Medicinal ground orchids: source for value addition

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Abstract

Orchids are most diverse group among the angiosperms belonging to the family Orchidaceae. They are known for their unique habit, habitat, flowers and fragrance. They have aesthetic, economic and medico-food values. Less documentation is available on their medico-food values. Keeping this in view, an attempt has been made to document the medicinal uses of commonly available ground orchids in selected states of India. A survey was made during 2016-2022 with many project works and field visits along with literature survey. Results revealed that about 15 ground orchids commonly used for medico-food purposes belonging to 10 genus. The present works highlights the importance of ground orchids as a source of medicinal agents and to do value addition.

Keywords: Ground orchid, medicinal, phytochemical, value addition

INTRODUCTION

Orchids are the subject of interest from many sections of the society due to this alternative flowers, morphology, habitat, ornamental, food, medicinal and aesthetic values. About 1256 species of orchids are reported from India with 388 species being endemic or unique to India (Wildlife and biodiversity: Indian must conserve its orchid wealth by V. Sundararaju, Published by Downtoearth on 17 August 2020). The genus *Bulbophyllum* represent 137species shows the highest diversity. Among, the ground orchid, *Habenaria* represents 61 taxa. The diversity and distribution of Orchid species indicate that they could be the great source of medicinal agents. Most of Orchid species are unexplored and not evaluated their medicinal and pharmacological values. Among the orchid species, ground orchids are more alternative and easier to get. They are mostly tuberous and could be an agent for medicinal and pharmaceutical evaluation.

Whole world facing lack of adequate food and medicines for increasing population and on other hand, due to anthropogenic activities, climate change and deforestation, the biowealth is going to decline. The mal practices of drugs also created antimicrobial resistance (AMR) and drugs are going to fail (Kumar et al., 2013; Kumar and Jena 2014; Kumar 2017; Kumar and Jena 2017). All these above mentioned burning issues indicate at alarming rate towards finding new food and medicines from wild or unexplored habitats of the world. COID-19 pandemic highlights the importance of natural nutraceuticals as well as preventing agents. Therefore, an attempt has been made to gather the information on the medicinal ground orchids of India through field and literature survey. The present survey highlights the importance of ground orchids as a medicinal agent for pharmaceutical industries.

METHODOLOGY

Literature survey was made during Feb 2022 to March 2022 along with field surveys. The information gathered from the field during many projects works on floral wealth in Odisha, Jharkhand, Manipur, Sikkim and Kerala during the year 2015-2022 (Plate 1). The species was identified by Dr. Sanjeet Kumar, Ambika Prasad Research Foundation, Odisha, India.



Plate 1: Field survey for the collection of medicinal values of ground orchid species

RESULTS AND DISCUSSION

The field and literature surveys revealed that about 15 common ground orchids are used as medicofood agents belonging to 10 genera. The common enumerated medicinally important orchids are *Arundina graminifolia, Bletitla striata, Calanthe plantaginea, Calanthe triplicate, Cypripedium cordigerum, Goodyera discolor, Habenaria commelinifolia, Habenaria emarginata, Habenaria intermedia, Habenaria pectinata, Phaius tarikervilliae, Spiranthes sinensis,* and *Zeuxine strateumatica.* Details are listed in the Table 1 and Plate 2. Parts mostly used as root and rhizome for medicinal purposes. Orchid species cure many diseases like urine infection, dysentery, swelling and as tonic (Figure 1). It was observed that Habenaria is used often among the other enumerated ground orchids of India. Researchers also documented the medicinal values of Orchid species.

 Table 1: Medicinally important ground orchids of India

Botanical name	Medicinal uses
Arundina graminifolia	Root juice is used as a tonic.
Bletitla striata	Tuber is used as tonic.
Calanthe plantaginea	Rhizome is used as tonic.
Calanthe triplicata	Root is used to cure dysentery.
Geodorum densiflorum	Root is used to cure skin infections.
Cypripedium cordigerum	Root is used as tonic.
Goodyera discolor	Root juice is used in urine infection.
Habenaria commelinifolia	Root used as tonic.
Habenaria plantaginea	Tuber paste juice is used in stomach pain.
Habenaria marginata	Root juice is used as a tonic.
Habenaria intermedia	Used in Astravarga (Singh & Duggal, 2009)

Habenaria pectinata	Tuber paste is used to reduce swellings.
Phaius tarikervilliae	Tuber is used as tonic.
Spiranthes sinensis	Root is used to reduce headache.
Zeuxine strateumatica	Tuber is used as tonic.



Plate 2: Some common medicinal ground orchids; a) *Habenaria plantaginea*; b) *Habenaria commelinifolia;* c) *Habenaria marginata;* d) *Arundina graminifolia;* e) *Calanthe triplicata;* f) *Bletitla striata;* g) *Geodorum densiflorum*





In 2012, Singh et al. states that *Bletitla striata* has specific compounds which can be used for medicinal purposes. Tezuka et al. (1990) states that *Spiranthes sinensis* has specific secondary metabolites which can be used to treat many diseases. In 2017, Tsering et al. states that *Habenaria intermedia* used as Astavavarga known as herb of immortality as it is a classical ingredient for ayurvedic formulations. In 2013, Pant states that *Arundina graminifolia* root is used to relieve body ache. *Calanthe plantaginea* rhizome dried powder is used as an aphrodisiac. In 2015, De et al. states that *Calanthe triplicata* root part is used to treat diarrhea with many ingredients in North East India. *Habenaria pectinata* tuber part is used to treat arthritis. Still more information and detailed work needed for documentation on orchids, specially ground orchids along with analyse the medicinal value (uses).

CONCLUSION

Orchids are specification or attractive for its flowering pattern but there is a lack of documentation on medicinal values and their validation. As orchid is a key indicator of non-pollution areas, it has some other uses that need a sound proof documentation scientifically. Many ground orchids are used as a tonic which could be a strong nutraceutical values. From this point of view, present work highlights the need of exploration works on ethnomedicinal values of ground orchids. Further need advanced work on their food, medicinal and pharmacological potential of ground orchids for value addition (Figure 1).

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REFERENCES

- De LC, Rao AN, Rajeevan PK, Pathak P and Singh DR. (2015). Medicinal and aromatic orchids: an overview. International Journal of Current Research. 7(9): 19931-19935
- Kumar S and Jena PK. (2014). Chromatographic, antibacterial and FT-IR analysis of *Dioscorea pentaphylla* L. tuber extracts. Plant Science Research. 36 (1&2): 83-90.
- Kumar S and Jena PK. (2017). Tools from Biodiversity: Wild Nutraceutical Plants. Ed: James N Furze et al.: Identifying Frontier Research Integrating Mathematic Approaches to Diverse Systems / Sustainability. Springer, Swithzerland. DOI: 10.1007/978-3-319-43901-3-9.
- Kumar S, Behera SP and Jena PK. (2013). Validation of tribal claims on *Dioscorea pentaphylla* through phytochemical screening and evaluation of antibacterial activity. Plant Science Research. 35: 55-61.
- Kumar S. (2017). Yam (*Dioscorea* species): Future functional wild food of tribal Odisha, India. In Frontiers in bioactive compounds. Bentham Science Publishers Limited.
- Pant B (2013). Medicinal orchids and their uses: Tissue culture a potential alternative for conservation. Africal Journal of Plant Science. 7(10): 448-467.
- Singh A and Duggal S. (2009). Medicinal orchids: an overview. Ethnobotanical leaflets. 13: 357-363.
- Tezuka Y, Li J, Hirano Hirano H. Ueda M, Nagashima K, Kikuchi T. (1990). Studies on the constituents of Orchidaceous plants IX. Constituents of *Spiranthes sinensis* (PERS.) AMES var. Amoena (M. Bieberson) HARA. Structures of spiranthesol, spiranthoquinone, spiranthol Cand spirasineol B, new isopentenyl dihydrophenantrenes. Chem. Pharm. Bull. 38: 629-635.
- Tsering J, Tam N, Tag H, Gogoi J, Apang O. (2017). Medicinal orchids of Arunachal Pradesh: A Review. Bulletin of Arunachal Pradesh Forest Research. 32(1&2): 1-16.