

Orchids, the Jewels of Kuldiha Wildlife Sanctuary of Balasore District, Odisha, India

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(Received: 23 November 2023; Revised: 30 November 2023; Accepted: 24 December 2023; Published: 15 January 2024)

(Published by Research Trend)

ABSTRACT: The Kuldiha Wildlife Sanctuary in the Balasore district of Odisha is one of the biodiversity rich protected areas of immense importance out of the 21 sanctuaries of Odisha being the transition point between the Similipal Biosphere Reserve and Hadagarh Wildlife Sanctuary. Its congenial climatic conditions along with other edaphic factors enables this wildlife sanctuary to harbour a moderately rich orchid flora. Orchids the rare and unique components of a healthy forest ecosystem do not attain the attention as it deserves to be. Taking this into account the present piece of work deals with the enumeration of 24 orchids dwelling in the Kuldiha Wildlife Sanctuary along with their socio-economic importance and conservation practices. This will surely pave the way for creating due awareness among different populace.

Keywords: Orchid, Diversity, Kuldiha, Therapeutic importance, Conservation.

INTRODUCTION

Kuldiha Wildlife Sanctuary ideally has rich and unique diversity of plants, animals and micro-organisms owing to its location coupled with microclimatic conditions. Among the harboured life forms, orchids being the rare and unique plants deserve special mention. Keeping the un-exploredness and sporadic works, moreover lack of awareness and firsthand information on the orchids of Kuldiha wildlife sanctuary this study aimed at providing a detailed enumeration of the orchids which includes a brief description of the species along with flowering and fruiting time and distribution. A total of 24 species of orchids have been encountered under 21 genera. Out of which 17 are epiphytes and rest 07 are of terrestrial life forms.

Orchids are extravagant plants found everywhere except desert and in the poles (Pant, 2013; De & Singh 2015; De *et al.*, 2015; Zhang *et al.*, 2018; Rao & Kumar 2018) and are the second largest family in Angiosperm (Dressler, 2005). Currently about 1430 species divided into 192 genera are found in India (Kumar & Kumar 2005; Misra 2019). They are mainly found in Himalayas and in the mountain ranges of Ghats in Eastern and Western (Gogoi *et al.*, 2012; Linthoingambi *et al.*, 2015; Swain *et al.*, 2019). Three types of orchids can be observed: epiphytic, terrestrial and saprophytic plants (Misra, 2014). Orchidaceae is the family having maximum number of endemic species (Dash *et al.*, 2017). Among the rich and varied flora of India, the most dominant plant family is Orchidaceae, members of which are known as orchids.

Orchids are known for their incredible range of beautiful flowers. The flowers often attain odd shape resembling various life forms like a butterfly, bee, scorpion, lizard, snake and even a man or a ghost! Orchids breed easily among members of one group or different groups forming interspecific or intergeneric hybrids. The new crosses are even more beautiful than any of their parents. Many of the flowers remain in bloom for a very long period. Flowers which have a thick and waxy texture have a long vase-life. For all these orchids are very popular among florists as also with the hobbyist. Orchids, number of species wise are the largest family of flowering plant in India. On the basis of its population they are however one of the least occurring groups of plants. It is because they are restricted to a few geographical areas, mainly due to the aerial mode of living of most (73%) of its members.

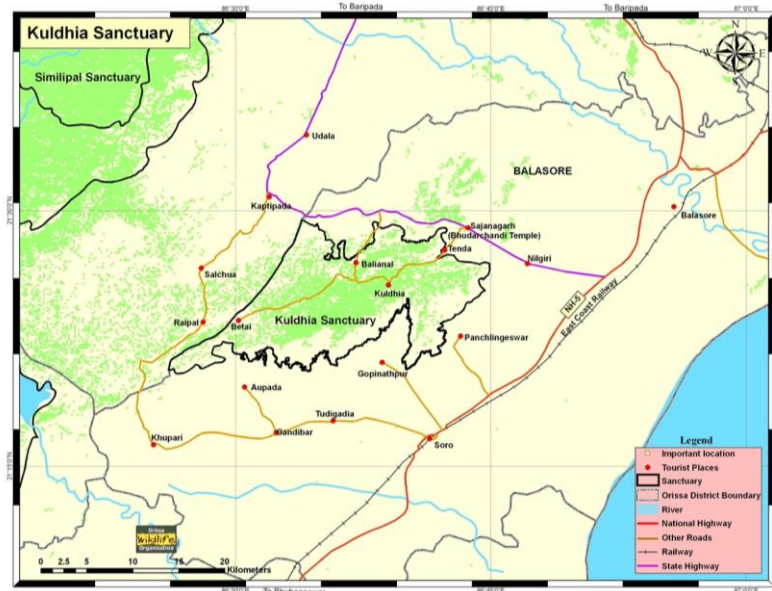
Study Area. Odisha State has many wildlife sanctuaries, forest reserves and national parks which increases state wealth (Mishra *et al.*, 2012). The study was conducted in Kuldiha Wildlife Sanctuary lying in between 21°20' to 21°30' North latitude and 86°26' to 86°45' East longitude and located in South-western part of the Balasore district bordering Mayurbhanj District of Odisha State (Map 1 & 2). The area has a subtropical climate with three distinct seasons i.e summer, monsoon and winter. The mean annual rainfall is about 1630 mm and a normal winter characterizes the climate. The air is quite humid with relative humidity always exceeding 70%. Kuldiha Wildlife Sanctuary, a part of mega-habitat located at trijunction of Balasore, Mayurbhanj and Keonjhar Districts, is a densely

forested hill range spreading over 272.75 km² (Map 3). The Kuldiha Wildlife Sanctuary has been declared U/S -18 of the Wildlife Protection Act, 1972 by the State Govt. vide their Notification No. 243-FFAH dt. 04.01.1984, published in the Orissa Gazette No.5 dt. 03.02.1984. It is located in the South-western part of Balasore District under Nilgiri Civil Sub-Division in the State of Odisha. It comes under Mahanadian biogeographical region. However, Kuldiha represents features of all the four Biotic Provinces for which Odisha is the junction. These provinces are Eastern Plateau, Chhotanagpur, Lower Gangetic Plain and Coastline. Four types of major vegetation are observed in Odisha: Semi-evergreen forest, Tropical moist deciduous forest, Tropical dry-deciduous forest and Littoral & Tidal swamp forest (Champion & Seth 1968). There are 5 Sections and 16 Beats within the Sanctuary. Kuldiha is not only a compact mass of hills, valleys and streams but a bounty of natural beauties of trees, climbers, orchids, ferns, mosses, fungi, animals, birds and micro-organisms. The protected area of

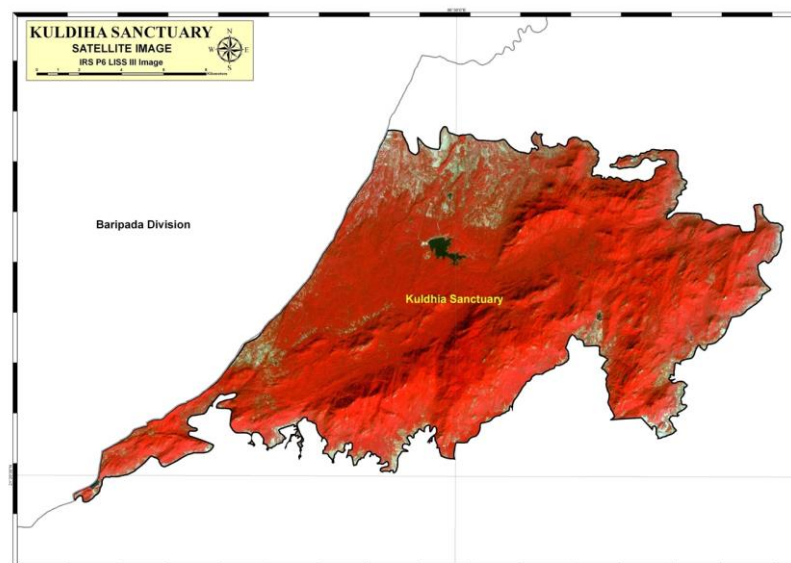
Kuldiha represents high forest ecosystem with sparse grassland and riparian vegetation along the perennial nalas. The major species found in the area are *Shorea robusta*, *Terminalia tomentosa*, *Syzygium cumuni*, *Michelia champaca*, *Careya arborea*, *Lagerstromea parviflora*, *Diospyros melanoxylon*, *Madhuca indica*, *Scleichera oleosa*, *Anogeisus latifolia*, *Mangifera indica*, *Embllica officinalis*, *Xylia xylocarpa*, *Dalbergia latifolia*, *Tectona grandis*, *Holorrhena antidysentrica*, *Combretum decandrum* etc.

MATERIAL AND METHODS

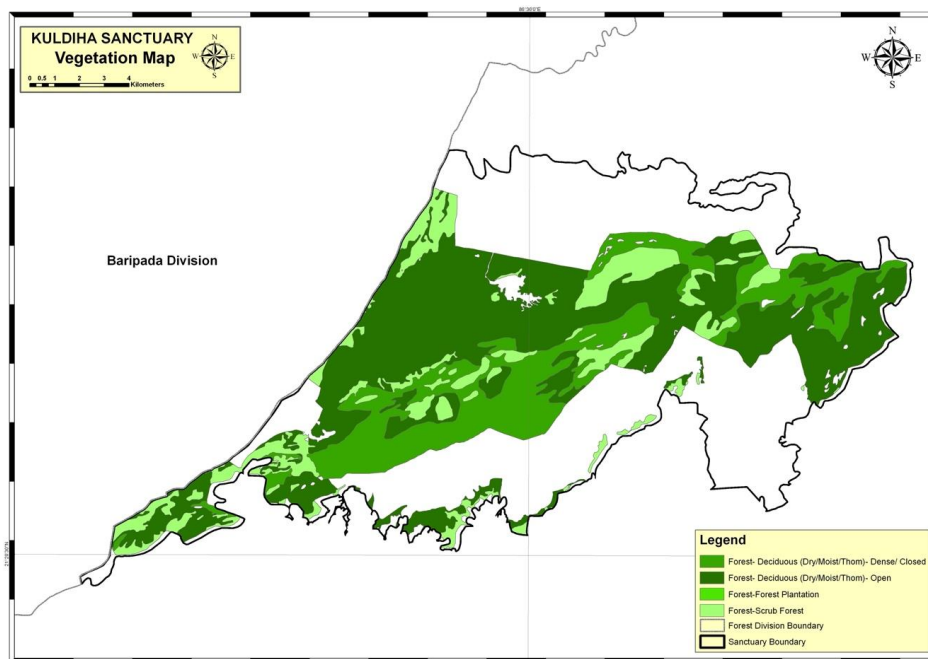
Extensive field collection tours in different seasons mostly summer, rainy and winter were made all the forest areas of the wildlife sanctuary. Information pertaining to the uses of different species was gathered from the local forest dwellers. Due care was taken for recording the flowering and fruiting time along with other important parameters such as habitat, frequency of occurrence and status etc.



Map 1. Kuldiha Wildlife Sanctuary



Map 2. Satellite map of Kuldiha Wildlife Sanctuary



Map 3. Vegetation map of Kuldiha Wildlife Sanctuary.

ENUMERATION

1. *Acampe praemorsa* (Roxb.) Blatter & Mc Cann (*Epidendrum praemorsum* Roxb.)

Epiphytes, rarely lithophytic. Inflorescence short, condensed, axillary or leaf opposed, subumbellate, sheathed with sterile bracts. Flowers clustered, petals and sepals fleshy, succulent, creamy yellow with brown transverse lining or/and spots.

Flowering: May-July.

Fruiting: August-February.

Distribution: Odisha (Mayurbhanj, Kendujhar, Deogarh, Balasore, Sundargarh, Koraput, Khurda, Kalahandi, Malkanagiri), Jharkhand, Sikkim, West Bengal, Gujarat, Madhya Pradesh, Tamil Nadu, Karnataka, Andhra Pradesh, Assam, Arunachal Pradesh; Myanmar and Sri Lanka.

2. *Aerides odorata* Lour.

Epiphytes. Inflorescence raceme, extra-axillary, flowers many. Flowers fragrant, white with purple blotches and spots.

Flowering: June-July.

Fruiting: August-March.

Distribution: Odisha (Mayurbhanj, Keonjhar, Balasore, Kalahandi, Koraput, Sambalpur, Sundargarh), Jharkhand, Arunachal Pradesh, Sikkim, West Bengal, Tripura, Mizoram, Andhra Pradesh; Nepal, Bhutan, Bangladesh, Indonesia, Thailand, Vietnam, Philippines

3. *Bulbophyllum crassipes* Hook. f.

(*Phyllorkis crassipes* (Hook.f.) Kuntze)

Mostly lithophytes and occasionally epiphytes. Closely allied to *B. careyanum* (Hook.) Spreng. Which differs in the longer column with shorter apical teeth, in the side lobes of the lip being shorter and blunter and in having shorter racemes.

Flowering: October.

Fruiting: November-March.

Distribution: Odisha (Mayurbhanj, Balasore, Keonjhar, Dhenkanal, Sundargarh), Sikkim, Meghalaya, Jharkhand; Thailand, Malaysia, Myanmar.

4. *Cleisostoma appendiculatum* (Lindl.) Benth. & Hook.f. ex Seidenf.

(*Aerides appendiculata* Lindl.)

Epiphytes. Inflorescence leaf-opposed, erect or sub-erect, simple or branched, racemes, deflexed, laxly 5-15 flowered. Flowers 20-22×15-17 mm; tepals reflexed, pale yellow with a central purple at back.

Flowering: August-October.

Fruiting: October.

Distribution: Odisha (Dhenkanal, Ganjam, Keonjhar, Mayurbhanj, Sundargarh); Meghalaya, Mizoram, Assam, West Bengal, Karnataka; Bangladesh, Nepal and Myanmar.

5. *Cymbidium aloifolium* (L.) Sw.

(*Epidendrum aloifolium* L.)

Epiphytes. Inflorescence raceme, decurved, arising from the base. Flowers yellow with brown stripes and brownish lip.

Flowering: April- June.

Fruiting: June- April.

Distribution: Odisha (Mayurbhanj, Keonjhar, Balasore, Deogarh, Koraput, Sundargarh), Jharkhand, Chhattisgarh, West Bengal, Assam, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Maharashtra; China, Thailand, Nepal, Bhutan, Bangladesh, Myanmar, Indonesia, Sri Lanka.

6. *Cymbidium bicolor* Lindl.

Epiphytes. Inflorescence from rhizome at base of pseudobulb; peduncle decurved, thick, terete, sheathed; raceme drooping with 10-15 lax flowers.

Flowering: February- March.

Fruiting: May- November.

Distribution: Odisha (Balasore, Mayurbhanj), Uttaranchal, Sikkim, West Bengal, Assam, Tamil Nadu, Kerala, Karnataka, A & N Islands; China, Thailand,

Nepal, Bangladesh, Laos, Vietnam, Cambodia, Indonesia, Sri Lanka.

7. *Dendrobium aphyllum* (Roxb.) C.E.C. Fischer

Epiphytes. Flowers fascicles, from the swollen nodes, pale-rose, lip yellow.

Flowering: February-April.

Fruiting: May-November.

Distribution: Odisha (Mayurbhanj, Balasore, Koraput, Kalahandi, Sundargarh, Rayagada), Jharkhand, Chhattisgarh, Uttarakhand, Sikkim, West Bengal, Arunachal Pradesh, Assam, Meghalaya, Manipur, Madhya Pradesh, Tripura, Andaman Islands; Nepal, Bhutan, China, Myanmar, Laos, Thailand, Malaysia, Vietnam, Laos.

8. *Dendrobium macrostachyum* Lindl.

Epiphytic. Inflorescence solitary or in cymes, peduncle solitary or in pair from the nodes of the leafless stem. Flowers not much spreading lemon green, inodorous.

Flowering: May – July.

Fruiting: August – July.

Distribution: Odisha, (Mayurbhanj, Deogarh, Kalahandi, Malkanagiri, Nawarangpur, Rayagada, Sundargarh), Jharkhand, Chhattisgarh, Uttaranchal, Andaman and Nicobar, Karnataka, Maharashtra, Tamil Nadu; Nepal, Sri Lanka.

9. *Dienia ophrydis* Ormer. & Seidenf.

Terrestrial. Inflorescence furrowed, with a few deflexed sterile bracts; raceme short, dense flowered. Flowers minute, light yellow, pale purple or maroon.

Flowering: June – August.

Fruiting: October – May.

Distribution: Odisha, (Balasore, Keonjhar, Mayurbhanj), Jharkhand, Chhattisgarh, Sikkim, Meghalaya, Manipur, Nagaland, Mizoram, Arunachal Pradesh, Andaman, West Bengal, Kerala; Nepal, China, Hong Kong, Myanmar, Thailand, Laos, Vietnam, Cambodia, Malaysia, Indonesia, New Guinea, Australia, Sri Lanka.

10. *Eulophia graminea* Lindl.

Terrestrials. Inflorescence 1-3, erect with a few short branches, lax-flowered.

Flowering: January-May.

Fruiting: April-June.

Distribution: Odisha (Balasore, Khurda, Gajapati, Keonjhar, Mayurbhanj); Uttaranchal, Uttar Pradesh, Bihar, Jharkhand, Sikkim, Assam, West Bengal, Andhra Pradesh, Tamil Nadu, Nicobar Islands, Kerala, Maharashtra; Myanmar, Malaya, China, Formosa, Philippines and Sri Lanka

11. *Geodorum densiflorum* (Lam.) Schltr.

(*Linodorum densiflorum* Lam.)

Terrestrial. Inflorescence lateral, arising from the base of newly developed foliar shoot, taller than leaves, decurved during flowering, erects during fruiting, green, terete, sheathed. Flower pinkish purple, not fully opened.

Flowering: July – August.

Fruiting: August – October.

Distribution: Odisha (Mayurbhanj, Deogarh, Koraput), Jharkhand, West Bengal, Assam, Meghalaya, Andhra Pradesh, Tamil Nadu, Andaman and Nicobar Islands, Kerala, Karnataka, Maharashtra; Nepal, Bangladesh,

China, Hong Kong, Thailand, Malaysia, Indonesia, Sri Lanka.

12. *Habenaria marginata* Colebr.

Terrestrial. Inflorescence terminal, erect; spike cylindrical, lax or dense flowered, with 5-14 flowers.

Flowering: August-October.

Fruiting: October-November.

Distribution: Odisha (Balasore, Kandhamal, Koraput, Raygada, Sundergarh); Jammu & Kashmir, Himachal Pradesh, Punjab, Uttaranchal, Chattisgarh, Jharkhand, West Bengal, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Gujarat, Rajasthan; Nepal, Bhutan, Myanmar and Thailand.

13. *Kingidium deliciosum* (Rchb.f.) Sweet

(*Phalaenopsis deliciosa* Rchb.f.)

Epiphytes. Inflorescence suberect, basal, simple or sometimes with a few short branches; rachis zigzag, thickened upward, compressed. Flowers spreading, pale yellow, faintly scented.

Flowering: May-September.

Fruiting: October-June.

Distribution: Odisha (Balasore, Keonjhar, Koraput, Mayurbhanj, Sundergarh); Jharkhand, Sikkim, Assam, Meghalaya, Arunachal Pradesh, Andhra Pradesh, Tamil Nadu; China, Cambodia, Laos, Myanmar, Thailand, Vietnam, Borneo, Jawa, Malaya, Maluku, Philippines, Sulawesi, Sumatera.

14. *Luisia trichorrhiza* (Hook.) Blume

Epiphytes. Inflorescence, extra axillary, 4-5 flowered. Flowers greenish-pink to purple.

Flowering: March-April.

Fruiting: May-June.

Distribution: Odisha (Mayurbhanj, Keonjhar, Balasore, Deogarh, Kalahandi, Koraput, Kandhamala, Sundergarh, Gajapati); Jharkhand, West Bengal, Sikkim, Meghalaya, Uttarakhand; Nepal, Myanmar, Thailand, Sri Lanka.

15. *Luisiopsis inconspicua* (Hook.f.) Sathish & Suresh

(*Saccolabium inconspicuum* Hook.f.)

Epiphytes. Inflorescence leaf opposed, 1-3 per plant, a condensed raceme, rachis bearing 4-7 flowers. Flowers pale yellowish green.

Flowering: June-September.

Fruiting: June-September.

Distribution: Odisha (Balasore, Gajapati, Ganjam, Kandhamal, Keonjhar, Koraput, Mayurbhanj, Raygada, Sundergarh); Uttaranchal, Jharkhand, Sikkim, Assam, Meghalaya, Arunachal Pradesh, West Bengal, Tripura; Nepal, Bangladesh

16. *Micropera pallid* (Roxb.) Lindl.

(*Aerides pallidum* Roxb.)

Epiphytes. Inflorescence leaf opposed; raceme many-flowered. Flower pale yellow or whitish; dark mark on the petal.

Flowering: May-July.

Fruiting: July-January.

Distribution: Odisha (Mayurbhanj, Keonjhar, Khurda), Meghalaya, Tripura; Bangladesh, Myanmar, Thailand, Laos, Vietnam, Cambodia, Malaysia, Indonesia.

17. *Nervilia aragoana* Gaudich.

Terrestrials. Scape flowered. Flowers green with purple veins, pendulous.

Flowering: May-June.

Fruiting: June.

Distribution: Odisha (Mayurbhanj, Keonjhar, Kalahandi, Koraput, Rayagada, Sundergarh, Bolangir, Gajapati, Ganjam, Dhenkanal), Jharkhand, West Bengal, Meghalaya, Sikkim, Andra Pradesh, Tamil Nadu, Andaman, Kerala, Karnataka, Maharashtra, Goa; Nepal, China, Pakistan, Thailand, Vietnam, Laos, Philippines, Japan, Indonesia, Malaysia, Australia, New Guinea.

18. *Nervilia infundibulifolia* Blatt.*et* Mc Cann.

Terrestrials. Inflorescence 1 flowered; dorsal bracts lanceolate, acute to acuminate, concaved 3-veined. Flower single, at right angles to the axis; sepals and petals light green, with maroon veins.

Flowering: June.

Fruiting: June.

Distribution: Odisha (Mayurbhanj, Balasore, Kandhamala, Kalahandi, Gajapati); Jharkhand, Arunachal Pradesh, Karnataka, Maharashtra; Thailand.

19. *Pelatantheria insectifera* (Rchb.f.) Ridl.

Epiphytes. Inflorescence raceme, subsessile, shorter than the leaves, usually 3-5 flowered, de-curved and appearing from old place on the stem. Flowers small, attractive, well spread.

Flowering: September- November.

Fruiting: December-May.

Distribution: Odisha (Mayurbhanj, Keonjhar, Balasore, Kalahandi, Koraput, Rayagada, Sundergarh, Balangir, Gajapati, Ganjam, Dhenkanal, Nayagarh); harkhand, Chhattisgarh, West Bengal, Uttarakhand, Assam, Tripura, Manipur, Andhra Pradesh, Andaman; Nepal, Bangladesh, Myanmar, Thailand.

20. *Rhynchostylis retusa* (L.) Blume

Epiphytes. Inflorescence raceme, longer than the leaves, axillary, drooping, densely many flowered. Flowers fragrant, white or pink with purple or pink markings, dense.

Flowering: May-June.

Fruiting: July-November.

Distribution: Odisha (Mayurbhanj, Keonjhar, Balasore, Kalahandi, Ganjam, Gajapati, Dhenkanal); Jharkhand, Chhattisgarh, Uttarakhand, Madhya Pradesh, Sikkim, Assam, Meghalaya, Arunachal Pradesh, Mizoram, Andhra Pradesh, Tamil Nadu,

Andaman and Nicobar Islands, Kerala, Karnataka, Maharashtra; Nepal, Bhutan, Bangladesh, Myanmar, China, Thailand, Philippines, Malaysia, Indonesia, Sri Lanka.

21. *Smitinandia micrantha* (Lindl.) Holtt.

Epiphytes. Inflorescence raceme, leaf-opposed, longer than leaves in fruits, peduncle and rachis stout. Flowers pinkish, with dark pink lip.

Flowering: April-June.

Fruiting: July-November.

Distribution: Odisha (Mayurbhanj, Keonjhar, Balasore, Dhenkanal, Koraput, Sundergarh); Jharkhand, Chhattisgarh, West Bengal, Sikkim, Meghalaya, Arunachal Pradesh, Meghalaya, Nagaland; Nepal, Bhutan, Myanmar, Thailand, Cambodia, Vietnam.

22. *Staurochilus ramosus* (Lindl.) Seidenf.

(*Saccolabium ramosum* Lindl.)

Epiphytes. Inflorescence axillary paniculate raceme, 1-2 per plant, erect. Flowers very small, ca 8x7 mm, faintly scented.

Flowering: April-May.

Fruiting: May-March.

Distribution: Odisha (Mayurbhanj, Keonjhar, Koraput, Sundargarh, Dhenkanal, Balasore); Jharkhand, Chhattisgarh, Sikkim, Meghalaya, West Bengal; Bangladesh, Myanmar, Thailand.

23. *Tropidia pedunculata* Blume

Terrestrial. Inflorescence terminal, erect, subcapitate; spike very densely flowered. Flowers greenish white.

Flowering: May-July.

Fruiting: October-May.

Distribution: Odisha (Balasore, Keonjhar, Khurdha, Mayurbhanj, Sundergarh); Uttaranchal, Sikkim, Meghalaya, Nagaland, Manipur, West Bengal, Tamil Nadu, Andaman; Bangladesh, Myanmar, Thailand, Malaysia, Indonesia and Philippines.

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

Epiphytes. Inflorescence 3-10 flowered, axillary raceme. Flowers yellowish-green, with blue tinge, scented.

Flower: March-May & Oct.-Dec.

Fruiting: After Flowering & Persist for 1 year

Distribution: Odisha (Almost in all district); Jharkhand, Chhattisgarh, West Bengal, Bihar, Uttarakhand, Tripura, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Maharashtra, Gujarat, Nepal, Bangladesh, China, Sri Lanka.

Table 1: Habitat, Range and Status of Orchids of Kuldiha Wildlife Sanctuary.

Name of the orchid	Habitat (Forest type)	Range (in metres)	Status
<i>Acampe praemorsa</i>	DD-MD	50-800	C
<i>Aerides odorata</i>	DD-MD	100-900	O
<i>Bulbophyllum crassipes</i>	MD-SE	150-800	O
<i>Cleisostoma appendiculatum</i>	MD-SE	600-800	S
<i>Cymbidium aloifolium</i>	MD	100-800	O
<i>Cymbidium bicolor</i>	SE	600-900	R
<i>Dendrobium aphyllum</i>	MD	200-1000	O
<i>Dendrobium macrostachyum</i>	MD	200-900	O
<i>Dienia ophrydis</i>	SE	600-900	S
<i>Eulophia graminea</i>	MD-SE	200-1000	R

<i>Geodorum densiflorum</i>	MD	500-600	O
<i>Habenaria marginata</i>	MD	250-900	O
<i>Kingidium deliciosum</i>	SE	250-800	R
<i>Luisia trichorhiza</i>	MD	250-1600	O
<i>Luisiopsis inconspicua</i>	MD-SE	250-900	O
<i>Micropera pallida</i>	SE	400-600	R
<i>Nervilia infundibulifolia</i>	MD	250-1000	S
<i>Nervilia aragoana</i>	MD	250-1100	S
<i>Pelatantheria insectifera</i>	DD-MD	200-600	C
<i>Rhynchostylis retusa</i>	MD	100-1100	O
<i>Smitinandia micrantha</i>	MD-SE	250-900	S
<i>Staurochilus ramosus</i>	MD-SE	150-800	R
<i>Tropidia pedunculata</i>	MD-SE	250-800	S
<i>Vanda tessellata</i>	DD-MD	15-600	C

Note: C: Common; DD: Tropical Dry Deciduous; MD: Tropical Moist Deciduous; O: Occasional; R: Rare; S: Scarce; SE: Tropical Semi-Evergreen.

Therapeutic importance of orchids. In many countries, since antiquity, some orchids have been used as traditional herbal drugs (Bulpit, 2005). Orchids (wild) have immense medicinal value. In the Indian system of medicine several ingredients like *Gandhaharini*, *Jeevak*, *Jeevanti*, *Kakoli*, *Munjattak*, *Rasna*, *Riddhis*, *Swarnajeewanti* and *Vridhhi*, are all orchidaceous plants. These contain phyto-constituents

like alkaloids, flavonoids, glycosides and trepans etc. of therapeutic importance and possess anti-bacterial, anti-viral, anti-malarial, etc. properties. However, in some parts of Odisha, the wild orchids are used by the local people/tribals residing in the remote forests as medicines to get rid of several diseases. Orchids of Kuldiha Wildlife Sanctuary, Balasore, Odisha with therapeutic value is given in the below Table 2.

Table 2: Medicinal use of orchids of Kuldiha Wildlife sanctuary.

Sr. No.	Botanical name	Habit	Therapeutic use
1.	<i>Acampe praemorsa</i>	E	Root paste along with tubers of <i>Asparagus racemosus</i> is administered in arthritis and rheumatism.
2.	<i>Aerides odorata</i>		Leaf juice is anti-tubercular; applied as poultice on cut and wound; heals boils in ears and nose. Root paste is used to relieve joint pain and swelling. Ground fruit is used for healing wounds.
3.	<i>Cymbidium aloifolium</i>	E	Salep made from pseudobulb is used as nutrient and demulcent; as emetic and purgative. Decoction of plant is used to stop vomiting and diarrhea. Plant is used in treatment of tumor. Root powder is used in paralysis.
4.	<i>Dendrobium aphyllum</i>	E	Leaf paste is applied on the abnormal and deformed parts of new-born baby to get normal shape.
5.	<i>Eulophia graminea</i>	T	Pseudobulb juice used as ear-drop.
6.	<i>Geodorum densiflorum</i>	T	Extract of corm is antidiarrheal; also used in skin inflammation and tumors. Root paste is useful in curing irregular menstrual cycle in women.
7.	<i>Habenaria marginata</i>	T	Boiled plant extract is used in suppressed urination. Tubers are used in the treatment of malignant ulcer.
8.	<i>Luisia trichorhiza</i>	E	Plant paste is administered in jaundice; in relieving muscular pain.
9.	<i>Rhynchostylis retusa</i>	E	Plants used against asthma; tuberculosis; cramps; infantile epilepsy; vertigo; palpitation; kidney-stone; and menstrual disorders. Paste of whole plant applied against various skin diseases. Roots are used in rheumatism.
10.	<i>Vanda tessellata</i>	E	In rheumatism; in nervous disorder; in scorpion bite; in asthma; anti-malarial. Decoction of root given for cholera; paste of roots applied on body to reduce fever.



Plate 1: A. *Cymbidium aloifolium* (L.) Sw., **B.** *Eulophia graminea* Lindl., **C.** *Acampe praemorsa* (Roxb.) Blatt. & McCann, **D.** *Habenaria marginata* Colebr., **E.** *Staurochilus ramosus* (Lindl.) Seidenf.



Plate 2: F. *Bulbophyllum crassipes* Hook.f., G. *Geodorum densiflorum* (Lam.) Schltr., H. *Aerides odorata* Lour., I. *Luisia inconspicua* (Hook.f.) King & Pantl., J. *Kingidium deliciosum* (Rchb.f.) H.R. Sweet, K. *Luisia trichorhiza* (Hook.) Blume, L. *Micropera pallida* (Roxb.) Lindl.



Plate 3: M. *Rhynchostylis retusa* (L.) Blume, N. *Nervilia aragoana* Gaudich., O. *Vanda tessellata* (Roxb.) Hook.exG. Don, P. *Pelatantheria insectifera* (Rchb.f.) Ridl.

CONSERVATION

As the most advanced family among the flowering plants, orchids have various uses. They are also good indicator species; presence of orchids depicts the health of local forest ecosystem. It is therefore, essential to conserve orchids. For successful and effective conservation, protection of habitats are very much required. Large scale plantation of host trees like 'Kusum' (*Schleichera oleosa*), 'Jamun' (*Syzygium cumuni*), 'Mango' (*Mangifera indica*), 'Mahua' (*Madhuca indica*) etc., should be undertaken which will quite significant for orchid conservation especially epiphytes. Conservation of orchids should also be attempted *ex-situ* in botanical gardens, parks, and tourist resorts etc. Awareness should be generated among the plant lovers, forest employees and public about the orchids, their role in the eco-system and necessity of their conservation. This will supplement to the *in-situ* conservation of orchids.

Acknowledgement. The first author is thankful to the Director, Botanical Survey of India, Kolkata for necessary facilities. The help and support of the DFO, Balasore Wildlife Division, Balasore along with the field staff is duly acknowledged.

Conflict of Interest. None.

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How to cite this article: S.P. Panda, P. Mardaraj, Z. Mazhar, K. Chakraborty, S. Dasgupta, D. Behera and R. K. Nayak (2024). Orchids, the Jewels of Kuldiha Wildlife Sanctuary of Balasore District, Odisha, India. *Biological Forum – An International Journal*, 16(1): 205-212.