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Ethnobotanical Studies on Orchids of Niyamgiri Hill Ranges, Orissa, India

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ABSTRACT

Niyamgiri hills, the abode of the primitive Dongria Kandha tribe in southwest Orissa, is a unique forest ecosystem harbouring a rich flora and vast natural resources. The present ethnobotanical study concerns some 20 species of orchids including 16 epiphytes and 4 terrestrials that are used by the Dongarias of the Niyamgiri hill range to treat 33 kinds of diseases. This paper also discusses some of the threats to the orchids of this hill region, as well as some very serious problems regarding their conservation.

Keywords: Niyamgiri hill, Dongaria tribe, orchids, ethnobotanical studies, conservation.

INTRODUCTION

Orchids are herbaceous plants that are classified in their own family, the Orchidaceae. Aside from the many wild species of this family, the cultivated orchids constitute an order of royalty in the world of ornamental plants. Economically, they are of immense importance in horticulture. The wild species, on the other hand, have been used as indicators of regions that have a healthy ecosystem (S. Mishra, 2004). However, one often overlooked value of the plants of this family lies in the role that they have played in medicine. In many countries like China and in some parts of Europe and America, Australia and Africa, orchids have been used as traditional drugs for a very long time. 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 headaches, and most

importantly, functioning as anti-cancer agents (Bulpitt, 2005). In still another report, Rajendran (1997), cites the medicinal uses of some orchids from South India. And, according to Reddy et al. (2005), the different ethnic groups of Andhra Pradesh are known to use some 23 species of orchids for the treatment of ailments that are associated with different diseases.

Recently in one study conducted at a botanical research institute in India, scientists evaluated the species *Vanda tessellata* and discovered its role as a potent aphrodisiac and fertility booster. This species, grown in abundance locally, has had a long history of use by the native population for its anti-inflammatory properties (Kumar et al., 2005). The Indian *Vanda* orchid does indeed express antiproliferative effects against various types of cancers, including those from choriocarcinoma (cancer of germ cells), lung cancers, and stomach cancers (Ho and Chen, 2003). Still other orchids have been used in the treatment of epilepsy, flatulence, rheumatism and spasms. They have also been used for sedatives and flavor enhancers and for everything from cramps to increased virility (Kong, 2003).

The hill range acts as a meeting ground for the floras of the northern and southern parts of India. In a recent study of the hill ranges, R.C. Mishra (2007) reported the occurrence of 663 species of vascular plants belonging to 454 genera and 130 families. The Niyamgiri hills, evidently, are an important orchid-rich area of Orissa, next only to Similipal and Rebana and at par with the Koira (Sundargarh) forests. S. Mishra (2005), however, accounts for only 31 species (19 epiphytic, 12 terrestrial) of orchids from Niyamgiri. Bearing in mind the multifaceted importance of orchids, the majority of the surveys that have been conducted of this group have focused on species that have been used medicinally. In the present paper an attempt has been made to collect information on medicinal importance of orchids traditionally used by the Dongaria Kandha tribes of the Niyamgiri hill ranges of Orissa.

STUDY SITE

The Niyamgiri hill range lies between 19° $26^{'}$ to 19° $43^{'}$ N latitude, and 83° $18^{'}$ to 83° $28^{'}$ E longitude. The hills are situated within the districts of Rayagada and Kalahandi, and veer off in a NE-SW direction as part of the Eastern Ghats of India. The region is known for its innumerable valleys, watercourses and high mountain peaks, as well as for its very diverse vegetation.

MATERIAL AND METHODS

An ethnobotanical survey of the orchids of this region was undertaken between the years 2005 and 2007. A total of 20 informants were interviewed from a sample pool that included 150 small areas. In this study, questionnaires were used to collect information on the informant's name, sex, age and village. Additional questions included the vernacular name of the plant, the parts and proportions that were used, the methods of preparation and approximate doses and modes of administration. As far as possible, the data was verified by a cross checking method to confirm the authenticity of the information. The specimens were provisionally identified on the spot and later confirmed using local floras (Haines, 1921-25; Mooney, 1950; Saxena and Brahmam, 1994-96; Mishra S., 2004). The nomenclature of each species follows the principles and articles of the International Code of Botanical Nomenclature, or ICBN (Greuter et al., 1994). Our data was checked against such standard reference works as Kirtikar and Basu (1935), Chopra et al (1956), Agarawal and Ghosh (1985), Satyavati et al (1987), Warrier et al (1995), and Jain.S.K, (1964). The information cited in the present work, however, was not found to be previously reported by earlier researchers.

ENUMERATION

1. *Acampe carinata* (Griff.) Panig.
Local name: *Kano-Kato*
Place of collection: Khambesi
Part used: Root
Mode of administration: The root paste is applied externally on scorpion and snake bites. The leaf paste along with one piece of garlic is taken once a day for seven days to get relief from chest pain and stomach disorder caused by hyper acidity.

2. *Acampe praemorsa* (Roxb.) Blatt. & McCann
Local name: *Kano-Kato*
Place of collection: Sakata, Kularpeta, Monda
Part used: Root
Mode of administration: Half spoon of fresh root paste, 1gm root paste of *Asparagus racemosus* mixed together and made into paste, of which one spoonful is taken orally on an empty stomach twice a day for 15 days to cure arthritis.

3. *Aerides odorata* Lour.

Local name: *Hameri*
Place of collection: Denguni
Part used: Root and leaves
Mode of administration: One gm of fresh root, 1gm common salt, 1gm root powder of *Saraca asoca* and 2gm bark powder of *Azadirachta indica* are mixed thoroughly and made into paste. Half spoon of it is taken orally twice a day with a cup of water for one month to reduce joint pain and swellings. The leaf juice is taken orally twice a day for 20 days against tuberculosis.

4. *Bulbophyllum cariniflorum* Rchb.
Local name: *Sumura*
Place of collection: Mondanala and Sutanguni
Part used: Root
Mode of administration: Two gm of dried root, 1gm of black pepper, 5 ml of cow milk are mixed and made into paste. A half spoon of the decoction is taken orally with a cup of water by women for 5 to 10 days to induce abortion within 2 to 3 months of pregnancy.

5. *Cymbidium aloifolium* (L.) Sw.
Local name: *Supurn*
Place of collection: Khajuri Kurli
Part used: Root
Mode of administration: Two gm of root powder mixed with 2gm dried ginger and 1 gm of black pepper mixed thoroughly and made into a powder. Half spoon of it is taken with cup of cow milk twice a day for two months to reduce paralysis.

6. *Dendrobium herbaceum* Lindl.
Local name: *Sasanga*
Place of collection: Denguni and Jiniguda.
Part used: Leaves
Mode of administration: Ten gm fresh leaves are made into paste with 10gm young shoot of *Andrographis paniculata* and applied on the infected parts twice a day for 7 days to treat syphilis. The wounds are washed after half an hour with leaf decoction of *Azadirachta indicia* to avoid over use of the decoction.

7. *Eulophia spectabilis* (Dennst.) Suresh
Local name: *Bonga taini*

Place of collection: Monda Niyam Raja
Part used: Tuber
Mode of administration: Ten gm of dried tuber, 5 gm of dried leaves of *Withania somnifera*, 5 gm dried leaves of *Curculigo orchioides* and 5 gm of black pepper are crushed and the powder taken orally with a cup of water for 20 days against aphrodisiac. The leaf decoction is also used against vermifuse.

8. *Eria bambusifolia* Lindl.
Local name: *Kimar*
Place of collection: Mundabai
Part used: Whole plant.
Mode of administration: The whole plant of *Eria bambusifolia* and ripe fruit of *Aegle marmelos* are sealed in different earthen pots separately and burnt into ashes. The ash is mixed together in 1:1 ratio. A half spoon is taken with cup of water on empty stomach twice a day for seven days to cure hyper acidity and stomach disorder.

9. *Flickingeria macraei* (Lindl.) Seidenf.
Local name: *Sakar*
Place of collection: Serkapada
Part used: Root
Mode of administration: One spoonful of root paste along with 1g seed powder of black pepper is administered orally on empty stomach twice a day for 21 days to cure diseases including skin allergy and also applied on affected part to cure eczema.

10. *Geodorum recurvum* (Roxb.) Alston
Local name: *Tejraj*
Place of collection: Kesarpada
Part used:
Mode of administration: A decoction made from 100 gm of dried tuber, 15 to 20 gm of black pepper, and 20 to 25 nos. of garlic and taken orally twice a day for 15 days to cure malaria fever. The root paste is also applied externally to suppress tumors.

11. *Geodorum densiflorum* (Lam.) Schltr.
Local name: *Kukurmuria*
Place of collection: Jarapa,

Part used: Root

Mode of administration: One gm of fresh root paste, 2 drops of ghee and 5 ml of honey taken orally twice a day for 15 days on an empty stomach to regularize menstrual cycle in women.

12. *Habenaria commelinifolia* (Roxb.) Wall. ex Lindl.

Local name: *Devsunda*

Place of collection: Khambasi

Part used: Root

Mode of administration: Equal quantity of dried root of *Habenaria commelinifolia* and *Saraca indica* boiled in 1 liter of water till the volume is reduced to 100 ml. Then, 6-8 drops of this decoction is administered orally on an empty stomach for 10 days to cure spermatorrhea.

13. *Habeneria longicorniculata* Graham

Local name: *Devasunda*

Place of collection: Kalyanasingpur

Part used: Tuber

Mode of administration: Ten gm of tuber paste is mixed with an equal amount of turmeric powder and made into paste. The decoction is applied externally on affected parts to cure leucoderma.

14. *Habenaria marginata* Coleb.

Local name: *Humari*

Place of collection: Jiniguda

Part used: Tuber

Mode of administration: Approximately 250g of tuber are boiled in one liter of water until the volume is reduced to 250 ml. The decoction is then mixed with 5 ml of honey and taken daily on an empty stomach for 14 days for treatment of malignant ulcer.

15. *Luisia trichorhiza* (Hook.) Bl.

Local name: *Koira*

Place of collection: Bhisamkatak

Part used: Root

Mode of administration: 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. The root extract is used as an anti-diarrhoea (for cattle) and to reduce muscular pains

in humans.

16. *Polystachya concreta* (Jacq.) Garay & Sweet.

Local name: *Kakina*

Place of collection: Kucharla

Part used: Tuber

Mode of administration: Approximately 100g of fresh tuber with 500 ml of water is boiled till it reduces to 100 ml. Then, 3 to 4 ml of this decoction is taken orally with 7 to 8 drops of honey on an empty stomach twice a day for 2 months for treatment of arthritis.

17. *Rhynchostylis retusa* (L.) Bl.

Local name: *Pumam*

Place of collection: Pusuguda

Part used: Root

Mode of administration: About 3 to 4gm of root and 2gm of fresh leaf buds of *Pisum sativum* are made into paste. One gm of the paste is taken orally with water on an empty stomach twice a day for seven days to cure blood dysentery. The plant is also used as emollient and the leaf paste is applied externally to cure wounds.

18. *Seidenfia rheedii* (Sw.) Szlach.

Local name: *Simil*

Place of collection: Tonda

Part used: Root

Mode of administration: About 250gm of root is boiled in one liter of water till it becomes one third of its volume. Then, 5 ml of this decoction along with 2 ml of honey is taken orally on an empty stomach twice a day for 15 to 21 days to cure cholera.

19. *Vanda testacea* (Lindl.) Rchb.f.

Local name: *Malanga*

Place of collection: Khambesi

Part used: Leaves and root

Mode of administration: Leaf paste of *Vanda testacea* and the boiled rhizome paste of *Rhaphidophora glauca* are mixed in equal proportions and tied with a bandage on bone fractures of cattle. The plant has also been used for ear ache. A decoction made from the root extracts of this plant and *Curculigo orchioides* is taken twice a day for 7 days to cure asthma.

20. *Vanda tessellata* (Roxb.) Hook. ex G.Don.

Local name: *Banki*

Place of collection: Bhisamkotak.

Part used: Root

Mode of administration: Fifty g of the root is boiled in 250 ml of water until it is reduced to 100 ml., and filtered and cooled. Then, 5 ml of the decoction is mixed with 3 to 5 ml of honey taken orally on an empty stomach twice a day for one month for treatment of sexually transmitted diseases. The root paste is also used to cure rheumatism and nervous disorders.

RESULTS AND DISCUSSION

Traditional and indigenous systems of medicine persist all over the world. The unique traditional system of healthcare that is passed down from generation to generation within a society is still the prevalent system found within the remote rural areas of the country. It is evident that the Dongaria tribes of the Niyamgiri hill region are very knowledgeable about phytomedecines. Brought out in the present study are the therapeutic potentials of some 20 species of orchids for the treatment of different diseases and ailments. The present investigation has also brought to light the therapeutic value of orchids in curing scorpion and snake bites, as well as in the treatment of stomach disorders, chest pains, arthritis, tuberculosis, pregnancy, syphilis, paralysis, cholera, acidity, eczema, tumor, menstrual disorder, spermatorrhea, leucoderma, wounds and sores, diahorrhea, muscular pain, blood dysentery, bone fractures, rheumatism, asthma, malaria, earache and sexually transmitted diseases. According to the Dongarias of Niyamgiri, orchids are used as an emetic, a purgative, an aphrodisiac, a vermifuge, a broncho-dialator and an anti-tumor agent. However, the mode of administration could not be documented for all species due to a lack of informants. Further studies are in progress to explore the various medicinal uses of orchids, as well as the problems of their threatened ecosystems.

Due to the incredible genetic diversity of the orchid family, future investigators will undoubtedly find this group a potentially rich area for doing further research. Many species of orchids, having helpful 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, pharmacology and other, as yet unexplored fields of science. Presently, the

Niyamgiri hill ranges are capturing the interest of scientific communities due to their unique biodiversity. But, the habitats of the orchids of the hill ranges are presently under threat of upcoming mining operations. Bearing in mind the rich biodiversity of this region and the importance of retaining the indigenous knowledge of the primitive Dongaria kandha tribes for future generations, long term conservation measures will have to be taken to preserve this rich orchidarium 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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