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## **An ethnobotanical survey of medicinal plants used by Dongaria and Kutia tribe of Niyamagiri hill, Odisha on Dermatological Infection Diseases (DID)**

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### **Abstract**

The present paper provides complete information on the ethno medicinal plants used to cure different types of skin diseases by the tribal people living in Niyamagiri hill region of Kalahandi district of Odisha. Fungi causing skin infections are treated by the Dongaria and Kutia Kandh are siding at Niyamagiri Hills, Odisha, India, in the last thousand years back using plant parts of local flora of Niyamagiri as traditional medicine. Keeping this in view it was conceptualized to study the ethnobotany of species used as traditional medicines among them in order to validate their therapeutic claims against Czema and other skin diseases. Different herbal methods of treating Dermatological infection diseases (DID) Like Scabies, Ringworm, Itching, Measles, Mumps, Chicken pox, Eczema, Cuts, Wounds, Burns and other skin irritation in ethno medicinal practice of the tribal people of Dongaria and Kutia Kandhas of Kalahandi district are described based on survey among scheduled caste and scheduled tribe population. On closer examination of the literature, almost all of the species are discovered to be new to Orissa. A total of 30 angiosperms belonging to 27 families and 29 genera having ethno medicinal uses in skin diseases were documented and the study goes on to discuss the bioactive substances found in various plant parts and their potential application in medicine manufacture.

**Keywords:** Ethnobotanical survey, Dongaria and Kutia Kandhas, dermatological infection diseases (DID), Niyamagiri hill

### **1. Introduction**

The district of Kalahandi is located between the latitudes of 19°10'-20°30'N and the longitudes of 82°30'-83°50'E. The undulating plains to the north east and the extension of the Eastern ghat are two physiographic units found in the district. High plateaus of 300-500 metres above M.S.L. cover the region from east to south east. Many flat hill tops, locally known as Mali, with elevations ranging from 1200 to 1200 metres above sea level, are part of the Eastern ghat, whereas those in Nuapada district are part of the Chhota Nagpur mountain chain and part of the Eastern ghat. Mohangiri, near Urladani, Niyamagiri, near Lanjigarh, and Baphlimali hills, near Thuamul Rampur, are the district's principal hills. The magnificent Indrabati stream rises near Thuamul Rampur and defines the southern limits of these hills. Hati River rises in the north and flows in the exact opposite direction of Indrabati, forming Mardiguda. The Niyamgiri mountain ranges also give rise to the Nagabali and Bansadhara rivers. Kalahandi forest is a tropical dry mixed deciduous type with a wide range of flora and fauna. The Tel and the Indrabati are tributaries of major rivers such as the Mahanadi and the Godavari. The information on 30 species is offered, as well as the tribal healers' treatment methods [1]. According to the World Health Organization, traditional medicine practitioners in India treat roughly 85% of patients [2], demonstrating the important value of the relationship between local tribal people and medicinal plants. Plants have long been used for therapeutic purposes. According to the texts, plant medicinal use has been practised since 5000-4000 B.C., and the Chinese were the first to use natural herbal concoctions as medicines. However, in India, the earliest references to the use of plants as medicine are found in the Rig-Veda, which is thought to have been written between 3500 and 1600 B.C.; later, the properties and therapeutic uses of medicinal plants were studied in depth and empirically recorded by ancient physicians in Ayurveda, which is a basic foundation of ancient medical science in India [3]. Odisha claims to have the biggest number of tribes (62), including 13 vulnerable tribal groups, among India's states and union territories. According to the 2001 census, it has the third largest tribal population, with almost 8 million people, accounting for 9.7% of the country's total population and 22.13 percent of the state's total population. It means that one out of every five people in the state is a member of a scheduled tribe community. Every tribal group represents distinct indigenous ethnobotanical systems, which include the practice of ingesting or applying plant

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components topically or internally as a form of treatment. Without adequate documentation of such knowledge, Odisha's cultural and traditional heritage is fading, and traditional indigenous wisdom is disappearing. Tribal tribes are compelled to change their way of life, resulting in ethno cultural deterioration. As a result, an attempt has been made to investigate the Dongaria Kandha of the Niyamagiri Hills in Odisha's traditional healthcare system for the treatment of many sorts of skin problems using native medicinal flora. Dongaria Kandha is one of the state's most primitive tribes, with a vital and symbiotic relationship with the Niyamagiri forests. Traditional medical practitioners of Dongaria Kandha use a variety of medicinal plants in their daily lives to treat a variety of ailments. They are a strong tribal group that makes up a primitive component of the Kandha, Odisha's 62 tribes' largest numerically. Their neighbours call them Dongaria because they live in the hills, forests, and highlands (Dongar), but they call themselves "Dongran Kuan" or Drili Kuan. The Dongaria Kandha lives Niyamgiri Hill ranges, which stretch through Bissam Cuttack, Kalyansinghpur, and Muniguda blocks. The Dongrias, as sons of Nature, prefer to dwell in their natural habitat, far from the madding throngs of society. The climate in the Dongaria Kandha habitat is cool and

pleasant due to its high elevation [4].

The writers of this research discussed the herbs utilized by Dongaria Kandha to treat skin problems. This community uses 30 different plants to treat skin disorders.

## 2. The study area

The Niyamgiri Hills range, part of India's Eastern Ghats, rises sharply from 1,000 feet to a series of peaks, the tallest of which is 4,970 feet above sea level, on the borders of Rayagada and Gunupur subdivisions in southwest Odisha. Niyamgiri is a 250-square-kilometer island located between 19° 26' and 19° 43' N latitude and 83° 18' to 83° 28' E longitude. Topographically, dense forests with evergreen and semi-evergreen nature cover 75 percent of the Niyamgiri highlands landmass, with an average forest density of approximately 0.6 and 1300 to 1400 trees per acre. Depending on the local microclimate, Niyamgiri has eight different types of plants. The effect of biotic and edaphic factors on plant density, species association, and the effect of biotic and edaphic factors, with deciduous forests dominating. The Niyamgiri Hills are culturally and environmentally exceedingly diverse.

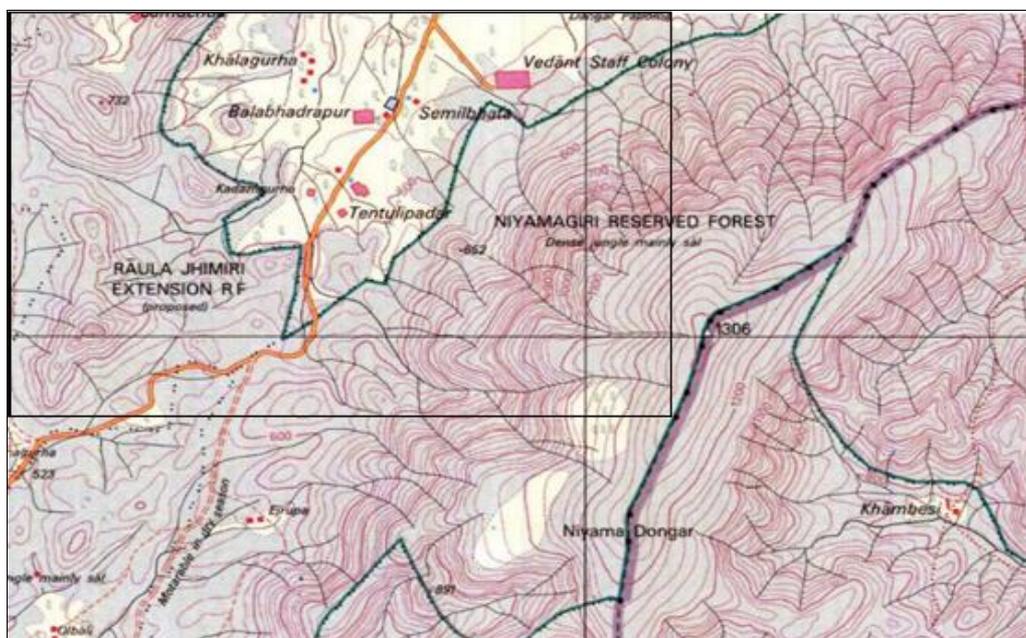


Fig 1: Geographical location of Niyamgiri Hills.

## 3. Materials and Methods

During a field trip in 2019-20, a detailed ethnomedical survey was conducted with traditional healers, village heads, and knowledgeable elders, and data was collected. The information gathered in one village was compared to that gathered in another. The information obtained is enumerated in alphabetical order, with acronyms for family, local name, method of application, and so on. Fam-Family Pl-Place of collection, L-Local name, P-Parts used. The following is a list of plant species in detail.

## 4. Results

**Argemone mexicana L:** Fam-Papaveraceae, L. Dragugach, P- Leaves, Pl-Haridaguda. The juice of the leaf is mixed with salt and water (1:1) and applied externally to cure ringworm, scabies.

**Aspidopterys tomentosa Roxb:** Fam-Malphiaceae, L. Alti

laha, P-Root Whole Plant, Pl-Haridaguda. Boil the Roots in tile oil and use externally to prevent eczema. Decoction of Whole plant is used to cure skin disease. Roots boiled in tile (*Sesamum indicum*) oil is applied locally for treating eczema and itches.

**Averrhoa carambola L.,** Fam-Oxalidaceae, L. Karamanga, P-Flowers, leaves, Pl-Haridaguda. The paste of 5 to 6 leaves is used locally, three times a day to prevent chickenpox [5].

**Azadiractaindica A. Juss.,** Fam-Meliaceae, L. Nimba P- Flowers, Pl-Palberi. Flowers powder with leaf powder mix with seed oil of *Pongamia pinnata* is used to cure skin infections and eczema [5].

**Boerhavia diffusa L. nom. cons.,** Fam-Nyctaginaceae, L. Punarnava, P-Root, Pl-Tadijhol. Poultice cool root is applied on the affected part to prevent skin diseases [5].

***Butea monosperama (lam) Kuntz***, Fam- Fabaceae, L. Phalsa, P-Flower, Pl-Tadijhola Terminal bud paste with 3 seeds of black pepper added in water to prevent skin diseases [5].

***Cassia fistula L.*** Fam-Caesalpiaceae, L. Sunari, Pujariguda, P-Leaves, Pl-Palberi. Leaf paste is externally applied to cure eczema or other skin disease [5].

***Celastrus paniculatus Wild***: Fam-Celastraceae, L. Pengu, P-Seeds, Pl-Olabali. Crush the seed by stone and is used to prevent ring worms. Seeds are pounded in stone and applied on the skin to cure ring worms, scabies and eczema [5].

***Chloroxylon weitenia DC***: Fam-Rutaceae, L. Bherun, P-Leaves, Pl-Olabali. Paste of the leaves is massaged on skin to prevent leucoderma [5].

***Clerodandrum serratum (L.)*** Fam-Lamiaceae, L. Bharangi, P-Roots, Pl- Haridaguda. Paste of roots and leaves used in infected areas to prevent skin diseases [5].

***Curcuma ammada***. Fam-Zingiberaceae, L. Amba ada, P-Rhizome, Pl-Haridaguda. Prepare a paste of rhizome and 200 gm bark of *Moringa oleifera* is used to cure arthritis. The paste of Rhizome is applied to reduce skin diseases [5].

***Averrhoa carambola***: Fam-Dilleniaceae L. Oau, P-Fruit, Pl-Palberi. The fresh juice of fruit improves the digestive capacity. The paste of the bark of *dillenia indica* is applied over the area affected with scabies and pigmentation of the skin [6].

***Gossypium arboreum L.*** Fam-Malvaceae, L. Kappa, P-leaves, seed, Pl-Haridaguda. Make a paste of leaves, Apply it on the affected part to cure skin diseases [5].

***Jasminum grandiflorum L.*** Fam-Oleaceae, L. Chameli, P-flower, leaves, Pl-Haridaguda. The leaf paste, root and flower is used on the affected part to cure scabies and itching [5].

***Leonotis nepetifolia (L.) R. Br.***, Fam-Lamiaceae, L. Kantasido, P-Leaves, whole plant, Pl-Olabali. Plant paste is used to prevent skin diseases [5].

***Ludwigia perennis Linn.***, Fam-Onagraceae, L. Jaljali, P-Leaf, Pl-Haridaguda. Leaf paste with salt is applied locally at infected skin parts to cure scabies and ring worms [5].

***Madhuca indica J.F. Gmel*** Fam-Sapotaceae, L. Mahua, P-flower, seed, Pl-Palberi. The juice of flower is massaged to cure skin diseases [5].

***Mimosa pudica L.*** Fam-Mimosaceae, L. Lajkuli, P-Leaves, seed, Pl-Olabali. Leaf paste is used externally to prevent eczema [5].

***Momordica charantia Linn.*** Fam-Cucurbitaceae, L. Karla, P-Leaves, Pl-Haridaguda. Half to one cup of leaf juice is eaten in empty stomach for seven day prevent chicken pox, measles and Fever [5].

***Operculina turpethum (L.) Silva Manso*** Fam-Convolvulaceae, L. Tihudi, P-Root, Pl-Haridaguda. Wash the root with water and then cooked with cow's milk, this is taken

in the dose of 20-30 ml in adults and 5-10 ml to children to cure abdominal disorders and skin diseases [5].

***Oroxylum indicum (L.) Benth.*** Ex Kurz Fam-Bigoniaceae, L. Phapen, P-Bark, Root, Pl-palberi. Paste of 1 tsp of bark is eaten with water to prevent measles [5].

***Pergularia daemia (Forssk.) Chiov.*** Fam-Asclepiadaceae, L. Uturudi, P-Leaves, Pl-palberi. Take leaves juice with lime juice and is applied to the affected area to prevent skin diseases [5].

***Pongamia pinnata L.*** Fam- Fabaceae, L. Karanja, P- Seed, Pl-palberi. Seed oil is used to cure eczema and other skin infections [6].

***Ricinus communis L.*** Fam-Euphorbiaceae, L. Joda, P-Seed, Pl-Tadijhola. Seed oil applied on itching portion.

***Schleichera oleosa (Lour) Oken*** Fam-Sapindaceae, L. Kusum, P-Seed, Pl-Tadijhola.

Extracted seed oil is used as a message to cure back pain and on joints to cure rheumatism and also to cure skin diseases [5].

***Solanum surattense Burm F.*** Fam-Solanaceae, L. Kantabhejri, P-Whole plant, Pl-Tadijhola. The paste of 6 gm of root and 3 seed black pepper is used to prevent measles [5].

***Terminalia alata Heyne ex Rath.*** Fam-Combretaceae, L. Asan, P-Bark, leaves, Pl-Haridaguda. Mix the Bark ash with sesamum oil and is applied to prevent itches [5].

***Terminalia chebula Retz.*** Fam-Combretaceae, L. Harida, P-Fruits, Roots, Bark, Pl-olabali. A lump of warmed paste of fruits is applied externally on skin to cure fungal skin infection [5].

***Trichodesma indicum L.*** Fam-Boraginaceae, L. Hetamund, P-Leaves, Pl-olabali. Leaf paste is applied to prevent skin disease [5].

***Tridax procumbens L.*** Fam-Asteraceae, L. Bishalya karani, P-Root, Pl-olabali. Leaves are applied externally in ringworm [5].

## 5. Discussion

The enumeration reveals that ethnomedicine for skin disease therapy is based on many plant components such as leaf, root, flower, fruit, and seed.

A review of the literature reveals that almost all of the plants have been reported for the first time for Skin disease from the state. *Bambusa vulgaris*, *Gossypium herbaceum*, and *Dendrop the falcate* have also been described for use in ear disorders, however the methods of application are different [7-14]. Species such as *stachyterpheta indica* and *spondias pinnata* have recently been recorded for the treatment of oral disease, while *tricosanthes bracteata* is a common therapy for ear problems in western Orissa.

## 6. Conclusion

This is a summary of the ethnobotanical survey conducted in the Kalahandi district, as well as more detailed investigations on several dermatological illnesses. In order to collect and document the rich and broad knowledge available with traditional healers, disease in the state is required. As a result,

more useful cures for low-cost and effective health care can be examined and studied. In order to document ethnomedicinal knowledge, more rigorous research is needed in local areas. Tribal people's widespread use of vital medicinal herbs demonstrates their efficacy.

The survey's findings revealed that herbal remedies are commonly used by tribal people and that these medicines have a high potential for curing various sorts of skin problems. The traditional healthcare system is heavily reliant on the indigenous rural people. The study also stresses the gathering of extensive information on Niyamgiri Hill medicinal plants, as well as the existence of bioactive substances in various plant parts. Anthropogenic activities such as unsustainable harvesting and agricultural practices, as well as overexploitation of bio-resources, have posed a major threat to the area's potential genetic resources. This has resulted in a significant drop in medicinal plant populations in their native habitat <sup>[11]</sup>. Ecologists, ethnobotanists, pharmacologists, anthropologists, and plant taxonomists should all be aware of this. The conservation of such resources which in turn will lead to develop strategy for conservation of rich biodiversity.

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