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Publisher

The journal is published annually by the Principal, Bankura Christian College, Bankura, West Bengal, India, 722101. Supplementary issues based on seminar/ conference proceedings are also published.

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Contents

Documentation of Some Rare Medicinal Plant Species of Bankura District with their Ethnomedicinal Uses.

Bandana Pradhan and Samir Kumar Mukherjee

Abstract : The research work presented was initiated to get information and report on the biodiversity in medicinal flora of the district Bankura, West Bengal, India. As a whole attached a table with 25 plant species of investigated taxa have been recorded from the district through regular field observation and perusal of literature on medicinal plants. Most of the plant species of recorded 25 taxa are used as herbal drugs in various Indian Systems of Medicine and in the pharmacopeia of different ethnic communities of the country. These 25 plants belonging to 23 genera, 23 species of 14 dicot families, and 2 genera, 2 species of 2 monocot families. Habitually the investigated taxa fall under four groups like trees, shrubs, climbers, and herbs. The numbers of species in each group and their respective percentage have been defined as herbs- 5 (20%), shrubs- 5 (20%), climbers- 6 (24%), and trees- 9 (36%). Among these recorded 25 plant taxa 5 plant species namely *Aristolochia indica*L. (Aristolochiaceae), *Celastrus paniculatus* Willd. (Celastraceae), *Erycibe paniculata* Roxb. (Convolvulaceae), V*ernonia anthelmintica*(L.) Willd. (Asteraceae), *Soymida febrifuga* (Roxb.) A. Juss. (Meliaceae) recorded as rare medicinal plant species from the district on the basis of field observation, information from local informants, and on the basis of literature survey on medicinal plants.

Keywords : Medicinal plant; Bankura district; herbal drug; ethnobotany; tribal people.

1. Introduction:

Medicinal plants grow naturally around us. Over centuries cultures around the world have learned how to use plants to fight illness and maintain health. These readily available and culturally important

traditional medicines from the basis of accessible and affordable health care regimes are an important source of livelihood for the indigenous and rural population. Increasingly medicinal species that grow in natural areas have received specific and commercial attention. In this scenario present study has been undertaken to give focus on the documentation of medicinal plants in the Bankura district.

Documentation of any biological resources is an essential pre-requisite for its scientific exploitation, utilization, and future conservation measures for human being. So documentation and conservation of medicinal plants of a district, state, or country is a very important aspect of proper management.

From the perusal of literature, it was found that some scattered records on the ethnobotanical study and on ethnomedicine have been documented in the Bankura district by several workers (Namahata and Mukherjee, 1988, 1989; Acharya and Mukherjee, 2010; Mallick and Mallick, 2012; Mondal and Biswas, 2012; Mallick et al, 2012; Sinhababu and Banerjee, 2013; Rahaman and Karmakar, 2015). But if we consider the status of medicinal plants that is, which medicinal species commonly found, which are rarely found are not recorded by the workers from the district. So, in this scenario present study has been undertaken to know the present status of medicinal plants and documentation of rare species in the Bankura district.

2. Study Area :

Bankura is one of the most important districts of West Bengal where most of the tribal villages are adjacent to forests. It is located in the Western part of the state of West Bengal. It covers an area of 6.871.24 sq.km. The north and north east, south and west borders of the district are demarcated by the district of Burdwan, Hoogly, Midnapur, and Purulia respectively. River Damodar flows along the northern boundary of the district. It includes the area known as rarh in Bengal bounded by latitude 22038/N and longitude 86036/E to 87047/

E. The district approximately resembles and is a scales triangle with its northern apex at the junction of Burdwan and Purulia with an irregular east-west best line attached to Midnapur and Hoogly. The main tribal communities of the district consist of Santhals, Oraon, Munda, Bhumiz, Kaora, Mahali, Kheria, and Malpahariyas. Of these communities, Santhals have got a specific attachment to the forests (Fig.-1).

3. Materials and Methods :

Regular field surveys have been conducted in different villages and forest areas of Bankura district, surroundings Susunia hill in different seasons for the last two years (2018-2019) to gather information about medicinal plants of the district and to collect the herbarium specimens of the plants growing in the district. Before collection of the data, we have to make an approach for friendship and kinship to feel them comfortable in sharing their valuable knowledge on the use of medicinal plants. The Prior Informed Consent (PIC) has been taken from each informant to publish their information which will protect the intellectual property of those traditional people and it will ensure the benefit sharing agreement of the traditional people that are mentioned in Article 8 (j) of CBD. Special emphasis has been given to collecting the data on ethno-pharmacognosy. The aspects of ethno-pharmacognosy include the traditional collection practices of crude drugs, their collection time and season, practices of drying and storage of crude drugs, etc.To confirm the authenticity of the information it has always been cross-checked by interviewing other tribal medicine men of the same and different localities by applying visual stimuli methods either showing photographs of the collected plants or fresh and herbarium specimens (Albuquerque et al., 2014).

Through a perusal of literature on medicinal plants finally, a list of medicinal plant species of the district has been prepared (Namahata and Mukherjee, 1988, 1989; Acharya and Mukherjee, 2010; Mallick and Mallick, 2012; Mondal and Biswas, 2012; Mallicket al, 2012; Sinhababu and Banerjee, 2013; Rahaman and Karmakar, 2015). The

collected plant specimens were carefully identified with the help of different floras (Manilal &S ivarajan, 1982; Panigrahi& Murti, 1989; Saldanha & Nicolson, 1976; Sanyal, 1994). The collected plant specimens are preserved as herbarium specimens following the standard method (Jain & Rao, 1977) and kept in the Bankura Sammilani College Herbarium Department of Botany, Bankura Sammilani college for future reference.

4. Results and Discussion :

Altogether 25 ethnomedicinal plants have been recorded from the district which is used by the tribal and local people for their primary health care needs. These 25 plants belong to 23 genera, 23 species of 14 dicot families, and 2 genera, 2 species of 2 monocot families. Habitually the investigated taxa fall under four groups–trees, shrubs, climbers, and herbs.The numbers of species in each group and their respective percentage have been defined as herbs- 5 (20%), shrubs- 5 (20%), climbers- 6 (24%), and trees- 9 (36%) Fig.1.

The most dominant life form of the species used by the tribal people in the district includes trees (36%) (Fig.1). which indicates that they are easily accessible and commonly grown around the tribal villages in the district.

Considering individual plant-parts, it is found that leaves of 5 plants, roots of 5 plants, barks of 8 plants, fruits of 3 plants, flowers of 2 plants, and latex of 2 plants are used as crude drugs for primary health care needs (Fig3).

The family Fabaceae was represented by the highest number of species (4 species, 25%) followed by Euphorbiaceae (3 species, 18.75%) (Fig.3). Dominance of medicinal plant species from families Fabaceae and Euphorbiaceae could be attributed to their wide distribution and abundance in the flora of this area.

These recorded 25 taxa are used by the local people to cure 13 different diseases and ailments. Among these13 ailments categories, stomach trouble was frequently recorded which also indicates that the

local people of that particular study area frequently suffered from stomach issues (Table.-1).

Collection of the plant parts and their storage are also very important aspects of maintaining the quality of crude drugs. Though these ethnic communities do not have specific storage capacities, they follow some ways or techniques regarding drug collection, storage, and mode of administration.

The preparation of the drug and mode of administration are also very important aspects of ethnic herbal practice. Medicines are given in various forms. It may be as an infusion, decoction, mixture, syrups, paste, powders, extract, fresh juice, massage balm, etc. Fresh juice is given by squeezing any fresh medicinal plants.

Among these recorded 25 plant taxa *Alstonia Scholaris*(L.) R.Br., *Tamarindus indicus* L., *Andrographis paniculata* (Burm.f.) Wall.exNees, *Pergularia daemia* (Forssk.) Chiov. etc. are commonly found throughout the district but, 5 plant species namely *Aristolochia indica*L. (Aristolochiaceae), Celastrus paniculatus Willd. (Celastraceae), *Erycibe paniculata* Roxb (Convolvulaceae), Vernonia *anthelmintica*(L.) Willd. (Asteraceae), *Soymida febrifuga*(Roxb.) A. Juss. (Meliaceae) are recorded as rare plant species from the district on the basis of field observation, information from local informants, and a literature survey. The informants also informed that the number of these recorded species decreased day by day in the study area. From the literature survey, it has been found that these recorded plant taxa are also reported as rare species in another district as well as from the state of West Bengal also and they have immense medicinal importance (Pradhan and Rahaman, 2015; Rahaman and Pradhan, 2011).

4.a- Enumeration of the recorded rare medicinal plant species :

1. *Aristolochia indica*L. (Aristolochiaceae).

Scientific Name: *Aristolochia indica***L.**

Family : Aristolochiaceae.

Local name : Iswarmul.

Tribal name : Bhedijanetet.

Flowering and Fruiting : July to February.

Habitat : Terrestrial, found in open forests and hedges.

Status in the area : Wild, infrequent.

Description :

Perennial twining herb; stem branched with woody rootstock; leaves usually ovate to oblong; flowers few in axillary racemes; hooded perianth; fruit capsules; oblong and narrowed into pedicels; openingfrom base to upwards, seeds deltoid ovoid.

Means of Propagation : Rootstocks.

Parts Used : Roots, Whole plant.

Drug collection and storage : Roots are collected in little amounts dried and kept in polythene packets.

Mode of administration : 1. Root made into a paste and taken 2-3 teaspoonfuls in an empty stomach in case of snake bite.

2. The roots of *Aristolochia & Cynodon* (1:1) are made into a paste and strained. One teaspoonful of the juice is taken thrice a day for 3-4 days to cure stomach aches.

2. *Celastrus paniculatus* Willd. (Celastraceae)

Scientific name: *Celastruspaniculate* Willd.

Family : Celastraceae

Local name: Kujari

Tribal name : Munjui

Flowering and fruiting : February-August.

Habitat: Terrestrial, fairly common in hedges and edges of forests.

Status in the area : Rare, restricted to the forest.

Description : Climbers; leaves alternate, simple, ovate-elliptic; flowers in terminal panicled cymes; fruit capsules, 3-valvate; seeds arillate.

Means of propagation : Seeds.

Parts used : Leaves.

Drug collection and storage: Roots are collected in little amounts dried and kept in polythene packets.

Mode of administration : 1. Fresh leaves made into a paste with a little amount of water and applied externally or as a poultice on the forehead to get relief from headache.

3. *Erycibe paniculata* Roxb. (Convolvulaceae)

Scientific name : *Erycibe paniculata* Roxb.

Family : Convolvulaceae

Local name : Kari

Tribal name : Kanri

Flowering and fruiting : November-March

Habitat : Terrestrial, found in the forest.

Status in the area: Rare, occasionally found in forest areas.

Description: Defused shrub; leaves alternate,elliptic; flower small, in axillary & terminal raceme; yellow in color; stamens 5, adnate to corolla throat; fruit berry; seed solitary.

Means of propagation : Seeds

Parts used : Stem, bark

Drug collection and storage: Barks are collected, dried, made into powder and kept in air tight container.

Mode of administration : 1. Stem, bark made into powder mixed with water and poultice on the infected part of children to cure rickets.

4. *Soymida febrifuga* (Roxb.) A. Juss. (Meliaceae)

Scientific name : *Soymida febrifuga* (Roxb.) A. Juss.

Family : Meliaceae.

Local name : Rohini.

Tribal name : Raktaarha.

Flowering & Fruiting : May-July.

Habitat : Terrestrial, found in forest areas.

Status in the area : Very rare, planted in forest areas.

Description : Tree; leaves pinnately compound; flowers in branched panicles, tubular; fruits capsules, obovoid; seeds winged.

Means of propagation : Seeds.

Parts used : Bark.

Drug collection and storage : Barks are collected from the middle part of the mature plant, dried, and kept in a gunny bag.

Mode of administration - 1. Bark juice is used in any kind of cuts and wound.

2. Bark made into a paste and applied as a poultice on any kind of body ache.

5. *Vernonia anthelmintica*(L.) Willd. (Asteraceae)

Scientific name : *Vernonia anthelmintica*(L.) Willd.

Family: Asteraceae

Local name: Kujari

Tribal name: Not known

Flowering & Fruiting: October-January

Habitat: Rarely found in forests and waysides of forest

Status in the area: Rare, restricted in forest areas

Description :

Coarse annual, 50-90 cm in height, sometimes with long pendent flowering branches. Leaves ovate or elliptic-lanceolate, coarsely serrate, acute or acuminate, scabrous membranous, pubescent, attenuate at the base into a short petiole. Head stout, long; peduncle 1-5 cm long; outer bracts linear-oblong, green. Corolla purple, 1 cm, glabrous, teeth

5, lanceolate, acute. Achenes 3-4 mm long, oblong-cylindric, 10 ribbed, pubescent. Outer Pappus of linear chaffy scales, inner of caduceus hispid hairs, 5-6 mm long.

Means of propagation : Seeds

Parts used : Root

Drug collection and storage : Root collected from mature tree after flowering, dried in sunlight, and made into powder.

Mode of administration : 1. Root powder one teaspoon mixed with water and taken onan empty stomach in the early morning to get relief from stomach ache.

5. Conclusion:

It can be concluded that the district harbors plenty of medicinal plants. Tribal and non-tribal people of this district still use many plant species for their primary health care. Many important medicinal plant species occurring here in this district like, *Aristolochia indica* L. (Aristolochiaceae), *Celastruspaniculatus*Willd. (Celastraceae), *ErycibepaniculataRoxb* (Convolvulaceae), *Vernonia anthelmintica*(L.) Willd. (Asteraceae), *Soymidafebrifuga*(Roxb.) A. Juss. (Meliaceae). These species are also recorded as potent medicinal plants from other districts as well as other states of India. But these potent taxa face high use pressure by the local people as they are culturally very important. Further studies regarding the phytosociological analysis and distribution status of medicinal plants should need a clear picture of their distributional status. Immediate steps should be taken to conserve these valuable resources. The present study will provide baseline data to the scientists for further scientific research on medicinal plants and drug discovery.

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Table-1: List of recorded medicinal plants.

Scientific name	Habit	Family	Parts used	Disease cured
Alstonia Scholaris(L.)R.Br.	tree	Apocynaceae	Bark	Stomach trouble
*Moringa olifera*Lamk.	tree	Moringaceae	Flower	Nutrition, anti-pox
Butea monosperma (Lamk.) Taub.	tree	Fabaceae	Bark	Stomach trouble
Aristolocia indica L.	climber	Aristolo-chiaceae	Root	Snakebite
*Curculigoor-chioides*Gaertn.	herb	Hypooxidaceae	Root	Stomach trouble
*Cynodonda-ctylon*Pers.	herb	Cyperaceae	Whole plant	Cuts and wounds
Holarrhena anti-dysenterica	tree	Apocynaceae	Bark	Stomach trouble
Tamarindus indicus L.	tree	Fabaceae	Bark	Stomach trouble
Andrographis paniculata (Burm.f.) Wall. ex Nees	herb	Acanthaceae	Leaves	Worm
*Abrus precatorius*L.	climber	Fabaceae	Root	Stomach trouble
Hygrophilla schulli (Buch.-Hem.)M.R.et. S.M.Almeida	herb	Acanthaceae	Leaves	Anaemia
*Justicia Adhatoda*L.	shrub	Acanthaceae	Leaves	Cold and cough
Vitex negundo L. (BMP)	shrub	Verbenaceae	Leaves	Bone fracture
Calotropis procera (Ait.) R.Br.	shrub	Apocynaceae	Root	Stomach trouble

Scientific name	Habit	Family	Parts used	Disease cured
Shorearobusta. Gaertn.f	tree	Dipterocar-paceae	Bark	Burn
Buchnanialanzan Spreng.	tree	Anacardiaceae	Fruit	Nutrition
Croton bonplan-dianum Baill.	herb	Euphorbiaceae	Latex	Cuts
Cissus quadran-gularis L.	climbers	Vitaceae	Stem bark	Bone fracture
Pergularia daemia (Forssk.) Chiov.	climbers	Apocynaceae	Fruit	Cuts and wounds
Emblica officinalis Gaertn.	tree	Euphorbiaceae	Fruit	Stomach-ache
Celastrus pani-culatus Willd.	climber	Celastraceae	Leaves	Headache
Erycibe paniculata Roxb.	climber	Convol-vulaceae	Bark, flower	Rickets
Vernonia anthel-mintica(L.) Willd	shrub	Asteraceae	Root	Stomach-ache
Soymida febrifuga (Roxb.) A. Juss.	tree	Meliaceae	Bark	Cuts and wound, body ache
*Jatropha gossy-pifolia*L.	herb	Euphorbiaceae	Gum	Toothache

Table- 2: Photographs of some rare plant species.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>1. Aristolochia indica L.</td><td>2. Celastrus paniculatus Willd.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>3. Erycibe paniculata Roxb</td><td>4. Vernonia anthelmintica (L.) Willd</td></tr>
<tr><td>  </td><td>1. Aristolochia indica L.
2. Celastrus paniculatus Willd.
3. Erycibe paniculate Roxb.
4. Vernonia anthelmintica (L.) Willd.
5. Soymida febrifuga (Roxb.) A. Juss.</td></tr>
<tr><td>5. Soymida febrifuga (Roxb.) A. Juss.</td><td></td></tr>
</table>

Fig.-1: Map of the study area

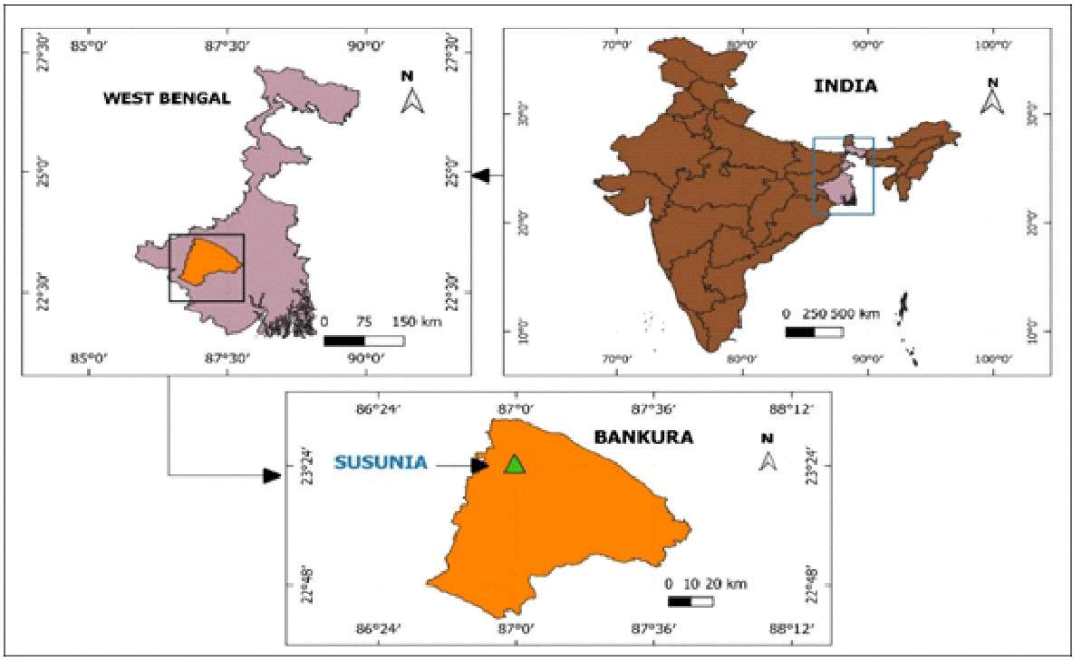

Fig.-2: Distribution of plants across the various life form (Habits).

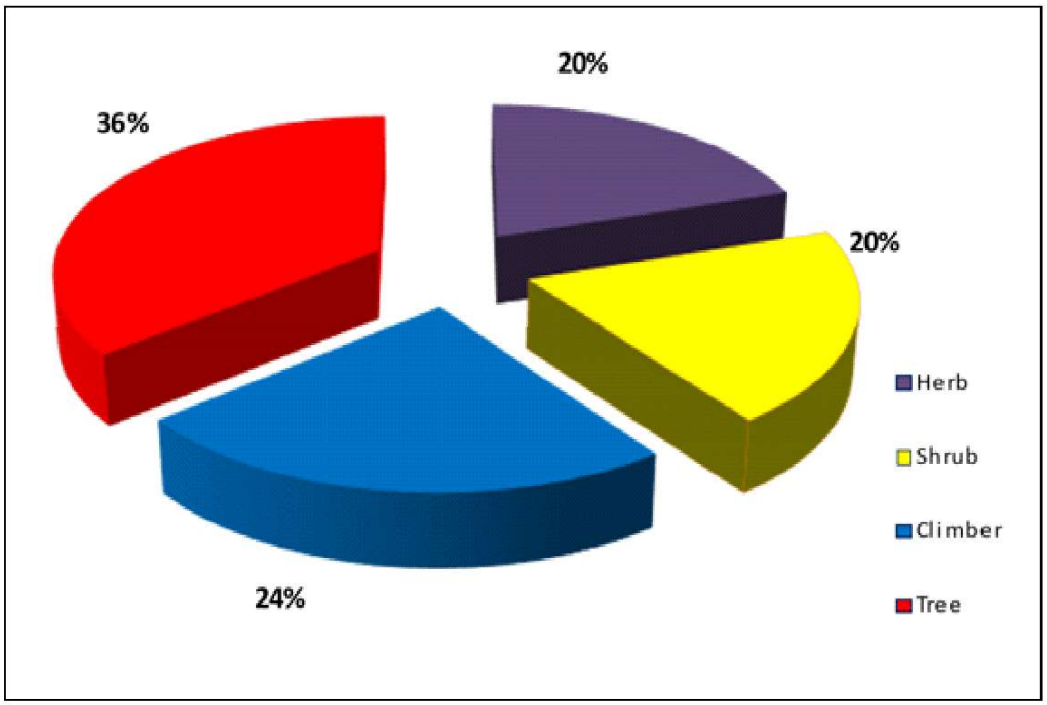

Fig.-3 : Percentage composition of plant parts used as drug.

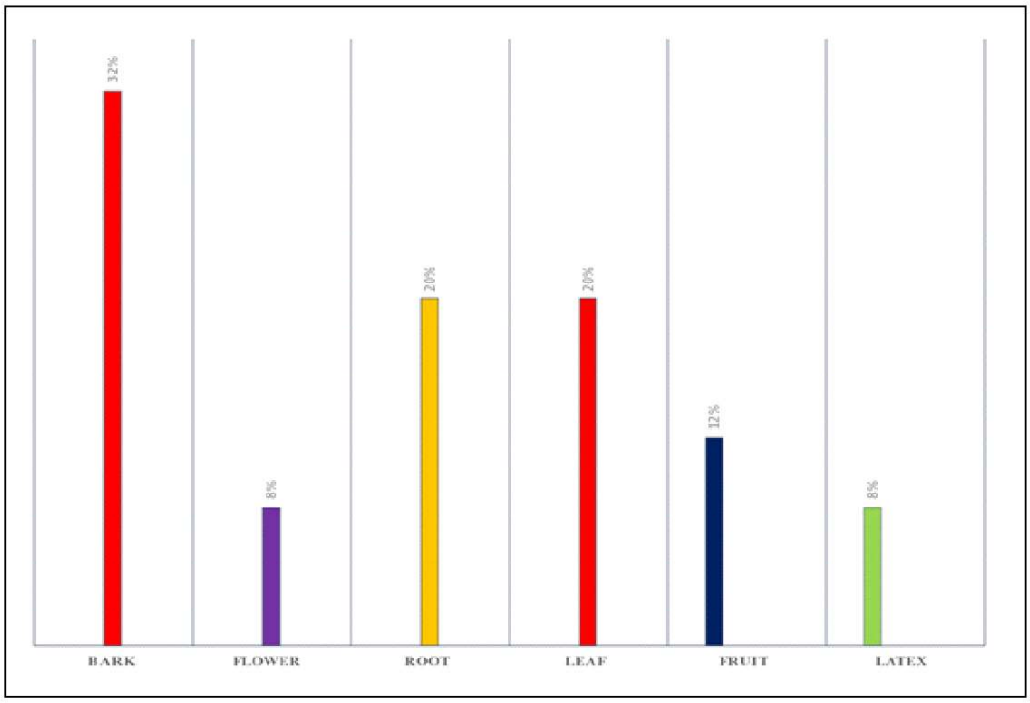

Fig.-4: Percentage composition of different families.