (3914 feet) and the elevation range includes an array of habitats ranging from dry thorn forests in the low foot hills to semi-evergreen stretches to grass hills and evergreen sholas. The region is rich in orchid diversity and harbour a number of species.

In India, orchids from 9% of our flora and are the largest and highly advanced botanical family of higher plants and is represented by 1,331 species belonging to 186 genera [3]. They have attracted people because of their exquisite. The flowers have every credible colours combination. The attractiveness of orchid appreciation has a very long history in western and eastern cultures. Orchids are valued not only for their attractive flowers but many of them have been used for the therapeutic purpose [4]. Numerous orchid species have been occur and are being used in maintaining human health and improving the quality of human life in different countries as well as valuable source of new therapeutic potentials.

Orchids have been used as a source of medicine over millennia to treat a variety of ailments like acidity, arthritis, asthma, bone fractures, boils, blood dysentery, chest pain, cholera, dyspepsia, diarrhoea, earache, eczema, hepatitis, inflammations, jaundice, lecoderma, malaria, menstrual disorders, rheumatism, spermatorrhoea, sexually transmitted diseases, sores, tuberculosis and wounds. Recently, it has been reported that orchid molecules are important in reducing fevers, serving as anti-impotence aids, increasing the white blood cell count, curing eye diseases, treating fatigue and headache, and most importance functioning as anti-cancer agents [5].

Realizing the importance of this unique group of plants, the present study was attempted to document the orchid species diversity and their medicinal importance/value in Valparai hills of Coimbatore district, Tamil Nadu. Ethnobotanical research can provide a wealth of information regarding both past and present relationships between plants and the tribal communities [6]. It is envisaged that, in the future, ethnobotany may play an increasingly important role for the use of different orchid species. Moreover it is important for the sustainable development and conservation of biodiversity.

Map 1: Location of the Study region



Location of Tamil Nadu in India **Location of Valparai in Tamil Nadu**

Methodology

Intensive field survey was carried out during 2011-2013 covering all the seasons of the year in all parts of Valparai including floral nurseries, estates (tea company lands) and forest areas. The collected specimens were made into standard mounted herbarium sheets following the procedure of Jain and Rao [7]. The authors have done photographs and sketch the some orchid species from floral nurseries of the region. The relevant data from the field note books were then transferred to the labels of the herbarium sheets. Normally, 2-3 specimens of each species in flowering or fruiting stage were collected during field visits.

The specimens were identified and described with the help of Flora of British India [8], Flora of Presidency of Madras [9], Flora of Tamil Nadu Carnatic [10], Introduction to Orchids of South India [11], Orchids of India [12] and specimens authentication were done in Madras Herbarium (MH), Botanical Survey of India, Coimbatore. Finally, the voucher specimens were deposited in the Herbarium of Department of Botany, Bharathiar University, Coimbatore, Tamil Nadu. All the collected species were arranged alphabetically with botanical names, habit, habitat, flowering month, voucher specimen number and medicinal importance.

Enumeration

Acampe praemorsa (Roxb.) Blatt. & Mc Cann. in J. Bombay, Nat. Hist. Soc. 35: 495. 1932. (NP – 0456)

Herb, with woody stem. Leaves fleshy, coriaceous, 10-15 cm long. Inflorescence leaf opposed, 6-8 cm long, sub-corymbose. Flowers 1 cm across, fleshy, yellow barred with red. Epiphyte on tree trunks.

Fl.: March - June.

Uses: Fresh root and 1gm roots of *Asparagus racemosus* mixed together and made into paste, in which one spoonful is taken orally on an empty stomach twice a day to cure arthritis.

Aerides crispum Lindl. Gen. Sp. Orch. 239. 1833. (NP – 0454)

Herb, with woody stems. Leaves leathery, rigid, 8-12cm long, 2.5cm broad. Inflorescence branched, 10-12 flowered. Flowers 3 cm across, whitish-pink. Epiphyte on the tree trunks.

Fl.: May – July.

Uses: Leaf paste applied as poultice on cuts and wounds.

Anoectochilus elatus Lindl. in. Linn. Soc. 1: 178. 1857.(NP – 0622)

Herb. Leaves 3-5, 4-5cm long, 3-3.5cm wide, deep rusty-red with velvety sheath and silver veins. Inflorescence upto 30 cm high. Flowers 4, 1.5 cm long, pink and white. Terrestrial in dense shade of the forests.

Fl.: December – February

Uses: The whole plant paste is applied on body swellings.

Arundina gramniflora (Don.) Hochr. in. Bull. N.Y. Bot. Gard. 6: 270. 1910. (NP – 0425)

Herb, with rigid and woody stem. Leaves pale green, glaucous, 5-8 cm long, 2 cm wide. Flowers in terminal racemes. Flowers 3.5-4 cm across, 4.5 cm long, deep magenta in colour. Terrestrial in the marshy areas of moist-deciduous forests.

Fl.: October - December

Uses: Scrapped bulbous stems are pasted and applied on heels to treat the cracks.

Bulbophyllum fuscopurpureum Wight, Ic. 5 (1): 6. 1845. (NP – 0466)

Herb with trailing rhizomes. Leaves coriaceous, 10-12 cm long, 3 cm wide. Inflorescence 15-20 cm long, 5-6 flowered. Flowers large, 2.5 cm across, deep purple. Epiphyte on the tree trunks.

Fl.: August - December

Uses: The pseudo-bulbs are washed and made into paste and is applied externally on affected parts to cure skin diseases.

Bulbophyllum tremulum Wight, Ic. t. 1749. 1851. (NP – 0567)

Herb. Leaves small, coriaceous, 3-4 cm long, 0.75-1 cm wide. Inflorescence long, slender, 5-10 flowers in two rows, 10-15 cm long. Flowers 15 cm across, pale yellowish. Epiphyte on the tree trunks.

Fl.: October - December

Uses: The whole plant is washed, crushed and pasted and is applied externally on affected parts to cure pimples and skin allergy.

Calanthe triplicata (Willem.) Ames. in. Phillipp. Sci. 2: 326. 1907. (NP – 0512)

Herb, 30 cm tall. Leaves large, 20-30 cm long, 8-10 cm wide, narrowed to a grooved petiole. Inflorescence in axillary racemes, 30-50 cm long. Flowers white, 2.5 cm across. Terrestrial in the dense shade forest patches.

Fl.: May - July

Uses: Leaf paste is applied on sores and eczema.

Coelogyne glandulosa Lindl. Folia Orchidaceae: 6. 1854. (NP – 0519)

Herb. Leaves 2, dark green, thick, coriaceous, 18-20 cm long, 2-2.5 cm wide. Inflorescence 15-20 cm long, 7-8 flowers. Flowers white with yellow on the lip. Epiphyte on the tree trunks.

Fl.: March - July

Uses: Dried pseudo-bulbs are pounded into powder and applied to the spots of burn injuries for 7 days.

Coelogyne nervosa A. Rich. in. Ann. Sci. Nat. 15: 16. 1841. (NP – 0613)

Herb. Leaves 2, from the top of the pseudo-bulb, 15-18 cm long, 3-3.5 cm broad, coriaceous. Inflorescence terminal, in racemes, 7-9 cm long, with 3-4 flowers. Flowers large, pretty, whitish. Epiphyte on the tree trunks.

Fl.: August - October

Uses: The powder obtained from pseudo-bulb is used to treat burn injuries and wounds.

Cymbidium aloifolium (L.) Sw. in. Nov. Act. Soc. Upsal. 6: 73. 1799. (NP – 0538)

Herb. Leaves thick, short, leathery and pale green, broadly linear, obtuse, 20-30 cm long. Inflorescence 20-30 cm long. Flowers 10-25, 3.5 cm across, yellow and dark purple, fleshy. Epiphyte on tree trunk in dense humid evergreen forests.

Fl.: March - July

Uses: 2gm of root powder is mixed with 2gm of dried ginger and 1gm of black pepper mixed thoroughly and made into a powder, in which half spoon is taken with cup of cow's milk twice a day for two months to reduce paralysis.

Dendrobium crepidatum Lindl. Paxton, Fl. Gard. 1: t. 45. 1850-51. (NP – 0540)

Herb, with ribbed and fleshy stem. Leaves membranous, 9-10 cm long, 1 cm wide. Inflorescence terminal, 4-7 flowered. Flowers wavy white with pinkish tinge, 3 cm across. Epiphyte on thick-barked tree trunks.

Fl.: June - September

Uses: A poultice of leaves is administered to cure boils and pimples.

Dendrobium haemoglossum Thw., Enum. Pl. Zeyl.: 429. 1864. (NP – 0489)

Herb, with woody stems. Leaves leathery, coriaceous, glabrous, 5-6 cm long, 1 cm wide. Flowers in pairs, leaf-opposed, 1.5 cm across, greenish-yellow with deep purple markings in lip. Epiphyte on huge bunched and heavy shaded tree trunks.

Fl.: April - June

Uses: The pseudo-bulb extract is used to cure eye infections and to soothe burns.

Dendrobium heterocarpum Wall. *ex* Lindl. Gen. Sp. Orch. 78. 1830. (NP – 0493)

Herb, with tufted stems. Leaves membranous, 6-7 cm long, 3 cm wide. Flowers in pairs, at topmost nodes, yellowish-brown, very fragrant, 4-5 cm across. Epiphyte on thick-barked tree trunks.

Fl.: December - February

Uses: The paste of fresh leaves is applied to treat syphilis.

Dendrobium macrostachyum Lindl. Gen. Sp. Orch.: 78. 1830. (NP – 0520)

Herb, with tufted stems. Leaves membranous, 4-6 cm long, 2-25 cm wide. Flowers in leaf-opposed fascicles from the nodes, 2-3 pre-fascicle, 2.5 cm across, fragrant, straw-coloured. Epiphyte on tree trunks.

Fl.: April - June

Uses: The juice of fresh leaves is used for earache.

Eria mysorensis Lindl. in J. Proc. Linn. Soc. Bot. 3: 54. 1859. (NP – 0491)

Herb, with swollen pseudo-bulbs. Leaves 2 or many at the apex of pseudo-bulbs,

15x3 cm. Inflorescence in racemes. Flowers straw-coloured, fragrant, 1.2 cm long, pubescent. Epiphyte on the tree trunks.

Fl.: August - December

Uses: Decoction of whole plant is administered orally twice a day to cure hyper acidity and stomach disorders.

Habenaria plantaginea Lindl. Gen. Sp. Orch. 323. 1835. (NP – 0556)

Herb. Leaves radical, membranous, 6-10 cm long, 3 cm wide. Inflorescence in racemes, 6-8 cm long. Flowers white, 2 cm across. Terrestrial in the open grasslands.

Fl.: August - November

Uses: Whole plant is boiled and the extract is taken to alleviate continual chest pain, stomachache and flatulence.

Luisia zeylanica Lindl. Fol. Orch. 3. 1853. (NP – 0619)

Herb, with erect and tufted stems. Leaves rigid, green with purple spots, 10-12 cm long. Inflorescence in racemes, 5-6 flowered. Flowers greenish with purple tinge, 0.5 cm across. Epiphyte on tree trunks in the margins of semi-evergreen forests.
Fl.: June - August
Uses: A paste is made from the dried plant, turmeric and ginger and a half spoon of the paste is taken orally with a cup of water thrice a day for 10 days to cure jaundice.
Malaxis acuminata D. Don. Prodr. Fl. Nep. 29.1825. (NP – 0642)
Herb, upto 20 cm high. Leaves 3 or 4, fleshy, 6-10 cm long, 2-3.5 cm wide. Inflorescence in terminal racemes, 12-15 cm long. Flowers yellowish-green, yellow tinged with red-purple. Terrestrial in the marshy places of moist deciduous forests.
Fl.: July - September
Uses: Decoction of bulb is taken as a tonic to treat bronchitis.
Oberonia brunoniana Lindl., Bot. Reg. 25. Misc. 9. 1839. (NP – 0653)
Herb. Leaves 15 cm long, 1 cm wide, oblong-ensiform, acute. Inflorescence in spikes, 15cm long. Flowers 3.5 mm across, orange- yellow, scattered on the rachis. Epiphyte on the tree trunks in dense shaded forests.
Fl.: August - November
Uses: Leaves are crushed with salt and turmeric and is pasted and tied as bandage for external tumors and swellings on body.
Peristylus brachyphyllus (Lindl.) Sant. & Kapad. Orch. 46. 1966. (NP – 0614)
Herb. Leaves coriaceous, 6-12, 4-6 cm long, 1-1.5 cm wide. Flowers small, 0.8 cm across, greenish-yellow. Terrestrial in open grasslands.
Fl.: August - November
Uses: Root paste is applied externally to cure boils 2-3 times a day until cured.
Polystachya concreta (Jacq.) Garay & H. R. Sweet, Orq. 9 (3): 206. 1974. (NP – 0565)
Herb, 10-29 cm high. Leaves 3-5, ovate-lanceolate, 7-8 cm long, 1-3 cm wide, unequally 2-lobed. Inflorescence terminal, 3-10 cm long. Flowers small, pale yellowish. Epiphyte on the tree trunks.
Fl.: August - December
Uses: Fresh tuber with 500 ml of water is boiled in which 3 to 4 ml of the decoction is taken orally with honey on empty stomach twice a day for 2 months for treatment of arthritis.
Rhynchostylis retusa (L.) Bl., Bijdr. 286. t. 49. 1825. (NP – 0548)
Herb, woody stem. Leaves thick, leathery, distichous, 15-20 cm long, 2cm wide. Inflorescence axillary, in racemes, 20-30 cm long, 1-6 flowered. Flowers 1.8 cm across, whitish. Epiphyte on thick-barked tree trunks.
Fl.: June - August
Uses: Leaves are pasted and applied on joins to cure rheumatic pains.
Satyrium nepalense Don. Prodr. Fl. Nep. 26. 1825. (NP – 0485)
Herb. Leaves 1 or 2, coriaceous, glaucous, 10-15 cm long, 3-4 cm wide. Inflorescence 25-40 cm long. Flowers dense, bright rose-pink to snow-white, 1-5 cm across. Terrestrial in the grasslands.
Fl.: August - November
Uses: Root used as tonic in the treatment of diarrhoea. The decoction of dried tubers are used to cure malaria and dysentery.
Taenia bicornis (Lindl.) Reich. f. in Bonplandia 5: 54. 1857. (NP – 0589)
Herb. Leaves single on the top of the pseudo-bulb, 8-12 cm long, 5-6 cm wide, glabrous. Inflorescence 20 cm long, in racemes. Flowers pale greenish-yellow, 3-3.2 cm across. Terrestrial in the deep shade forest patches.
Fl.: February – April
Uses: The decoction of boiled roots is administered orally to cure diarrhoea.
Vanda tessellata (Roxb.) Hook. *ex* D. Don., Loud. Hort. Brit. 372. 1830. (NP – 0532)
Herb, stem woody. Leaves stiff, leathery, 15-20 cm long, 1.5 cm wide. Inflorescence 30 cm long, 4-5 flowered. Flowers fleshy, fragrant, 5 cm across, greyish-green, tessellated with blue. Epiphyte on tree trunks of moist deciduous forests.
Fl.: April - June.
Uses: A decoction made from the root extracts of this plant and *Curculigo orchioides* is taken twice a day for 7 days to cure asthma.

Results and Discussion

During field studies, a total of 20 genera with 25 orchid species diversity and their medicinal importance have been recorded from the Valparai hills. Out of the total 20 genera, 9 species with 9 genera are terrestrial and the rest 16 species with 11 genera are epiphytic. The numbers of epiphytic are greater than terrestrial species. The total numbers of recorded species of each genus are 1 *Acampe* spp., 1 *Aerides* spp., 1 *Anoectochilus* spp., 2 *Bulbophyllum* spp., 1 *Calanthe* spp., 2 *Coelogyne* spp., 1 *Cymbidium* spp., 4 *Dendrobium* spp., 1 *Eria* spp., 1 *Lusia* spp., 1 *Malaxis* spp., 1 *Oberonia* spp., 1 *Peristylus* spp., 1 *Rhynchostylis* spp., 1 *Satyrium* spp., 1 *Tainia* spp. and 1 *Vanda* spp. The terrestrial orchid species like *Anoectochilus elatus* and *Malaxis acuminata* are frequently found in marshy habitats of study region.
The epiphytic orchid species like *Dendrobium, Coelogyne* and *Bulbophyllum* were found highest in number of species diversity and wide distribution throughout the hill ranges. Some attractive orchid species in the regions are *Cymbidium aloifolium*, *Coelogyne nervosa*, *Peristylus brachyphyllus*, *Rhynchostylis retusa* and *Taenia bicornis*. The orchid species which are rare and endemic and high risk of threat in the region viz., *Anoectochilus elatus*, *Bulbophyllum fuscopurpureum*, *Coelogyne nervosa*, *Eria mysorensis*, *Habenaria plantaginea* and *Peristylus brachyphyllus*.
Several species of orchids have been used since ancient times as medicinal herbs.
The present investigation has also brought to light the therapeutic value of orchids in curing different diseases and ailments such as arthritis, body swellings, skin diseases, cuts and wounds, paralysis, syphilis, stomach disorders, jaundice, bronchitis, rheumatism, malaria, dysentery, diarrhoea and asthma. It has been observed in the Valparai plateau that when the stream vegetation and privately

owned small rainforest fragments inside the estates are manipulated or logged, it only aggravates human-animal conflict, especially with large mammals such as gaur, elephant and leopard. It indicates the need for maintaining such vegetation.

The study noticed that the rare and endemic orchids of this region are facing various kinds of localized threats like livestock grazing and forest fires as well as landscape-level threats such as mining, construction of roads, large as well as micro-hydal power projects, wind farms, large-scale agricultural expansion and creation of monoculture plantations.

Conclusion

It is concluded that many species of orchids, having useful phyto-constituents, are currently being used as drugs in the Indian system of medicine. Being members of a highly advanced family, orchids have a major role to play in the genetic engineering of new forms that may be useful in the fields of floriculture, pharmaceutical and fragrance industries. Bearing in mind the rich biodiversity of this region and the importance of retaining the indigenous knowledge of the local tribes for future generations, long term conservation measures will have to be taken to preserve this rich orchid wealth for the state. Although the full biodiversity of the hill ranges remains unknown, preliminary surveys have already given promising results. Therefore, conservation efforts combined with detailed biodiversity studies must become a part of a comprehensive plan to ensure the viability of this irreplaceable resource.

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