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Research Article

Characterisation of the Dicotyledonous Wild Edible Plants of The District of Bardhaman, West Bengal

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Abstract

The paper aims to document the traditional knowledge about wild edible plants of the Bardhaman district of West Bengal, India with special reference to the dicotyledons. During the present investigation, a total of 44 species of dicotyledonous wild edible plants belonging to 42 genera and 27 families (*sensu* Takhtajan, 2009) have been inventorised. Among them 19 are trees, 11 are herbs, 7 are shrubs and 7 are climbers. Majority of the species are fruit-bearing (28). Some edible plants have great economic value and are linked with the socio-economic development of the rural people of the district. Some other species may be introduced in the agroforestry systems, which could become the potential photosynthetic pool to counter environmental degradation.

Key words: Traditional knowledge, wild edible plants, Bardhaman district, Dicotyledons, Economic value, Agroforestry.

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1. Introduction

Evidence of man's dependence on plants for his survival can be demonstrated by palaeo-ethnobotanical findings from prehistoric archaeological sites [1]. Besides, they protect our environment and maintain nature. That's why plants are often recognised as the 'silent nurses' of the nature.

Among the extant group of seed-plants, Angiosperms are the most significant for human survival. Many of the extant angiospermic plants of modern time are invaluable sources of raw materials for innumerable domestic and commercial purposes like - food, fodder, medicine, timber etc [2].

Although people have been utilising plants for their livelihood for ages, the scientists have recently realised the importance of such plants in rural economy [3].

The easy access to the resources and proximity to widely dispersed markets are the key factors which enable the rural people to generate income from plant resources. There has been a revival of

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interest in food plants during the last few decades among the botanists which is somehow associated with an increasing desire for wild or organically grown foods [4].

Though some authors have worked on the plants of the Bardhaman district in isolated manner [5-7] – there has been paucity of information on the wild edible plants of the district. Therefore, the present study was conducted to provide data that can be helpful in ensuring sustainable utilisation of the wild edible plants of the district, with special reference to the dicotyledons.

Study area

The district of Bardhaman, covering an area of about 70,280 sq. kms., lye between 22°56′ - 23°53′ N latitudes and 86°48′ - 88°25′ E longitudes. It is situated in the Southern part of the state of West Bengal, India and is regarded as the 'Granary of the state'. The Bardhaman district is bound on the north by Dumka (of Jharkhand), Birbhum district and Murshidabad; on the east by Nadia; on the south by Hooghly, Bankura and Purulia and on the west by Dhanbad (again of the present-day Jharkhand). The river Barakar forms the district boundary to the west, the Ajay separates Birbhum and Dumka to the north with the exception of a portion of Katwa subdivision; the Damodar forms a southern boundary with Purulia and Bankura, while Bhagirathi forms the main eastern boundary with a few exceptions. The maximum length from east to west is 208 kms. While the maximum breadth from north to south is 112 kms. for this 'hammer-shaped' district.

The district of Bardhaman consists of interesting vegetation with many indigenous and polymorphic taxa due to wide variation in topography (less than 10 m to more than 150 m), geomorphology and climate at the different parts of this district.

Babla, Bramhani, Banka, Dwarakaswar, Kana, Khari, Kumar, Nunia, Singaran are the streams passing through the district. All rivers are from west, south-west to east indicating the natural slope from west and south-west to east. Though natural lakes are absent in this vast stretch of land, there are small 'jheels' in the Katwa and Kalna subdivisions.

Western tract mainly depends on its surface water but holds a better prospect for development of ground water by exploratory tubewells [8].

In the district of Bardhaman, the rainy season starts generally in June and continues till September. There is not much variation in the intensity of average rainfall in the two tracts of the district (vide Figure 1 below).

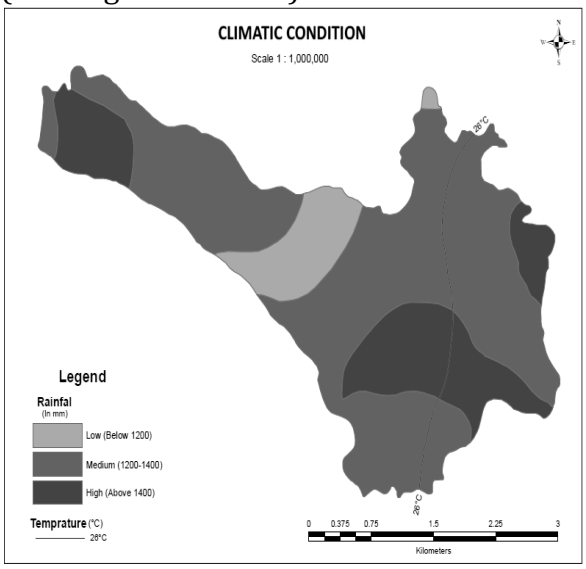


Figure 1. Schematic representation of rainfall in different parts of the district of Bardhaman.

At present there is no typical forest worthy to name except the thin "Sal" forest of Durgapur. Large trees are scarce here and there. Mango groves and Tamarind groves are scattered in the eastern tract.

Wide geographical and climatic diversity provides a repository of valuable medicinal [9] and edible plants of the region. These plants hold a valuable place in the dietary requirements of the people of the district.

Now, the economy of the district is basically an agro-industrial one. This has led to a comparatively thick human population in the district. In the last census of 2011, the total population of the district was recorded as 77,23,663 which reflects an increase of 12.01 % over the total population recorded in the census of 2001. The present population density in the district as of census 2011 - is 1,100 people living in every square kilometere of land [10]. Consequently, rapid rate of urbanisation has led to the massive exploitation of vegetation of the district. In this context, an attempt has been made to report the wild edible plants of the district of Bardhaman, with special reference to the dicotyledons, which is gathered during our survey work.

2. Methodology

Several field tripsin different seasons (2009 - 2012) were carried out to collect data. Details on wild edible plants were recorded by interviewing the native people of some randomly selected rural areas of the district. The informants were also consulted to locate and collect the plants. They provided useful information on the common names, including usefulness of the different parts of the wild edible plants. Frequent visits to the local markets were carried out to inventorise the wild edible plants used for commercial purposes in the Bardhaman district.

The standard methods as suggested by Jain&Rao (1977) were adopted for herbarium preparation [11].For the sake of identification of the plant materials, the authors had to look for the flowering stages of the specimens all round the year. Plant identifications were done by consulting different floras [12-16] and also by personal interactions with some of the specialists in the area of Plant Taxonomy and Biosystematics. Correct names are checked for each of the enlisted plants from Mabberley's Plant Book [17] and author citations are confirmed from Brummit's book [18].

Later, standard literatures and recent works of some botanists of India [19, 20] were consulted for cross-verification of the accumulated data from the native people. Finally, a list of forty four plant species - belonging to 27 families (*sensu* Takhtajan, 2009) [21] has been prepared for the present purpose.

3. Results and Discussion

Scientific names of the wild edible plants along with their family names, vernacular names (in Bengali), growth habit, season of availability and plant parts used are enumerated in Annexure -1. During the present investigation, it has been observed that out of the total edible dicotyledonous plant species - some are already under cultivation.

Number of wild tree species are more (19), followed by herbs (11), shrubs (7) and climbers (7) - as is graphically depicted in the Figure 2. Percent contributions of different parts of plants used indicate that fruits of majority of species are edible (64%) while leaves contributed 25 % only (vide Figure 3).

Further, Rutaceae was found to be the most dominant family with 4 species. Other important families are Anacardiaceae (with 3 species), Piperaceae (with 3 species) while Apiaceae, Caesalpiniaceae, Convolvulaceae Euphorbiaceae, Fabaceae, Moraceae,

Myrtaceae, Solanaceae, Tiliaceae, Verbenaceae are represented by 2 species each. The monospecific families are counted as 14 (vide Annexure - 2).

Flowering in most of the enumerated plants start between January and March but, fruiting period varies from species to species. Fruits are mostly consumed raw and leafy vegetables are cooked, boiled or, fried. The survey in the local markets showed that the vendors selledible fruits in fresh conditions due to lack of proper storage facilities affordable by them.

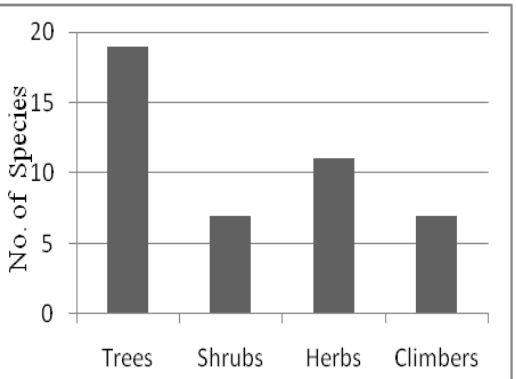


Figure : 2- Proportionate distribution of wild edible plant habits of Bardhaman district of West Bengal, India

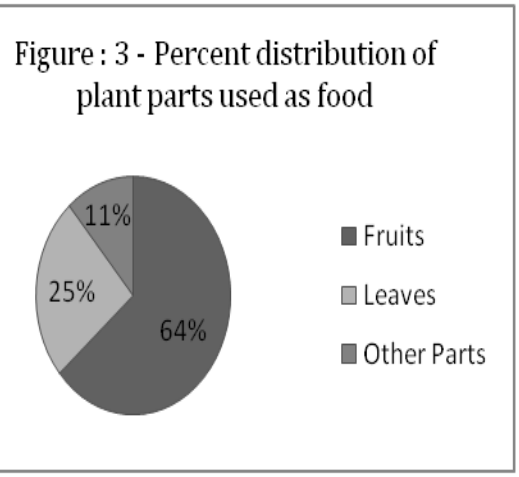


Figure : 3 - Percent distribution of plant parts used as food

4. Conclusion

Modern crop production of any region is based on only a few plant species [22]. However, many less-recognised plant species continue to be grown, managed, or collected, particularly in the rural areas of developing economies. Thus, these less-recognised plants contribute to the livelihood soft poor and to the agricultural biodiversity [23]. Some of the species, called underutilized plant species, are characterized by the fact that (a) They are locally abundant in developing countries but globally rare; (b) Scientific information and knowledge about the misscant; and (c) Their current use is limited relative to their economic potential [24]. Most of the underutilized plant species can benefit from marketing development as a means to support their sustained use and help foster the conservation of agrobiodiversity, while generating sustainable income for the native people.

The findings of the present study indicate that the wild edible dicotyledonous plants are closely linked with the socio-economic status of the people of Bardhaman district for their day-to-day dietary requirements. Over-exploitation of these plants may cause threat to certain species as well as destroy the balance in the ecosystem in near future. Hence, there is an obvious need to explore wild edibles that can be easily harvested without much pressure on a particular species in conformity of the principles of sustainable utilisation of genetic resources. That may add a new dimension towards the traditional methods of management and conservation of plant wealth of the district.

Again, there is an ample scope for studies in the regeneration behaviour, population structure and status of such wild edible plants. The studies on the phenological characters of different species must be given due importance. The outcome of such studies will be useful in determining appropriate conservational strategies for these plant species.

ANNEXURE - 1

Plant Name	Family	Common Name	Habit	Flowering & Fruiting	Edible Part
Adhatoda vasica Nees	Acanthaceae	Basak	Shrub	January - March	Leaves , flower
Aegle marmelos (L.) Corrêa	Rutaceae	Bel	Tree	May - August	Fruits
Albizia saman (Jacq.)Merr.	Mimosaceae	Kalosirish	Tree	February - June	Fruits
Amaranthus tricolor L.	Amaranthaceae	LaalShaak	Herb	November - May	Leaves , stem
Argyrea nervosa = *A. speciosa*	Convolvulaceae	-	Climber	October	Leaves
Artocarpus lakoocha Roxb.	Moraceae	Danpheul	Tree	-	Fruits
Azadirachta indica A.Juss.	Meliaceae	Neem	Tree	March - July	Leaves
Bauhinia purpurea L.	Caesalpiniaceae	-	Tree	-	Flowers
Bridelia stipularis (L.)Blume	Euphorbiaceae	-	Shrub	September - March	Fruits
Cayratia japonica (Thunb.) Gagnep.	Vitaceae	-	Climber	April - June	Fruits
Centellaasiatica(L.) Urb.	Apiaceae	Thankuni	Herb	September - March	Leaves
*Citrus medica*L.	Rutaceae	Batabi	Shrub	March - February	Fruits
Combretum decandrum Jacq.	Combretaceae	-	Climber	November - April	Bark
*Corchoruscapsularis*L.	Tiliaceae	Paat	Herb	July - September	Leaves
Desmodiumtriflorum (L.) DC.	Fabaceae	-	Herb	August - December	Leaves
*Dilleniaindica*L.	Dilleniaceae	Chalta	Tree	June - April	Fruits, calyx
Eryngiumfoetidum L.	Apiaceae	-	Herb	May - February	Leaves
*Ficusauriculata*Lour.	Moraceae	-	Tree	-	Fruits
Flacourtiajangomas(Lour.)Raeusch.	Flacourtiaceae	-	Tree	March - October	Fruits
Glycosmispentaphylla(Retz.) DC.	Rutaceae	-	Tree	January - April	Fruits
*Gmelinaarborea*Roxb.	Verbenaceae	-	Tree	February - July	Fruits

*Grewiasapida*Roxb. ex DC.	Tiliaceae	-	Shrub	March - May	Fruits
Ipomoea batatas (L.)Poir.	Convolvulaceae	RangaAlu	Herb	-	Tuber
Lantana camara L.	Verbenaceae	-	Shrub	June - February	Fruits
*Leeamacrophylla*Roxb. exHornem.	Leeaceae	-	Herb	August - March	Fruits
*Litchi chinensis*Sonn.	Sapindaceae	Lichu	Tree	January - June	Fruits
Mangiferaindica L.	Anacardiaceae	Aam	Tree	February - July	Fruits
*Momordicadioica*Roxb. exWilld.	Curcubitaceae	Kakrol	Climber	June - October	Fruits
*Moringaoleifera*Lamk.	Moringaceae	Sajina	Tree	January - April	Fruits, leaves, flowers
Murrayakoenigii(L.) Spreng.	Rutaceae	-	Shrub	February - May	Leaves
Paederiafoetida L.	Rubiaceae	-	Climber	-	Leaves
Peperomiapellucida(L.) Kunth	Piperaceae	-	Herb	-	Fruits
Phyllanthus emblica L.	Euphorbiaceae	Amloki	Tree	March - February	Fruits
Piper betle L.	Piperaceae	Paan	Climber	-	Leaves
Piper longum L.	Piperaceae	-	Climber	May - December	Fruits
Pisumsativum L.	Fabaceae	Mator	Herb	-	Seeds
*Portulacaoleracea*L.	Portulacaceae	-	Herb	January - July	Fruits, leaves
Psidiumguajava L.	Myrtaceae	Peyara	Tree	January - December	Fruits
*Semecarpusanacardium*L.f.	Anacardiaceae	-	Tree	July - March	Fruits
*Solanumferox*L.	Solanaceae	Ram begun	Shrub	June - February	Fruits
Solanum virginianum L.	Solanaceae	-	Herb	December - February	Fruits
Spondiaspinnata(L.f.) Kurz	Anacardiaceae	Amra	Tree	March - November	Fruits
Syzygiumcumini(L.) Skeels	Myrtaceae	Jaam	Tree	February - June	Fruits
Tamarindusindica L.	Caesalpiniaceae	Tentul	Tree	-	Pulp

(-) = Not Known

ANNEXURE - 2

Family wise distribution of the dicotyledonous wild edible plants of the district of Bardhaman

Sl. No.	Family	No. of Genera	No. of Species
1	Acanthaceae	1	1
2	Amaranthaceae	1	1
3	Anacardiaceae	3	3
4	Apiaceae	2	2
5	Caesalpiniaceae	2	2
6	Combretaceae	1	1
7	Convolvulaceae	2	2
8	Curcubitaceae	1	1
9	Dilleniaceae	1	1
10	Euphorbiaceae	2	2
11	Fabaceae	2	2
12	Flacourtiaceae	1	1
13	Leeaceae	1	1
14	Meliaceae	1	1
15	Mimosaceae	1	1
16	Moraceae	2	2
17	Moringaceae	1	1
18	Myrtaceae	2	2
19	Piperaceae	2	3
20	Portulacaceae	1	1
21	Rubiaceae	1	1
22	Rutaceae	4	4
23	Sapindaceae	1	1
24	Solanaceae	2	2
25	Tiliaceae	2	2
26	Verbenaceae	2	2
27	Vitaceae	1	1



(1)



(2)



(3)



(4)



(5)

Plate 1: (1) A villager of Bardhaman district, (2) *Argyrea nervosa*, (3) *Artocarpus lakoocha* Roxb., (4) *Dillenia indica* L. , (5) *Aegle marmelos* (L.) Corrêa

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