Wild Edible Plants of Tripura Tribes

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FOREWORD

Every year, Tribal Research and Cultural Institute, Government of Tripura, has been publishing lot of research oriented books based on Tribal History, traditional life and culture of the State. "Wild Edible Plants of Tripura Tribes" is one more addition of the aforesaid attempts.

In this book, the author has rightly selected the subject of forest vegetations with method of their use and cooking which will be of much help to others working in this line.

The author has properly described the Tribal names, authentically, in brief, of the vegetables, roots, fruits, shoots etc. in use with distinct photographs which has increased the value of this book. This book will be useful to the general readers and scholars. The subject of the monograph is a new attempt of our publications. I think this publication will be a great success.

In fine, I am thankful to Smt. Paushali Das for taking pains for this study of pioneer nature and G. Das, M. D. of Tripura Printers for printing the same in due time.

P. Srivastava
Commissioner,
Govt. of Tripura

MESSAGE

I am pleased to have gone through and note that "Wild Edible Plants of Tripura Tribes" concentrates on wild edible plants and plant parts like roots, shoots, leafy vegetables, leaves used as condiments, flowers, fruits, seeds and mushrooms used by the tribals as their food. The work is likely to have an impact on identification of potential vegetable resources of the state as well as pursuit of "ethnobotany".

Moreover, the work has some other features which deserves special mention for readers who are keen on knowing the tribal art and practice of using non-traditional forest products as food. As such, the discussion on processing of wild edible plants and 'ethno' art of preparing 'alkali' along with indigenous recipes will be interesting to the readers. Not the least, highlights on medicinal value and local uses of some plant resources as remedies will be an added attraction.

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Y. D. Pande
16.5.1997

PREFACE

Out of two lakhs of plants, at present man has used some 3000 species of which 150 or so have been commercially cultivated. With the present increase in population we must depend increasingly on more plants for their various potentialities. To help feed, cloth, supply of medicine etc. to rapidly increasing population, it is timely to consider the neglected or little known species.

Tribals living in forest use many non-traditional plants for food, medicine etc. Work of Smti Paushali Das on 'Wild Edible Plants of Tripura Tribes' is a good attempt in this respect, where she has described some 60 plants or plant parts used by them as food. Scientific identification of some plants were not possible for various reasons. Proper bio-chemical studies of these plants/plant parts may reveal a few species that might help to solve the increasing food problem of the future world. I thank the author for this honest attempt and hope that in future others will be encouraged in this type of endeavour.

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N. K. Chakraborty
13.01.1997

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PAUSHALI DAS

CONTENTS

CHAPTER - I

INTRODUCTION

Perhaps no subject is of more interest to the people at the threshold of twenty-first century than the food habit of the tribals or aboriginal communities of this planet. And the food habit of the primitive communities of Tripura, the land of hills and hillocks, rivers and rivulets in the North East corner of India, is no different. It has attracted towards itself not only the curious eyes of civilized world but also has drawn the attention of those people of old races who have already admixed themselves with the mainstream of the country.

The association of man with his environment is always in a state of change. But this relationship with the primitive group is almost static beginning from the pre-historic era to till now. It is not only their culture, tradition and heritage that have been striken root into the richness of forests, but their food habit has also been established in this environment.

More than 800 thousand tribals of Tripura belonging to 19 communities once in successive waves settled down on the hill tracts that were 'generally covered with thick vegetation and dense jungles ; in fact, some parts in the interior, the vegetation cluster together so thick, that day-light is obscured for many

miles along. Tracts through these jungles, are soon obscured with the fast growing vegetation, especially during the raining months, so that one is often trackless in the interior'. [1] In this densely covered forest of high trees and bamboo jungles 'with entanglements of thorny scrubs, cane, screepers and nettle, through which it is impossible to force a passage,' [2] the Tripuris, Riangs, Jamatias, Halams, Noatias, Kukis, Lushais and Uchais were first to set up their inhabitation followed by other communities from adjoining Assam and Chittagong Hill tracts [3] and 'eked out a precarious existence from forest products'. [4]

Available evidences suggest that, besides other, plenty of potential jhum land and abundant forest resources of Tripura had been the major causes of migratory flows of tribal population here. Since then, the forest areas of Tripura have been occupied and dominated by its different tribal communities. Their dependence on forest was not only due to the fact that their jhum fields were within the areas of forest land but the early people lived in that dense forest and survived by the complementarity of the forest. Moreover, forest in the life of the tribal people has been performing a more pervasive role. Their social and cultural ways of life also turn round the forest with intense emotional attachment and strong feelings of ownership over forest.

The deep forest and jungles of Tripura in and

around which they once concentrated were rich in flora and fauna. These bountiful nature served as an allurement to the early people for food gathering. [5] From another point of view the rich endowment of edible resources in forest perhaps kept the tribals of Tripura confined in living traditionally in forest areas some what with their own made standard of self sufficiency.

It requires no mention that sizeable number of the tribals have been practising jhum as the major economic activity in their way of life. But jhum produces fail to meet their needs throughout the year. Even pastoral activity do not contribute much to meet the shortfall of the jhum cultivation. The average annual income of the tribal jhumias on the whole is very low which hardly can provide even 'a meager subsistence to the extent of keeping body and soul together'. [6] As a result they are and have been dependent upon forest and gathering forest resources to supplement their livelihood throughout the year in general and during lean months of the year in particular. In other words, perhaps low economic return have been compelling the large number of tribals since the early times to use forest products as their food. As a result, many of them are still continuing fully or partially, for a long, in this primitive state of way of living where except jhuming and gathering from forest no other technology prevails as such.

The extent of extraction and uses of forest resources for food can be understood if one looks at the size of jhumia families. At the beginning of the 8th Five year plan there were 21,667 tribal families wholly dependent upon Jhum and 33,372 families were partly dependent.[7] But the quantification of the volume of extraction and uses of forest resources for food appears difficult because of non-availability of any useful information and study. However, a tentative picture can be drawn on the basis of some other supplementary information. In a balanced diet, the daily requirement of green leafy vegetables, other vegetables and roots and tubers for an adult man (sedentary worker) is 100 gms., 75 gms., and 75 gms respectively (although the minor members of the family consume less).[8] However, tribal families are unlikely to consume at the same rate in view of the local condition, taste and availability etc. Therefore, on an average there is a net consumption of nearly 110 tones of forest resources by the jhumias of Tripura per day if only a meagre amount of 200 gms of net forest resources are used as food per day by each tribal family particularly in the lean period.

It is revealed during the field survey that tribal women dispose off their surplus wild produces collected from the forest through barter system in unorganised weekly markets in the tribal compact areas. This signifies little or inadequate monetisation of tribal economy of Tripura. At the same time, as to the commercial status of the wild food resources in

the state, it has come to the notice that a few items of forest produces like bamboo shoots, roots, tubers and wild plantain flowers, stems and bananas etc. are brought by the tribals in the village markets of tribal dominated areas and the same is mostly purchased in a lot by the vegetable vendors of the urban areas or by middlemen.

It has been observed that the non-traditional forest resources which are used by the hill people of Tripura have not yet attained the significance of economic use and botanical value despite their immense potentialities to serve as useful vegetable resources of the State with 'Nutritive Value'. Moreover, in the midst of emerging food crisis 'reliance on small number of plants carries a great risk, for monocultures are vulnerable to failures brought about by disease or variations in climate. In this context, it is necessary to consider the neglected or little known species'[9] used by the tribals as food.

The magnitude of the interest in studying the art and practice of using forest products in day to day affairs of the tribal communities may be transpired if we look at the recent trends and developments in 'Ethnobotany' or 'Ethnobiology'.

In other words, the roots, tubers and leaves discovered and used by the traditional societies are now appearing as the effective sources of food for growing population and also proving to be an

important source of potentially therapeutic drugs.[10] Thus, the 'Ethnobotanical approach' strongly suggests to 'study the relationship between plants and people'.[11] As such, the interest in the present study of forest resources used as food by the tribals of Tripura rests on this emerging appreciation.

The tribals all over the country by virtue of living in the vicinity of the forests gained an unparallel knowledge of using wild flora and fauna for various purposes of their way of life including the using of the same as medicine and food. It requires no mention that because of a lot of socio-economic and environmental changes, the system and wisdom of using forest products as food in many respects have been fast disappearing. But in the matter of preservation of identity and traditional heritage of the tribal communities, the art and culture of consuming forest produces, is no less important. Moreover, the rich knowledge, art and system, if studied scientifically, may render unique benefit not only of medicinal prevention and cure, but also to shed light on the nutritional importance and value of the wild products used as food. As such, the time has, perhaps, properly ripen up to undertake study like present one in order to unfold, record and analyse the knowledge and wisdom of the tribals who, as it is perhaps truly described, are living in archeological museums of ancient tradition and cultural heritage[12], of using forest products as food.

Food habit of a race to a large extent depends on its origin. And it transpires from the available evidences that the Tripura tribals are Bodos who are, in turn, under Mongoloid blocks; and Tibet and China are assumed as their original homes. From there, crossing the Eastern, North-Eastern, and South-Eastern frontiers, they first appear to have settled over the entire Brahmaputra valley, ... skirted southern bend of Brahmaputra extended to Cacher and Sylhet they proceeded more further to the south, to Tripura estate.[13]

Not only that, their physical features are also akin to Mongoloid group of Tibeto-Burman block. Keane sheds light on the fact that all the tribes of North-Eastern India belong to the Mongoloid stock with such characters as black hair, absence of facial hair, and normally brachycephalic head.[14]

Against this back drop, the food habit of the tribals of Tripura are likely to be similar, at least to some extent, to that of their Mongolian counterparts who are inhabiting throughout the North-Eastern zone of India. Mongolians are well versed in taking rotten foods. Rotten fishes, crabs, meats etc. are not detested by Manipuri, Mizo, Naga etc. tribes of North-Eastern Region. J. P. Mill's observation about the A0 Nagas reveals that meat is preferred fresh, but animals long dead is by no means despised[15]. Here, in Tripura, all the tribals like to take an uncommon forest product, bamboo shoots. And

Tipperahs and Chakmas like to take the same both as fresh as well as in rotten condition. The dish prepared by the rotten shoots is known as "Muia Kasak". Similarly, it has been observed that the Lisu community of Arunachal Pradesh cut a particular variety of bamboo into pieces and bury the same under the ground. After one month they are taken out and used as vegetables[16]. Some of the tribals of Tripura eat decomposed snails, crabs etc. which they prepare by using pulp of rice flour termed as "Khangrai Kaichu". Like other Mongoloids of North East Region, to the tribals of this State dried fish is considered as highly palatable as it is seen in case of Nagas that the smell of dried fish is beyond all words.[17] The staple food of Khasis is also rice and dried fish.[18] Another interesting characteristic of the Mongoloid race is that they despise milk. [19] It is noticed in case of Garos[20] and Khasis[21] that they have aversion for milk. Similarly, almost all the other tribal communities of this State too abominate milk and the products of milk like butter, ghee etc. They also use little oil in cooking like mongoloid race. And they prefer most to consume boiled, smoked or roasted foods.

However, the main part of food gathering activities is collection of roots, tubers, leaves etc. from the forests. This collection is, of course, mainly carried on by young women and girls. At the same time, it is not infrequent that sometimes the adult males and boys extend their help and co-operation in food gathering

activities of the women.

Although food gatherers collect both vegetable and non-vegetable products of the forests, much stress is given in this work on vegetable products i. e. wild plant products which they mainly gather for food.

METHODOLOGY :

The study is new of its kind. There is as such no adequate published and unpublished materials readily reckoned at. As a result, the field survey as well as visit and interviews of members of tribal families of interior as well as urban areas have formed the primary sources of information. In the apprehension of any doubt or confusion possible cross examinations have been made. During the study doubt cropped up over the matter whether a particular produce was wild or cultivated. It has been seen that a particular produce is, in some areas, growing around homes but the same has been observed to treat as good as wild in other areas. For instance, *Dioscorea alata*, which is found to grow around courtyards of the tribal homes and at the same time, it is found to be collected from the forest. Sometime, a cultivated variety of fruit was mistaken for a wild variety. It might happen so that those areas were once under jhum cultivation. Jhum was done many years ago when they might have sown the seeds of those plants and then they left the area generally in quest of fresh jhum-land. And this

destitute land again infilled by forest growth. As a result, people are thinking those cultivated products as wild forest products. Reasonable care and caution, as such, has been exercised as far as possible to avoid such dilemma in this work.

SCOPE OF STUDY

As the title of the present study suggests, the work mainly deals with wild plant products used as food by the Tribals of Tripura under the theme 'Wild edible plants' that covers mainly roots and tubers, shoots, leaves, flowers, fruits, seeds, mushrooms. However, the scope of the present study does not permit any clinical work or investigation for evaluation of nutritional values and medicinal properties of wild products which are being taken as food by the tribals. Considering the importance of these two aspects all possible sources have been studied. The outcome of the efforts have been properly incorporated in the places where the same has been found relevant.

Moreover, the procedure of preparing food from forest resources are traditional and unique of its kind. But, as it has appeared in the course of field survey and interviews that, in many places, particularly in towns and in the tribal hamlets in nearing urban areas, such unique procedures are gradually becoming a lost heritage along with several forest products.

However, in view of the uniqueness and its values

in tribal identity and feelings, the work will not be completed unless the procedures of preparing foods by the tribals are recorded.

As such, the work starts with an introduction to tribal food and food habits with special focus on Tripura and North-Eastern tribal communities and methodology of work in Chapter-I.

Food habits of the tribals bear an intimate relationship with types of forest available to them. Because forest is their virtual abode of living. Therefore, chapter-II incorporates a brief description on the types of forest in Tripura.

In Chapter - III a review of literature relevant to the work has been incorporated. Chapter - IV incorporates the description of plants, the different parts of which are used by the tribals under relevant sub-headings, like shoots, roots and tubers, leaves, and flowers etc.

Chapter V deals with the recipes to prepare items of foods as mentioned in chapter IV. Chapter VI incorporates, as it has already been mentioned, the nutritional values of the forest produces used by the tribals of Tripura. It also includes the folk medicinal uses of the forest produces that are used as food by the tribals of this state.

Chapter-VII consists of a brief discussion on the whole of the work done in the previous chapters and concluding remarks.

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CHAPTER - II

PATTERN OF VEGETATION IN TRIPURA

Extraction of forest products that fulfil the multifarious requirements of the ethnic people along with their demand for food depends mostly on the types of forest available to them. In Tripura, forest occupies 3552 Sq. Kms. of the total area of the State i. e. 10,491 Sq. Kms.

According to the geographical distribution of plants, the forest occupied territory of Tripura can mainly be divided into evergreen forest and moist deciduous forest. Moist deciduous forest can again be subdivided into moist deciduous Sal forest and moist deciduous mixed forest, characterised by the presence or absence of Sal tree respectively. But there are also patches of grasslands, swamp vegetation, riverine forest, bamboo and Garjan forests scattered all over the State. All these vegetations have come under either Seral or Edaphic forests (Vide table - I).

TABLE - I

CLIMATIC TYPES	SERAL TYPES	SUBSIDIARY EDAPHIC TYPES
1. Evergreen Forest	1. Swamp vegetation	1. Bamboo forest
2. Moist deciduous forest.	2. Riverine forests.	2. Cane brakes
(a) Moist deciduous Sal forest.		3. Garjan forest
(b) Moist deciduous mixed forest.		4. Grassland
		5. Savannah

Table - II shows the forest types and different subdivisions where they are found :

TABLE - II

TYPE OF THE FOREST	AREAS OF THE STATE
1. Evergreen forests	Dharmanagar and Kailasahar sub-divisions, Jampai ranges bordering the Mizo district, portions of Belonia and Subroom sub-divisions, a portion of Sadar sub-division including Teliamura.
2. (a) Moist deciduous Sal forest	Belonia, Udaipur, Sonamura and Sadar sub-divisions.
b) Moist deciduous mixed forest	It covers large areas in Sadar, Amarpur, Sonamura, Udaipur sub-divisions and in places where depletion of evergreen forest has occured.

As availability of the forest produces, as it has been already mentioned, depends upon the types of

the vegetation, therefore, the habit of the use of forest resources is determined by the abundance of resources from forest where tribals are inhabiting. It appears from the tables that, on the whole, Tripura is not under a mono-type forest and thus, the same type of forest resources are not available all over the state. As such, the study attempts to survey the uses of forest products from different point of the state for having a comprehensive view under permissible limits. Because of continual shifting cultivation in the major areas of forest of Tripura 'the climax forest of the jhum areas have been disappeared' and, consequently, the useful food plants also might have suffered damage. Moreover, the successive jhuming operation has 'resulted in formation of vast expanses of bamboo forest'[1]. These bamboo jungles in fact represent the large share in supplementing the foods of the tribals. Now, the question is 'who knows what will come after bamboo forest'[2] for supplementing the food requirement if wanton destruction of forest accompanied by cleaning of bamboo jungle for jhum continues. This question perhaps poses when 'symbiotic relationship' that exists between man and forest erodes and it is forgotten that 'forest is a community or a society of living beings, of which tree is the biggest. There are big trees, small trees of different species, bushes, grasses, herbs, insects, birds and animals – all members of this big family, each dependent on the other. Forest people, of course, one of them'. [3]

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CHAPTER - III

REVIEW OF LITERATURE

Like other tribal culture the significance of land in the life of the ethnic people of Tripura is a pervasive phenomenon. It includes not only the plains but also the forests and hills. In fact, their lives, especially from the onset of their inhabitation in Tripura, were intermingled with thick forests and remotest hills. Perhaps, that is the reason for which Tripura tribes are fond of calling themselves as "hill people". And this is the reason where one might find the source of the feelings of the tribals that they have the right over the forests and forest products in absolute term.[1] They believe to have a free access to forest products for making objects of food of their daily living. Still a good number of tribals in Tripura struggle to depend upon gathering of the produces of forest. It has been observed in the remotest areas that the members of the tribal family are fed on only boiled roots or tubers or leafy vegetables during the lean periods of the year.

There is no denying the fact that cultivation prevails as the primary means of subsistence. However, 'Institutionalised Economic Persuits' have been taking place and practice of settled agriculture are making firm in roots. There has been changes in the food habits in some communities of Tripura. Despite the fact, gathering of forest products still

continues to influence considerably the lives of tribals of Tripura. The produces of cultivation hardly capable of meeting the needs of few months of tribal people.

During the field survey it has been observed that the materials, modernity and affluency have been replacing the traditional uses of forest products as food and, the same, in some way, is more visible in the life of the urban-dwelling tribals. But it is also true that the tribals who are living in towns are found interested, if not crazy, to consume available forest resources, particularly, bamboo shoots, wild bananas and plantain stems and varieties of leafy vegetables.

The available studies on the socio-economic life of tribal communities of Tripura suggest as such no detailed account of the forest resources used as food by them. But it cannot be denied that socio-economically as well as historically and emotionally tribal communities heavily depend upon gathering of food from forests for a considerable period of the year. Despite the fact, the monographs published on the major tribal communities of Tripura merely mention in a generalised manner that the diet of the tribals are supplemented by roots, shoots, tubers and vegetables and wild mushroom etc. collected from forests.[2] In 'Reangs of Tripura' only names of forest products without any categorical and other descriptions have been mentioned.[3] Some authors while discussing the traditional economic pattern of tribal societies of Tripura have mentioned only a few names

of some popular forest products used by them in connection with the practice of food gathering.[4] Although there is likely to have a commonality in the practice of using forest products by the tribal communities of Tripura as food but the other monographs on Jamatias[5] and Tripuries[6] did not contribute any further informative details of food habits. While discussing problems of tribal life, a number of studies, in general have indicated, in brief, how tribal economy is dependent upon forest at least as a secondary source of their livelihood and income, besides land.[7] Forest provides them food as edible roots, tubers, leaves and fruits of all kinds and freedom to use forest products for supplementing their meagre income has created a firm impression in the minds of the tribals that forests belong to them.[8] In an attempt to evaluate the importance of forest in the economic life of jhumias of Tripura, two major findings highlighted that the 'tribes-the so-called jhumias, are extremely dependent on forest resources of Tripura for their livelihood' and 'over the years tribals have been compelled to use the forest resources with such intensity that diminishing returns have set in'[9]. Another study on 'Plant Resources' of Tripura highlighted the demand for new products from previously unexploited or under exploited plants and assumed that some of these plants may be useful nutritional value. [10]

It transpires from the status report on Ethnobiology of India that there has been a continuing efforts to identify the forest resources enjoyed by the tribals for

the purpose of both as food and as medicine and to bring them within the structure of scientific study. The overall picture as noted in the report states that :

Over 9500 wild plant species used by tribals for meeting the varied requirements have been recorded so far. Out of 7500 wild plant species used by tribals for medicinal purpose, about 950 are found to be new claims and worthy of scientific scrutiny. Out of 3900 or more wild plant species used as edible (as subsidiary food/vegetables) by tribals, about 800 are new information and at least 250 of them worthy of attention to be developed as alternative source of food that the world would need in the near future.[11]

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CHAPTER - IV

WILD EDIBLE PLANTS

The myriad forest produces used as food by the different tribal communities of Tripura are diverse in nature and form the part and parcel of their unique dietary pattern and choice. The varieties of such edible wild produces contain not only several parts of numerous plants such as roots and tubers, stems, leaves, flowers, fruits etc. but even some entire plants too. Sometimes, to show their culinary zeal they use aromatic leaves of different wild plants for flavouring their several dishes. They consume all the forest products either by boiling or steaming, or by roasting or smoking the produces or they simply fry them using generally very little or no spices. Some of the products they relish as raw. Very often they sundry wild vegetables to preserve them throughout the year and to use them in off-seasons.

For the convenience of the study all these wild products consumed as food by the tribals of Tripura have been discussed under the following categories :

A. Edible Shoots and stem tubers.

B. Edible Roots and tubers.

C. Leaves both used as vegetables and as aromatic leaves for flavouring curries.

D. Flowers

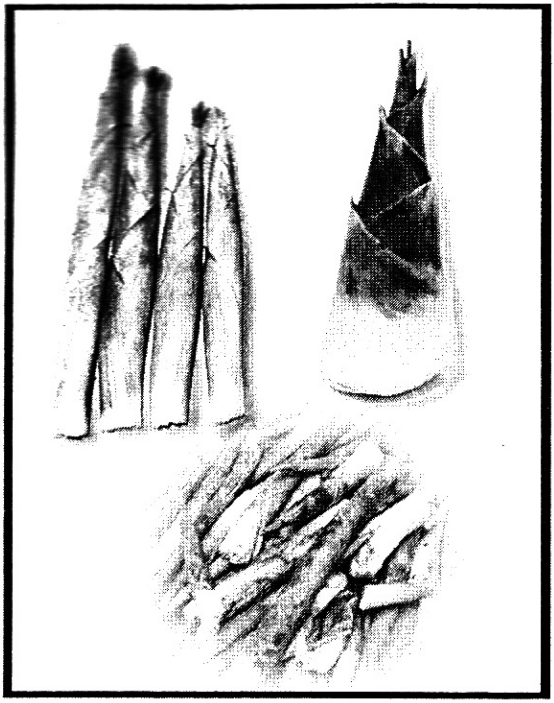
E. **Fruits used as vegetables and as raw.**

F. **Seeds.**

G. **Mushrooms.**

A. EDIBLE SHOOTS AND STEM TUBERS

1. Bamboo

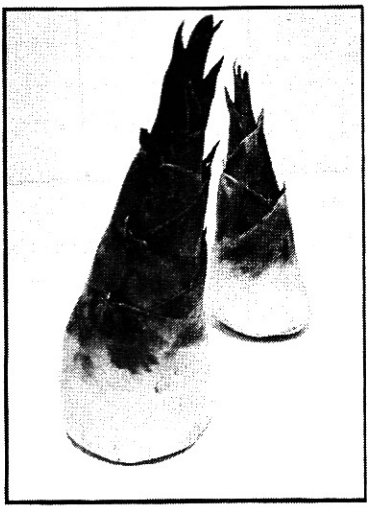


"Muia" i.e. bamboo sapling and "Karul" i.e. bamboo shoots are very common food item not only to the tribals of Tripura, but to other Mongoloids of North Eastern region as well as the non-tribals of this State. Some very tasty dishes like "Muia Gudak", "Muia Chakhai", "Muia Aundru" "Pickles" etc. are prepared from a variety of bamboo shoots. Reang, Tipperah, Noatia, Jamatia - all of them can easily loose their hearts over these delicacies. It will not be exaggerated if it is said that some of them are so fond of these dishes that they can even reject any dish of meat (which is also preferred by them) for any preparation of bamboo shoots.

One can not get "Muia" or "Karul" throughout the year. The proper timing for bamboo shoots are from the month of April to August (Baishakh-Bhadra). But, sometimes in middle of March "Muia" is available. These early young saplings come out just after burning of forests for jhuming. These shoots are popularly known as 'Hatalani Muia' that means bamboo shoots of new soil. These are smaller in size as growth remains retarded due to their untimely appearance. But that does not lessen their taste. Then comes early monsoon. The first shoot of Mirtinga shows its appearance at the end of March or at the beginning of April. These saplings are known as 'muia hakotui'. Sometimes in abandoned jhums-sites, shoots come out from muli (*Melocanna* sp.). Their growth stops only after reaching at the length of 1-1.5 m. Consequently, they have a value not as

bamboo but as 'muia'. This off-seasonal appetizer is popularly known as 'hapingne muia'. All these 'hatalani' 'hakotui' or 'hapingne' muia are very popular to the local tribals. Boiled, steamed, fried or in any preparation - these are considered a delicacy.

Although the hill people consume tender culms of almost all kinds of bamboo growing in Tripura, but they are very fond of especially Mirtinga or Owandal (*Bambusa tulda* Roxb.), muli or owathai (*Melocanna bambusoides* Trin.), Sil barak or Owachaur (*Bambusa balcooa* Roxb.) Owamli, Raphai or Bari etc.



Owandal

Bengali Name	Mirtinga, Jowa, Tulda, Matela
Scientific Name	*Bambusa tulda* Roxb.
Family	Graminae (Poaceae)
Source	Mohanpur forest area.

Description of the Plant :

It grows in cluster i. e. gregarious. Culms achieve a height of 22 m having a diameter of 5-10 cm, greyish green in colour, while ringed below the nodes. Nodes are not swollen but internodes are swollen. Lower branches are leafless. Stem sheaths 15-25 X 15-25 cm broad at the base but narrowed upwards, tip rounded or sub triangular, glabrous hairy or white powdered. Leaves linear-oblong or lanceolate, rounded at the base, tip twisted. Petiole often hairy; sheaths glabrous, ends in smooth callus. Inflorescence panicle, variable spikelets grow in interrupted clusters, 7-12 flowered. Lower and upper few imperfect but central one is bisexual. Ovary stipitate, style short; stigmas 3, plumose. Fruit-caryopsis, oblong, hirsute on the top.

This particular species is fairly common throughout the State.

Parts used :

Young saplings and tender culms are used as food.

Owathai (Owathui)

Bengali name	Muli
Scientific name	*Melocanna bambusoides* Trin.
Family	Graminae (Poaceae)
Source	Mohanpur forest area

Description of the Plant :

Annual shrubs of about 12-20 m tall, unbranched, erect and ascending. Woody culms grow from undergorund rhizomes. Culms bear sheath with reduced blades. Leaf blades flat with glabrous upper and glaucescent lower surface, lanceolate or oblong-lanceolate with a petiole like base and leaf sheath.

Inflorescence identical spikelets 3-4 in number arranged in panicles in the axils of smooth surfaced bract. Fertile spikelets are single flowered. Lemmas exerted from the glumes similar in appearance to the lemmas. Palea usully two keeled. Lodicules 2. Stamens 6, filaments connate, anthers yellow in colour. Ovary egg shaped mostly with 2 or 3 styles. Fruits very large, caryopsis. This plant occur throughout the State.

Parts used :

The young saplings and tender culms are very popular among the tribals.

Owachur

Bengali name	Sil Barak, Teli barak
Scientific Name	*Bambusa balcooa* Roxb.
Family	Graminae (Poaceae)
Source	Khowai (Kalyanpur)

Description of the Plant :

Plants of this particular species are arborescent, 16-24 m tall culms are stout with hollow internodes and solid, swollen nodes with a whitish ring above. Lower nodes bear leafless branches. Leaves simple,

lanceolate, tapering at the base, many nerved, petiolate, hairy underneath and articulated with the sheath. Inflorescence : bracteate spikelets borne in panicles, spikelets are 6-8 florets, upper and lower flowers are sterile and the others are bisexual. Each spikelet contains many nerved, acute glumes. Lemmas are fringed with hairs, membranous and mucronate. 2-keeled paleas are long and ciliated. Lodicules 3. Stamens are 6 in number bearing silky hairs. Ovary superior, stigmas 3, feathery. Fruits caryopsis with their pericarp.

Parts used :

Tender bamboo shoots are taken as vegetable.

Although above mentioned three species of bamboos are very popular among all the tribals of Tripura, they like the tender culms of other species of bamboos too. Few among these are :

Owamlang

Bengali name Dalu

Scientific name *Neohouzeaua dullooa A.*

Owakabar

Bengali name Bari

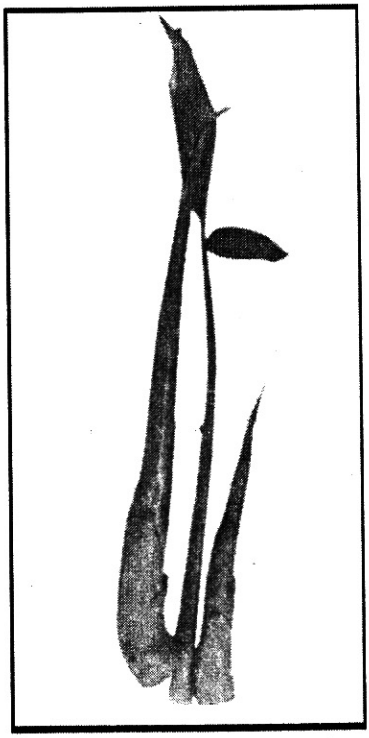
Scientific name *Bambusa polymorpha* Munro.

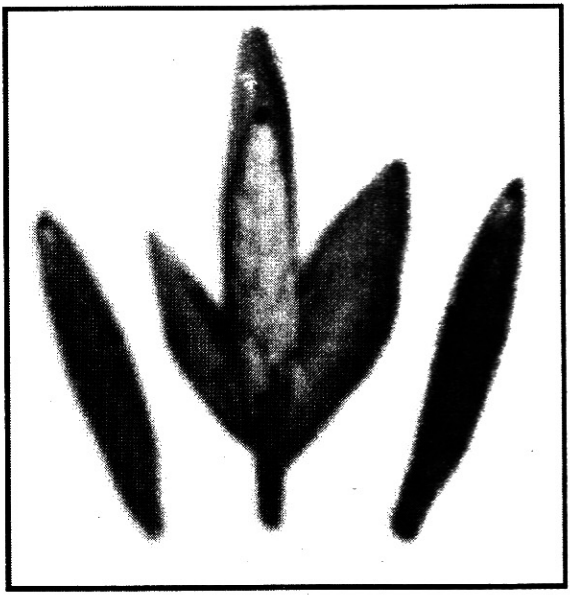
Owarowa

Bengali Betu etc.

Parts used :

They take the tender shoots of these different species of bamboos.





Tharai

Bengali name	Tara, Taruko
Scientific name	*Alpinia allughas* Rose.
Family	Zingiberaceae
Source	Mohanpur, Rankhalpada, Teliamura

Description of Plant :

This is herbaceous plant. It stands erect. Stem comes out from perennial tuberous rhizome and it is red at the base but the remaining part is green in colour. Stems are leafy. Leaves 30-50 cm long and

7.5-10 cm in breadth, acuminate, smooth surfaced and glossy. Petiole short. Ligule soft (pubescent). Panicles erect, narrow, branches soft. Flowers are pink in colour and rather small in size, bracts persistent and ovate. Calyx pubescent, petals are greenish white in colour, linear-oblong in shape, lip pink with 2 subulate glands at the base, clawed. Anthers too are pink in colour. Capsule globose and black on ripening. Seeds are 4-6 in each chamber and irregularly globose.

This plant is generally found in submerged regions and is available throughout the year as the rhizome is perennial. It is common and occur throughout the state.

Parts used :

Stem as well as the flowers of this plant is consumed as food. After peeling the outer hard skin, inner soft portion is used as vegetable. 'Mui barak' or 'Mui Gudak' are prepared from the stem. Flowers are used for preparing "chutney" with dryfish. (Recipes of these preparations are discussed later in Chapter - V).

Biring

Bengali name	Unknown
Scientific Name	*Alpinia* sp.
Family	Zingiberaceae
Source	Rankhalpada

Description of the Plant :

This plant is a herb with perennial root stock and stout stem. Leaves oblong-lanceolate and acute at the apex. Inflorescence erect receme.

Parts used :

Stem is taken as vegetable. 'Gudak' or 'Mui barak' is prepared from the stem.

Mui-Marang

Bengali Name Dagardoma, Dadonga

Scientific name *Amorphophallus bulbifer* Roxb. Bl.

Family Araceae

Source Mohanpur forest area

Description of the Plant :

This plant is a herb with large corm. Bulbils are present above the stalks of the foliage leaves. Leaves trifoliate, segments of the leaves are purple edged. Leaf stalk glabrous and are green and pink in colour along with black patches. Stalks of flowers too mottled and long. Spathes are open at the top, ovate, rose pink inside and outside with the patches of greenish

pink. Spadix 7-8 cm along with scarlet female portion. Style absent. Seeds exalbuminous.

This plant occurs as undergrowth in the forest. It is found to occur throughout the state.

Parts used :

Petioles are used as vegetable. 'Mui barak', 'Gudak' etc, are prepared from petioles.

Souramila

Bengali name	Unknown
Scientific name	*Tetrastigma angustifolia* Roxb.
Family	Vitaceae (Vitidaceae)
Source	Pacharthal

Description of Plant :

This plant is a climbing herb. It climbs with the help of tendrils. Leaves are compound and trifoliate. Serrated leaflets are *elliptic-lanceolate* in shape with smooth surface. Tendril leaf opposed, very slender, simple. Foliaceous, free lateral stipules are present. Flowers unisexual, arranged in axillary cymes, dense, almost sessile, green in colour. Fruit globose with 2-4 seeds.

Parts used :

Tender shoots and leaves are eaten as vegetable. This shoots and leaves are cooked with dry fish.

Gandrui/Gandhaki, Kamaetri, Gandiri

Bengali name	Gandhari
Scientific name	*Alocasia odora* Roxb.
Family	Araceae
Source	Champaknagar

Description of the Plant :

The plant grows in shady regions of forest or in swampy areas or lungas. Rootstocks tuberous. Leaves fairly large with long petiole, sagittately cordate

with triangular basal lobes, acute and slightly aromatic. Inflorescence enclosed in a spathe that is greenish yellow in colour. Spadix free, shorter than the spathe. Flowers monoecious. Flowering time August - September.

Parts used :

Tribals of Tripura consume the plant entirely i. e. they use tuberous rootstocks, petioles and flowers. They prepare 'Berama batui' using dry fish.

Batema, Batema blang

Bengali name Ol

Scientific name *Amorphophallus campanulatus* Roxb.

Family Araceae

Source Gamcha Kobra, Champaknagar

Description of the Plant :

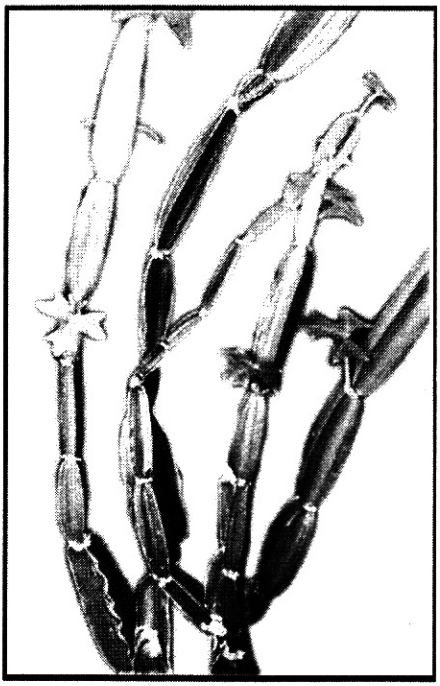
This is a stout terrestrial herb. Stem modified into corm. Corm is large and almost round. Adventitious roots grow from the corm. New young corms come out from the bud present in the parental corm. Leaves appear after the flowers, solitary or rarely two; leaf blade variously lobed with pinnate - netted venation.

Petioles rather thick and rough with wart like tubercles. Raphides and spheraphides are present in the tissues of corms and leaves. Unisexual flowers are densely arranged on fleshy spadix. Spathe campanulate tube wides suddenly. Male flowers are present in the upper part and the female flowers are in the lower part of the spadix. Anthers open by pores, sessile and pale yellow in colour. Ovaries depressed, style purple. Fruit a berry with 2-3 seeds. Seeds with copious endosperm.

This plant is generally found in waste lands.

Parts used :

Corms are used as vegetable. To remove calcium oxalate crystals tribals boil the corm in alkali water which they specially prepare at home and make cake of the sundried corm. Cakes are sometimes sold at the markets in interior areas. 'Masideng' is prepared out of these cakes by using dryfish.



Naljora, Mukhram Yathek

Bengali name	Harjora Aranga
Scientific name	*Cissus quadrangularis* L.
Family	Vitacea
Source	Bankumari (Baramura hill)

Description of the Plant :

This plant is a large climbing shrub with tendril. Stem nodose that is contracted at the nodes, fleshy, quadrangular, green in colour with watery juice. Leaves simple and grows from the nodes, alternate, crenate with smooth surface. Petiole short. Stipules absent. Tendrils too arise from the nodes and opposite to the leaves, long and simple. Inflorescence umbel. Flowers bisexual, whitish, minute, tetramerous. Calyx cup shaped, small lobed. Petals 4 united at the base, free above. Stamens 4, adnate to the base of the ovary. 2 locular with one ovule in each, style short, stigma slender and tapering. Fruit fleshy berry. Flowering time from December to February and fruiting time from March to September.

Parts used :

Young shoots are used as vegetable. They cook it both with dry fish or without fish. They take the inner soft portion of the stem and grind this soft portion to prepare 'chutney'.

Raichak

Bengali name	Bet
Scientific name	*Calamus sp.*
Family	Palmae

Source Teliamura

Description of the Plant :

Almost all the species available in Tripura are taken as food by the tribals. The species available are *C. erectus, C. floribundus, C. tenuis, C. guruba, C. leptospadix.*

Slender palm, stem climbing by hooked spines. Very frequently long flagella are used to climb and are provided with numerous recurved prickles, which may be a continuation of the leaf rachis or an appandage to the leaf sheath or a continuation of the spadix or its spathes. Leaves alternate, pinnatisect or pinnately compound, acuminate. Flowers small, polygamous, dioecious in usually distichous often scorpoid spikelets, solitary, either male or female or both in the axils of bracteoles of axillary elongated and branched spadices, sometimes produced as flagellum. Male flowers : calyx cupular, 3 toothed. Petals 3, acute, valvate, coriaceous. Stamens 6, filaments short, anthers dorsifixed. Female flowers : calyx tubular, 3 toothed, corolla tubular, valvate staminodes present and connate in a cup. Ovary incompletely 3 celled, clothed with retrorse scales; ovules basal, erect; style terminate, stigma 3. Fruit globose or ellipsoid drupe. Seeds subglobose or oblong, smooth or pitted, albumen homogenous or ruminate.

Parts used :

Tender stems are edible. Tribals cook this with dry fish.

Muitu Lati

Bengali nme	Lati
Scientific name	*Colocasia* sp.
Family	Araceae.
Source	Mohanpur forest area

Description of the Plant :

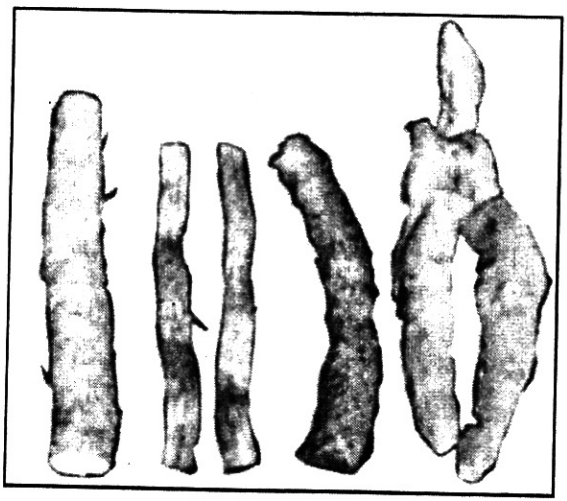
This plant is a herb, rhizomatous with calcium oxalate crystals in tissues; suckers or stolons usually present. Leaves alternate, simple, petiolate. Inflorescence enclosed in spathe. Flowers monoecious, minute; peduncle stout. Spadix shorter than the spathe. Male flowers more united into synandria. Female flowers : ovary superior with many ovules on parietal placenta. Fruit berry.

Parts used :

Horizontal stems are edible. Tribals cook the stems with dryfish.

B. EDIBLE ROOTS AND TUBERS :

Roots and tubers have an important role in the food items of tribals of Tripura. During winter season when scarcity of food is there, they become solely dependent on roots and tubers collected from the forest floors. Among these roots and tubers some species of *Dioscorea* are noteworthy.



Thabarchuk

Scientific name	*Dioscorea glabra* Roxb.
Family	Dioscoreaceae
Source	Gamcha Kobra (Champaknagar)

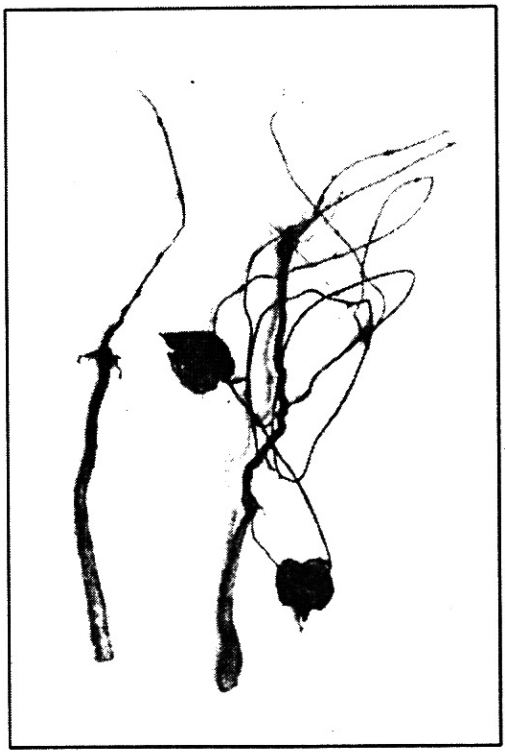
Description of the Plant :

This plant is a climber. Weak, long and slender stems climb up other plants or objects turning to the right, i.e., the plant is dextrose. Stem smooth. Spiny at the base. Tuber, fleshy and swollen and gradually increases in its diameter as it comes down deep into the soil. It is cylindrical with white flesh. Leaves woolly, opposite or lower alternate, deeply sagittate or cordate and pinnately nerved; petiole long. Inflorescence spikes. Flowers sub-globose. Petals obovate or oblanceolate, thick. Stamens perfect, 6 in number. Female flowers are solitary or remain two together. Fruit capsule. Seeds winged.

This plant occurs at the central part or estern part of this State.

Parts used :

Tubers are edible. Tribals take boiled tuber after sprinkling salt, or with dry fish.



Tha balang

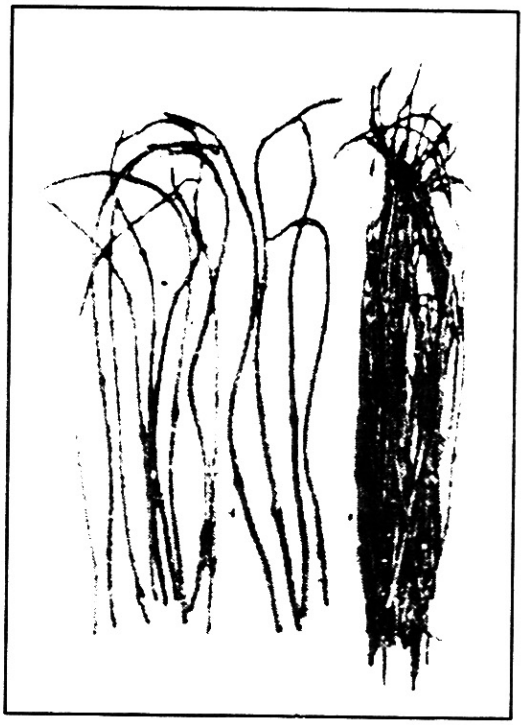
Scientific name	*Dioscorea* sp.
Family	Dioscoreaceae
Source	Gamcha Kobra (Champaknagar)

Description of the Plant :

The plant is a climber. Stem slender, not prickly. Tuber long stalked and descend deep down into the soil, flesh white in colour. Small lateral roots come out of the tuber.

Parts used :

Tubers are edible.



Tha Ganga

Scientific name	*Dioscorea hamiltonii* Hook.
Family	Discoreacea
Source	Champaknagar

Description of the Plant :

Plant is a climber and turns to the right. Stem slender angled. Long stalked tuber goes deep into the soil. Leaves lanceolate to ovate, alternate, acuminate. Male flowers sessile and are arranged in spikes on axillary branches. Stamens 6, fertile. Fruit reniform capsule, broader than longer. Seeds winged all around. Plant become reddish when dry.

This plant is found in Sadar and Dharmanagar subdivision.

Parts used :

Tubers are eaten by the tribals. Tender young stems are also eaten by them.

Tha-Kui or Tha-kun

Scientific name	Could not determine.
Source	Gamcha Kobra (Champaknagar)

Description of the Plant :

This plant is a climber and available only in deep forests. Tuberous rootstock goes deep under the ground. This tuber is highly popular among the tribals. During December and January leaves of this

plant turn yellowish which acts as an indicator to the tribals for digging up the tubers.

Parts used :

Tubers are used by the tribals as food. This tubers are soft and tasty which is the reason why it is so popular among them.

C. LEAFY VEGETABLES.

Chichiri or Kichiri

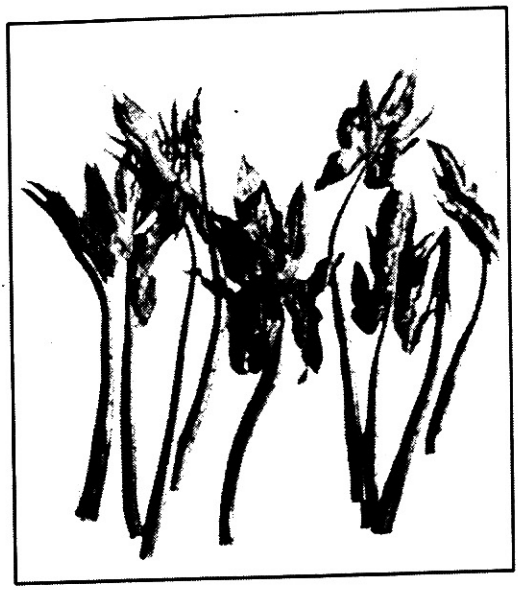
Bengali name	Banmura kachu
Scientific	*Monochoria hastata* L.
Family	Pontederiacae
Source	Mohanpur forest area

Description of the Plant :

This aquatic herb is fairly common in paddy fields. Rootstocks elongated and covered with leafy sheaths. Stems erect, leaves opposite, hastate i.e., broader at their base and narrow headed at the apex or sagittate with fleshy sheathing petioles. Inflorescence recemose or subumbellate. Peduncle short. Flowers are long stalked and brightly blue in colour. 6 unequal and differently coloured stamens are inserted within the perianth. The larger one is blue in colour and rest of the stamens are smaller and yellow in colour. Fruits capsule. This plant is available throughout the year.

Parts used :

Stems and leaves are used as vegetables.



Pachak and Gantha (roots)

Bengali name Kanta kachu

Scientific name *Lasia spinosa* L.

Family Araceae

Source Mohanpur forest area

Description of the Plant :

This is a stout herb with elongated thick rhizomatous prickly rootstock. Spines are also present on the stems, petioles and on the peduncles. Stems green in colour. Leaves alternate, hastate or sagittate with a membranous sheath at the base. Leaves are prickly on the nerves at its lower surface. Peduncle as long as petiole and prickly. Minute flowers are arranged on a spadix enclosed in a spathe. Spathe thick, purple in colour and open at its base. Flowers monoecious. Perianth 4 lobed, lobes are arranged in an imbricate manner. Stamens are short filamented, 4 in number; anther cells parallel. Ovary superior with one chamber and with a strong style. Stigma orange in colour. Number of ovules one. Fruit a berry. Seeds large with abundant endosperm.

Parts used :

Tender stems and leaves are consumed as vegetable. They prepare 'gudak' and 'chakhai' from this plant.

Kutuilla busu

Bengali name	Kanta nutia, kanta doga
Scientific name	*Amaranthus spinosus* L.
Family	Amaranthaceae
Source	Mohanpur forest area

Description of the Plant :

This plant is an annual herb. Much branched, axillary spines are present all over the stems and branches. Leaves are simple, alternate and more or less oval in shape. Lower leaves are larger with long petiole. Inflorescence spike. Flowers are densely clustered, small in size, regular. Tepals 5, greenish, imbricate. Stamens opposite the tepals, hypogynous. Ovary superior. Fruit utricle. Minute seeds are shining black or brownish black in colour.

This plant grows in waste lands and very common throughout the state.

Parts used :

Stems and leaves are eaten as vegetable. Tribals cook this plant with dry fish or they make simple mixed vegetable from it.

Duk Pui

Bengali name	Gandal, Gandha bhadali
Scientific name	*Paederina foetida* L.
Family	Rubiaceae
Source	Takarjala

Description of the Plant :

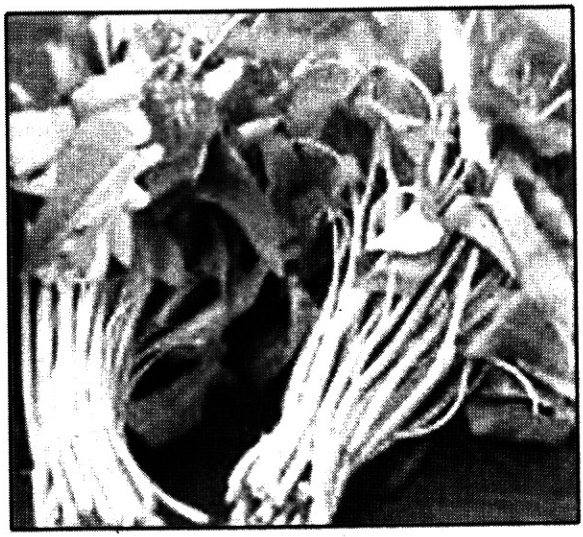
This plant is a slender climber with foetid smell. Leaves simple, opposite, almost oval in shape with round or subcordate base, entire and petiolate. It

emits a very offensive smell when crushed. Inflorescence biparous cyme. Flowers are in axillary or terminal panicles with persistent calyx and funnel shaped corolla. Stamens alternate with corolla lobes, anthers introrse, opens longitudinally. Ovary inferior. Fruits capsule and seeds compressed.

Flowering time is from October to January and fruiting time is from November to April.

Parts used :

Leaves of this plant are used as vegetable. Tribals prepare 'Berma batui' or 'gudak' using dry fish and these leaves.



Kalmi hak/Kalmi basak

Bengali name Kalmi shak

Scientific name *Ipomoea aquatica* L.

Family Convolvulaceae

Source Agartala

Description of the plant :

This plant grows on moist, marshy or inundated places, shallow pools and ditches forming dense masses. This plant is a herb with a rootstock that lasts for several years. Stems trailing, soft, spongy and fistular. Leaves alternate and simple and varies in size and shape. In some cases leaves are linear or ovate but sometimes they are cordate or sagittate or hastate at the base, smooth surfaced. Inflorescence cymose. Flowers showy, bisexual, actinomorphic. Bracts present. Sepals persistent, glabrous. Corolla funnel shaped, medium sized white, pink or pale lilac in colour. Stamens are inserted towards the base of the corolla tube. Ovary 4 celled, glabrous, Fruit capsular. Seeds 4 or less.

Parts used :

Twigs and leaves are edible. Tribals prepare 'gudak' from this vegetable.

Arai

Scientific name Could not determine

Source Mohanpur forest area

Description of the Plant :

This plant is a shrub with stout stem. Leaves opposite, ovate and serrated, rough surfaced. Upper surface of the leaves are bright green in colour but pale beneath. Petiole short, stipulate. Inflorescence cymose panicles. Flowers minute, sessile, greenish

white in colour. Flowering time is from July to August.

Parts used :

Leaves are used as vegetable. These are bitter in taste. They prepare 'mui barak' by using dry fish or they simply fry the leaves with garlic.

Bukhate

Bengali name	Ghima or Ghimi shag
Scientific name	*Polycarpon prostratum* forssk.
Family	Caryophyllaceae
Source	Bankumari (Baramura hills)

Description of the Plant :

This plant is a dichotomously branched herb. Leaves opposite, simple linear, fleshy, entire with murcronate leaf apices. Stipules present and often scarious. Inflorescence cymose (Panicles). Flowers actinomorphic, bisexual, bract scarious. Sepals 5 keeled. Petals as many as sepals, small, entire, hyaline. Stamens free, present on an annular disc, 3-5 in number. Ovary unilocular, style 3. Seeds many, cylindrical. This plant occurs throughout the State in shady waste places.

Parts used :

Leaves are bitter in taste. These leaves are eaten by both tribals and non-tribals. Tribals cook these leaves with dry fish. In some tribal communities they serve this particular preparation as a first course during some occasions, like 'New Years Day' or 'Shraddhya'.

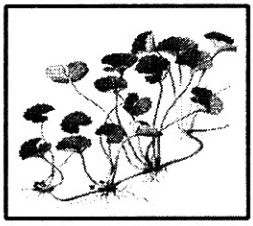
Samchota

Bengali name — Thankuni, Adamani, Thunimankuni.

Scientific name — *Centella asiatica* L.

Family — Umbelliferae

Source — Agartala



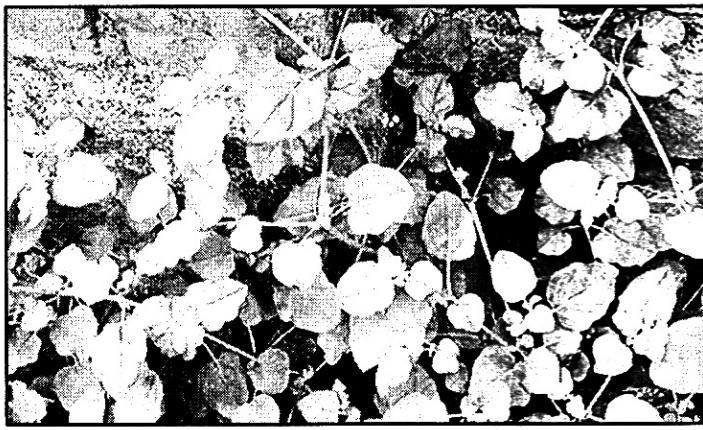
Description of the Plant :

This plant grows in shady places and very common herb and a creeper. Stems grow horizontally over the surface of the soil branching profusely spreading in all directions. Roots arise from the nodes. Leaves simple, kidney shaped, leaf margin crenate, petiole long. Inflorescence umbel. Several umbels subtended by bracts arise at the node. Flowers bisexual, 3-5 in number. Sepals 5. Petals 5, deep red in colour, ovate, imbricate. Stamens red. Fruits schizo-

carp composed of broader mericarp with very narrow commissure. Fruit is traversed by longitudinal ridges and furrows. Vittae absent, pericarp thick. Seeds laterally compressed and endospermous.

Parts used :

Leaves are used as vegetable. Tribals cook the leaves with fishes like koi, magur etc.



Samberma

Samberma

Bengali name Punarnaba

Scientific name *Boerhavia diffusa* L.

Family Nyctaginaceae

Source Mohanpur forest area

Description of the Plant :

This plant is a herb with erect branches. Leaves opposite in unequal pairs, ovate, acute, exstipulate. Flowers are minute, sessile and are arranged in heads on slender peduncle that arise from the axils of the leaves in terminal panicles. Perianth campanulate, tube glandular, lobes 5. Stamens 2-3 in number, exerted. Ovary stipitate, stigma peltate. Fruit a glandular nut.

Parts used :

Leaves and tender shoots are used as vegetables. Tribals prepare 'mui barak' from this plant.

Thalibak

Scientific name could not determine.

Description of the Plant :

This plant is a climber with rhizomatous rootstock. Flowers tube like.

Parts used :

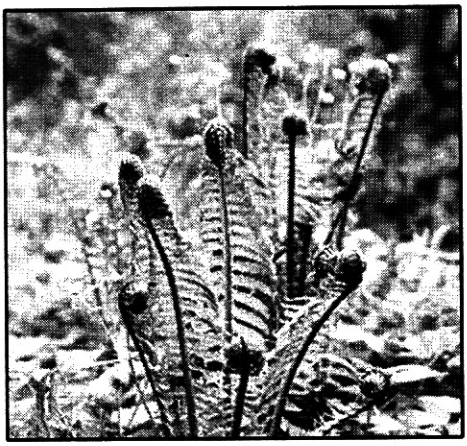
Leaves of this plant are taken as vegetables. Leaves are cooked with fresh fishes like koi, magur etc. Tribals sundry the leaves to use them throughout the year.

Ganga basak

Scientific name could not determine

Parts used :

Leaves are used as vegetable. Leaves contain mucilage. Tribals collect these leaves during summer. They prepare 'gudak' from these leaves.



Muikhun-chak, Mukhainde busa

Bengali name	Dhenki sag (pot herb)
Scientific name	*Diplazium polypodioides* Bl.
Family	Athynaceae
Source	Mohanpur forest area

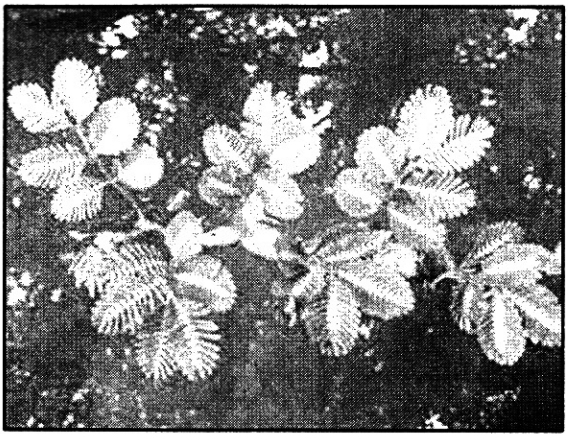
Description of the Plant :

This is a non-flowering plant under the phylum Pteridophyta. This sporophyte is a perennial terrestrial herb with partly horizontal and partly erect rhizomatous stem. This short, stout, unbranched rhizome is covered with dry brown scales known as ramenta. Slender and much branched adventitious roots grow from the rhizome. Lower part of the rhizome bears persistent leaf bases. Leaves, i.e., fronds grow acropetally at the apex of the rhizome. The younger leaves at the apex are coiled circinately but fronds are large, pinnately compound. Each leaflet has an open venation. Kidney shaped black sori are produced at the under surface of the sporophylls. Sori produce spores for the generation of new plant.

This plant grows in shady areas near streams or marshes. It is available during summer and in rainy seasons.

Parts used :

Tender coiled leaves (leaf buds) are eaten as vegetables. Tribals cook this with dry fish (sidal) to prepare 'gudak' or with Loitka, a kind of dryfish.



Kharai

Bengali name	Pani-Lajuk
Scientific name	*Neptunia prostrata* Lamk.
Family	Mimosaceae
Source	Mohanpur forest area

Description of the Plant :

This plant is an aquatic herb. Stems widely creeper or floating stem. Roots arise from the nodes and consist of suberect branches. Leaves bi-pinnate with

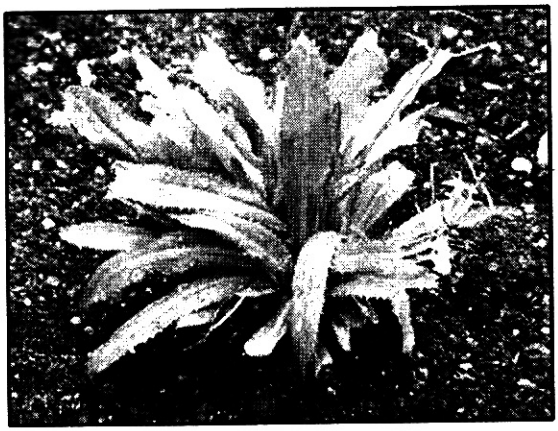
4-6 pinnae. Leaflets sensitive, 5-15 pairs, about 8-12 mm. long, oblong, obtuse, glabrous; stipules obliquely cordate. Flowers minute in dense heads, the lower replaced by numerous ligulate yellow staminodes; peduncles axillary, ascending 7.8-30 cm long. Bracts small, ovate. Calyx minute, campanulate. Corolla 5 lobed. Stamens exserted, anthers gland crested. Pods 1.5-2.5 cm., obliquely oblong, beaked, dehiscing early by the upper suture; seeds 6-8.

This plant occurs in swamps and tanks.

Parts used :

This plant is used as vegetable. Tribal cook sag by this vegetable. They remove the spongy tissues of the stem and take the inner soft tender portion along with leaves.

LEAVES USED AS CONDIMENTS :



Kachin masala

Bengali name Bilati Dhone

Scientific name *Erygium foetidum* L.

Family Umbelliferae

Source Mohanpur forest area

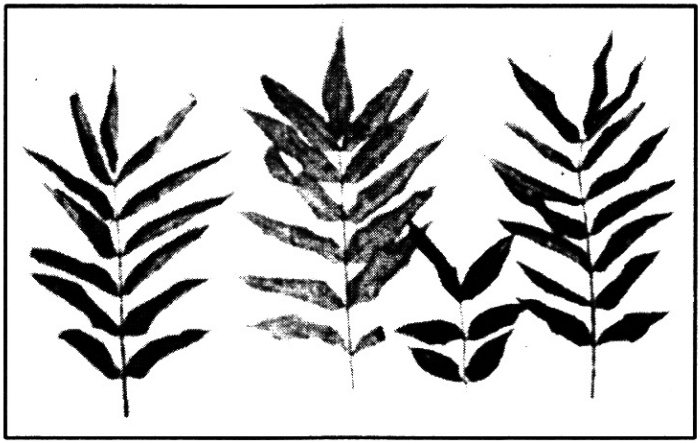
Description of the Plant :

This plant is a diffuse herb with fusiform root. Leaves simple, spathulate and leaf margin spinous toothed. Inflorescence recemose. Flowers white in

colour with pubescent spinous bract arranged in head. Calyx teeth rigid, acute. Fruit dry, 2 locular, dividing into two mericarps which often remain suspended at the top by the divided thread like central axis. Seeds semi ternate with minute embryo and copious endosperm.

Parts used :

Leaves are aromatic and used in flavouring the curries.



Muiching

Scientific name Could not determine.

Source Baramura hills (Bankumari)

Description of the Plant :

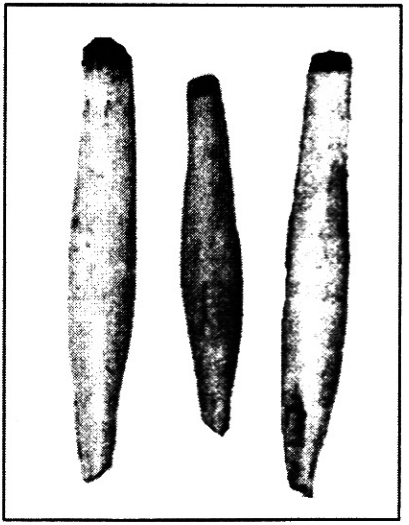
This plant is a tree. Tender stems are red in colour, armed. Leaves pinnately compound, leaf blade highly serrated. Mid veins contain spines at the lower surface. Leaves are glossy at the upper surface but pale green at the lower surface. This plant bears minute flowers of yellow colour. Flowering time September-October.

PARTS USED :

Leaves are aromatic and these are used by the tribals as condiment to flavour the curry.

There is also another wild leaf called 'Mui Ching cha' which is also used by the tribals as condiment.

D. FLOWERS :



Mui Khun, Laifung, Bugili, Chupui (plantain stem)

Bengali name Ram kala

Scientific name *Musa acuminata* Colla

Family Musaceae

Source Champaknagar

Description of the Plant :

This plant is a large perennial rhizomatous herb. Stem is unbranched pseudostem formed of convolute

leaf sheaths possessing brown-black marks on it. Leaves are simple, very large and arranged spirally to form a compact crown. Lamina glaucous, entire, oblong, truncate with distinct midrib, lateral nerves parallel. The adaxial surface of the lamina is green but abaxial surface is waxy and green in colour with a tinge of purple. Midrib greenish yellow above and underneath it is tinged with red. Inflorescence paniculate i. e. mixed spadix. Each group of flowers are covered by a large spathe like bract. The colour of the bract is yellowish with a tinge of purple. Bisexual flowers grow in rows with about twenty flowers per bract. Compound tapae yellowish. Stamens as long as perianth. Ovary yellowish green, glabrous. Fruit an elegant, elongated berry. Seeds with hard testa, black, irregularly angular.

The hill ranges of Baramura, Atharamura and Jampui are the common places where this plant can be found growing wildly.

Parts used :

The flowers of this plant is eaten as vegetable and are used to prepare 'Gudak'. Fruits are also eaten when ripe. The tribals take both young and mature stem. They peel the outer layer of the stem of the young plant to take the inner immature soft portion which they call 'Laifung'.

And after giving off the fruits the mature stem of

the plantain which they take as vegetable is called as 'Bugili' or 'chupui'. It is the inner comparatively soft portion. Tribals prepare 'chakhai', 'Gudak', and 'Masideng' by these Laifung and Bugili.

Even the tribals use the plantain stem and leaf ash to prepare 'alkali water'.

Phui chung

Bengali name Dumur, Dhangri

Scientific name *Ficus hispida* L.

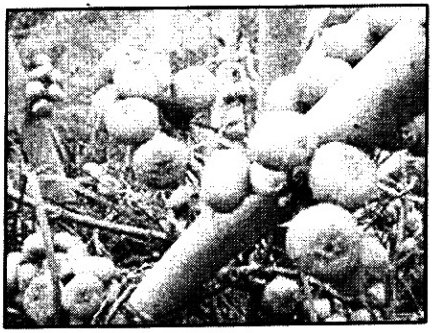
Family Moraceae

Source Teliamura

Description of the Plant :

Small tree with milky juice and fistular branches. Leaves opposite, obovate or elliptic-oblong, acuminate, dentate, hispid, and underneath they are pubescent. Leaves are subcordate or rounded at their base. Petiole hispid. Stipules 2, lanceolate. Flowers much reduced and in hollow receptacles. Receptacles arise in cluster or in pairs on the small rounded protuberances or tubercles of the stem or on the long branches or from the leaf axils, stalk short, greenish yellow in colour. Basal bracts are 3 in number. In male flowers perianth lobes 3 but in

female flowers perianths rudimentary. Male flowers consist of only a single stamen. In female flowers style long and hairy whereas in gall flowers short styles are with dilated stigmas.



Parts used :

Immature inflorescence is edible and consumed as food by both tribals and non tribals.

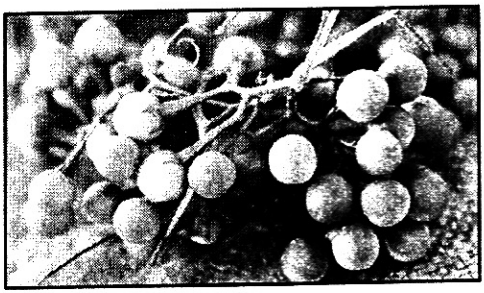
Chapak

Scientific name Could not determine.

Source Pacharthal

PARTS USED :

Flowers of this plant are edible. Gudak is prepared using this flower.



E. FRUITS USED AS VEGETABLE

Khamka sikum

Bengali name Brihati begun.

Scientific name *Solanum torvum* Swartz.

Family Solanaceae

Source Mohanpur forest area

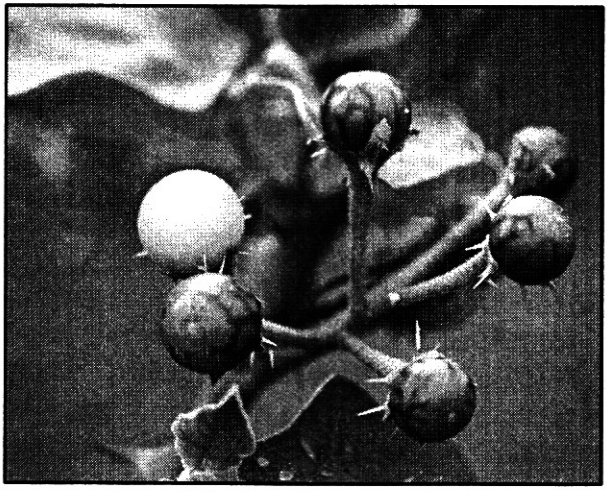
Description of the Plant :

This plant is a tall shrub with few branches growing near the ground. Stem tomentose. Leaves simple, alternate, exstipulate with a lobed margin. Scanty spines are present both on the stem and branches and on the petiole and midrib of the leaves. Inflorescence axillary cyme. Flowers white in colour

and actinomorphic, bisexual. Calyx persistent, imbricate, enlarged in fruit. Corolla rotate, imbricate. Stamens inserted in corolla tube and alternate with its lobes, epipetalous, filaments shorter than anthers, anthers basifixed, dehiscent through the apical pores, 2-celled, loculi parallel. Ovary superior, style columnar. Fruit many seeded berry. This plant is a very common plant and occurs throughout the State.

Parts used :

Tender fruits are eaten as vegetable. Tribals prepare 'Gudak' from the tender ones. From the mature fruits they take out the seeds and cook dishes known as 'Gudak', 'Chakhai' or simply fry the fruits.



Khamka

Khamka

Bengali name	Phutki begun; Bakair.
Scientific name	*Solanum indicum* L.
Family	Solanaceae
Source	Mohanpur forest area

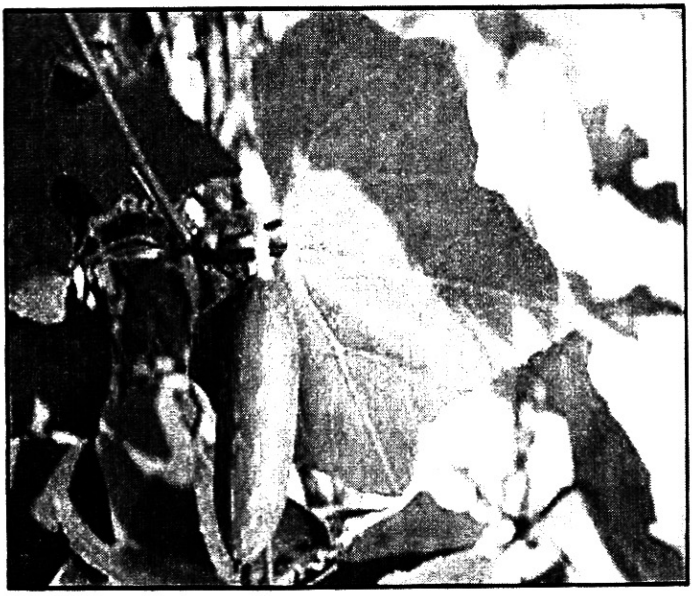
Description of the Plant :

This plant is also a common shrub, tomentose with few branches. It is thickly spined all over the plant but on the nerves and on the inflorescence prickles are very few. Short, yellowish and curved prickles are present on the stem and branches. Leaves alternate, ovate, shadowy lobed. Abaxial surface dirty tomentose, prickly. Inflorescence scorpoid cymes. Flowers are pale violet in colour. Calyx armed, sepals persistent, pubescent outside. Corolla woooly outside, lobes reflexed. Stamens epipetalous, alternate with corolla lobes. Filament shorter than anther. Ovary and base of the style hairy. Fruit berry globose and smooth.

This plant is very common throughout the State.

Parts used :

Fruit is edible. Tribals mainly eat these fruits by frying.



Taokha thaichmu

Bengali name	Telakachu
Scientific name	*Coccinia grandis* L.
Family	Cucurbitaceae
Source	Agartala

Description of the Plant :

This a herbaceous, simple tendril climber with profuse branching. Roots long tuberous. Leaves

alternate, exstipulate, petiolate, entire to palmately lobed, glabrous with a few glistening glands on the midrib towards the base. Flowers white, dioecious, solitary, actinomorphic. Male flowers : Calyx glabrous, bell shaped, lobes 5, imbricate. Corolla white in colour, tubular imbricate, glabrous above and villous within, generally 5 lobed (rarely 4). Stamens 5, inserted on the calyx tube. Anthers connate, exerted 1 or 2 locular, longitudinally dehiscent. Female flowers. Solitary with short peduncle. Calyx and corolla similar as staminate flower. Calyx tube adnate to the ovary. Ovary inferior, oblong, carpels 3. Ovules numerous, placenta 3, long style with 3 thick stigmas. Fruits ovoid or elliptic, 2.5-5 cm long, bright green in colour with white stripes, bright scarlet when ripe. Seeds various. Flowering time starts from June and Fruiting time is from June to February.

This plant is common throughout Tripura in jungles and forests.

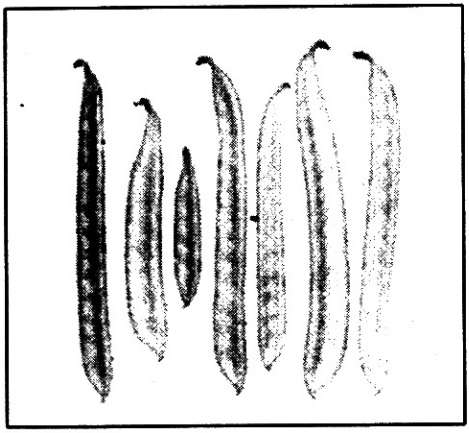
Parts used :

The leaves and fruits of this plant are used as vegetable by the tribals of Tripura.

Dus pe

Scientific name could not determine.

This plant is also a climber. Fruits are eaten by the tribals.



Baikang

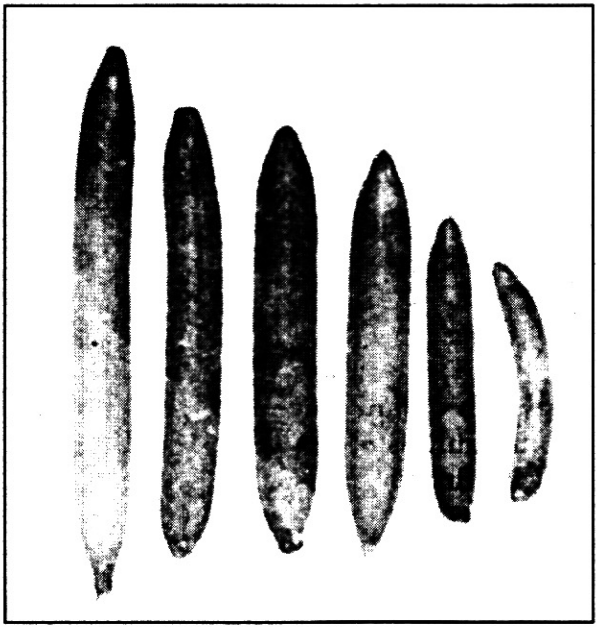
Bengali name	Bara Sim, Makhan Sim
Scientific name	*Canavalia gladiata* Jacq.
Family	Papilionaceae
Source	Mohanpur forest area

Description of the Plant :

This plant is a large perennial climber. Leaves pinnately three-foliate with long swollen based petiole. Stipulate. Leaflets ovate to rhomboid elliptic, terminal leaflet is largest and laterals are oblique, apex acuminate but cuneate at the base, smooth surfaced. Inflorescence axillary raceme on long peduncles. Large flowers are white in colour with purple tinge and short pedicels. Calyx unequally lobed, 2 lipped, upper lip projecting, lower 3 lobed. Corolla long, exserted, petals clawed and auricled at the base. Stamens 10, inserted with the petioles, monadelphous, anthers 2, opening lengthwise. Pistil monocarpellary, ovary with many ovules, silky, style

one incurved beardless, stigma one. Fruit a legume. Pod with two prominent longitudinal ridges along the upper suture with a sharp serpentine curvature along the vertical plane. Seeds large, compressed.

Parts used : Fruit is used as vegetable. Tribals cook the fruits with dry fish.



Konagula

Bengali name	Shona, Kanak
Scientific name	*Oroxylum indicum* L.
Family	Bignoniaceae

Source Pacharthal

Description of the Plant :

This plant is a tree with light brown bark and yellowish white soft stem. Enormous leaves are exstipulate, opposite, upto about 2 m long, bipinnately arranged, leaflets broadly ovate, entire, smooth surfaced. Inflorescence racemose with showy purplish flowers. Calyx fleshy, campanulate. Corolla fleshy, campanulate with 5 cream yellow imbricating lobes. Stamens 5 with longitudinally opening anthers. Disc prominent. Ovary superior, 2 celled with many ovules in axile placenta. Fruit sword like, exalbuminous. Seeds winged, embryo straight. Fruiting time : October to March.

Parts used :

Fruits of this plant are consumed as vegetables by some communities of tribals of Tripura. Fruits are cooked with dry fish.

Yongchak, Owakere buthai

Bengali name	Sapota, Kuki, Tetai
Scientific name	*Parkia javanica* Lamk.
Family	Mimosaceae
Source	Pacharthal

Description of the Plant :

This plant is a middle sized tree with spreading branches. Leaves bipinnate with glandular branches. Pinnae opposite, leaflets sessile, linear-oblong, truncate at the base. Flowers bisexual, small, actinomorphic, densely arranged in capitate on long peduncle. Sterile flowers are present at the base of the peduncle, bracts spathulate, silky pubescent outside. Calyx 5 lobed, imbricate, tubular. Petals are connate into a short tube, pale yellow in colour. Stamens monadelphous 10; anthers small, 2 locular, apex is not glandular. Pods 25-50 cm long. Flowering time is from October to December and fruiting time starts from December and ends in April.

This plant occurs throughout the State.

Parts used :

Although the flowers and fruits of this plant are very popular among Manipuris, tribals of this State too take the tender fruits of this plant as vegetables. Manipuris take this vegetables as raw in a particular preparation called 'Singju' or they cook a curry called 'Iromba'. But here, in Tripura, tribals prepare 'Gudak' from this vegetables.

Gadanarasing

Bengali name	Kanta nageshwar
Scientific name	*Acacia nilotica* L.
Family	Mimosaceae
Source	Baramura hills (Bankumari)

Description of the Plant :

This plant is a small prickly tree with downy branchlets. Bark dark brown in colour. Spines straight and stipular. Leaves bipinnate with glandular rachis.

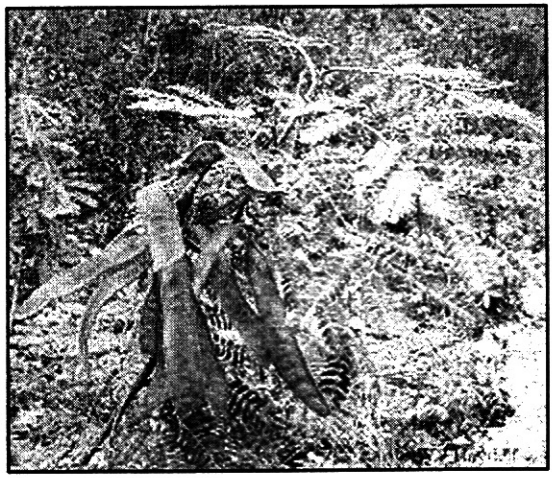
Pinnae 3-6 pairs. Small leaflets are membranous. Inflorescence capitulum. Peduncles short. Flowers fragrant and yellow in colour. Calyx tiny, campanulate, 4-5 toothed. Corolla double in size than calyx. Petals connate at the base. Stamens numerous, exserted. Ovary 2, many ovuled with filiform style and capitate stigma. Fruit a moniliform pod with persistent grey hairs, solitary. Seeds 8-12 in number and are arranged in single row.

This plant can be found throught Tripura.

Parts used :

Tender fruits are eaten as vegetables by the tribals of this State. A particular preparation of dryfish called 'Chutney' is made from the fruits.

Subabul



Subabul

Bengali name Kelikadam

Scientific name *Leucaena leucocephala* Lamk.

Family Mimosaceae

Source Baramura hill

Description of the Plant :

This plant is a small tree. Spines absent. Leaves large, bipinnate with 4-8 pairs of pinnae; leaflets linear, acute, membranous. Flowers white regular, hypogynous, pentamerous in dense globose head like spikes. Axillary peduncles are as long as the petiole. Sepals are united. Corolla funnel shaped. Stamens

free, exerted with long filaments. Anthers are not with glandular apex, versatile. Fruits are flat, coriaceous, strap shaped legumes with many seeds.

Parts used :

Tender fruits and seeds are edible. Raw fruits are chopped and mixed with the 'Chutney' of dry fish.

FRUITS USED AS RAW

Zram buthai

Zram buthai

Bengali name Chamal, Chalash,

Scientific name *Artocarpus chaplasha* Roxb.

Family Moraceae

Source Rankhalpada, Teliamura

Description of the Plant :

This plant is a very large deciduous tree with milky juice. Stiff hairs are present in young shoots, bark greyish brown in colour. Leaves are alternate, simple, entire or minutely serrated, stipulate, sparsely hispid above, underneath they are hispid pubescent, leaving an annular scar. Shape of the leaves are obvate-oblong with 2.5 cm long petiole. Leaves of saplings and young shoots are pinnatified or lobed. Flower monoecious, densely crowded around a globose receptical. Male flowers : Perianth present with 2-4 segments. Stamen one, erect and opposite the perianth lobes, filament distinct, anther 2 celled. Female flowers : Parianth funnel shaped. Ovary straight with exerted style, ovule pendulous. Fruits fleshy globose syncarp, tubercled, apex of the anthocarp free. Fruit turns into pale brown in colour as it is ripen. Seeds exalbuminous, ellipsoid, cotyledons fleshy.

Flowering time of this plant is from January to March whereas fruiting time is from April to June.

This plant is scattered throughout the State.

Parts used :

Fruits are edible. These are little soury in taste. Seeds are also roasted and taken by the tribals as food.

Dukramma

Description of the Plant :

This plant is a climber. Stem thick and strong. Fruit a berry globular. Fruits are slightly sour.

Parts used :

Fruits are edible.

Demphal, Cham

Tribal name	Unknown
Scientific name	*Artocarpus lakoocha* Roxb.
Family	Moraceae
Source	Bankumari (Baramura hill)

Description of the Plant :

This is a large deciduous tree forming a crown, bark dark brown in colour. Leaves alternate, oblong or ovate, short acuminate, entire or serrated towards the apex. Leaves in seedlings are pinnatified. Inflorescence axillary, solitary, globose head like spikelet. Flowers unisexual, regular. Male heads ellipsoid, ovoid or clavate. Style exserted through emerging papillae in female heads. Fruits irregularly lobulate, subglobose, multiple sorosis, yellow or orange red when ripe. Flowering time is January to March and fruiting time is June-July.

This plant is generally found in Sadar and Dharmanagar sub-divisions.

Parts used :

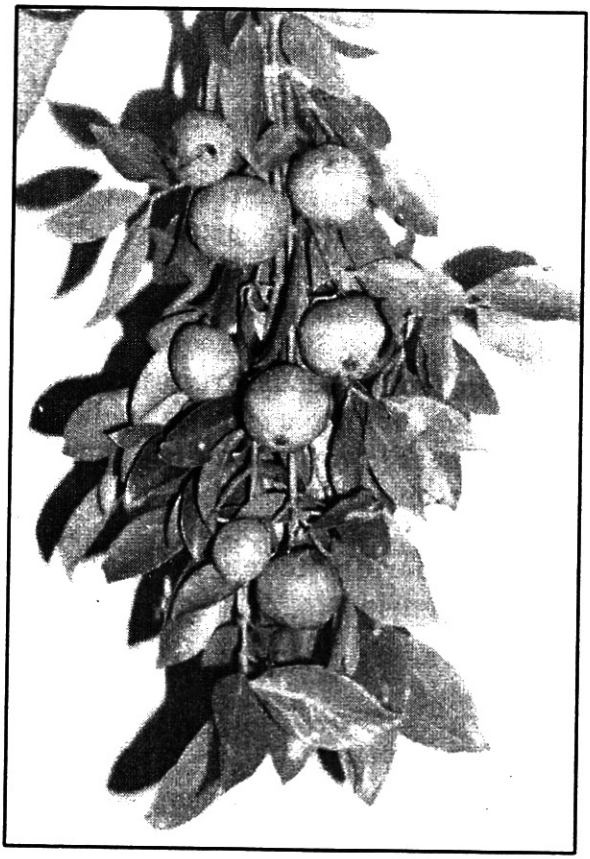
Fruits are edible when ripe.

Thaichua

This plant is a climber. Leaves entire, lanceolate. Fruits are sour.

Parts used :

Fruits are edible when ripe.



Kak, Akard

Bengali name	Cowa, Kau
Scientific name	*Garcinia cowa* Roxb.
Family	Guttiferae
Source	Rankhalpada, Teliamura

Description of the Plant :

This plant is glabrous, middle sized tree bearing greyish brown bark. Leaves opposite, simple, elliptic lanceolate, exstipulate with fine parallel nerves. Flowers showy, actinomorphic and polygamous in cymose inflorescence. Male flowers are arranged in axillary or terminal cyme, and short pedicelled. Calyx with 4 sepals, fleshy, yellowish, pink or red in colour. Petals as same in number as sepals, oblong, hypogynous. Stamens numerous, filaments minute. Minute female flowers are arranged in terminal fascicles of 2-5. Ovary 6-8 locular with sessile stigma. Fruits a berry, green in colour when unripe but orange red when ripe.

Flowering time is from December to February and fruiting time is from February to July.

Parts used :

Fruits are edible when ripe.

Chatakra

Scientific name Could not determine

Fruit a berry. This is edible and eaten by the tribals for its medicinal value.

Kusumai, Samai

Bengali name	Lotka, Iphek, Bhubi,
Scientific name	*Baccaurea ramiflora* Lour.
Family	Euphorbiaceae
Source	Mohanpur forest area

Description of the Plant :

This plant is small or middle sized tree. Bark dark grey with lenticels, young parts hairy. Leaves alternate, simple, smooth surfaced, obovate,

acuminate and narrowed at the hypopodium. Petiole long and thickened at both ends. Inflorescence tomentose, racemes from old wood or branches. Flowers dioecious, floral stalk short. Petals absent. Male flowers arise in the axils of stipular bracts in group or as a solitary flower, subsessile. Clayx 4 lobed. Stamens free, 4-8 in number, anthers small, pistillode present. Female flowers are in simple receme. Sepals tomentose, yellow in colour. Ovary 2-3 celled with 2 ovules in each cell, tomentose; stigma peltate, fimbricate. Fruit capsule, yellowish brown in colour. Seeds with white aril and testa red.

This plant occurs throughout the State.

Parts used :

Fruits are edible when ripe.

Mairung dui

This plant is a climber. Fruit is edible.

Subra

Bengali name	Tekrai, Paniala
Scientific name	*Flacourtia jangomas* Lour.
Family	Flacourtiaceae.

Source Bankumari (Baramura hills)

Description of the Plant :

This plant is a small, deciduous tree. Branching spines present on the young trunks. Leaves simple, alternate, ovate to lanceolate, acuminate, crenate-serrate. Young leaves are pinkish or light cinnamon brown in colour. Inflorescence raceme, subcorymbose with slender pedicels. Flowers small, regular. Ovary 2-8 celled with 2-6 styles. Fruit subglobose, red or purple, 4-6 minute stigmatic points are present in the single short style column at the tip of the fruit. Seeds 4-6.

Flowering time is from March to June and fruiting time is from June to October.

Parts used :

Fruits are taken by tribals as raw.

F. SEEDS.

Thaibai

Bengali name Makal, Kowaluli,

Scientific name *Trichosanthes bracteata* Lamk.

Family Cucurbitaceae

Source Pacharthal

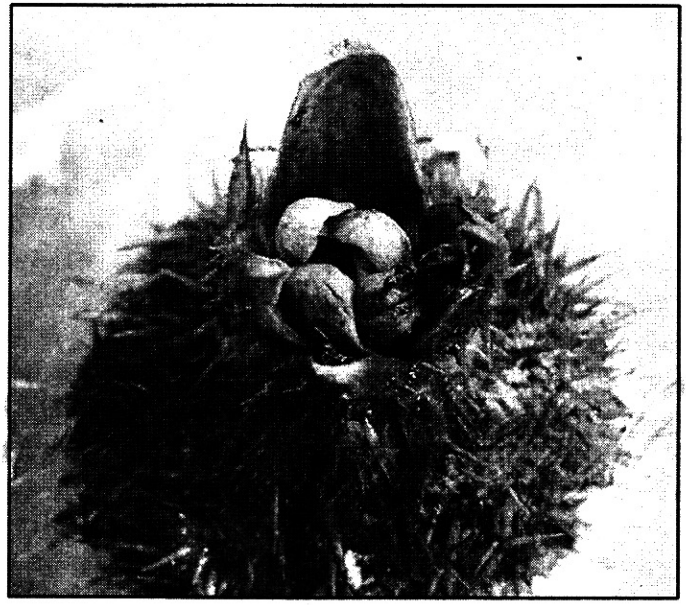
Description of the Plant :

This plant is an extensive climber with profuse branching. Leaves palmately compound with 3-5 lobes, ovate or suborbicular, denticulate, scabrous above with stout petiole. Tendril simple, stout. Flowers dioecious, white in colour. Male flowers in recemes with stout peduncle and floral stalk. Bracts long. Calyx tubular, striated, 5 lobed. Corolla 5 lobed, lobes oblong. Stamens 3, filament short inserted in the calyx tube. Female flowers are solitary or arranged in racemes. Calyx and corollar are as same as male flowers, staminodes absent. Ovary with many ovules. Fruit fleshy, globose, glabrous, red with longitudinal orange streaks.

This plant occurs throughout the State.

Parts used :

Seeds of this plant are eaten by the tribals. They eat roasted seeds.



Thangjing

Bengali name	Pukhal, Makhna
Scientific name	*Euryale ferox* salisb.
Family	Nymphaeaceae
Source	Mohanpur forest area

Description of the Plant :

Plant is an aquatic herb, thickly armed. Rootstock perennial, short. Leaves floating on long petioles, very large, spherical in shape with wrinkled upper surface and pink lower surface. Stout spines are

present along the interlacing veins. Flowers violate, blue or red, epigynous, partially submerged. Sepals 4. Petals numerous. Stamens numerous in bundles of eight. Carpels 8, united; ovary 8 celled. Fruit spongy berry covered with stout prickles and crowned by the persistent sepals. Seeds large, about 20, arillate.

Flowering time August-Septeber and fruiting time is from October to February. This plant is very common in lakes and jheels.

Parts used :

Seeds are eaten as raw and roasted. Tribals prepare masideng by the raw seeds using dry fish. Actually, the seeds of this plant are taken by the Manipuris. But these days it is gradually becoming popular among the tribals of this state.

G. MUSHROOM

Tribals of Tripura are very fond of mushroom which they collect from the forests.

Bufang-mui-Khu-mu

Scientific name	*Clitocybe* sp.
Family	Agaricaceae
Source	Mohanpur forest area

Description of the Plant :

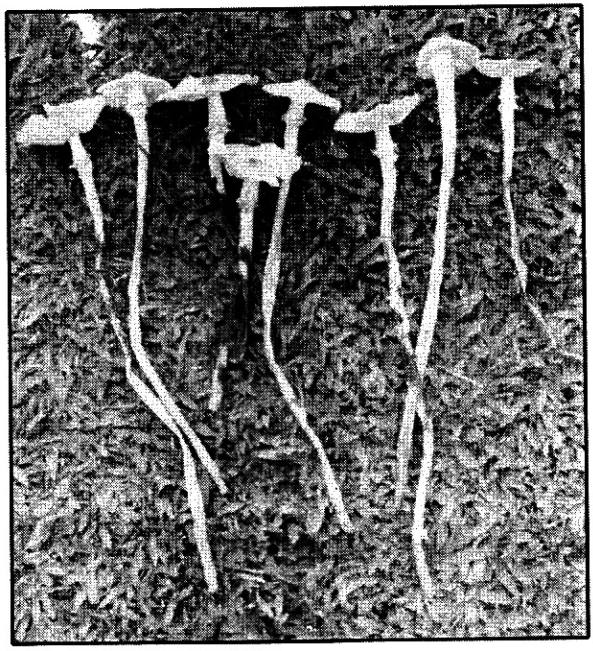
This particular fungus grows on tree. As it is a saprophytic plant, it is colourless. Stalk small and the pileus i. e. the umbrella like cap is large.

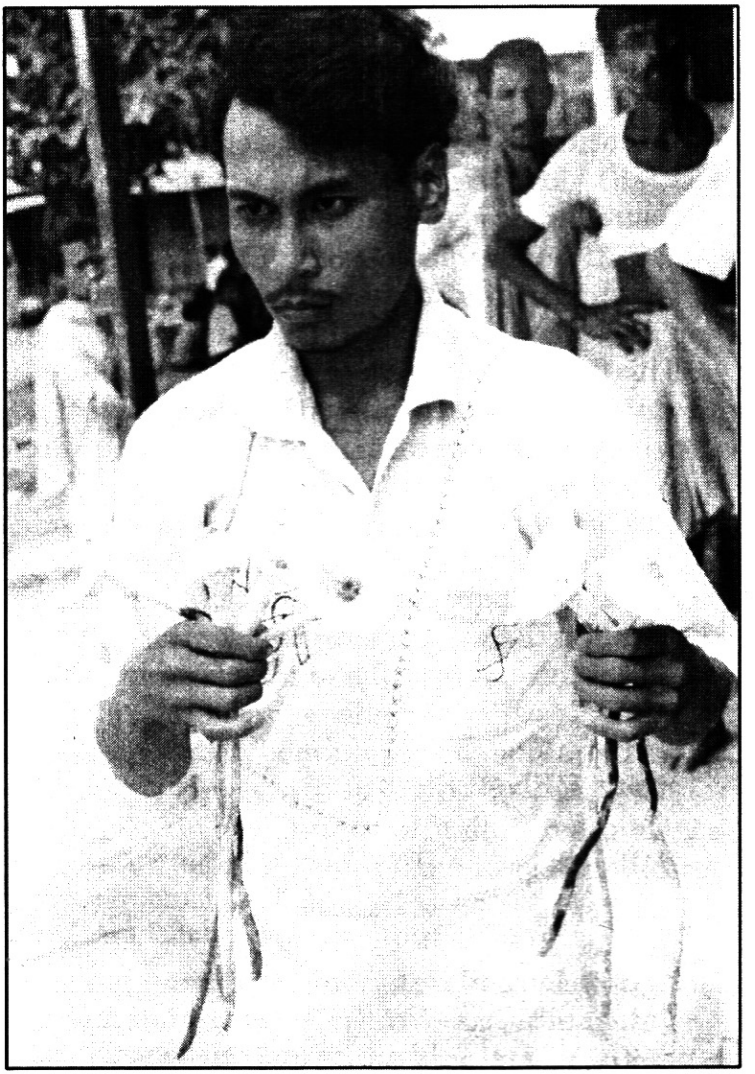
Mui-khu-mu-ratai

Scientific name could not determine.

Description of the Plant :

This plant grows on dead bamboo.





A tribal with his favourites

Mui-khu-mu-hapalak

Scientific name could not determine.

Source Rankahalpada, Teliamura

Description of the Plant :

This fungi grows on the ant-hill. Stalk is large and the umbrella like cap (pileus) is raised above the soil. This fungus is very tasty.

Parts used :

Tribals prepare 'gudak' and also use all these different varieties of mushrooms for the preparation called 'aundru'. They like to take fried mui-khu-mu too.

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CHAPTER - V

PROCESSING OF WILD EDIBLE PLANTS

It has appeared during the field study that the practice and procedure of using forest products as food by the tribals of Tripura considerably differ from that of the non-tribal population of the State. It would not be out of place to mention that, in one hand, there are, of course, some commonalities in the matter of processing of forest products for food among the tribes in India and various studies on the societies in India, on the other, show that the art and practice of using forest products in many respects differ from tribe to tribe.[1] Although there are different tribal communities in Tripura, the procedure of preparing cooked food from forest products are almost similar except some changes in nomenclature. For instance, a particular preparation which is called as 'Thamsa peimi' by the Reang community is popularly known as 'Gudak' by others like Tripuri, Jamatia etc. Interestingly, their culinary zeal finds its resemblance with their mongoloid ancestors spread over the North-Eastern region of the country.

The art of processing food, as it has been revealed by several studies, not only increases the taste and add to the food a new flavour making it more palatable and appetising, but also increases the digestibility, makes the foodstuffs like meat, cereal etc.[2] soft and at the same time cooking helps to kill the disease

causing organisms too[3]. As a result leaving few leafy vegetables and fruits almost all the food products need cooking.

The ingredients used by the tribals in preparing their food from forest products suggest that they use less spices and in some cases no conventional spices at all except chillies. Instead they sometime use some aromatic leaves in their preparation. It is also interesting that tribals of Tripura are fond of using a kind of 'alkali' specially prepared by their indigenous method. One of the remarkable features in the list of their ingredients used for preparing food is that they use less oil in preparation of food that is frying the leaves and vegetables is not so popular among them. Rather they prefer to boil, steam, smoke or roast their vegetable and non-vegetable products of the forest.

During survey it came to the notice that many communities of the tribals of Tripura use leaves as wrapper to scorch or roast their food. But the same art of cooking food is also practised not only by a good number of tribal communities in India, but also by the tribals of other countries of the world. No doubt this is an old method of scorching food. The available evidences suggest that the hill Kharias[4] and Onges[5] of Andaman & Nicober island practice this old habit of roasting food by wrapping between leaves. Even 'Agnaruna Jivaro Community'[6] of Amazon, Peru and tribal communities of Solomon island [7] have also

been found to roast and bake food in the manner by wrapping between leaves. They not only steam or bake the non-vegetable items like meat and fish but also use leaf wrapper in roasting roots and vegetables like banana[8]. One interesting thing that came to the notice that Tripura tribal use aromatic leaves like turmeric leaves as a wrapper to bring the flavour into the cooked food. Another unique and interesting feature of tribals of this State is that sometimes they use fresh bamboo culms as a container to cook food instead of leaves and throw it into the live charcoal to cook the ingredients kept inside. The watery juice of the fresh bamboo helps to cook the inside food.

From the above it is clear that practice, procedure and art of preparing food using forest products by the tribal communities of Tripura has a strong diversity which deserves special attention and mention.

Again during field survey and cross exmination it came to the notice that not only the tribals in towns but also of some other fur off places are forgetting their unique procedures of preparing food from forest produces. Even in some cases this traditional procedures are being replaced by modern practice. All these have fuelled a thinking of investigating the recipes of the preparation of tribal food and incorporates the same as part of this present discussion.

As a result in the following a few recipes which

are popularly used by them have been discussed :

One of the peculiarity is that almost all the recipes described below need dry fish (sidal) as one of the ingredients.

(i) **MUI-CHA-KHUI** : (a highly popular tribal delicacy)

The procedure of preparation of this dish is unique in its kind and a specially prepared alkali is used for this dish. Not only the tribals of Tripura have a great fascination for this preparation, the same kind of preparation is equally popular among the other tribal communities of the North-East.

Dry Fish (Sidal)
- one of the most essential ingredient of Tribal recipes.

Preparation of Alkali :

The main part of preparing cha-khui is the extraction of alkaline material from ashes. They use a special kind of traditional basket shown in the photograph to prepare this alkali water. For making ash they use banana leaf and stem (laifung), bamboo leaves and shoots mainly muli bamboo and sesame plant. Only one or two or all of the ingredients are used at a time. This ash is then taken into the basket that is kept hanging above a container. Water is then poured little by little on the ash of the basket. Water trickels down after washing the ash into the container placed below. The same process of pouring water is repeated until the water collected into the container tastes like alkali. Clear water from the container is decanted and it is used as alkali water or 'Kharpani' for chakhui. Many of the above mentioned forest products can be used as ingredients. But the tribals of Tripura prefer mostly the bamboo shoots or young banana stems (Lai fung). They chop all these vegetables into thin slices and boil them in alkali water along with dry fish, salt, a small amount of lentil (if they like). Occasionally, they use small pieces of intestine of pig. Sometimes for flavouring this preparation they add the leaves of lemon or ginger. Rice flour is also sometimes used as a thickener.

Tribals believe that this preparation is very good for stomach trouble and act as an ante-malarial

anecdote.

ii) **GUDAK/THAMSA PEIMI** (a very hot dish) - This is another favourite dish of all the tribal communities of Tripura. This preparation is such a tasty one that it has excited also the palate of Bengalees of the State and has become very popular among them. According to their traditional method they use fresh bamboo culms to prepare this dish. All ingredients are put inside the hollow internode of the fresh culm and after closing the open surface they put the culm inside the burning charcoal. The watery juice of the fresh culm cook the ingredients. After cooking they make paste of these ingredients by thrusting a bamboo stick repeatedly into the culm. But now a days, people cook 'Gudak' in pan as bamboo culms are not always available. For this preparation although several forest products like chichiri, pachak, raichak, dagardoma, mushroom, tara, tubers, and roots etc. are used, but the bamboo shoots (karul or muia) is the most preferred one. Only one or several vegetables can be used at a time. They chop all these vegetables into fine slices. Finely chopped potatoes are also used sometime to increase the taste. They boil all these chopped ingredients with dry fish, salt and green chillies, make paste of all these boiled materials and mix thinly chopped onion with it. Sometimes they use fresh fishes in this preparation.

iii) **BERMA BATAI :**

It is a kind of curry of Sidal (dry fish) with gravy. Water is taken in a saucepan or pot and placing it on the oven, chopped vegetables like Muikhun chak, Kalmi hak, Tara, Biring etc., potato, thaibang buchli (dry seeds of jackfruit), onion are put in it. Few de-scaled dried fishes are also added to it. After mixing salt and turmeric powder it is cooked for long to make all the ingredients soft and give it gravy like consistency.

iv) MUI BARAK :

This preparation is required a lot of green chillies. Several wild products like dagardoma, Gandrui, Arai leaves, Pachak etc. are used. After peeling the skin the dagardoma (Muimarang) is cut into small pieces. These small pieces are boiled and water strained off to remove the iching affects of raphides present in the plant tissues. Now little water is taken in a pan and placed it on the fire, washed and de-scaled dry fish (sidal), salt and chopped green chillies and boiled vegetables placed in it, cooked until the gravy thickened.

In this prepration Arai leaves can be used. Large pieces of Arai leaves are added just a little before removing the curry from the fire.

By using 'Arai Bulai' :

The procedure to prepare Mui Barak by using Arai

leaf is little different. Here garlic flakes are applied with green chillies for seasoning. Dry fishes, green chillies and salt are at first boiled in water. Then added large pieces of arai leaves and cooked until all the ingredients turn soft and gravy thickened. Lastly, garlic paste is added and stirred it for a while.

V) CHA-KHUI-CHAPRANG OR CHAKHUI CHATANG :

This is another unique preparation taken by almost all the tribal communities of this State. They sundry several seasonal forest products to preserve them and to use them during off-seasons. The vegetables they keep in this way are muitu hakaya (stem of arum), bamboo shoot (karul), khamka (Solanum sp.), khamka sikam etc. and some aromatic leaves like the leaves of ginger, turmeric (Sutui bulai) etc. Even they dry up chillies for this preparation.

To make this dish, the dried vegetables, and the leaves they use as a flavouring agent soaked in water for 1-2 hours. Specially made alkali or water 'khar pani' is also required in this preparation. Chopped soaked vegetables, grinded dried chillies, garlic paste and few descaled dried fishes are mixed and boiled in 'kharpani' until all the vegetables become soft. Finally chopped aromatic 'muiching' leaves are added for flavouring the curry.

vi) MASI DENG :

Tribals prepare this dish using several forest products. Batema is one of them. Batema (*Amorphophallus campanulatus*) needs processing in 'alkali' water i. e. 'khar pani' to make it edible by diminishing the affect of raphides which have a strong irritant action on the skin and mucous membranes. Soft boiled pieces are mashed and made small round cakes and dried in sun. An intersting fact was noticed during field survey that tribal women were selling Batema cakes in the markets in interior tribal areas. To prepare 'masi deng' scorched dry fish, green chillies and onion made into paste to mix with boiled batema cakes. Similar fish paste preparation is found to be in vogue among the tribal communities of North-Eastern region. It is J. P. Mill's observation about Ao Nagas that "another thirst producer is fish paste made of mash, rotten fish."[9]

vii) CHAKH-TU-KUTHUNG :

In this preparation too tribals scorch both the dry fishes and chillies and make paste of them but here unlike masideng they mix khar pani with this paste instead of onion.

viii) MUI-AUNDURU :

This is another very popular and favourite dish of

the tribals of Tripura and it is the preparation of bamboo shoots (Karul). Bamboo shoots are chopped into thin slices and soaked rice grinded into pulp. Chopped bamboo shoots are then boiled in water along with dry fishes, chopped green chillies and salt. Cooking continues until bamboo shoots become soft. Rice pulp is added and again cooked for sometime. Then add paste of few garlic flakes. Just before removing the curry from the fire chopped coriander leaves or aromatic khundrupui are applied.

Wild mushroom can also be used along with bamboo shoots for this preparation.

ix) IGO :

In this preparation they use leaves of turmeric (sutui bulai) as a wrapper. Within the leaves they take washed de-scaled small fishes, one or two washed dry fishes (sidal), chopped onion, chillies and salt. Adding little amount of oil the mixture wrapped between the leaves and placed in burning charcoal or on ashes. As turmeric leaves are aromatic, they bring flavour to the preparation.

Some communities of the tribals especially Reangs cook pork or other meat within the holow internode of the culms of bamboo. They use fresh bamboo culm as a container and put the same in burning charcoal.

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CHAPTER - VI

NUTRITIONAL AND MEDICINAL EVALUATION

Nutritional evaluation of some forest products :

Extensive reserch work is being carried on the forest products used as food by several tribal communities of India and so far nutritional value of about 200 edible wild plants were determined[1]. But very few studies are available about the plants used as food by the tribal communities of Tripura and much less if not nil on their nutritional value. To sustain a healthy life it is important to know the nutritional composition of different foodstuffs which will also help to take a balance diet. Although primitive groups are not much aware of modern science of nutrition, it is revealed that tribals who are still living in undisturbed forest abode and are fed on their traditional large varieties of seasonal food, are found to be healthy and are free from most of the diseases. And those tribals to whom their traditional forest proudcts are not available due to deforestation are malnourished and much prone to several diseases[2]. This fact is also true in case of tribals of Tripura. Ruthless deforestation in this State caused the existence of such forests in patches in the stiff uncultivable slopes and rocky and steady river banks[3]. Now a days, it is not easy to collect the food from the

forests. It is noticed during survey that during the lean period maximum tribals mainly of hilly areas only taking boiled tubers (several species of *Disocorea*) collected from the forests and that too sometimes only once in a day. And their economic condition is so poor that they connot afford to buy, at least, the dry fishes which is the main item of their food habit, leaving aside meat and fresh fishes. As a result, they are forced to change their traditional dietary habit in many cases making themselves undernourished. So, there is no denying the fact that it is most important to study the nutritional value of the forest products used by the tribals of Tripura.

However, the scope of the present study does not permit to undertake any clinical analysis of the nutritional values of the forest products used by the tribal communities of this State. But information regarding nutritional values of edible wild products are of immense importance. As almost no work was done in this respect, an attempt has been made to give nutritional composition of few forest products which are similar with the products used by other Indian tribal communities and work on which had already been done by several nutritionists.

1. TUBERS :

During the lean period roots and tubers become the staple food of the tribals of Tripura, especially, those who are living in hilly terrains. Among the

tubers several species of *Dioscorea* are their main food. And among 600 edible species of *Dioscorea*, study of nutritional composition had been done on several species by many scientists. Nutrient components of some of the species of *Dioscorea* are as follows :

(All the following nutritional values given are per 100 gm of edible portion)

(i) Tha-balang (*Dioscorea versicolor*) :

It contains energy 110 KCal, Protein 2.5 gm, Fat 0.3 gm, Minerals 1.4 gms, Fibre 1.0 gm, Carbohydrate 24.4 gms, Calcium 20 mgs, Phosphorous 74 mgs, Iron 1 mg, Carotene 565 µgs, Thiamine 0.19 mg, Ribolavin 0.47 mg, Niacon 1.2 mgs, Vitamin C 1 mg and Moisture 70.4 gms.

(ii) Tha duk (*Dioscorea alata*) :

It contains energy 79 KCal, Protein 1.3 gms, Fat 0.1 gm, Minerals 0.8 gm, Fibre 0.1 gm, Carbohydrate 18.1 gms, Calcium 16 mgs, Phosphorous 31 mgs, Iron 0.5 mg, and Moisture 79.6 gms.

(iii) Tha Ganga (*Dioscorea Hamiltonii)* :

Energy 124 KCal, Protein 1.8 gms, Fat 0.2 gm, Minerals 1.0 gm, Fibre 1.5 gms, Carbohydrate 28.8 gms, Calcium 52 mgs, Phosphorous 49 mgs, and

Moisture 66.7 gms.

(iv) Thabarchuk (*Dioscorea glabra*) :

It contains Energy 59 KCal, Protein 1.6 gms, Fat 0.1 gm, Minerals 0.6 gm, Fibre 1.2 gms, Carbohydrate 12.8 gms, Calcium 19 mgs, Phosphorous 38 mgs, and Moisture 83.7 gms.

2. <u>Other uncommon vegetables</u> :

It has already been mentioned that tribals of Tripura are very fond of tender bamboo shoots. They take bamboo shoots both as fresh and as sundried form :

(i) Fresh bamboo shoots (*Bambusa sp.*) : contain Energy 43 KCal, Protein 3.9 gms, Fat 0.5 gm, Mineral 1.1 gms, Carbohydrate 5.7 gms, Calcium 20 mgs, Phosphorous 65 mgs, Iron 0.1 mg, Thiamine 0.08 mg, Riboflavin 0.19 mg, Niacin 0.2 mg, Vitamin C 5 mgs and Moisture 88.8 gms.

The dried bamboo shoots contain Energy 302 KCal, Protein 25.3 gms, Fat 3.3 gms, Fibre 9.5 gms, Carbohydrate 42.8 gms, Calcium 208 mgs, Phosphorous 569 mgs, Iron 12.5 mgs, Riboflavin 0.09 mg and Niacin 3.8 mgs.

(ii) Kantadoga (*Amaranthus spinosus*) :

It contains Energy 43 KCal, Protein 3 gms, Fat 0.3 gm, Carbohydrate 7 gms, Fibre 1.1 gms, Minerals 3.6 gms, Calcium 800mgs, Phosphorous 50 mgs, Iron 22.9 mgs, Carotene 3,564 µgs, vitamin C 33 mgs and Moisture 85.0 gms.

(iii) Bhatema (*Amorphophallus campanulatus*) : (Corm)

It contains Energy 79 KCal, Protien 1.2 gms, Fat 0.1 gm. Carbohydrate 18.4 gms, Fibre 0.8 gm, Minerals 0.8 gm, Calcium 50 mgs, Phosphorus 34 mgs, Iron 0.6 mg, Thiamine 0.06 mg, Carotene 260 µgs, Riboflavin 0.07 mg, Niacin 0.7 mg and Moisture 78.7 gms.

(vi) Dry khamka sicum (*Solanum torvum*) :

(Fruit)

The nutrient components present in it are Energy 269 KCal, Protein 8.3 gms, Fat 1.7 gms, Carbohydrate 55.0 gms, Fibre 17.6 mgs, Minerals 5.1 gms, Calcium 390 mgs, Phosphorous 180 mgs, Iron 22.2 mg, Carotene 450 µgs, and Moisture 12.3 gms.

(v) Demphal (*Artocarpus lakoocha*) :

(Fruit)

The nutritional composition of this fruit is energy

66 KCal, Protein 0.7 gm, Fat 1.1 gms, Carbohydrate 13.3 gms, Fibre 2.0 gms, Minerals 0.8 gm, Calcium 50 mgs, Phosphorous 20 mgs, Iron 0.5 mg, Carotene 254 µgs, Thiamine 0.02 mg, Riboflavin 0.15 mg, Niacin 0.3 mg, Vitamin C 135 mgs and Moisture 82.1 gms.

(vi) Subra (*Flacourtia cataphracta*) :

(Fruit)

It contains Moisture 77.7 gms, Protein 0.5 gm, Fat 0.1 gm, Minerals 0.8 gm, Fibre 1.0 gm, Carbohydrate 19.9 gms, Energy 83 KCal, Calcium 43 mgs and Phosphorus 25 mgs.

(vii) Thanjing (*Euryale ferox*) :

(Seeds)

Seeds of Thanjing contains Moisture 12.8 gms, Protein 9.7 gms, Fat 0.1 gm, Minerals 0.5 gm, Carbohydrate 76.9 gms, Energy 347 KCal, Calcuim 20 mgs, Phosphorous 90 mgs and Iron 1.4 mgs.

(viii) Naljora, Aranga (*Cissus quardrangularis*) :

(Stem)

Stem of this plant contains Protein 12.8%, Fat 10%, Fibre 15.6%, Carbohydrate 36.6% and Vitamin C 398 mgs.

(ix) Mui khumu/mushroom (*Agaricus sp.*) : This particular mushroom that grows on dead bamboo is also used by the tribals both as sundried form and as raw. Dried mushroom is rich in protein content that is 26.1 gms, ash 7.7 gms and fibre 6.9 gms.

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LOCAL USES OF SOME FOREST PRODUCTS AS MEDICINE :

The life of the tribals of Tripura have always been independent. If they have been depended on anything, then it is only the natural forests, as forests are supplementing their all necessaries. And it is no exception in case of medicinal needs in curing their diseases. Still now, it is noticed, that tribals who are living in their ancestral habitat, cure their ailments by using the plants collected from the forests and jungles. They have utilised their close relationship

with the nature by gaining unique knowledge about the use of wild plants. And it has been revealed during the study that for medicinal purpose they are using many of the wild plants which they receive as food.

As such the study cannot be completed unless an account of medicinal utility of the forest products which they have been consuming as food is given. As a result following discussion endeavours to focus the medicinal use of forest resources which in earlier discussion have been found to be used as their food :

(i) Muli (*Melocanna bambusoides*) :

To prepare alkali water which they use in preparing chakhai, tribal burn muli bamboo to ash and wash the ash by water. Silicius secretion which is medicinal are abundant in the culms of this variety of bamboo. Tribals use this alkali water in curing stomach trouble and as an anti-malarial anecdot.

(ii) Zram buthai (*Artocarpus chaplasha*) :

(iii) Demphal (*Artocarpus lakoocha*) :

Seeds of these plants are used in purging of bowels. Bark is grinded and used in removing pus.

(iv) kau (*Garcinia cowa*) :

The gum-resin of this plant is used as medicine.

(v) Baikang (*Canavalia gladiata*) :

Fruit of this plant are utilised in curing hernia, colic, antibillious and in removing irritation of mucous membrane.

(vi) Konagula (*Oroxylum indicum*) :

Edible tender fruit acts as an antiflatulent and as a reliever of colic.

Root bark is used in diarrhoea and dysentery.

Powdered bark is used in acute rheumatism and the seeds are as purgative.

(vii) Phui chang (*Ficus hispida*) :

Fruit, seed and bark are used as purgatives and as emetic medicines which cause vomiting.

(viii) Chichiri (*Monochoria hastata*) :

Extract of leaves is used in curing boils and the plant is used as an alternative medicine to correct bodily disorder of nutrition, in tonic, cooling.

(ix) Kachin masala (*Erygium foetidum*) :

Roots of this plant is used to remove stomachic.

(x) (*Dioscorea bulibfera*) : Tubers are used as vegetables and at the same time as curer of piles, dysentery, syphillis and to apply to ulcers.

(xi) (*Dioscorea pentaphylla*) :

Tubers are used to lessen swelling, in continuous contraction.

(xii) Aranga, Naljora (*Cissus quadrangularis*);

Pulp of the stem is used in curing fracture bone by applying on the affected part of the body.

(xiii) Samberma (*Boerhavia diffusa*) :

This plant is boiled to extract the juice which is used in curing Jaundice, Oeadema, urinogenital diseases, scanty and burning micturation.

(xiv) Duk pui (*Paederina foetida*) :

External and internal application of the plant is helpful in reducing rheumatism.

Roots act as an inducer of vomiting i. e. emetic agent.

Leaves juice is used in diarrhoea and in indigestion.

(xv) Bukhate (*Polycarpon prostratum*) :

Leaves are medicinal.

(xvi) Kanta nageshwar (*Acacia nilotica*) :

Fruits are eaten as raw or with dry fish to take preventive measure against measles and small pox.

(xvii) Kharai (*Naptunia prostrata*) :

Leaves are boiled in water and juice is taken to cure Jaundice.

(xviii) Thalibak bulai

Rhizome is used in indigestion.

(xix) Samchota (*Centella asiatica*) :

Juice of the leaves is used in amoebiosis.

(xx) Chatakra - Fruit is used in breathing trouble and in asthma.

(xxi) Kerang-mui-thapek -Bulbils are used as an antiflatulent.

(xxii) Takha - thaich-mu (*Coccinia grandis*) :

Juice of the leaves are taken in diabetes and in cold.

(xxiii) Thaibai (*Trichosanthus bractata*) :

Plant is medicinal.

CHAPTER - VII

DISCUSSION AND CONCLUDING REMARKS

The discourses in the present study, it may be recalled, were initiated with an endeavour to focus the forest products and the food habit of the tribals of Tripura. The object of these discussions primarily is to unfold the discreet field of forest produces that are used as food by the primitive people and to record them as well as to discern how much the tribes are dependent on such forest products in this land of Tripura and an attempt has also been made to show the similarities that exist in relation to the art of using forest produces as food between tribals of Tripura and their Mongoloid counterparts spread over North Eastern region. After giving a brief account of the vegetation pattern of Tripura, a review of the available literature containing, in some way, or other the information regarding the uses of forest products as food and its art of processing. An interesting point that has been observed, is that the procedure of using forest products as food is, of course, traditional but unique of its kind that deserves special mention.

However, forest where once the primitive dwellers built-up their own world of living and has given birth of many myths, folklores and tales on uses of wild plants, is now facing the danger of ruthless destruction in the name of welfare, development and rehabilitation etc. Tripura virtually goes on fire

during dry seasons due to preparation of Jhum field (slash and burning) by almost over 50,000 jhumia household who are wholly or partially dependent upon shifting cultivation. Consequently, this state is not only likely to loose its potential plants for basic needs of food and medicine but the natural habitat of a considerable portion of its tribal population too. Not only that, the change in environment or forest surroundings and scarcity of the means of their basic needs may be the cause of, besides other, many a social and developmental problems of the day. Moreover, the 'symbiotic relationship' that exists between man and forest is likely to be jeopardized. And thus, the traditional mutual dependence of the tribals upon forest may seriously turn to ruinous exploitation of forest endangering several plant species having food and nutritive value. It has been mentioned in the discussions in earlier chapters that the produces of Jhum cultivation are insufficient for their sustenance through out the year and thus, the tribal life is inextricably dependent upon forest produces. Even they have been bringing the edible forest plant and plant parts to the weekly markets in and around the tribal areas and also in towns in the tribal settings. But, deforestation and to some extent over-exploitation of forest due to increase in population and diminishing return of jhum, as it is revealed during the study, that many kinds of edible roots, shoots, tubers, fruits etc. are in many instances either have disappeared or confined to inaccessible patches or reduced areas of remaining climax forest

in remote areas. Consequently, to the tribals of Tripura in forest surroundings all kinds of edible forest resources are also not freely within their reach.

It was also noticed that many of the urban dwelling tribal people have already forgotten many names of wild plants and in some cases they could not even recognize the particular plant. And for the villagers they sometimes could only recall the names of some of the plants which they used to take as food long back.

It would not be out of place to mention that, during the study, prevailing social condition had been an unavoidable impediment for extensive field study in the interior areas of the state. Consequently, it was not always possible to collect the whole plant. I had to satisfy myself in some cases only with the edible fragments of the wild plants. And sometimes although the plants were collected but that was not flowering or fruiting season of those plants. As a result, the determination of the scientific names of plants in few instances became difficult.

Sometimes I had collected names of many plants like 'Aiming-Chukai, 'Kerang-mui-thapek' etc., and I could not collect those plants for the reasons mentioned above and few among those plants, for instance, 'Thakui', 'Mui-ching-cha', etc. were available in such remotest deep forests that even many of the

tribal people do not dare to go there.

It was also revealed during the field study that the tribals of, at least remotest areas of Tripura, still now are collecting wild products not only for using them as food and medicine, but also exchanging those products to have cultivated foods in barter system. For instance, wild tubers were found to have been exchanged for sweet potatoes, onion etc.

It has transpired from the study that the town and urban dwelling tribals are equally interested to have many of the forest resources which have been mentioned here to make their daily meal. Similarly, some of the forest products which are used by the tribals as food are also becoming popular among the non-tribals. And the supply of those products to the towns as well as urban areas can be increased. For this purpose, efforts may be undertaken to explore the possibilities of cultivating some of the popular items, so that in one hand supply is maintained in a planned manner and on the other hand forest is not alarmingly exploited. In that endeavour stress can be given on those forest produces which are popular and at the same time are of high nutritional value.

Dietary intake and health, these two things are inter-related with each other. A healthy and disease free person, in turn, is the symbol of balanced dietary intake. It is noticed that the tribals of the interior areas and who have a free access to the forest products

are of good physical stature and health. At the same time, it was also noted that tribals are much more prone to several diseases in the areas which have suffered fierce deforestation causing the depletion of wild edible produces. From the nutritional evaluation in Chapter-VI it is perhaps clear that wild vegetables are the good sources of at least minerals and vitamins which are indispensable for health care and growth.

Finally, there have been sustained efforts by the State Government, Central Government and Tripura Tribal Autonomous District Council to contain the practice of shifting cultivation or to allure the tribals from practice of Jhuming by providing alternative sources of income generation under various settlement schemes. One of the cause of the limited success of such schemes is attributable to the lack of integrated approach essential for success of all schemes to wean away tribals from their traditional occupation. Gathering of forest resources for food is one of such traditional occupation upon which tribals are dependent. As such, new strategy in jhumia settlement scheme is that tribals be allowed to practice jhum in very limited way under the settlement scheme. With this, care should also be taken while selecting the sites for jhumia settlement scheme, so as to ensure that tribals under the scheme do have free access to forest edible plants. Otherwise, sudden change in their food habit in new situation may create nutritional deficiencies.

APPENDIX

GLOSSARY OF BOTANICAL AND MEDICINAL TERMS

Acuminate	Apex of leaves are sharp with concave sides.
Acropetal	When flowers open from base to apex on the rachis of an inflorescence.
Actinomorphic	Regular flower which can be bisected through any longitudinal plane.
Acute	Leaf apex sharp with tapering sides.
Adnate	When the filament is attached to the back of the anther throughout the whole length.
Adventitious root	Roots developing from any region other than the place of normal root i.e., radical.
Arborescent	Tree habit.
Aril	Fleshy outgrowth of funicle found in some seeds.
Berry	Many seeded fleshy fruit in which seeds remain embedded freely in the massive pulp.
Bisexual	When both male and female reproductive organs are present in the same flower.
Bract	Morphologically specialized leaves, from the axils of which flowers are developed.

Bulbil	Metamorphosed aerial stem.
Callus	Cap like masses of soft tissues which form on or below the injured surface of stems and roots.
Campanulate	Type of recemose inflorescence where flowers aggregated on shortened rachis.
Capsule	Dry, dehiscent, many seeded fruit, the dehiscence may take place either along the septas or by pores.
Carpel	Individual member of gynoecium.
Caryopsis	Very small, one celled, dry and one seeded fruit where pericarp is inseperable from the seed coat.
Circinate	Rolling up of the leaves from the apex to the base.
Colic	Severe pain in the abdomen.
Cordate	Heart shaped.
Coriacious	Texture of leaf when it is rough.
Creanate	When the margin of leaf is toothed with rounded teeth.
Culms	Unbranched stem of monocot.
Cupule	A cup shaped hard body formed by bract or bracteoles surroundings the fruit
Cymose	Inflorescence where growth of the primary axis is terminated by a flower and young flowers occur below it.
Dichotomous	Type of branching where apical mass of tissues bifurcates giving of two daughter branches.

Dorsifixed	Filament is firmly attached to the back of the anther.
Drupe	One or more seeded, one or more chambered fleshly fruit with many layered paricarp.
Emetec	A drug which induces vomiting.
Epipetalous	Stamens attached with petals of the flower.
Exalbuminous	Seeds without endosperm.
Exerted	Length of stamens being more than the length of the petals.
Exstipulate	Leaf without stipule.
Filament	Stalk of the stamen.
Fimbricate	Petals with folded margin.
Foliaceous	Leaf like.
Fusiform	Type of modified fleshy root with swollen middle and two ends tapering.
Gall flower	Sterile flower present in hypenthodium.
Glabrous	Leaf with smooth surface.
Glaucescent	Waxy shining leaf surface.
Glumes	Dry, stiff, scaly bracts.
Hernia	Rupture through its covering of any organ of the body.
Hirsute	Surface of leaf covered with short, erect and stiff hairs.
Hispid	Leaf surface covered with straight, erect, dense and bristly stiff hairs.
Hypogynous	Flowers with gynoecium occupying

	topmost position on thalamus.
Hypopodium	Leaf base.
Imbricate	A kind of aestivation of sepals and petals of a flower.
Imperfect	Flowers without stamen and carpel.
Inflorescence	Arrangement of the flowers on the floral axis.
Introrse	Line of dehiscence of anther facing centre of the flower.
Keel	Two petals of a papilionaceous flower forming boat shaped structure.
Lanceolate	Lance shaped.
Legume or Pod	A kind of dry, dehiscent fruit where pericarp dehisces through ventral and dorsal sutures.
Lemma	Flowering glume in grass family.
Lodicule	Perianths represented by two or three very small membrabous structures.
Mericarp	Schizocarpic fruit dehiscing into one seeded part.
Micturation	The act of passing urine.
Monadelphous	Stamens with filaments united to form a bundle.
Monoecious	Plants bearing unisexual flowers of both sexes.
Mucronate	When the leaf apex blunt or round

(Cuneate)	or flat but has a short triangular point in the middle.
Oeadema	Dropsy
Palea	The bracteole opposite to lemma
Panicle	Compound receme inflorescence
Peduncle	Stalk of inflorescence
Peltate	Leaf where petiole arise from middle of lamina
Pentamerous	Floral parts in five or multiple of five.
Perianth	Calyx and undifferentiated corolla are termed as perianth.
Pericarp	Fruit wall.
Pinnatified	Leflets of a compound leaf arranged on both sides of the rachis directly or indirectly on the branches.
Pistillode	Abortive pistil in a male flower.
Plumose	Hairy
Polygamous	Plant bearing unisexual as well as bisexual flowers.
Pubescent	When the leaf surface is covered with various types of hairy outgrowths.
Purgative	A drug causing evacution of fluid faeces.
Quadrifoliate	Palmate compound leaf with four leaflets.
Receme	Inflorescence with primary axis not terminated by a flower.
Receptacle	Fleshy dilated floral axis.
Rheumatism	This term is used for pains in

	muscles, tissues and joints.
Rhizome	Modified underground stem.
Scarious	Dry, thin with dried up appearence
Schizocarp	Dry dehiscent fruit not exposing seeds
Serrated	Margin of lamina of a leaf incised like teeth of a saw.
Sessile	Stalkless leaf or flower.
Sori	The spore bearing structures grouped together.
Spadix	Modified spike where rachis is fleshy and inflorescence is covered with spathe.
Spathe	Boat shaped bracts enclosing the spadix inflorescence.
Spikelet	Condensed spike with few flowers.
Stamen	Individual member of androecium.
Staminode	Stamen modified to petal like structure.
Stigma	The knobed style.
Stipitate	Fruit body provided with stalk.
Stipulate	Leaves with stipule.
Style	Thread like part of carpel.
Subulate	Leaf blade long tapering towards apex.
Subcorymbose	Corymb like inflorescence.
Syncarpous	Two or more carpels of a compound gynoecium united with each other.
Syphillis	A chronic venereal disease.
Tepal	Individual part of perianth
Tetramerous	Floral parts in four or multiple of flower.
Tomentose	Leaf surface is covered with

	wooly hairs.
Tonic	A state of continuous contraction.
Trifoliate	Palmate compound leaf with three leaflets.
Truncate	Leaf apex flat, more or less straight across.
Umbel	Inflorescence bearing a short floral axis on which pedicillate flowers are arranged in radiating manner.
Unisexual	Flower containing either stamen or carpel.
Valvate	A type of aestivation of calyx and corolla.
Versatile	A fixation of anther when it can swing free in air.
Villous	Leaf surface covered with almost erect, dense, long, and soft hairs.
Vittae	Oil containg glands in some fruits.

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