

Documentation of Medicinal Flora of Birbhum District, West Bengal, India



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Abstract

The research work presented was initiated to get information and report the biodiversity in medicinal flora of the district Birbhum, West Bengal, India. As a whole about 315 plants species have been recorded from the district through regular field observation and perusal of literature on medicinal plants. Most of the plant species of recorded 315 taxa are used as herbal drug in various Indian Systems of Medicine and in pharmacopoeias of different ethnic communities of the country. These recorded medicinal angiospermic plant species belonging to 205 genera and 93 families. Habitually these 315 plants are of 4 types like trees-83 species, herbs- 120 species, shrubs- 61species and climbers- 51 species. Considering individual plant parts it is found that in most of the cases leaves are used followed by root, whole plant, bark, fruit, gum etc. The recorded species have been enumerated in tabular form with its updated scientific name, family, plant parts used, occurrences and their uses in Indian System of Medicine.

Keywords: Birbhum District, Ethnobotany, Ethnomedicine, Flora, Medicinal Plants.

Introduction

India has rich diversity of medicinal plant species. The herbal wealth of India and the knowledge of their medicinal properties have a long tradition, as referred to in Rigveda and other ancient literature.

It has been felt that documentation and inventorying of medicinal plants and its related indigenous knowledge of a particular region, state, or country is an essential prerequisite for its better scientific exploitation. For this vital reason almost many the countries in the world are actively engaged in documentation of their medicinal plant resources and related folk knowledge. In order to promote these activities, Government of India constituted National Medicinal Plant Board and it is having the working link with the Medicinal Plant Boards of various states. It has now been well understood that for proper management of medicinal plant resources including its sustainable utilization and conservation, the essential pre-requisite is documentation of medicinal plants of any region.

Review of Literature

For this reason in India, documentation of medicinal plant resources from almost each state has been started in recent past. But in this respect district Birbhum remains largely unstudied. A few reports regarding floristic studies, ethnobotanical as well as ethnomedicinal plants have been published from the district Basak (1968), Rahaman *et al.* (2008, 2009, 2011), Rahaman and Pradhan (2011), Pradhan and Rahaman (2011, 2014). Rahaman (2011) dealt with the ethnomedicinal flora of Birbhum district which account for 205 plant species along with their ethnomedicinal uses. Choudhury *et al.* (2013) enlisted 227 plants as ethnomedicinal plants- from the district. But here in our study we have enlisted 315 plant species along with their botanical name, families, occurrences, their uses in Indian system of medicine and ethnomedicinal uses which indicating that a large number of plant species (110 or 88) have been unexplored or neglected by the previous worker.

Aim of the Study

In our work we have compiled the flora biodiversity and ethnomedicinal uses of Birbhum district with the previous worker and it will be great asset for further exploitation. During our working periods we have also discuss the present status of plant species thoroughly in the forest areas by phytosociological analysis and IVI studies in our earlier publication (Pradhan and Rahaman 2015). Regular exploitation of additional medicinal species from the district indicating that the study area is very much enrich in plant diversity. But the present status of many

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important ethnomedicinal species are not satisfactory (Pradhan and Rahaman 2015). So proper management of these important resources in the study area is very important for future conservation.

Aim of Study

To explore the medicinal resources of the district and to know the present status of the plant species for future conservation.

Materials and Methods

An extensive field survey was conducted in different villages and forest areas of Birbhum district in different seasons for last five years (2009-2013) to gather the information about medicinal plants of the district and to collect the herbarium specimens of the plants growing in the district. Information about medicinal plants were gathered through formal and informal interviews of the tribal and non tribal people of the district, recording local name and tribal name of the plants, medicinal uses, parts used, present and past distribution of the plants in the district, rarity and its possible causes in the locality, etc. Through perusal of literature on medicinal plants finally a list of medicinal plant species of the district has been prepared Kirtikar and Basu (1935), Jain (1989, 1991, 1997), Pal and Jain (1998), Jain and Mudgal (1999), Maheshwari (2000). The collected plant specimens have been carefully identified with the help of different floras Saldanha and Nicolson (1976), Varma (1981), Manilal and Sivarajan (1982), Panigrahi and Murti (1989), Sanyal (1994). The collected plant specimens have been preserved as herbarium specimens following the standard method Jain and Rao (1977) and kept in the Visva-Bharati Herbarium (VBH), Department of Botany, Visva-Bharati, Santiniketan for future references.

Results and Discussion

Altogether 315 plants species have been recorded from the district as medicinal species through regular field observation and perusal of literature on medicinal plants (Table.1). It has been found that most of the plant species among these recorded 315 taxa are used as herbal drug in various Indian Systems of Medicine (Ayurveda, Unani & Siddha) and in pharmacopoeias of different ethnic communities of the country.

These recorded plant taxa spread over 286 species, 180 genera and 79 families of dicotyledons, 26 species, 22 genera and 11 families of monocotyledons and 3 species, 3 genera, 3 families of pteridophytes (Fig.-1). Habitually these 315 plants are of 4 types like trees-83 species, herbs- 120 species, shrubs- 61 species and climbers- 51 species (Fig.-2). Considering individual plant parts it is found that barks of 52 plants, leaves of 138 plants, roots of 130 plants, fruits of 45 plants, gum of 5 plants are used as medicine for primary health care needs. In 82 cases whole plants are used (Fig.- 3).

Among these 315 plants 18 plants belong to leguminosae, 18 plants belong to euphorbiaceae, 12 plants belong to malvaceae, 11 plants belong to ceasalpiniaceae, and 9 plants belong to asteraceae.

Out of these recorded 315 plants, 112 plants are used in Ayurveda, 77 plants are used in Unani and 77 plants are used in Siddha. So, it indicates that

Remarking An Analisation

these plants are very much medicinally important as they are used in Indian System of Medicine. Most of the plants are also used by the people of Birbhum district for their primary health care need (Fig.- 4).

From this investigation it has been observed that among 315 recorded plant species, 158 plant species like, *Achyranthes aspera* L., *Aegle mermelos* Corr.ex Roxb., *Aerva lanata* Juss.ex Schult., *Azadirachta indica* A. Juss., *Calotropis gigantea* (L.) R.Br.ex Ait., *Croton bonplandianus* Baill. (etc. are commonly found throughout the district (Table - 1).

Numbers of infrequent or uncommon plants are nearly 72. The infrequent plant species found in this study area are - *Abrus precatorius* L., *Abutilon indicum* (L.) Sw., *Abutilon theophrasti* Medic., *Acacia catechu* (L.f.) Willd., *Cayratia pedata* (Lamk.) Juss.ex Gangnep, *Ampelocissus latifolia* (Roxb.) Planch, *Curculigo orchioides* Gaertn., etc. (Table - 1).

19 important medicinal plant taxa have been recorded as rare species from the district. These rare plants are *Acacia farnesiana* Willd., *Asparagus adscendens* Roxb., *Antidesma ghaesembilla* Gaertn., *Butea superba* Roxb., *Careya arborea* Roxb., *Celastrus paniculata* Willd., *Erycibe paniculata* Roxb., etc. (Table - 1).

During survey it has been observed that 10 species out of 315 are cultivated here in this district. These cultivated plants are *Agave sisalana* Perr., *Cajanas cajan* (L.) Millsp., *Saccharum officinarum* L., *Aloe vera* Tourn.ex.L., *Curcuma longa* L., etc. (Table - 1).

Nearly 52 plant species out of 315 are planted in the district either in home gardens or along the road side. The planted plant taxa are *Amorphophallus campanulatus* Blume ex Decne., *Artabotrys odoratissimus* R.Br., *Bombax ceiba* L., *Gossypium herbaceum* L., etc.

From the data analysis it is also found that among the recorded 315 plant species nearly 200 plants like *Aeschynomene aspera* L., *Carissa carandas* L., *Chamaecrista mimosoides* (L.) Greene, *Ecbolium viride* (Forsk.) Merrill, *Xanthium strumarium* L., etc. are not used by the tribal or rural people of this district as medicinal species Mandal (1988), Mondal *et al.* (1998), Rahaman *et al.* (2008, 2009), Ghosh *et al.* (2011). But those plants have been enlisted here in this study because they have mentioned as medicinal plants in various standard literature on medicinal plants Kirtikar and Basu (1935), Chopra *et al.* (1956), Jain (1981, 1989, 1991, 1997), Pal and Jain (1998), Maheshwari (2000).

During field observation it has been found that populations of some important, infrequent and rare taxa are being declined day by day throughout district. *Aristolochia indica* L. *Ambroma augusta* L.f., *Careya arborea* Roxb., *Euphorbia fusiformis* Ham., *Ochna obtusata* DC., *Soymida febrifuga* (Roxb.) A. Juss., *Flacourtia jangomus* Raeusch., etc. are few of them. Indiscriminate collections, habitat destruction, decrease in area of the forest patches throughout the district, lack of proper collection procedure among the rural and tribal people, etc. are the factors are responsible for dwindling of population of those

important plant species. It is also assumed that, there may be some constraints regarding proper fruit set, seed germination, etc. of those important medicinal plant species in the district.

In case of root and bark drugs, plants like *Aristolochia indica* L. *Ambroma augusta* L.f., *Careya arborea* Roxb., *Euphorbia fusiformis* Ham., *Ochna obtusata* DC., *Soymida febrifuga* (Roxb.)A. Juss., *Flacourtia jungomus* Raeusch., etc. are collected in unsustainable way by the herbalists or by the local users. Due to this unsustainable collection practices the populations of these important medicinal species in the district are gradually being decreased.

From literature survey it is revealed that 30 plant species have been recorded (*Celastrus paniculata* Willd., *Erycibe paniculata* Roxb., *Careya arborea* Roxb., *Crotalaria verrucosa* L., etc.) as new from the district as they have not reported earlier in the literature on medicinal plants of Birbhum district (Rahaman *et al.* 1999, 2008, 2009, 2011, Ghosh *et al.* 2011, Pradhan and Rahaman 2012) (Table - 5).

Out of these recorded 315 plant species a rare orchid *Eulophia explanata* Lindl. Was reported as new record for the state of West Bengal in our earlier publication (Rahaman *et al.* 2015).

Finally, the recorded 315 plant taxa have been enlisted in tabular form with their botanical name, families, habitat, field numbers, their occurrences in the area and various uses in different systems of medicine (Table -1).

Conclusion

It can be concluded that the district harbours plenty of medicinal plants i.e. 315 species. But the current overexploitation, soil compaction, a practice for removal of forest biomass in the form of grazing, lopping, surface burning seems to limit the ability of some species to propagate, however, despite dense urbanization in the area, medicinal plants still play a key role in the health care of the local people. Hence, it is high time to conserve these precious species for sustainable uses for the future and multidimensional efforts should be taken to start sustainable cultivation and harvesting programmes in the district. The present study will also provide base line data to the scientists for further scientific research on medicinal plants and drug discovery.

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Fig-1. Percentage Composition of Plant Species and Different Plant Groups

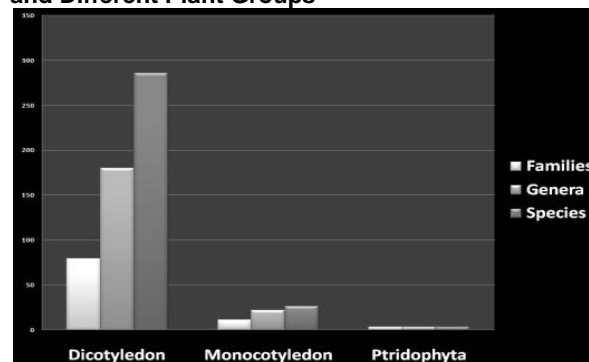


Fig- 2 Distribution of Recorded Plant Species across the Various Life Form

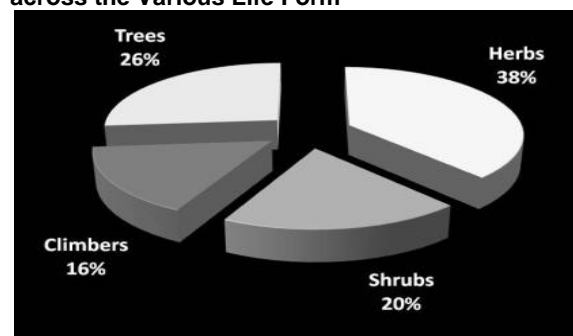


Fig -3 Percentage Composition of Plant Parts Used As Drugs

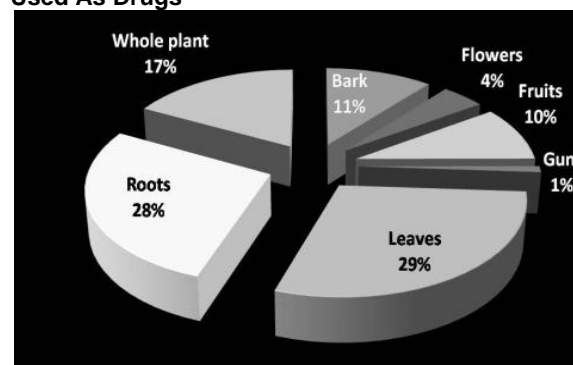


Fig - 4. Percentage Composition of Plant Species Used In Different Systems of Medicine

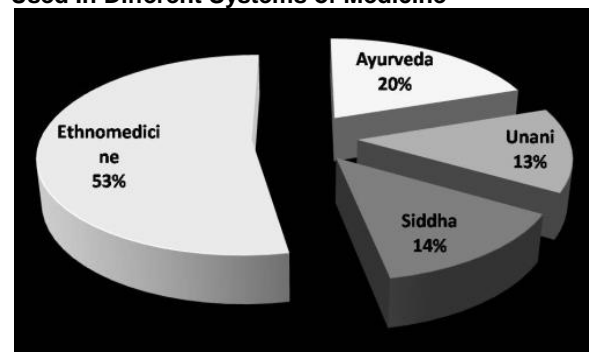


Fig-5.Map of Birbhum District along with Its Forest Areas

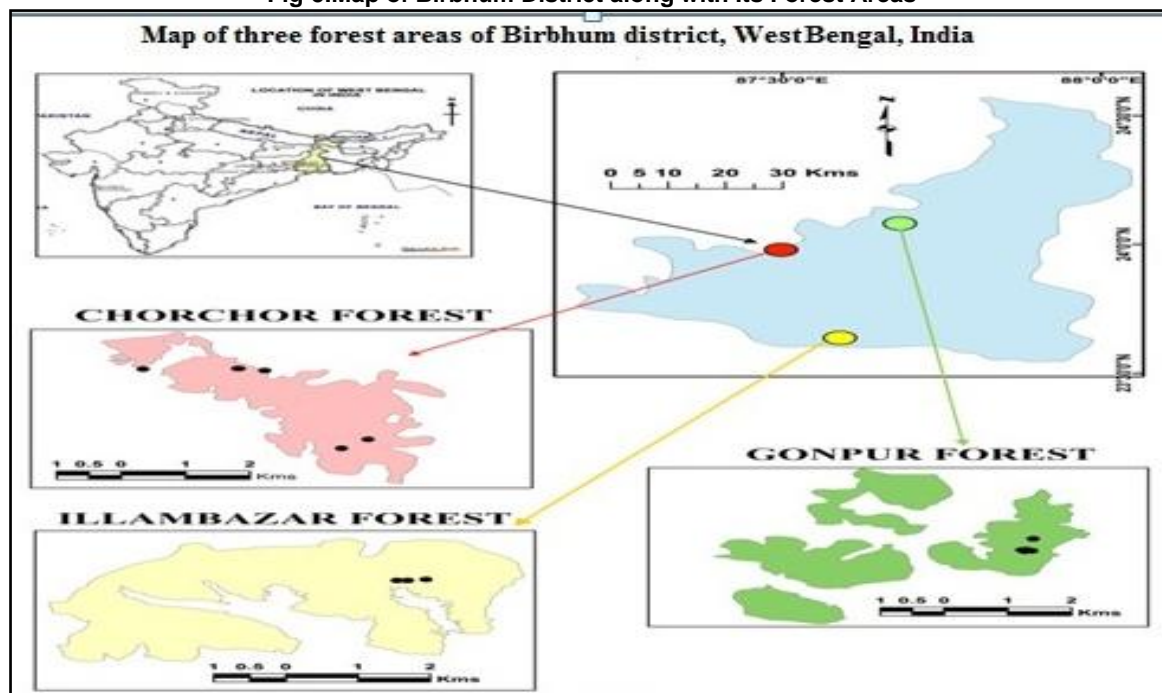


Table -1 List of some recorded medicinal plant species of the Birbhum district

S. No.	Botanical name with family	Habit	Field Number	Occurrence	Used in different system of medicine
1.	<i>Abrus precatorius</i> L. (Fabaceae)	Climber	Santiniketan, B. Pradhan 242	Wild, Infrequent	Ethnomedicine, Ayurveda, Unani, Siddha.
2.	<i>Abutilon indicum</i> (L.) Sw. (Malvaceae)	Shrub	Kasba, Bolpur, B. Pradhan 108	Wild, Infrequent	Ethnomedicine
3.	<i>Abutilon theophrasti</i> Medik. (Malvaceae)	Shrub	Santiniketan, B. Pradhan 241	Wild, Infrequent	Ethnomedicine
4.	<i>Acacia catechu</i> (L.f.) Willd. (Mimosaceae)	Tree	Illambazar, B. Pradhan 145	Wild, Infrequent	Ethnomedicine, Ayurveda, Siddha.
5.	<i>Acacia farnesiana</i> (L.) Willd. (Mimosaceae)	Tree	Goalpara, B. Pradhan 109	Wild, Infrequent	Ethnomedicine, Ayurveda, Siddha.
6.	<i>Acacia nilotica</i> (L.) Delile (Mimosaceae)	Tree	Santiniketan, B. Pradhan 105	Wild, Rare	Ayurveda, Unani
7.	<i>Aegle mermelos</i> (L.) Correa. (Rutaceae)	Tree	Ahamad Pur, B. Pradhan 138	Planted, Common	Ethnomedicine, Ayurveda, Siddha.
8.	<i>Aerva javanica</i> (Burm.f.) Juss. ex Schult. (Amaranthaceae)	Herb	Bolpur, B. Pradhan 81	Planted, Common	Ethnomedicine
9.	<i>Aerva lanata</i> (L.) Juss. (Amaranthaceae)	Herb	Santiniketan, B. Pradhan 246	Wild, Common	Ethnomedicine
10.	<i>Aeschynomene aspera</i> L. (Fabaceae)	Shrub	Bolpur, B. Pradhan 98	Wild, Infrequent	Ethnomedicine
11.	<i>Agave americana</i> L. (Agavaceae)	Herb	Prantik, B. Pradhan 45	Wild, occasionally planted	Ethnomedicine
12.	<i>Agave sisalana</i> Perrine. (Agavaceae)	Herb	Prantik, B. Pradhan 122	Wild, occasionally planted	Ethnomedicine
13.	<i>Ageratum conyzoides</i> (L.) L. (Asteraceae)	Herb	Santiniketan, B. Pradhan 125	Wild, Common	Ethnomedicine
14.	<i>Antidesma ghaesembilla</i> Gaertn. (Euphorbiaceae)	Small tree	Illambazar, B. Pradhan 187	Wild, Rare	Ethnomedicine
15.	<i>Aristolochia indica</i> L. (Aristolochiaceae)	Climber	Illambazar, B. Pradhan 140	Wild, Rare	Ethnomedicine, Ayurveda

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