



## RESEARCH ARTICLE

# Ethnobotanical knowledge and practices among the tribal people of Ranibandh block of Bankura district, West Bengal, India

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### Abstract

The present research has documented 67 less known medicinal plants with some commonly used plants used by the selected tribal people (Bhumij, Lodha, Kharia, Kora Munda, Oraon, Santal and Savar) of 10 villages of Ranibandh block of Bankura district in West Bengal. These tribal people are dependent on forests for their livelihood and use medicinal plants as a primary healthcare source. In addition, it has gathered the knowledge, practices and experiences on uses of medicinal plants by semi-structured interviews, participant observation, case histories and focused group discussion. This study has established that the known, less known and new valuable medicinal plants can be useful to the other communities and can also be supportive for conservation of resources for future generations.

**Keywords:** Conservation, Ethnobotany, Medicinal plants, Traditional knowledge, Tribal people

### Introduction

The long term use of natural resources and environmental observation by humans is known as their traditional knowledge. It is deeply rooted in history, time and place but is adaptable and dynamic in ways that keep it relevant and useful in contemporary life. This knowledge is used in daily life and is intertwined with peoples' identity (Karunamoorthi

*et al.* 2013; Raymond-Yakoubian and Raymond-Yakoubian 2015). Nowadays, traditional knowledge of food production, clothing, shelters and traditional knowledge of medicinal plants have received considerable attention throughout the world. In India, application of plants for medicinal purposes has been documented long back in ancient literature. The importance of medicinal plants in healthcare practices provides evidence to new areas of research of ethnobiology, ethnobotany, pharmacology and ethnology (Asfaw *et al.* 2023, Satpati 2020, Roberson 2008, urib-Fakim 2006, Jagtap *et al.* 2006, Cotton 1996). Therefore, consumption, management and valuation of wild varieties of plants are very important to understand the traditional knowledge of medicinal plants. Many human populations apply these wild varieties of plants to maintain their health. In this way, the traditional medicinal plants offer an accessible and affordable health care system and serve as an important source of livelihood for indigenous rural populations. Several indigenous communities like tribal people are responsible for the discovery of most of the medicinal plants and many local communities are still involved in the wild collection, domestication, cultivation and management of these medicinal plant resources.

In our country like India, various tribal communities have a rich knowledge on traditional medicine and even today they use various medicinal plants to cure a variety of diseases (Debberma *et al.* 2017; Panghal *et al.* 2010;

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Chaudhuri and Sarkar 2003). Several scholars investigated the use of medicinal plants among the various tribes of India and they have explored ethnobotanical information of the plants as well as their traditional uses (Makal *et al.* 2018; Jain *et al.* 2010; Samy *et al.* 2008; Parinitha *et al.* 2005 Harsha *et al.* 2002). In a similar manner numerous scholars studied the ecological settings, socio-economic status, availability of plant resources and the level of knowledge on ethnomedicinal plants of the tribal people who are living in the Indian state of West Bengal (Paul 2021; Mandal *et al.* 2020; Raj *et al.* 2018; Datta *et al.* 2014; Mondal and Chowdhury 2012; Shukla and Chakravarty 2012; Bhattacharya 1997). Following these tribal studies in reference to traditional knowledge of medicinal plants some researcher started to study the particular local or tribal communities of various regions of India who have rich knowledge on the medicinal plants and its application and consumption (Ariharan and Revathi 2021; Choudhury *et al.* 2018, Kala 2005; Mahishi *et al.* 2005; Rajendran *et al.* 2002). On this ground, the analyses and documentation of the traditional knowledge of the valuable plants used by the tribal people living in various regions of Indian state of West Bengal are very significant in the light of global health care demand to the subject of pharmacology, ethnobiology, ethnobotany, anthropology and social sciences which could enhance the potential of medicinal plants to other communities and can also be helpful for conservation of these resources for further use.

## Materials and Methods

### Objectives

Investigation, identification and documentation on use of medicinal plants are significant for restoration and preservation of knowledge about the plants and conservation of these species for the greater interest of

human society. Keeping these understandings in mind the present study has tried to reveal and document different medicinal plants used by the purposively selected tribal people of 10 villages of Ranibandh block of Bankura district in Indian state of West Bengal who have traditionally depended on forests for their livelihood and still depend on medicinal plants as a primary healthcare source. This study has highlighted plant resources and ethnobotanical knowledge available among the selected tribal communities (Bhumij, Lodha, Kharia, Kora Munda, Oraon, Santal and Savar). The qualitative data on knowledge, practices and experiences on uses of medicinal plants among the selected tribal people were collected with the help of semi-structured interview, participant observation, case history and focused group discussion. This research has also documented all the known, less known and new valuable medicinal trees, plants, shrubs and herbs used by the selected tribal people for the treatment of various diseases.

### Study Area and People

In India and particularly in West Bengal people living in remote and rural areas are still reliant on traditional medicines as well as medicinal plants for treatments of various diseases (Kumar *et al.* 2007). In addition to that, in the state of West Bengal majority of forest dwelling communities belong to ethnic tribal groups. However, the reports regarding medicinal plants of the district are in scattered form and restricted in a few particular localities. Significantly, the Ranibandh block of the district Bankura has the highest tribal population and this area is mostly covered by forests (Census of India 2011). Ranibandh block is located about 60 kilometers to the south of Bankura town and 15 kilometers from the sub-divisional headquarter Khatra (Figure 1). The total geographical area of this block is 428.11 square kilometers and it is popularly known as

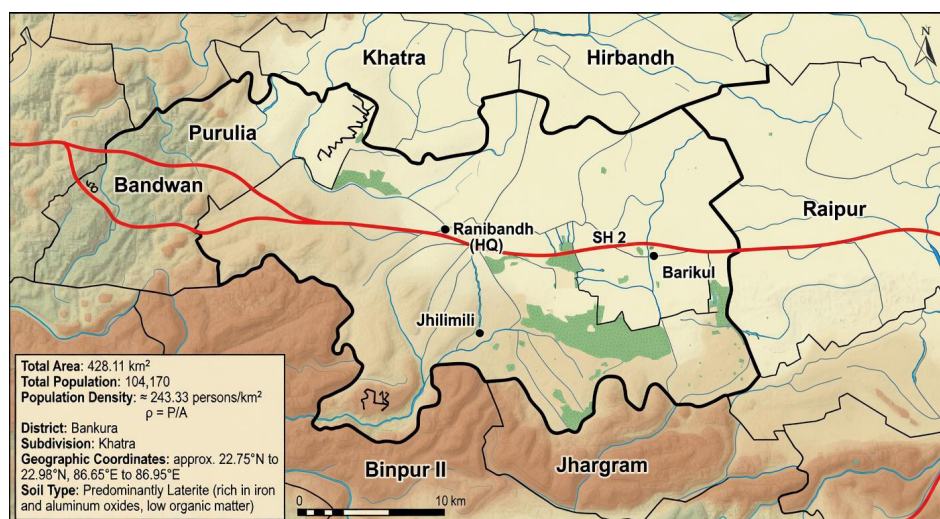


Figure 1: Map of Ranibandh block, Bankura district, West Bengal, India.

'jungle-mahal' due to several vast stretches of attractive green landscapes with different flora and fauna. Tribal population is the major component of its demography. In this block tribal population constitutes 47.07% of the block's population i.e. 56061 thousand (Census of India 2011). They mostly belong to Bhumij, Lodha, Kharia, Kora Munda, Oraon, Santal and Savar communities.

### **Data Collection, Demographic Information and Analysis**

This study involved 50 traditional healers in all. Key informants from a range of age groups were chosen on the basis of their age, ethnicity, familiarity with ethnobotanical medicines, at least five years of healing experience, and referrals from village leaders. We gave informants our word that the information they provided would only be utilized for research. Every informant took part freely and was older than eighteen (18). According to Ranibandh Block's demographic data, over 80% of informers are men and 20% are women. The informers were divided into four major categories based on their age: those between the ages of 40 and 50 (30%), those between the ages of 51 and 60 (30%), those between the ages of 61 and 70 (20%), and those above the age of 71 (20%). Throughout the survey, it was found that uneducated people had more basic knowledge about the use of medicinal plants (60%), while people with primary (20%), middle level (20%), secondary (00%), and graduation (00%) education levels had less similar knowledge.

Intense knowledge of habit type, flowering time, preparation technique, and adverse effects of ethnobotanicals was also discovered among informants. A semi-structured questionnaire was created in order to methodically gather data. Since the authors are familiar with the healers' native tongue, they created a semistructured questionnaire in Bengali for data collection using the conventional ethnobotanical method (Paksoy *et al.* 2016).

## **Results**

### **Forestry, Ecological Settings and Status of Livelihood**

Forestry is one of the wealth in the Ranibandh block of the district Bankura. The improvement of this block depends much on it. This region is known as jungle-mahal for its long stretched dense forest with lots of rare plants and animals. Fringe tribal people of this forest are very significant because they are mostly trusted on the forests for their livelihood. Besides, they still depend on forest resources for their food, fodder, fuel and medicinal plants. The tribal people of this region are predominantly engaged with the production and collection of 'lac' and 'tassar'. They also collect 'kendu' leaves from this forest which is used in the tobacco industry. They collect wood and a huge quantity of honey from this forest. In addition, the naturally grown forests and grasslands are also observed in the selected tribal

villages (Atasol, Bansdiha, Jhilimili, Rautara, Sarasdanga, Ranibandh, Rajakata, Bansol, Barikul and Birbhandh) of the Ranibandh block. Here the tribal people (like Santal, Oraon, Munda, Mahali, Savar, Lodha, Bhumij, Kharia and Kora) of selected villages opined that in early days their living areas were covered with dense deciduous forests and presently these forest areas are decreasing day by day due to over exploitation and urbanization. But still the tribal people of the selected villages have close relations with the forest and forest producers. They not only use the forest resources for satisfying their daily needs, but they also use it for the sustenance of their lives. They collect various forest products as a source of income like dry and fallen wood for fuel, fibers for making clothes, fodder for cattle, fruits and vegetables for nutrition, small timber, bamboo, nuts, berries, medicinal plants and herbs. Besides, various plants and trees like shal (*Shorea robusta*), mahua (*Madhuca longifolia*), palash (*Butea monosperma*), tentul (*Tamarindus indica*) and bamboos (*Bambusa tulda*) are found in the locality of the selected tribal villages. The fruits of 'mahua' plant are used for preparing liquor which is very popular among the selected tribal people as a country drink. Due to excessive exploitation, these shal, mahua, palash plants and trees are becoming rare progressively. Various fruit bearing trees like jaam (*Syzygium cumini*), kanthal (*Artocarpus heterophyllus*), bel (*Aegle marmelos*), aam (*Mangifera indica*) are observed in great numbers in the locality of selected tribal villages. Therefore, the major occupations of the selected tribal people are based on forest. Most of them are traditionally engaged in gathering jungle foods and selling jungle products like firewood, dry leaves, mats, brooms, and fish-traps. They also collect food materials like fruit, vegetables, tubers and roots from the forest and till now continue the traditional method of hunting. One of the major economic pursuits based upon the selling handicrafts such as broom-stick, fish traps made of bamboo. Now they are also working as agricultural laborers on the field of non-tribal people in neighboring villages. Additionally, they are involved as daily laborers seasonally. But their livelihood is mainly based on forest. During the winter and summer season, major food collections are taken by them from the forest. During the rainy season, the forest becomes dense and inaccessible. As a result, the collection is minimized and continued only in forest areas close to the residential sites. It is also revealed from the study that the female members of the selected tribal villages are basically involved in household activity, forest product collection and rearing of livestock.

### **Ethnobotany, Plant Resources, Tribal Culture and Medicinal Practices**

Ethnobotany involves the indigenous knowledge of plant classification, cultivation and use as food, medicine and shelter. It contains an area's plants and their hands-on uses

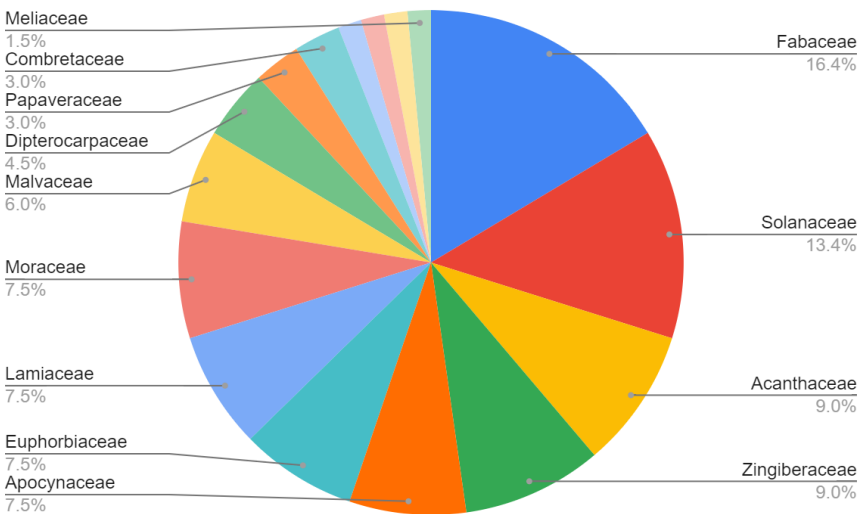
**Table 1:** Traditional and Medicinal uses of common plants among tribal communities

| Plants (Common Name) | Scientific Name and Family               | Primary Traditional Uses                    | Core Medicinal Uses                          |
|----------------------|------------------------------------------|---------------------------------------------|----------------------------------------------|
| Shal                 | <i>Shorea robusta</i> (Dipterocarpaceae) | Timber, leaf-plates, and fodder.            | Respiratory (cough), Digestive, and Skin.    |
| Mahua                | <i>Madhuca longifolia</i> (Sapotaceae)   | Spirits (liquor), cooking oil, and fuel.    | Fever, Wounds, and Heart health.             |
| Palash               | <i>Butea monosperma</i> (Fabaceae)       | Natural dyes, decoration, and soil control. | Parasitic worms, Blood sugar, and Snakebite. |
| Kendu                | <i>Diospyros melanoxylon</i> (Ebenaceae) | «Green Gold» for bidis and fruit pulp.      | Urinary and Blood disorders.                 |
| Shimul               | <i>Bombax ceiba</i> (Malvaceae)          | Cultural folklore and folk songs.           | Liver protection and Dysentery.              |

through the traditional knowledge of a local culture and people. In a similar way, the culture of the selected tribal people of the Ranibandh block principally originated and developed in the forest which is also the source of their economic security. This forest area is the habitation of various wild as well as local trees, plants, shrubs and herbal species such as shal, segun, sishu, sonajhuri, piyal, kendu, lohajangi, palash, bamboo, date, palm, amalaki and haritaki. These varieties of trees and plants of the forest nearer to the selected tribal villages are useful for their daily livelihood and have countless significance in their village economy. Besides, these wild and local plants and trees like shal, mahua, palash, shimul, kendu, sonajhuri, aam, jam, bel, tentul and bansh provide foods, vegetables, medicine, drink and fuel to the tribal people. In addition, several types of edible roots, tubers, medicinal plants and mushrooms are noticed in the forests of Ranibandh block by which tribal people make their regular foods and drink. They also sell these edible roots, medicinal plants, mushrooms, leaves of shal tree, flowers of palash plant as well as flowers and fruits of mahua plant to various tribal and non-tribal communities in the nearby

market of Ranibandh town. The cultural and economic importance of major trees and plants are described here in Table 1.

Along with the importance of shal, mahua, palash and kendu, a large number of plants are also connected with the life of the selected tribal people. The common names of these plants are piyal (*Buchanania cochinchinensis*), shimul (*Bombax ceiba*), sonajhuri / akashmoni (*Acacia auriculiformis*), tamal (*Diospyros tomentosa*), arjun (*Terminalia arjuna*), asan (*Terminalia tomentosa*), , aswatha (*Ficus religiosa*), bot (*Ficus benghalensis*), kadam ( *Neolamarckia cadamba*), haldu (*Adina cordifolia*) and sheora (*Streblus asper*). Furthermore, the selected tribal people consume fruits and vegetables of various other trees and plants as well as eat different mushrooms. The local names of these plants are aam (*Mangifera indica*), jaam (*Syzygium cumini*), kanthal (*Artocarpus heterophyllus*), bel (*Aegle marmelos*), amra (*Spondias pinnata*), kul (*Ziziphus mauritiana* ), dumur (*Ficus hispida*) and sajina (*Moringa oleifera*). All over again, it is revealed from the study that the selected tribal women extract various fruits like kendu and mahua for food and



**Figure 2:** Ethnomedicinal plants used by the selected tribal peoples based on plant families

Table 2: List of known medicinal plants used by tribal people of Ranibandh Block, Bankura

| Sl. No. | Local Name    | Scientific Name                | Family Name       | Locality and Distribution Status                 | Parts Used                                 | Medicinal Uses                                                                                                                                                                                                                             |
|---------|---------------|--------------------------------|-------------------|--------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Shal          | <i>Shorea robusta</i>          | Diptero-carpaceae | Ghagra Village<br>Common Wild                    | Leaves, Bark, Resin                        | Leaves and bark used to treat cuts, ulcers, cough, headache and diarrhea                                                                                                                                                                   |
| 2       | Mahua         | <i>Madhuca longifolia</i>      | Sapotaceae        | Ladda Village<br>Common Wild                     | Leaves, Bark, Flower, Fruits, Seed         | Leaves to treat fever, cough and dysentery; Bark used to cure wounds; Flowers used to relieve vomiting and heart trouble; Fruits used to heal the blood related diseases; Seed oil applied to cure skin conditions                         |
| 3       | Palash        | <i>Butea monosperma</i>        | Fabaceae          | Jhilimili Village<br>Common Wild                 | Leaves, Bark, Flowers, Fruits, Seed, Roots | Leaves to cure the problem of skin and eyes; Bark to treat sore throat, cuts and snakebite; Flowers to cure skin rashes<br>Fruits to cure eyes problem; Seeds are helpful to cure the problem of skin and eyes; Roots to cure eyes problem |
| 4       | Kendu         | <i>Diospyros melanoxylon</i>   | Ebenaceae         | Punshya Village<br>Common Wild                   | Leaves, Fruits                             | Leaves to cure cuts and damages; Fruits to treat many stomach disorders like diarrhea                                                                                                                                                      |
| 5       | Shimul        | <i>Bombax ceiba</i>            | Malvaceae         | Sutan Village<br>Common Wild                     | Leaves, Barks, Flowers, Seed Roots, Gum    | Leaves to treat skin eruptions; Barks to heal wounds; Flowers are good for skin troubles; Seed to prevent liver damage; Roots to cure dysentery; Gum for burning sensation                                                                 |
| 6       | Sonajhuri     | <i>Acacia auriculiformis</i>   | Fabaceae          | Ladda Village<br>Common Wild                     | Barks, Seeds, Root                         | Barks used to heal diarrhea; Seed oil used to treat skin problem; Root used to treat pains and aches                                                                                                                                       |
| 7       | Tulsi         | <i>Ocimum sanctum</i>          | Lamiaceae         | Barda Village<br>Common wild and Cultivated      | Leaves, Stem, Flower, Root, Seeds          | Leaves, stem, flower, root, seeds and even whole plant for the treatment of coughs, colds and bronchitis                                                                                                                                   |
| 8       | Neem          | <i>Azadirachta indica</i>      | Meliaceae         | Hatikhedda Village<br>Common wild and Cultivated | Leaves, Barks, Fruits, Flower, Root, Seeds | Leaves, barks, fruits, flowers, roots, seeds used are used for the treatment of wounds, infections, fever, skin diseases, dental problems and to reduce blood sugar levels                                                                 |
| 9       | Vasak         | <i>Justicia adhatoda</i>       | Acanthaceae       | Ghagra Village<br>Common wild and Cultivated     | Leaves                                     | Leaves used to cure respiratory problems like asthma, cough and bronchitis                                                                                                                                                                 |
| 10      | Kalmegh       | <i>Andrographis paniculata</i> | Acanthaceae       | Jhilimili Village<br>Common wild and Cultivated  | Leaves                                     | Leaves used to treat liver problems                                                                                                                                                                                                        |
| 11      | Haritaki      | <i>Terminalia chebula</i>      | Combretaceae      | Jamda Village<br>Common wild and Cultivated      | Fruits                                     | Fruits used to treat indigestion, cold, cough, asthma, urinary tract infections and skin problems                                                                                                                                          |
| 12      | Chirchiri     | <i>Achyranthes aspera</i>      | Amaranthaceae     | Kamardanga Village<br>Common Wild                | Leaves, Roots                              | Leaves and roots are used to treat wounds, injury and burns                                                                                                                                                                                |
| 13      | Amrul         | <i>Oxalis corniculata</i>      | Oxalidaceae       | Ghagra Village<br>Common Wild                    | Leaves                                     | Leaves are used to prevent fever and destroy worms of the intestine                                                                                                                                                                        |
| 14      | Anantamul     | <i>Hemidesmus indicus</i>      | Apocynaceae       | Ladda Village<br>Common Wild                     | Roots                                      | Used to treat skin and urinary tract infection, leprosy, rheumatism and impotency                                                                                                                                                          |
| 15      | Holud / Haldi | <i>Curcuma longa</i>           | Zingiberaceae     | Ranibandh Village<br>Common Cultivated           | Rhizome                                    | Used in folk medicine and to treat diabetes, cancer, diarrhea, arthritis, inflammation and ulcers                                                                                                                                          |

**Table 3:** List of less known medicinal plants used by tribal people of Ranibandh Block, Bankura

| Sl. No. | Local Name | Scientific Name                   | Family Name   | Local Distribution Status | Parts Used        | Uses                                                                                                                                 |
|---------|------------|-----------------------------------|---------------|---------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Akanda     | <i>Calotropis gigantea</i>        | Apocynaceae   | Common Wild               | Leaves, Flowers   | Leaves used to treat wounds; Flowers to cure colds and coughs                                                                        |
| 2       | Bhant      | <i>Clerodendrum infortunatum</i>  | Lamiaceae     | Common Wild               | Leaves, Roots     | Roots and leaves are used as antidiabetic, antipyretic, anti-dandruff and also as laxative                                           |
| 3       | Bherenda   | <i>Jatropha curcas</i>            | Euphorbiaceae | Common Wild               | Leaves            | Used to treat fungal and bacterial infections                                                                                        |
| 4       | Bohera     | <i>Terminalia bellirica</i>       | Combretaceae  | Common Wild               | Fruits            | Used to treat liver and respiratory tract related infections                                                                         |
| 5       | Dhutura    | <i>Datura stramonium</i>          | Solanaceae    | Common Wild               | Leaves, Flowers   | Commonly used for human ailments like arthritis, gout, inflammations, ulcers, asthma, bronchitis etc.                                |
| 6       | Korobi     | <i>Nerium oleander</i>            | Apocynaceae   | Common Wild               | Leaves, Flowers   | Aqueous extract is used to cure cancer, ulcers, leprosy, ringworms etc.                                                              |
| 7       | Karamcha   | <i>Carissa spinarum</i>           | Apocynaceae   | Common Wild               | Leaves, Flowers   | Used to treat arthritis, malaria and sexually transmitted diseases (STDs) like syphilis and gonorrhea                                |
| 8       | Nilontho   | <i>Curcuma caesia</i>             | Zingiberaceae | Uncommon Wild             | Leaves, Flowers   | Mostly used in treating asthma, bronchitis, leucoderma and piles                                                                     |
| 9       | Nishinda   | <i>Vitex negundo</i>              | Lamiaceae     | Uncommon Wild             | Leaves, Flowers   | Leaf smoke is used to cure cough and bronchitis; Flowers are used to cure diarrhea                                                   |
| 10      | Shialkanta | <i>Argemone mexicana</i>          | Papaveraceae  | Common Wild               | Leaves, Flowers   | Used in treating jaundice, malaria, leprosy, rheumatism                                                                              |
| 11      | Kurchi     | <i>Holarrhena antidysenterica</i> | Apocynaceae   | Uncommon Wild             | Stem bark, Leaves | Used for the treatment of diarrhea, dysentery and constipation                                                                       |
| 12      | Thankuni   | <i>Centella asiatica</i>          | Apiaceae      | Common Wild               | Leaves            | Used to cure skin infections, epilepsy, leprosy and improve mental clarity                                                           |
| 13      | Sushni     | <i>Marsilea quadrifolia</i>       | Marsileaceae  | Uncommon Wild             | Whole plant       | Whole plant is used to cure inflammation and diuresis                                                                                |
| 14      | Telakucha  | <i>Coccinia grandis</i>           | Cucurbitaceae | Common Wild               | Leaves, Fruits    | Leaves are used as antipyretic, antispasmodic, and antidiabetic agents; Fruits help to cure asthma, bronchitis, jaundice and leprosy |
| 15      | Kulekhara  | <i>Hygrophila auriculata</i>      | Acanthaceae   | Common Wild               | Leaves            | Used to cure anemia, inflammation, diarrhea and abdominal disorders                                                                  |

selling, mahua flower for liquor making, leaves of shal for making of plate, kendu leaves for making of bidi, shal seed, mushroom for their own food and also for marketing, dry branches of tree for fuel, lighting and also for selling, medicinal plant for their own healing, and fodder for their domestic animals like goat and cattle. These tribal women also consume some part of their collected non-timber forest products like kendu and mahua fruit, mushroom, fuel wood towards their family and rest of the parts are sold by them in local markets. In addition, the collection of mahua flowers, shal leaves and kendu leaves from the nearby forest as well as the achievement of preparation from these leaves and fruits are exclusively done by the tribal women of the selected

villages. They make plates from shal leaves, mats from taal (palm, *Borassus flabellifer*) and khejur (date, *Phoenix sylvestris*) leaves and rope from sabai (*Eulaliopsis binata*) grasses. Thus, these minor forest produce like shal leaves, kendu leaves, khejur leaves and sabai grass provide scope to the tribal people for making various handicrafts and the selected tribal women were possessed with these activities as well.

In addition to the above, the selected tribal people use various other medicinal plants and herbal plant species for their own treatment and health. Field survey observed that Kora, Bhumij and Kharia of the village Ladda plant large numbers of tulsi (*Ocimum sanctum*) beside their huts. Sometimes they build an elevated earthy platform with a

**Table 4:** List of new medicinal plants used by tribal people of Ranibandh Block, Bankura

| Sl. No | Local name              | Scientific name             | Family name    | Local distribution status | Parts used                  | Uses                                                                                   |
|--------|-------------------------|-----------------------------|----------------|---------------------------|-----------------------------|----------------------------------------------------------------------------------------|
| 1      | Shatamull/<br>Shatavari | <i>Asparagus racemosus</i>  | Asparagaceae   | Uncommon Wild             | Roots                       | It has antibacterial and antioxidant properties. It helps to cure diabetes and AIDS    |
| 2      | Kantanote               | <i>Amaranthus spinosus</i>  | Amaranthaceae  | Uncommon Wild             | Whole plant                 | Used as blood purifier, laxative and diuretics                                         |
| 3      | Borola                  | <i>Sida cordifolia</i>      | Malvaceae      | Uncommon Wild             | Seeds, Roots                | Ephedrine used to treat allergies, asthma, cold and erectile dysfunction               |
| 4      | Garikalai<br>(Soybean)  | <i>Glycine max</i>          | Papilionaceae  | Uncommon Wild             | Pods, Seeds                 | It has anticarcinogenic, antiproliferative and antioxidant activities                  |
| 5      | Bhabri                  | <i>Lantana camara</i>       | Verbenaceae    | Uncommon Wild             | Whole plant                 | Used for the treatment of respiratory syndromes and has antipyretic properties         |
| 6      | Changalkhuri            | <i>Ipomoea pes-caprae</i>   | Convolvulaceae | Uncommon Wild             | Whole plant                 | Used in the treatment of skin problems, inflammatory disorders and rheumatism          |
| 7      | Hapar                   | <i>Vallis solanacea</i>     | Apocynaceae    | Uncommon Wild             | Leaves, Seeds               | Milky latex is used to treat cuts and wounds, skin infections and ringworm             |
| 8      | Asamlata                | <i>Chromolaena odorata</i>  | Asteraceae     | Uncommon Wild             | Fresh leaves                | Used as insect repellent, and for the treatment of wounds and diabetes                 |
| 9      | Bagnoki                 | <i>Martynia annua</i>       | Martyniaceae   | Uncommon Wild             | Fruits                      | Used to treat epilepsy, wounds and skin allergies                                      |
| 10     | Dholkalmi               | <i>Ipomoea carnea</i>       | Convolvulaceae | Uncommon Wild             | Stem                        | Glycosidic saponin obtained from the stem has oxytocic and anticarcinogenic properties |
| 11     | Chandra/<br>Sarpagandha | <i>Rauwolfia serpentina</i> | Apocynaceae    | Uncommon Wild             | Roots                       | Used for the treatment of hypertension                                                 |
| 12     | Gulancha                | <i>Tinospora cordifolia</i> | Menispermaceae | Uncommon Wild             | Whole plant                 | Used to treat diabetes, lymphoma, arthritis, hepatitis and STDs                        |
| 13     | Amalaki                 | <i>Phyllanthus emblica</i>  | Euphorbiaceae  | Common Wild               | Whole plant                 | Used for the treatment of jaundice, inflammation and diarrhea                          |
| 14     | Pipul                   | <i>Ficus religiosa</i>      | Moraceae       | Common Wild               | Leaves, Bark, Fruits, Seeds | Used to cure diabetes, ulcer, bacterial infections and STDs                            |
| 15     | Tentul/ Imli            | <i>Tamarindus indica</i>    | Fabaceae       | Common Wild               | Fruit/Pod                   | Commonly used for antifungal and antibacterial infections                              |

tulsi plant at the top of their courtyards locally called tulsi-bedi for worship. In this regard they opined that the tulsi plant acts as a protector from evil spirits and they believe that *tulsi-bedi* is a holy place of deities. They also use different parts of the tulsi plant like leaves, stem, flower, root, seeds and even whole plants for the treatment of coughs, colds and bronchitis. Along with *tulsi* plant, the selected tribal people also use many others shrubs and herbs to maintain their traditional forms of treatment like neem (*Azadirachta indica*), vasak (*Justicia adhatoda*), kalmegh (*Andrographis paniculata*), bohera (*Terminalia belerica*), haritaki (*Terminalia chebula*), akanda (*Calotropis gigantea*), bhant (*Clerodendrum*

*infortunatum*), bherenda (*Jatropha curcas*), dhutura (*Datura stramonium*), korobi (*Nerium oleander*), karamcha (*Carissa spinarum*), nilontho (*Curcuma caesia*), nishinda (*Vitex negundo*), sotomuli (*Asparagus racemosus*) and shialkanta (*Mimosa rubicaulis*).

#### **Use of known, less known and new medicinal plants by selected tribes**

Medicinal trees, plants, shrubs and herbs play a vital role in the lives of the selected tribal people (Santal, Oraon, Munda, Mahali, Savar, Lodha, Bhumij, Kharia and Kora) of Ranibandh block of the district Bankura. They use different

**Table 5:** Family names of the medicinal plants with scientific name of plant species and number

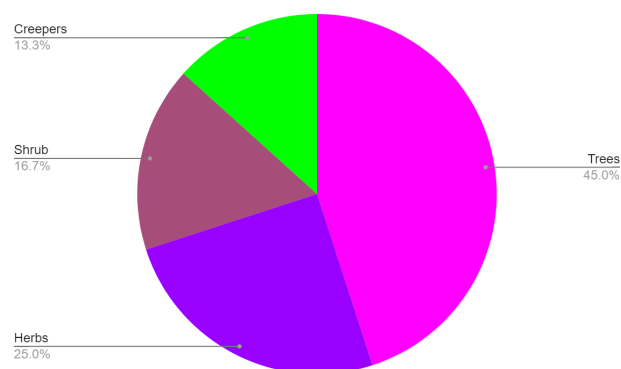
| Sl. No. | Family name      | Scientific name                                                                                                                                                                                                                                                                    | Number |
|---------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1       | Acanthaceae      | <i>Justicia adhatoda</i> <i>Andrographis paniculata</i>                                                                                                                                                                                                                            | 6      |
| 2       | Amaranthaceae    | <i>Achyranthes aspera</i>                                                                                                                                                                                                                                                          | 1      |
| 3       | Apocynaceae      | <i>Hemidesmus indicus</i> <i>Calotropis gigantea</i> <i>Nerium odorum</i> <i>Carissa spinarum</i> <i>Holarrhena antidysenterica</i>                                                                                                                                                | 5      |
| 4       | Combretaceae     | <i>Terminalia belerica</i> <i>Terminalia chebula</i>                                                                                                                                                                                                                               | 2      |
| 5       | Dipterocarpaceae | <i>Terminalia arjuna</i> ; <i>Shorea robusta</i> ; <i>Dipterocarpus retusus</i>                                                                                                                                                                                                    | 3      |
| 6       | Ebenaceae        | <i>Diospyros melanoxylon</i>                                                                                                                                                                                                                                                       | 1      |
| 7       | Euphorbiaceae    | <i>Jatropha curcas</i> ; <i>Phyllanthus emblica</i> ; <i>Ricinus communis</i> ; <i>Jatropha gossypifolia</i> ; <i>Euphorbia hirta</i>                                                                                                                                              | 5      |
| 8       | Fabaceae         | <i>Butea monosperma</i> ; <i>Medicago sativa</i> ; <i>Arachis hypogea</i> ; <i>Trigonella foenum-graecum</i> ; <i>Glycyrrhiza glabra</i> ; <i>Acacia nilotica</i> ; <i>Cassia tora</i> ; <i>Dalbergia sissoo</i> ; <i>Cajanus cajan</i> ; <i>Vicia faba</i> , <i>Pisum sativum</i> | 11     |
| 9       | Lamiaceae        | <i>Clerodendrum infortunatum</i> ; <i>Ocimum sanctum</i> ; <i>Vitex negundo</i> ; <i>Mentha spicata</i> ; <i>Pogostemon cablin</i>                                                                                                                                                 | 5      |
| 10      | Malvaceae        | <i>Abutilon indicum</i> ; <i>Hibiscus rosa-sinensis</i> ; <i>Sida acuta</i> ; <i>S. rhombifolia</i>                                                                                                                                                                                | 4      |
| 11      | Oxalidaceae      | <i>Oxalis corniculata</i>                                                                                                                                                                                                                                                          | 1      |
| 12      | Solanaceae       | <i>Datura stramonium</i> ; <i>Nicotiana tabacum</i> ; <i>Hyocyamus niger</i> ; <i>Withania somnifera</i> ; <i>Capsicum frutescens</i> ; <i>Atropa belladonna</i> ; <i>Solanum lycopersicum</i> ; <i>S. tuberosum</i> ; <i>S. melongena</i>                                         | 9      |
| 13      | Meliaceae        | <i>Azadirachta indica</i>                                                                                                                                                                                                                                                          | 1      |
| 14      | Moraceae         | <i>Ficus religiosa</i> ; <i>F. hispida</i> ; <i>F. benghalensis</i> ; <i>F. carica</i> ; <i>Artocarpus heterophyllus</i>                                                                                                                                                           | 5      |
| 15      | Papaveraceae     | <i>Argemone mexicana</i> ; <i>Papaver somniferum</i>                                                                                                                                                                                                                               | 2      |
| 16      | Zingiberaceae    | <i>Curcuma caesia</i> ; <i>C. longa</i> ; <i>C. amada</i> ; <i>Zingiber officinale</i> ; <i>Hedychium coronarium</i> ; <i>H. spicatum</i>                                                                                                                                          | 6      |

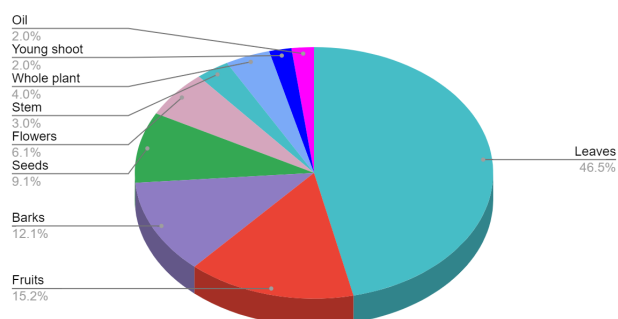
types of medicinal trees, plants, shrubs and herbs for the treatment of their various diseases and illnesses. They have generally collected the local name and uses of medicinal plants from the elder members of the family and village. They also use various medicinal plants to upgrade their knowledge regarding health and to maintain various cultural practices. But selected tribal people informed that some trees, plants, shrubs and herbs are well known to them, some are less known and new. They use various well known and less known medicinal plants to treat their illnesses as they positively think that plants are important healing resources to cure their diseases. This study reveals that tribal people of the selected villages know the use of various medicinal trees and plants. The details are given in Tables 2 to 4.

#### **Ethnobotanical Analysis of Medicinal Plants used by Selected Tribes**

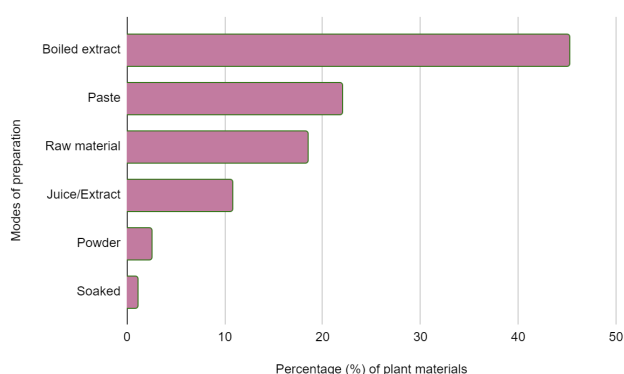
Along with the utilization and consumption of known, less known and new medicinal plants by selected tribes, this research study reveals the qualitative and quantitative indices regarding plant families' usage, practices of healing process and treatment procedure as well as the method of use of medicinal plants. Accordingly, the selected tribal people like Bhumij, Lodha, Kharia, Kora Munda, Oraon, Santal and Savar of the Ranibandh block of Bankura district report 67 precious medicinal plants belonging to

16 families regarding treatments of diseases and resolving health problems (Figure 2). Mostly used plant families by the selected tribal people in the Ranibandh block are Fabaceae with 11 plant species followed by Solanaceae with 9 plant species, Acanthaceae and Zingiberaceae with 6 plant species; Apocynaceae, Euphorbiaceae, Lamiaceae and Moraceae with 5 species. Other significant medicinal plant families used in the selected tribal villages are Amaranthaceae, Combretaceae, Dipterocarpaceae, Ebenaceae, Malvaceae, Oxalidaceae, Meliaceae, Papaveraceae. The high usage plant families like Fabaceae, Solanaceae, Acanthaceae and Zingiberaceae specify that majority of the tribal people

**Figure 3:** Pie chart showing plant types used by the tribal peoples



**Figure 4:** Pie chart showing the type of plant parts used by the tribal community



**Figure 5:** Bar diagram showing the percentage (%) of plant materials used after different modes of preparation

of the Ranibandh block use those medicinal plants which are easily accessible, available and plentiful around them (Table 5).

In addition, selected tribal people mostly use plants by trees (45.0%), herbs (25.0%), shrubs (16.7%) and creepers (13.3%). Besides, it is explored that among different parts, leaves, barks, flowers, fruits, seeds and roots of the trees and plants are used by the selected tribal people (Figure 3). In these contexts, informants of the selected tribal villages said that they mostly use the leaves and barks of the medicinal plants due to easy collection process and quick preparation process rather than other parts.

A detail quantitative analysis shows that leaves (46.5%) followed by fruits (15.2%), barks (12.1%), seeds (9.1%), flowers (6.1%), stems (3%), young shoot (2%), oil (2%) and in some cases the whole plant (4%) are used by the selected tribal people for remedial resolves (Figure 4).

Correspondingly, the field survey also revealed that selected tribal people commonly use the decoction or boiled extract (45.2%) followed by paste (22%), raw material (18.5%), juice/extract (10.76%), powder (2.47%) and soaked (1.07%) to prepare dosage from the different parts of the medicinal plants (Figure 5). They consume medicines from the specific plants for only one week to cure the short term sickness like cold, cough, fever, skin problems and stomach

pain. But they ingest medicines from the specific plants for more than a month for the treatment of long term diseases like diabetes, kidney problem and heart diseases.

## Discussion

Different tribal people like Bhumij, Lodha, Kharia, Kora Munda, Oraon, Santal and Savar living in the Ranibandh block of Bankura district have a strong knowledge, awareness and good understanding of various common and wild medicinal plants as they reported a total number of 67 plant species. They consume and use these medicinal trees, plants, shrubs and herbs for the treatment of various diseases like injury, wounds, burns, cold, cough, fever, stomach infection, skin problem, eye problem etc. by applying their own particular procedures and systems. No cases of side effects and complicity as well as harmful effects of these medicinal plants found among the selected tribal people. Medicinal uses of 16 plants from the Taldangra block of Bankura district was reported by a group of workers who have studied the traditional knowledge among the tribal people (Mandal *et al.* 2014). But it is revealed that the traditional knowledge regarding medicinal plants and its use are passed to the young age groups from the elder family members in the tribal villages by oral cultural traditions without any written document. But the young age groups from 15 to 35 have very little information regarding the names of locally available medicinal plants and species. Moreover these young people living in the tribal villages have little idea about the methods and procedure for making remedies or doses from the locally available medicinal plants. This is mainly happening in the tribal villages due to the modernization, acculturation and deforestation. Hence some awareness program related to the protection of medicinal plants is needed to sustain the ethnobotanical implications among tribal people (Mandal *et al.* 2014). Phytochemical assessment of 30 medicinal plants from Bankura district was revealed which contain saponin, tannin, lignin and sugars as major components (Pradhan 2023). Ethnomedicinal practices of wild plants by Santal communities of Susunia hill have been studied by Rahaman and Karmakar (2015). This study has shown quantitative analysis using open-ended and semi-structured questionnaires to study the traditional knowledge and beliefs among the Santal people. Study revealed that the easy accessibility of medicines, drugs and modern medical facilities destroy the traditional forms of knowledge, experience and practices regarding various medicinal plants and its use among the selected tribal people. As a result the important knowledge systems of the locally available medicinal plants are disappearing day by day in the study area (Sinhbabu and Banerjee 2013). The Bedia, Lodha and Koda tribes of Jhargram and Bankura districts of West Bengal used to cure many diseases including digestive problems, eye disorders, diabetes, cold, cough and fever using traditional medicinal plant based healing

techniques (Dutta *et al.* 2024). In Ajodhya Hills of Purulia, Paul (2021) has studied 40 ethnomedicinally important plants and their usage among the tribal communities. Paul has also documented that the overexploitation, agricultural expansion, deforestation, timbering and human settlements are the major risk factors for the decay of ethnomedicinal plants. A total number of 51 herbal plants of 34 families have been documented from the local area of Purulia district of West Bengal due to the therapeutic potentials of these plants among the tribal communities (Bhattacharjee *et al.* 2024). The tribal area of Lalgurh forest range is diversified with 52 different plant species of which 20 are trees, 17 herbs, 11 shrubs and 4 are climbers commonly used by the local people to cure different diseases (Manna and Mishra 2018). These plants Outside Bengal, a recent study from Ganjam district, Odisha have stated that 37 ethnomedicinally important plants of 34 genera of 24 families can be useful to cure 19 human diseases including skin disorders, insect bites, cut and wounds, fever, cough and cold among the tribal people of Khallikote area (Rout *et al.* 2025). The report says that 24 tribal communities of 11 undivided districts of Odisha use almost 421 herbal medicines and can treat 166 different diseases (Sahu *et al.* 2025).

Tribal participants also opined that the medicinal plants are declining with time due to agricultural expansion, wood extraction and pasturing. Therefore, recording and documentation of important medicinal plants and its related knowledge are required as it may be utilized for sustainable application of the selected tribal people as well as for developing management plans for conservation in the study area. For keeping these reasons in mind the present study has documented 67 precious medicinal plants belonging to 16 families and recorded the precious knowledge, practices and use of various significant medicinal trees and plants in the Ranibandh block of Bankura district for conservation of resources for future generations.

## Conclusion

Along with the recording and documentation of medicinal plants, this study has also analyzed different quantitative indices of using status of medicinal plants. Because these indices are very crucial in the arena of ethnobotany to establish the plant's value as well as its importance in a particular community or society and to develop conservation initiatives. Moreover, this study has clearly exemplified that medicinal plants are very important for the health care of the selected tribal people. As a result, the remedial significance of various medicinal trees and plants of the study area have been recorded which may be used for future phytochemical and pharmaceutical studies. In such a way, this particular study or research recommends that the government should make some national policies towards the conservation of the said medicinal trees, plants, shrubs

and herbs found in the Ranibandh block of Bankura district. Besides, there are still various less known and new medicinal trees and plants in the selected tribal villages that need to be confirmed and established for further studies to develop alternative drugs. Moreover, the selected tribal people like Bhumij, Lodha, Kharia, Kora Munda, Oraon, Santal and Savar have an enormous knowledge of traditional medicine (both plant and animal originated) which should be protected as well as should be cultivated. Also, the traditional medical knowledge of the said tribal communities is very rich regarding health, disease and treatment. These traditional perceptions should be encouraged to continue. Along with these, the government should make a policy to protect the forest in the Ranibandh block of Bankura district where the traditionally living tribal communities may totally depend on collection and practicing of traditional medical systems. In addition, time to time updates of knowledge regarding the medicinal plants of Ranibandh block of Bankura district must be executed for emerging new drugs. As a final point, the documentation of the medicinal flora as well as restorations of the knowledge of every local population are more significant presently otherwise these orally transmitted knowledge and cultural traditions regarding medicinal plants might disappear in the upcoming future.

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