SOME OF THE IMPORTANT ORCHIDS AND THEIR ETHNOBOTANICAL USES IN NARSINGHPUR DISTRICT, MADHYA PRADESH, INDIA

Deepika Patel, Satish Mohabe, and Rahul Soni

Madhyanchal Professional University, Bhopal- 462 044, Madhya Pradesh, India

Abstract

Presently, an attempt has been made to study some of the important orchids and list their ethnobotanical uses in Narsinghpur district of Madhya Pradesh, India. A total of seventeen important species of orchids belonging to 10 genera namely, *Acanthophippium, Aerides, Bulbophyllum, Crepidium, Dendrobium, Eulophia, Habenaria, Peristylus, Rhynchostylis,* and *Vanda* are briefly described in this paper. During the surveys, frequent interaction with urban, rural, and tribal people was made in the studied area and their ethnobotanical uses were listed.

Introduction

ORCHIDS BELONGING to the family Orchidaceae constitute a diverse and fascinating group of plants that have been used for various purposes by different cultures around the world. These plants rank amongst the most significant ornamental plants and are known for the beauty, colour combinations and shapes of their flowers (Fernandez and Sobhana, 2023; Sivakumar and Naramnaidu, 2023); these plants have always been interesting to evolutionary biologists because of their remarkable floral forms and diversity in pollination systems (Prakash and Pathak, 2020, 2022). This family is reported to be with 29,481 species (WFO, 2023) belonging to 703 genera worldwide (POWO, 2024); about 1256 species with 155 genera of orchid species are found in India (Singh *et al*., 2019). Forty eight species of orchids under 17 genera have been reported from Madhya Pradesh by Singh *et al*. (2019). About 70% of the world's orchids are epiphytic, 25% are terrestrial, and 5% of these grow in mixed substrates as lithophytic, epiphytic, and terrestrial (Chaitra *et al.,* 2023; Islam *et al.,* 2023).

Material and Methods

Study Area

Madhya Pradesh is the second largest state of India which is located in central region and lies between 23°28'23.9664' N and 77°56'52.7928' E. Geographically, it extends 3,08,252 km^2 and constitutes 9.38% area of the country (Fig. 1). Physiogeographically, Narshinghpur is one of the 8th districts in Jabalpur division of Madhya Pradesh; this district is endowed with diversity of angiosperms. The district is connected with the Vindhyachal mountain range on one side and the Satpura mountain range on the other end.

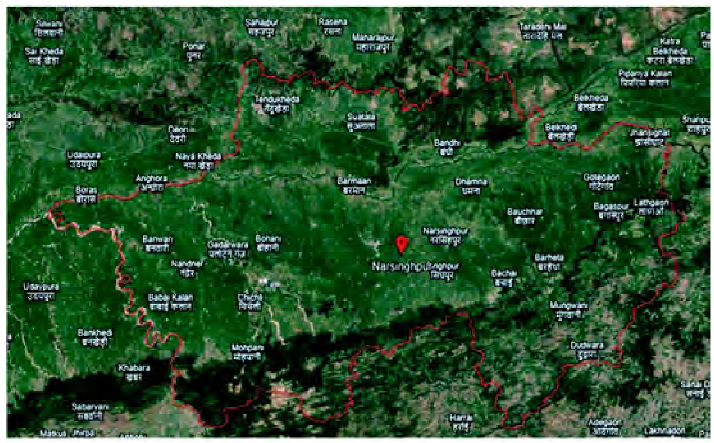

Fig. 1. Map of Narsinghpur district.

A systematic and extensive botanical survey was carried out in different areas of the district (Table 1) during June 2021 to January 2024. The orchid species were collected during their flowering and fruiting stage. Authentication of orchid species was done with the help of Flora of Madhya Pradesh (Singh *et al*., 2001). All the plant specimens were deposited in herbarium of Madhyanchal Professional University, Bhopal. Some of the tribals and reliable informants were also requested to accompany during the field trips.

Results and Discussion

During the present investigation (2021-24), an attempt has been made to study some of the important orchids and list their ethnobotanical uses in Narsinghpur district of Madhya Pradesh, India. The present communication briefly describes a total of seventeen important species of orchids belonging to 10 genera namely, *Acanthophippium, Aerides, Bulbophyllum, Crepidium, Dendrobium, Eulophia, Habenaria, Peristylus,*

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Rhynchostylis, and *Vanda* (Fig. 2A-D). During the surveys, frequent interaction with urban, rural, and tribal people was made in the studied area and their ethnobotanical uses listed. The Table 1 lists orchid genera with species in Narsinghpur district of Madhya Pradesh with the information on their habitat, herbarium number, flowering period, and distribution. Table 2 briefly describes the floral and vegetative characteristics in the studied orchids of the region.

A total of 11 species of orchids were terrestrial, whereas 6 species were epiphytic; 11 species of 8 genera belong to sub family Epidendroideae and 6 species of 2 genera belong to sub family Orchidoideae. Amongst the presently studied species, plants of *Vanda* were found in the abundance whereas those of *Habenaria furcifera* were the least. Some tribals reported the use of *Vanda tessellata* as traditional medicine for treating fever, wounds, and respiratory problems whereas use of a few other species including *Rhynchostylis* and *Vanda* was reported by urban communities for ornamental purposes. Literature studies revealed that such studies on orchid diversity and their ethnobotanical uses have been made in some other districts, regions, and states, in India, from time to time (Banoo *et al.,* 2023; Chaitra *et al.*, 2023; Jaryal and Pathak, 2021; Prakash and Pathak, 2019). Deb and Jakha (2019) observed orchid diversity in three districts (Kiphire, Tuensang, and Zunheboto) of Nagaland, India; a total of 180 species from 58 genera were collected, studied, and plants were maintained in the Orchidarium; of the 180 species studied, 30 were epiphytic, 15 terrestrial, 11 of dual habitat (terrestrial/epiphytic), and 2 were observed as saprophytes. Prakash and Pathak (2019) recorded 10 terrestrial species of orchids belonging to 7 genera from Water Catchment Wildlife Sanctuary, Shimla, Himachal Pradesh. De (2020) observed morphological diversity in 8 orchid genera and suggested the requirements for conservation and utilization of endangered orchids. Rahamtulla *et al*. (2020) observed and documented uses of 12 orchid species by local communities of Darjeeling Himalayas; they also recommended the conservation of wild orchid habitats in Darjeeling Himalayas. Rajput (2020) observed diversity and distribution of orchids with their host plants in Mesaki Reserve Forest, Tinsukia district of Assam of North East India; a total of 44 species belonging to 24 genera were recorded from this reserve forest. Jaryal and Pathak (2021) reported *Peristylus fallax* as a new record for the flora of Himachal Pradesh. Further, Jaryal *et al.* (2021) also recorded 10 species of orchids under 9 genera from District Kangra of Himachal Pradesh. Barman *et al.* (2021) observed 22 orchids under 18 genera from Ban Oak forests of Himachal Pradesh. Verma *et al*. (2021) reported the occurrence of a leafless *Cymbidium* in Western Himalaya. Kumar *et al*., 2022 worked on orchid diversity, conservation, and sustainability in NorthEastern India; observations made by them showed that 249 species of orchids are commonly found in the NorthEastern Himalayan region and some of these species also give information about climate change.

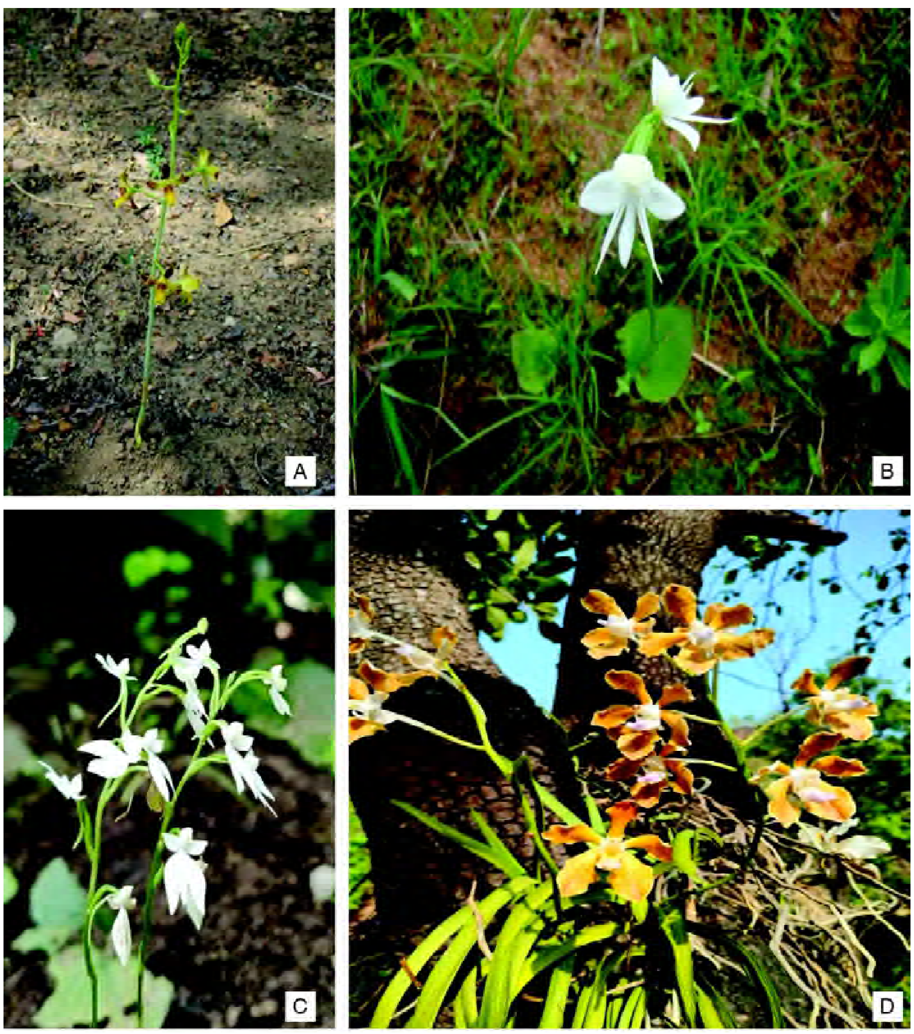

Fig. 2. Some of the important orchids found in Narsinghpur district, Madhya Pradesh. A, *Eulophia flava*; B, *Habenaria grandifloriformis*; C, *Habenaria plantaginea*; D, *Vanda tessellata*.

Kumari and Pathak (2020) studied the medicinal orchids of Shimla hills, Himachal Pradesh (NorthWestern Himalayas), indicated the threats, and suggested the conservation measures.

Table 1. List of orchid genera with species in Narsinghpur district of Madhya Pradesh with the information on their habitat, herbarium herbarium number, flowering period, and distribution.

Orchid genus	Species	Habitat	Herbarium number and specimen number	Flowering season	Distribution
Acanthophippium	*Acanthophippium bicolor* Lindl.	Terrestrial	HDP-206 & SDP-206	March-April	Forest areas of district
Aerides	*Aerides maculosa* Lindl.	Epiphyte	HDP-201 & SDP-201	June-July	Narmda valley, Gotitoria forest region, and Narsinghpur district nursery
Bulbophylium	*Bulbophyllum triste* Rchb.f.	Epiphyte	HDP-202 & SDP-202	October - April	Gotitoria forest region
Crepidium	*Crepidium acuminatum* (D.Don) Szlach.	Terrestrial	HDP-214 & SDP-214	July-August	Forest area of district, Gotegaon
Dendrobium	*Dendrobium herbaceum* Lindl.	Epiphyte	HDP-203 & SDP-203	January-March	Gotitoria forest region
Eulophia	*Eulophia nuda* Lindl.	Terrestrial	HDP-207 & SDP-207	February-April	Narmda valley, forest area of district
	E. flava (Lindl.) Hook.f.	Terrestrial	HDP-208 & SDP-208	February-April	Forest areas of district
	E. picta (R.Br.) Ormerod	Terrestrial	HDP-209 & SDP-209	May	Forest areas of district
Habenaria	*Habenaria digitata* Lindl.	Terrestrial	HDP-210 & SDP-210	September-December	Barha forest region, Kareli
	H. furcifera Lindl.	Terrestrial	HDP-211 & SDP-211	July-August	Gotitoria forest region
	H. grandifloriformis Blatt. & McCann	Terrestrial	HDP-212 & SDP-212	June-July	Gotitoria forest region
	H. plantaginea Lindl.	Terrestrial	HDP-214 & SDP-214	July-September	Chougan Village and Forest
	H. roxburghii Nicolson	Terrestrial	HDP-213 & SDP-213	July-August	Gotitoria forest region
Peristylus	*Peristylus constrictus* (Lindl.) Lindl.	Terrestrial	HDP-215 & SDP-215	March-May	Forest areas of district
Rhynchostylis	*Rhynchostylis retusa* (L.) Blume	Epiphyte	HDP-203 & SDP-203	March-July	Narmda valley, Gotitoria forest region
Vanda	*Vanda tessellata* (Roxb.) Hook. ex G.Don	Epiphyte	HDP-204 & SDP-204	May-July	Throughout the district
	V. testacea (Lindl.) Rchb.f.	Epiphyte	HDP-205 & SDP-205	May-July	Kareli, Gotegaon and Gotitoria forest region

Table 2. Floral and vegetative characteristics in the studied orchids of Narsinghpur district of Madhya Pradesh.

Orchid species	Vegetative characters	Floral characters
Acanthophippium bicolor Lindl.	Terrestrial, herb, pseudobulbs fusiform, 9 cm long, stout, fleshy, persistent sheaths, Leaves 2-3, broadly eliptic or ovate, unequal in size, 20-35 × 7.0-9.5 cm, acute, narrowed to sheathing petiole.	Flower in short, 3-flower raceme, fleshy, racemes arising from the axil of top of the new bulb, bract foliaceous, cymbiform, sepals fusiform, pitcher like calyx-tube, petals yellowish white with pink dots, erect, fleshy. Labellum 3- lobed, Capsule green, ellipsoid, 8-10 cm long, ridged, long stipitate.
Aerides maculosa Lindl.	Epiphyte, herb, roots thick, and succulent on host; Leaves alternate, linear-oblong, 5.5-20 × 0.5-3 cm; entire, apex unequally 2-lobed.	Racemes axillary. Sepals obovate -elliptic. Capsules obovoid, seeds many, brownish.
Bulbophylium triste Rchb.f.	Epiphyte, Pseudobulb, Leaves 2, sub-membranous, flaccid, narrowly oblong, acute apex, sub-sessile base, 5-8 cm long and 1.5-2 cm broad.	Densely flowered raceme. Sepals purple with greenish margins. Dorsal sepal oblong, ovate blunt, concave. Lateral pair slightly longer, cohering at the tips and with margins incurved. Petals purple, triangular, mid nerved, much shorter than the sepals. Lip brownish red with a very narrow yellowish margin, stipitate, oblong-lanceolate. The flowers are of an unpleasant odour.
Crepidium acuminatum (D.Don) Szlach.	Terrestrial and glabrous orchid less than 30 cm tall with small ovoid bulbs, underground stem and fibrous root. Roots are fibrous; bulbs ovoid; Stem is 15-30 cm long, erect and swollen at base. Leaves are two elliptic-lanceolate or ovate, obtuse, unequal, arising from the base of the stem and sessile.	Flowers pale yellowish-green, terminal racemes 8-20 cm long spikes borne in autumn season in second year and onward, 2-3 mm long bracts, lanceolate with acute apex. Sepals broadly lanceolate and laterals recurved; petals linear but shorter than sepals; Lip adnate to the base of column, sessile, ovate-rounded, abruptly pointed; basal lobes thick, Column is very short, anthers sessile on its top; Pollinia ovoid and free. Fruit is a capsule, 6-8 mm long, broadly ovoid-oblong, ribbed and of light yellow colour.
Dendrobium herbaceum Lindl.	Epiphyte or Lithophyte, erect to pendulous stem, Leaves lanceolate with leathery texture, alternate, 4-7 cm long.	Flowers borne short, few flowered inflorescences that emerge from the nodes near the top of the stem. The flowers typically yellowish-green or greenish-white, with possible brown or red markings. The flowers have a characteristic lip that is often broader than the other segments and may have a fringed or toothed margin. The flowers are small, typically around 1-2 cm in diameter.
Eulophia nuda Lindl.	Terrestrial, Pseudobulbs, ovate-conical. Leaves alternate, sheathing at base, linear- lanceolate, 20-35 × 0.5-2.0 cm long.	Inflorescence up to 50 cm long, many-flowered. Flowers greenish white, tinged with maroon. Capsules ellipsoid oblong, drooping.
E. flava (Lindl.) Hook.f.	Terrestrial, tuberous, glabrous herb, growing to 50 cm tall; Tubers underground, stout, about 3 cm long, about 1 cm across. Leaves 2-3, oblong-lanceolate, 20-30 × 4-6 cm, base sheathing, apex acute, margin entire, hairless, with 4-12 parallel nerves which are arising from the base.	Flowers bisexual, 4-6 cm long, bright yellow, arranged in 25-50 cm long racemes, distinctly stalked. Each flower is subtended by a single, persistent, prominent scaly projection called bract. The lip of the flower is more or less

Table 2. Floral and vegetative characteristics in the studied orchids of Narsinghpur district of Madhya Pradesh (contd.).

Orchid species	Vegetative characters	Floral characters
		tongue-shaped, 3-lobed at apex. Capsules ellipsoid, ribbed, smooth, with numerous powdery brown seeds.
E. picta (R.Br.) Ormerod	Terrestrial, Pseudobulbs present, tubers, ovoidconical, greenish-brown, bands transverse, circular. Leaves alternate, sessile, sheathing at base, oblong-lanceolate 15-20 × 3-5 cm, acuminate.	Flowers yellowish-white, 10-12-flowerd decurved racemes. Capsules pendulous, fusiform seeds minute, rounded, brownish.
Habenaria digitata Lindl.	Terrestrial, 30-50 cm tall; Tubers 1-2; ovate underground, stem terete slender closely sheathed. Leaves alternate, entire, acute, glabrous,	Lateral sepals ovate acute, falcate, dorsal sepal elliptic. Petals 2-partile, upper lobes linear, falcate labellum 3-lobed, green, Spur green, Column oblong. Capsules ribbed, brownish; seeds many, minute, brownish, glabrous.
H. furcifera Lindl.	Terrestrial, 35-60 cm tall; Tubers ovate-ellipsoid. Leaves clustered on ground, simple, oblanceolate-obovate, 13-17 × 3-5 cm, entire, sheathing at base, acute, glabrous.	Flowers in terminal lax racemes. Capsules fusiform, turgid, decurved with strong ribs. Seeds many, brownish, glabrous.
H. grandifloriformis Blatt. & McCann	Terrestrial, 10-15 cm tall; tubers 1-2, globose. Leaves 1-2, ovate to ellipsoid	Flowers white. Capsules strongly ribbed.
H. plantaginea Lindl.	Terrestrial, 20-50 cm high. Tubers 2, unequal. Leaves radical. prostrate on the ground, upper most small and bract-like, oblong- lanceolate or elliptic, 4-8 ×1.5-2.0 cm, membranous, entire.	Flowers in lax, few to many- flowered racemes on long, slender shape, shortly pedicellate; Bracts ovate lanceolate, much shorter than ovary. Sepals white, unequal; dorsal sepal broadly ovate, erect; lateral sepals falcately oblong. Petals white, linear- lanceolate. Labellum rhomboid, 3-lobed, long spurred; mid lobe narrowly linear; lateral lobes much broader than mid lobe, wing-like; Spur white, curved, pendulous, longer than ovary. Capsules fusiform, turgid, curved.
H. roxburghii Nicolson	Terrestrial, roots tuberous. Leaves fleshy, broadly ovate to sub-orbicular, apex acute	Flowers white. Capsules strongly ribbed, beaked.
Rhynchostylis retusa (L.) Blume	Epiphyte, roots long, thick. Leaves alternate, simple, linear, strap-shaped, 8-25 × 1.6-3.0 cm, recurved, unequally 2-lobed at apex, sheathing at base.	Flowers in axillary, dense, drooping, racemes. Capsules obovate, ellipsoid. Seeds many, brownish.
Peristylus constrictus (Lindl.) Lindl.	Terrestrial with pubescent tubers oblong or broadly-ellipsoid, stem stout, base covered with sheaths, 60-70 cm shortly petiolate and channeled, reticulate leaves , 8-15× 5-7.5 cm.	Sub densely many flowered Inflorescence with erect, lanceolate, acuminate floral bracts and carrying sweet scented flowers.
Vanda tessellata (Roxb.) Hook. ex G.Don	Epiphyte, glabrous plant, 20-45 cm long. Leaves linear-lanceolate, 15-20 × 1.5-2.0 cm, entire.	Racemes axillary, 10-15 cm long. Capsules elliptic-oblong, ribbed. Seeds minute, numerous, brown.
V. testacea (Lindl.) Rchb.f.	Epiphyte, glabrous, Roots large, pendulous, thick, vermiform. Lamina linear or linear-oblong, 10-15 × 1-2 cm, entire, 3-toothed at apex.	Racemes axillary, 3-15 cm long. Capsules fusiform, elliptic-oblong, ribbed.

Chaitra *et al.* (2023) recorded 29 species of orchids belonging to 22 genera from Sringeri region of Chikkamagaluru, Karnataka, in which most of them were epiphytic and two were terrestrial. Islam *et al.,* 2023 observed 18 species of orchids belonging to 13 genera from Jhargram district of West Bengal, of which 10 were terrestrial and 8 were epiphytic. Misra *et al.*, 2023 reported five endemic orchids from Similipal forest of Odisha. Dutt *et al.,* 2023 recorded 18 species of orchids belonging to 12 genera from Inderkilla National Park in Himachal Pradesh and studied their distribution pattern, and indigenous uses. Banoo *et al.,* 2023 recorded 7 terrestrial species in 3 genera from Ladakh, reported their use in traditional medicine and stress the need to develop further strategies for the conservation of these important orchid species. Propagation of orchids using tissue culture technique has been reported earlier by some workers (Anuprabha and Pathak, 2012, 2019, 2020; Anuprabha *et al.,* 2017; Arora *et al.,* 2014, 2016; Bhowmik and Rahman, 2022, 2023; Dhillon and Pathak, 2023; Hossain *et al.*, 2009, 2012; Kaur *et al.,* 2006, 2017; Kirti *et al.,* 2023; Kumari and Pathak, 2021; Mutum, *et al.*, 2022; Pathak *et al.,* 2016, 2017, 2022, 2023; Sunita *et al.,* 2021; Thakur and Pathak, 2020, 2021; Tripura *et al.,* 2022; Vasundhra *et al.,* 2019, 2021). Cost effective protocols for mass propagation of commercially important and rare, endangered, and threatened (RET) orchids also need to be developed in order to conserve them.

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