

Ethnobotanical studies on orchids among the *Khamti* Community of Arunachal Pradesh, India

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Other than the aesthetic values, orchids, the largest and most diverse group of flowering plants has a broad range of ethnobotanical applications. However, little work has been done on ethnobotanical studies of orchids used by the *Khamti* community of the North-East India. The present report is an account of the ethnobotanical uses of 4 medicinal orchids, viz., *Cymbidium aloifolium* (Linn.) Sw., *Cymbidium bicolor* Lindl., *Eria panna* Lindl., and *Dendrobium fimbriatum* Hook. among the *Khamti* community of the Lohit District of Arunachal Pradesh.

Keywords: Arunachal Pradesh, Ethnobotanical uses, *Khamti*, Orchidaceae.

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Introduction

The orchids with nearly 24,500 species in over 800 genera¹, represent a group of botanically significant and economically important plants known for beautiful flowers used in floriculture, medicine and food industries. Though, cosmopolitan in distribution, they are better distributed in the tropics but are rare in the arctic region. They are habitat specific and often serve as indicator plants of a healthy ecosystem^{2,3}. Orchids are well known for therapeutic values, and their curative and restorative properties are well documented. Traditional and indigenous system of medicine persists all over the world. The unique traditional system of health that is passed down from generation to generation within a society is still prevalent within the ethnic communities. In India, orchids are represented by

nearly 1300 species, many of these have therapeutic properties and have been extensively used as traditional and folklore medicines to cure various human ailments since time immemorial. The orchids are used in the treatment of epilepsy, reducing fevers, serving as anti-impotence aids, increasing the white blood cell count, curing eye disease, fatigue and headache, and most importantly, functioning as anti cancer agents, etc.^{4,6}. Such information has been reported earlier for Indian orchids by several workers from different parts of India⁷⁻¹³. The tribals and regional communities are the major practitioners of such medicines. However, as they are highly secretive about the medicinally traded plants, the ethnobotanical importance of several species has remained undocumented. This paper attempts to bridge this information gap and deals with some orchid species that are used in folklore medicine by the *Khamti* community of Lohit District in Arunachal Pradesh to treat a variety of human ailments. Incidentally, Lohit District is home to several communities including *Khamtis*, *Mishmis*, and *Adi* also rich in orchid diversity.

Materials and Methods

Study area

The present study was conducted in *Khamti* community of Lohit District, which covers a total geographical area of 11,402 Sq Km and is situated on the North Eastern extremity of Arunachal Pradesh between 27° 33'–29° 22' N and 95° 15'– 97° 24' E. The district is bounded in the north by Tibet, in the east by Burma, in the west by the Siang District of Arunachal Pradesh and the Tinsukia District of Assam and in the south by the Tirap District of Arunachal Pradesh¹⁴. Climate of the district is largely influenced by the nature of its terrain. There are high hills and snow-capped mountains, deep ravines and wide valleys intersected by innumerable stream and rivers. Except in the South-Western corner of the district, the elevation ranges from 2,000 to 4,000 m with mountain ridges and peaks rising to 4,500 to 5,000 m (15,000 to 17,000 ft) above the sea level at many places. As a result, the climate is cool and highly humid throughout the year in the lower elevations and intensely cold in the higher elevations, slightly decreasing only in the winter months.

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With a view to document the medicinal orchids used by the Khamti community, frequent field surveys were made in Khamti settlements. Ethnobotanical information was collected during March to October 2013 as a single season survey using the community survey approach. Knowledgeable people and local medicinal practitioner were interviewed to gather information about ethnobotanically important orchids. A simple questionnaire was prepared to collect information. The information on the orchid based drugs and their curative values were recorded. Standard procedures for survey, sampling, collection, and documentation were followed¹⁵. Voucher specimens have been prepared for all the collected materials and the identification of the collected species was carried out with the help of published orchid literature for the state¹⁶ as well as by comparing the herbarium specimens deposited in Orchid Herbaria of State Forest Research Institute and Botanical Survey of India, Itanagar. The voucher specimens of each accession have been deposited in the herbarium of Rajiv Gandhi University, Itanagar, Arunachal Pradesh (RGU) and Orchid Research Centre, Tipi, Arunachal Pradesh (ORCT). The details of herbarium accessions are given below:

Cymbidium aloifolium - 583 (RGU) and 171* (ORCT)

Cymbidium bicolor – 35431, 35432 (ORCT)

Dendrobium fimbriatum - 584 (RGU)

Eria pannea - 35408 (ORCT)

*under cultivation

Results and Discussions

The interactions with several elders of the tribe revealed that the *Khamti* use four different species of orchids (Plate 1) in their folklore medicines, having acquired knowledge about their curative properties through trial and error process over the years. These species are frequently used by the *Khamti* community. Information on botanical description, habit, habitat, occurrence, flowering and fruiting season, and therapeutic properties are provided for each of these species.

Enumeration

Cymbidium aloifolium (L.) Swartz.

Cymbidium aloifolium (L.) Swartz. in Nov. Act. Soc. Upsal. 6: 73. 1799.

Pseudobulb 5-7 cm long, ovoid; leaves fleshy, linear oblong, obtusely bilobed at apex; inflorescence pendulous raceme, 10-50 cm long, many flowered; flowers 3.5-4.3 cm across, usually dull maroon with yellow, widely opening; lip dull maroon with pale yellow, saccate

at base, disc with 2 interrupted keels, curved in lower half, 3-lobed, lateral lobes 4-5 x 2-4 mm, oblong, obtuse, erect, mid lobe 1.0-1.2 cm x 6-7 mm, ovate-oblong, decurved, longer than the lateral lobes; and column 1.2 – 1.3 cm long, slightly curved.

Local Name: *Mok Hang Meew*

Habit and habitat: Epiphytic, commonly grows on broad leaved trees including *Altingia excels*, *Atrocarpus chaplasha*, *Terminalia myriocarpa*, *Canarium bengalensis*, etc.

Flowering and fruiting: April – June.

Occurrence: Widely distributed in the district.

Part used: Leaves

Mode of administration: Approximately 5 g of freshly grounded leaves and green capsules are made into a paste and half a spoonful of it is taken orally twice a day for 1-6 month to cure epilepsy and also to enhance the memory. However, in serious condition it takes almost 1 year or more.

Cymbidium bicolor Lindl.

Cymbidium bicolor Lindl., Gen. Sp. Orch. 164. 1833.

Pseudobulbs 3.5-6 cm long, ovoid; leaves fleshy, linear-oblong, sheathing at base, Inflorescence pendulous raceme, 12-30 cm long, many flowered; flowers 3.0-3.5 cm across, purplish-brown; floral bract minute, slightly triangular; lip tri-lobbed, side lobes narrow, mid lobe slightly blunt, emarginated, and column 0.8-1.0 cm long, slightly curved.

Local Name: *Mok Hang Meew*

Habit and habitat: An epiphytic orchid, commonly noticed on evergreen forest of the district in *Amoora wallichii*, *Terminalia myriocarpa*, *Dysoxylum procerum*, *Magnolia campbellii*, *Mesua ferra*, etc. It is mainly found to grow on the main tree trunk with full exposed of sunlight.

Flowering and fruiting: March-April.

Occurrence: Widely distributed in the district.

Part used: Flowers, Leaves, Root

Mode of administration: Half spoon of root powder (made from 2 g of fresh roots) taken with 1 glass of water twice a day for 1-6 months is used in epilepsy and mental depression. One spoon of leaf paste (5 g) is applied twice a day for 20-25 days to treat joint swelling, rheumatic pains, and skin inflammation. Half spoon of flower paste (2 g) is applied thrice for 2 weeks to cure burnt face and for 1 week to cure dark spots on skin.

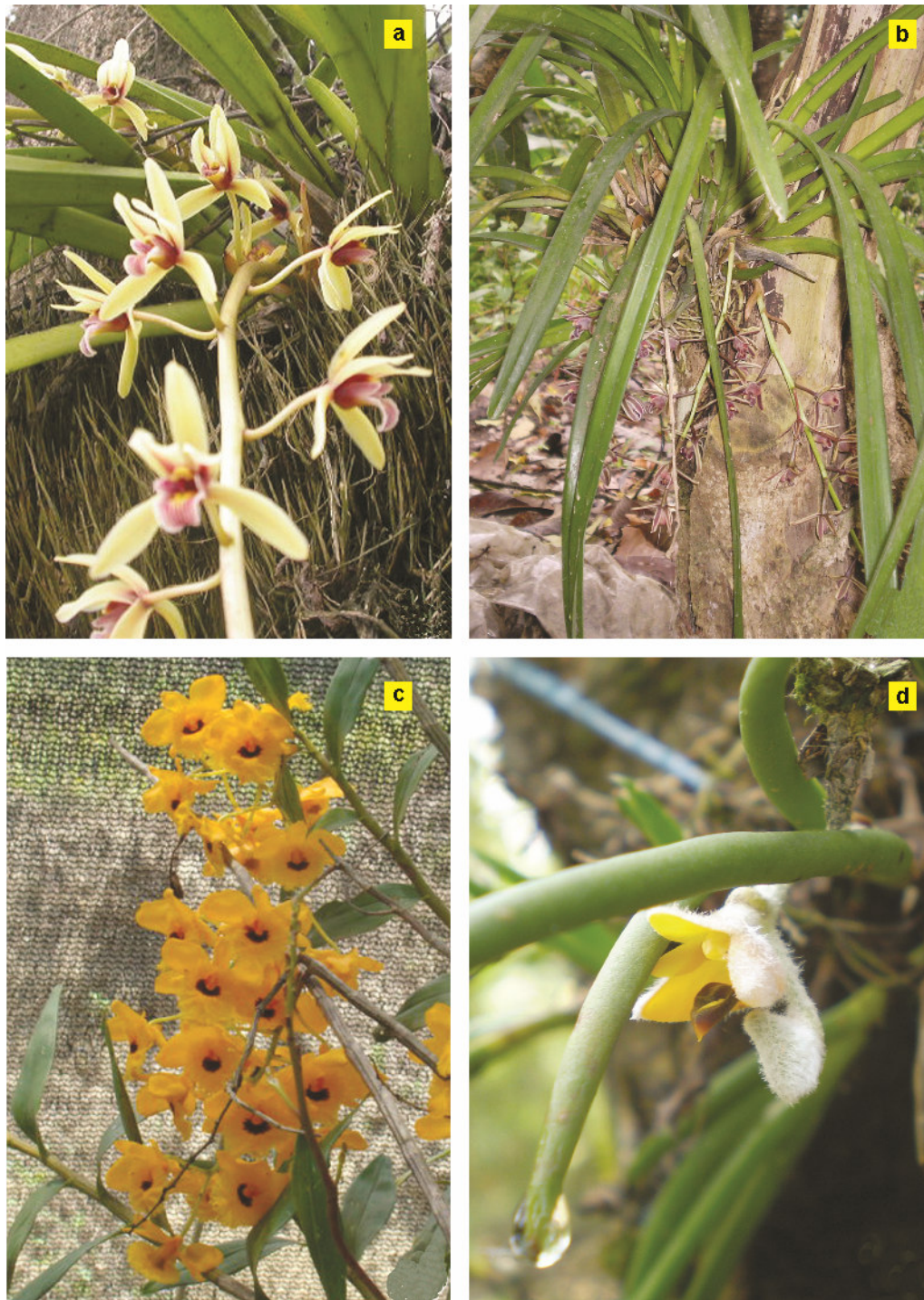


Plate 1-Medicinal orchids, a) *Cymbidium aloifolium* (L.) Swartz., b) *Cymbidium bicolor* Lindl., c) *Dendrobium fimbriatum* Hook. var. *occulatum* Hook. f., and d) *Eria pannea* Lindl.

***Dendrobium fimbriatum* Hook. var. *occulatum* Hook. f.**

Dendrobium fimbriatum Hook. var. *occulatum* Hook. f., Bot. Mag. t. 4160. 1845.

Stem 40-100 cm long, cylindrical, sub-erect or drooping, many leaved; leaves lanceolate or olong-

lanceolate, acute, sessile; inflorescence 15-25 cm long, laxly many flowered, lateral, arched; flowers ca 3.5 cm across, yellow, slightly scented, widely opening; pedicelled ovary ca 3 cm long, greenish-yellow; lip ca 3.2 cm long, yellow with 1 deep orange

blotch, orbicular, margins deeply and irregularly fimbriate; and column ca 0.5 cm long, yellow, stout.

Local Name: *Mokya tu*

Habit and Habitat: An epiphytic orchid, commonly noticed on evergreen forest of the district in *Castanopsis indica*, *Cinnamum cecidodaphne*, *Quercus glauca*, *Magnolia holgsonii*, *Callicarpa arborea*, etc.

Flowering and fruiting: April-June.

Occurrence: Widely distributed in the district.

Part used: Leaves

Mode of administration: About 10 g leaves are grounded and made into paste and applied twice a day for 10 days to heal the cuts and wounds.

Eria pannea Lindl.

Eria pannea Lindl. in Bot. Reg. 64. Misc 79. 1842.

Stem few leaved, very short, 3-4 leaved; leaves 4-15 x 0.3-0.4 cm, cylindrical, fleshy, terete, straight or arched; inflorescence 2-3 flowered, spicate, terminal; flowers ca 1 cm across, white with yellow on middle, woolly; floral bracts 4-6 x 3-4 mm, ovate, acute, slightly longer than the pedicelled ovary, densely woolly; Lip ca 7 x 3.5 mm, oblong, obtuse, yellowish brown, slightly concave, disc with an oblong callus near the base, and column ca 2 mm long, yellowish green, pubescent outside, column foot curved inward, glabrous.

Local Name: *Khadla*

Habit and habitat: An epiphytic orchid, commonly found growing in evergreen forest mainly in *Amoora wallichii*, *Terminalia myriocarpa*, *Callicarpa vestita*, *Bauhinia purpurea*, etc. It mainly prefers the semi shaded areas in the host tree.

Occurrence: Its distributional status is not very common in the district.

Flowering and fruiting: July-August

Part used: Leaves

Mode of administration: One spoonful of 5 g leaf paste is applied on the affected area for 2-6 months to heal bone fracture. For the treatment of skin inflammation and wounds paste is applied for 7-10 days.

The forest cover in Lohit district has suffered greatly under the tremendous influence of different developmental activities like clearing for agriculture, road construction, development of towns, etc. Consequently, most of our indigenous species are becoming rare or threatened. This necessitates the proper exploitation and popularization of these species

before they are eliminated from the scene. *Khamti* people are very rich in ethnobotanical knowledge and some ethnobotanical information of *Khamti* tribe is already reported¹⁷, but ethnobotany about orchids in that region not much known. Orchids of Arunachal Pradesh have been studied by many workers in different time intervals but they were focused mainly on taxonomy^{16,18,19}. In modern time, orchids are known for their long lasting and fascinating flowers and cultivated for ornamental purposes. But very little attention has been paid to medicinal properties of the orchids and hence, there is need to study the medicinal value of the orchids for herbal formulation.

Conclusion

As the studied four orchid species *Cymbidium aloifolium* (L.) Swartz., *Cymbidium bicolor* Lindl., *Dendrobium fimbriatum* Hook. var. *occulatum* Hook. f., and *Eria pannea* Lindl are quite common in distribution pattern, hence little attention is paid towards their conservation aspects. However, if the rate of destruction remains same, then very soon the number of orchids will be reduced. In view of the rich biodiversity of this region and the importance of retaining the indigenous knowledge of the *Khamti* community for future generations, long term conservation measures will have to be taken before they are eliminated from the wild forests of the region. The present study will be useful for future discovery of new sources of the drugs from different orchid species.

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