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ETHNOBOTANICAL STUDIES ON ORCHIDS USED BY TRIBALS OF GADCHIROLI DISTRICT M.S. INDIA.

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ABSTRACT:
Gadchiroli District, located in the ecologically rich yet underexplored easternmost part of Maharashtra, harbors one of the most intact forest ecosystems in central India. Characterized by tropical dry and moist deciduous forests with patches of semi-evergreen vegetation, the region is home to a unique assemblage of *Orchidaceae* species and indigenous communities with deeply rooted traditional knowledge systems. This study presents the first comprehensive ethnobotanical account of orchids from this remote and socio-politically sensitive landscape, based on field explorations conducted between 2014 and 2018. Through semi-structured interviews with 31 tribal informants across Gond, Madiya, Pardhan, Naik, and Kanwar tribal communities, six orchid species were recorded with detailed Ethnomedicinal and Ethnoveterinary applications, primarily for bone fractures, sprains, and musculoskeletal ailments. Remarkably, five of the six species used are epiphytic, indicating both cultural preference and ecological availability. The rare occurrence and use of *Pholidota imbricate* - reported here for the first time in this context -highlights the floral singularity of Gadchiroli. This first-hand documentation is particularly significant as it captures vanishing oral traditions from an area long inaccessible to researchers due to difficult terrain and socio-political constraints. The study not only bridges a major gap in Maharashtra's ethnobotanical records but also contributes uniquely to India's orchid Ethnopharmacology. It underlines the urgent need for the conservation of both bio-resources and indigenous knowledge systems embedded in this fragile landscape.

KEYWORDS:- Orchids, Ethnobotany, Ethnoveterinary Practices, Indigenous Knowledge, Epiphytic Plants, Ethnomedicine, Gadchiroli.

INTRODUCTION:

Orchidaceae, the largest family among monocotyledons, comprises over **25,000 to 28,000 accepted species** across approximately **770 to 880 genera,** based on recent phylogenomic studies and curated global taxonomic databases (Givnish et al., 2015; POWO, 2018). Consequently, their use in traditional practices is either limited or underreported.

Gadchiroli is the easternmost district of Maharashtra and about 76% of the land is covered with beautiful forest and hills, this is one of the natural treasures of central India. The district features Tropical Dry Deciduous and Tropical Moist Deciduous forests, interspersed with Tropical Semi-evergreen and Dry Evergreen forest patches, influenced by both the Western and Eastern Ghats, it lies in a transitional zone between the North Deccan (Eastern Maharashtra), South Deccan (Telangana), and

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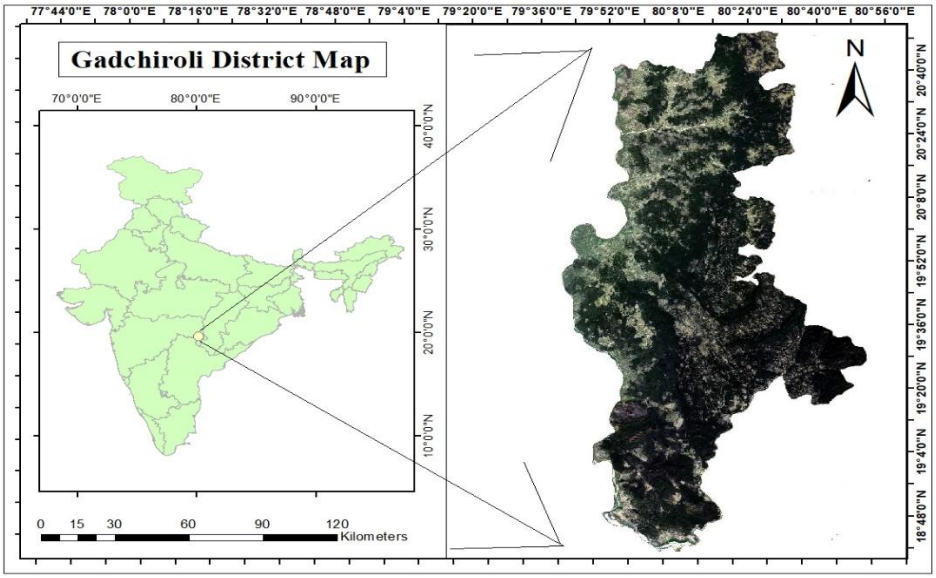
East Deccan (West Dandakaranya) regions. As a result, its vegetation reflects a blend of forest types and ecological elements from these adjoining areas. Floristically, the region exhibits affinities with the flora of Assam-Bihar, the Eastern Ghats, the Western Ghats, and the Central Indian region. (Govekar, Rawat 2008); (Setiya *et al.* 2016). The forest has a great diversity of flowering plants and a significant number of Orchid species. However, the regions have always been less explored by the scientific communities because of the extreme terrain and threats of left-wing activities. The purpose of this study is to analyze and record the traditional knowledge of orchids utilized by the indigenous communities living in the Gadchiroli district, as the documentation of traditional aboriginal knowledge is an urgent need of time. This study not only unfolds exclusive ethnobotanical documentation of orchids but also documents previously unreported Ethnoveterinary uses of orchids.

METHODS :

"Floristic and ethnobotanical explorations were conducted across Gadchiroli District (M.S., India) from 2014 to 2018, during which various observations were systematically recorded. The investigations were carried out by the methodologies suggested by (Jain 1963); (Schultes 1986); (Lipp 1989). The informants belong to the age group of 41 to 68. Prior informed consents (PIC) were obtained from these informants by verbal communication. The specific uses were recorded and subsequently cross-checked by the informers. The informants chosen belonged to the different tribes inhabiting the Gadchiroli District aboriginally, these included *Gond, Madiya, Pardhan, Naik, Kanwar, Dhivar,* etc. The herbal healers and the elderly knowledge holders from the community were the prime targets for the collection of information. A series of semi-structured interviews involving 31 informants were conducted using open-ended questions to elicit detailed ethnobotanical information. By field walk with the informers, the locations of the plants were noted down with ecological notes. The plants were identified by standard flora (Sharma *et al.* 1996). Other general observations were also noted down to carry out further forward linkages of research related to this study.



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REVIEW OF LITERATURE:

There is significant literature available on the diversity studies on the Orchidaceae in Maharashtra Barbhuiya and Salunkhe (2016) enumerated 122 taxa in 36 genera and recently Jalal and Jayanthi (2018) enumerated 106 taxa in 32 genera. From the Indian perspective many have made wide attempts to record the diversity of orchids like endemic Orchids of peninsular India were studied by Jalal and Jayanthi (2012), Kumari et al. (2012) have studied medicinal orchids in Sikkim. The Ethnobotanical studies on Orchids were done by many like Medicinal orchids were studied by Yonzone et al. (2012), Rambabu *et al.* (2012), Pant (2013), and Mohanty et al. (2015). Ethnomedicinal Orchids of Uttarakhand, Western Himalaya were studied by Jalal *et al.* (2008). Extensive ethnobotanical studies by Bhogaonkar and Devarkar (2001a, 2001b, 2002, 2006–2007, 2007) have shed light on the medicinal plant knowledge of the Korku tribes in Melghat, including references to orchid use, thereby establishing a foundational framework for orchid ethnobotany in Maharashtra. Panda and Mandal (2014) documented 36 Folklore orchids of Sikkim, but there are very few or none found on Ethnoveterinary uses of Orchids either in India (Rana *et al.* 2019) or Maharashtra.

OBSERVATIONS:

The ethnobotanical observations regarding some Orchids found in the study area which were used by the Aboriginal tribal populations were recorded and presented as follows:

1. *Acampe praemorsa* (Roxb.) Blatt. & McCann
Habit of the plant: Epiphytic
Occurrence: Rare
Exsiccata: AVS/GSC-Bot./M.87
Local Name: *Zadacha Vanda* (G) (M)
Plant part used: Roots
Ethnobotanical uses:

The fresh roots are crushed into a fine paste and tied firmly with the help of cotton strips or natural cordage over the affected body part to cure bone fracture or sprain in human beings and domesticated animals.

2. *Aerides maculosa* Lindl.
Habit of the plant: Epiphytic
Occurrence: Rare - Infrequent
Exsiccata: AVS/GSC-Bot./M.209
Local Name: *Zadacha Vanda* (G) (M)
Plant part used: Roots
Ethnobotanical uses:

The fresh roots are crushed into a fine paste and tied firmly with the help of cotton strips or natural cordage over the affected body part to cure bone fracture or sprain in human beings and domesticated animals.

3. *Geodorum densiflorum* (Lam.) Schltr.
Habit of the plant: Terrestrial
Occurrence: Infrequent
Exsiccata: AVS/GSC-Bot./M.504
Local Name: *Davan kanda, Amarkand* (M), *Gircha mati* (G)
Plant part used: Corms and Fruits
Ethnobotanical uses:

i. Fresh fruits are boiled and crushed to a fine paste and used to seal leather on a musical instrument.
ii. The fresh or stored corms are crushed to a fine paste and tied topically to cure sprains in Goat and Cattle.
iii. The fresh corm is crushed to a fine paste and applied directly to cure skin diseases like eczema in human beings.

4. *Pholidota imbricata* Lindl.
Habit of the plant: Epiphytic
Occurrence: Rare
Exsiccata: AVS/GSC-Bot./M.520
Local Name: Not Available
Plant part used: Pseudo-bulbs
Ethnobotanical uses:

i. Fresh Pseudo-bulbs are crushed to

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rough to a fine paste and the paste is tied firmly with the help of cloth strips to cure bone fractures or sprains in human beings and domesticated animals.

ii. The Pseudo-bulbs are boiled in water and then squashed and filtered; the hot supernatant is used in the bath to cure rheumatic pain, joint pain, and body aches.

5. *Rhynchostylis retusa* (L.) Blume
Habit of the plant: Epiphytic
Occurrence: Common
Exsiccata: AVS/GSC-Bot./M.498
Local Name: Not Available
Plant part used: Roots
Ethnobotanical uses:

The fresh roots are crushed and made into a fine paste and tied firmly over the affected body part to cure bone fracture or sprain in humans and domesticated animals.

6. *Vanda tessellata* (Roxb.) Hook. ex G. Don
Habit of the plant: Epiphytic
Occurrence: Abundant
Exsiccata: AVS/GSC-Bot./M.15
Local Name: *Shankh haad* (M); *Vanda* (M) (G)
Plant part used: Whole plant
Ethnobotanical uses:

The fresh plant (whole) is crushed and made into a fine paste and tied firmly over the affected body part to cure bone fracture or sprain in human beings and domesticated animals.

RESULT AND DISCUSSION:

The present paper reports six orchid species reported with Ethnobotanical uses and are also used in Ethnoveterinary medicine practices. The overall information was collected from very limited and special people and that too by very limited users. Out of the six orchids, only one genera were terrestrial and the other five genera were epiphytic. All of them were found in forested areas only; the *Pholidota imbricata* Lindl. was very rare and limited to only the higher altitude but still, the local *Madiya* tribe uses it in traditional health healing practices.

Conservation status of useful orchids:

Among the studies of orchid taxa, *Aerides maculosa* is the only species evaluated by the IUCN and is classified as Least Concern, though it faces pressures from habitat loss and overcollection in its endemic range in India (IUCN, 2014). *Acampe praemorsa*, *Vanda tessellata*, *Rhynchostylis retusa*, and *Pholidota imbricata* are not currently assessed by the IUCN Red List; however, all are listed under CITES Appendix II, indicating a requirement for controlled international trade to prevent overexploitation (CITES, 2023). *Geodorum densiflorum*, while also not assessed globally by IUCN, is locally listed as Endangered in New South Wales, Australia, due to threats such as habitat degradation, weed invasion, and trampling (NSW Government, 2002). These assessments underline the need for both global and region-specific conservation strategies to ensure the survival of orchid species with restricted distributions and ongoing anthropogenic pressures. While as per our observation based on extensive floristic explorations *Acampe praemorsa* (Roxb.) Blatt. & McCann & *Aerides maculosa* Lindl. is rare-infrequent; *Geodorum densiflorum* (Lam.) Schltr. is infrequent; *Rhynchostylis retusa* (L.) Blume is common, *Vanda tessellata* (Roxb.) Hook. ex G. Don is abundant while *Pholidota imbricata* Lindl. is rare; in occurrence. The most special finding in this study is the presence of *Pholidota imbricata* which is very rare in occurrence, it indicates the uniqueness of the Gadchiroli's flora. The government can take special initiatives in conservation of such unique ecosystem and its characteristics.

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Preference for Epiphytic Orchids in Fracture Treatments

Our ethnobotanical documentation in Gadchiroli District indicates a notable preference for epiphytic orchids in treating bone fractures and musculoskeletal ailments. Of the six orchid species identified for such treatments, five are epiphytic, with roots or pseudobulbs as the primary plant parts used. The use of *Acampe praemorsa* (Roxb.) Blatt. & McCann in Bone Fracture was also reported earlier by (Jain 1981) but from a different region in India. Although the use of *Pholidota imbricata*'s pseudobulbs in rheumatic pain management was reported by Jalal *et al.* (2010), Yonzone *et al.* (2012), our study is the first to document this application among the Madiya tribe in Gadchiroli. *Vanda tessellata* (Roxb.) Hook. ex G. Don used to cure Bone fracture was similarly reported by Yonzone *et al.* (2012).This predominance is partly attributable to the rich phytochemical profiles of these species. For instance, *Vanda tessellata* roots contain β-sitosterol-D-glucoside and tetracosyl ferrulate, compounds known for anti-inflammatory and analgesic activity (Kumar et al., 2014). Similarly, *Acampe praemorsa* contains flavonoids and alkaloids that support its use in rheumatism and bone healing (Panda & Mishra, 2011). *Pholidota imbricata* also possesses phenolics and flavonoids that contribute to its anti-inflammatory effects (Kumar et al., 2017). Cultural familiarity and ecological visibility further reinforce this pattern. Epiphytes growing on tree trunks are more accessible and often perceived as potent due to their fibrous, resilient roots, which may symbolically align with bone-strengthening properties (Kumar & Ghorpade, 2020). In contrast, terrestrial orchids like *Geodorum densiflorum* are less frequently used in fracture treatment, possibly due to differences in phytochemical efficacy or traditional usage norms. These findings highlight the ethnopharmacological relevance of epiphytic orchids and suggest potential for further phytochemical and pharmacological validation.

Ethnoveterinary Use of Orchids—A Novel Insight

Our study brings to light a rarely documented aspect of orchid ethnobotany especially their use in Ethnoveterinary medicine. Five out of six orchid species recorded in this study - *Vanda tessellata*, *Acampe praemorsa*, *Pholidota imbricata*, *Aerides maculosa*, and *Rhynchostylis retusa* are traditionally used to treat bone fractures and sprains in livestock. Crushed root or pseudobulb pastes are applied externally, often mirroring human therapeutic practices. While Ethnoveterinary knowledge is widely reported in India (Phondani et al., 2010; Verma, 2014; Ghosh, 2014), the specific use of orchids for veterinary musculoskeletal care is scarcely addressed in scientific literature. Our findings fill this gap and emphasize the unique local knowledge in Gadchiroli. The dual human-animal application also reflects a practical, empirical understanding of plant efficacy across species. This work contributes novel data to Indian Ethnoveterinary literature, where orchid-based remedies have been largely overlooked despite their phytochemical richness (Panda & Mishra, 2011; Kumar et al., 2014). It underlines the need for further phytochemical analysis, and pharmacological research as it may open new curative methods in medication and conservation of this valuable bio-cultural heritage.

The use of Fruits of *Geodorum densiflorum* (Lam.) Schltr. in pasting leather on a musical instrument is very unique from the Indian subcontinent; similar use was reported by J.C. Th Uphof (1959) but their observation was about the roots and not fruits.

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The local names of some species can't be documented as the informants knew the use only and not the names, also it has been the matter of exclusivity of the use of Orchids in traditional use on one side and declining traditional knowledge on the other side.

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