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EDIBLE WILD FRUITS USED BY THE TRIBAL COMMUNITIES OF ROWANGCHHARI UPAZILA IN BANDARBAN

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Abstract

Wild edible fruits play a vital role in the daily lives of the ethnic people living in Chittagong Hill Tracts. It has great nutritional and medicinal values. The present study deals with the identification, documentation, and exploration of wild edible fruits consumed by tribal communities in the Rowangchhari upazila of Bandarban Hill District, Bangladesh. Information on wild edible fruit tree species was collected through structured and semi-structured interviews. A total of 35 wild edible fruits belonging to 23 families were recorded with their scientific name, family, local name, time of availability, and mode of consumption. These fruits are generally eaten fresh and raw. *Dillenia indica, Diospyros malabarica, Ficus racemosa, Flacourtia jangomas, Haematocarpus validus, and Syzygium fruticosum* are some fruits that are commonly used by the local inhabitants, and some of these fruits are also used to treat different diseases traditionally.

Keywords: Bandarban, Hills, Medicinal plants, Tribal people, Wild fruit

Introduction

Wild edible fruits have played a very vital role in supplementing the diet of the ethnic people in the hilly areas of Bangladesh. Some of them are sold in local markets or preserved for use during prolonged droughts. Wild edible fruits are excellent sources of fiber, vitamins, minerals, and polyphenols, all of which have health advantages. The risk of many illnesses, including diabetes, cancer, and coronary heart disease, is decreased by eating wild fruits (Brahma *et al*., 2013). It has been used as a source of food, medicine and nutritional supplements by many people in rural areas, tribal and indigenous societies from ancient times and continue to be widely consumed today (Nahar *et al*., 1990). Wild edible fruits have a high nutritional and therapeutic value and are a good source of vitamins and minerals (micronutrients) like copper, zinc, iron, manganese, magnesium and some hormones, as well as protein and energy, all of which are needed for the human body. Many of these wild fruits have higher nutritional and mineral content than commercial fruits in some contexts (Nahar *et al*., 1990, Seal *et al*., 2014).

Wild fruits are a valuable source of carbohydrates, proteins, lipids, vitamins, minerals, fibers and other nutrients (Deshmukh and Waghmode, 2011). Wild edible fruit

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plants are essential for improving rural livelihoods and providing food, nutrition and sustenance to poor populations around the world (Mishra *et al*., 2008; Tiwari *et al*., 2010; Badhani *et al*., 2011). According to Johns and Eyzaguirre, (2007) indigenous populations in East Africa use dietary supplements made from wild plant material that contains antioxidants to break down cholesterol from traditional foods including meat, milk, and blood. However, due to overexploitation and different anthropogenic activities such as forest and jungle cutting, these wild fruits producing plants are currently diminishing and becoming increasingly threatened, with some even becoming extinct. During seasonal food shortages or calamities such as droughts and floods, wild edible fruit trees provide crucial protection against starvation or famine. The tribal people of Rowangchhari upazila of Bandarban Hill District collect a diverse range of wild edible fruit plants from their natural state. It is a part of their culture to eat wild edible fruit plants on a daily basis. It is necessary to explore present status and future availability of wild fruits under growing population. Apart from this, no significant work has been done on the availability of wild edible fruits in Rowanchhari. Considering this fact, the present research work has been undertaken on the documentation of wild edible fruits grown in the Rowangchhari upazila of Bandarban Hill District.

Materials and Methods

The present investigation was conducted for about two years, from July 2019 to June 2021 in Rowangchhari upazila in the Bandarban Hills District of Bangladesh. Rowangchhari Upazila has a total area of 442.89 sq km and located in between 22°03' and 22°20' north latitudes and in between 92°14' and 92°30' east longitudes. The upazila consists of 4 Unions/Wards, 15 Mauzas/Mahallas. The total population of Roangchhari upazila is 27,264. Of these, 14,243 are males and 13,021 are females. The upazila is inhabited by Marma, Chakma, Tripura, Thanchangya, Murang, Bawm, Kheyang, Khumi and other ethnic groups. The Marmas are the largest tribe inhabiting the forested hilly region in the Rowangchhari upazila of Bandarban Hill District. Four different paras namely Dalujhiri para, Mandui para, Rowangchhari bazar para and Bijoy para were selected to execute the present investigation. These areas have been selected because they have representatives of four communities namely Chakma, Marma, Tripura and Tanchangya. The field works were conducted in three prominent seasons (winter, summer and monsoon) in a year for better information about wild edible fruits. Twenty elderly ethnic people who depend on gathering wild fruits from the forest for their subsistence have been identified. Furthermore, five such ethnic individuals who gather wild fruits from the forest and resell them in the neighborhood market have been chosen. Most of them have primary level education. In order to ensure proper data collection in the field about wild edible fruit, data collectors were initially provided with a number of concepts. The information was gathered by local tribal people through scheduled interviews, questionnaires, informal meetings, and local market visits. During survey, live specimens along with photographs were taken and interacted with local wild edible fruit vendors and villagers for local identification and to assess the traditional knowledge on wild edible fruits. Questionnaire was prepared for the collection of data such as local name, habit of plants, plants type, and time of availability and mode of consumption as

food. The information was cross-checked after discussions with several tribal people, the village head, elder women, and other local informants. The common plant samples were identified in the field by the authors and the unidentified species were preserved in the Bangladesh Forest Research Institute and finally identified with the help of plant taxonomists of Forest Botany Division of Bangladesh Forest Research Institute, Chattogram and Bangladesh National Herbarium, Dhaka. The tribal name in this paper is abbreviated and placed in parenthesis (M stands for Marma, Ch for Chakma, Tr for Tripura, and Ta for Tanchangya).

Results and Discussion

In the present study, a total of 35 wild edible fruit plants have been collected belonging to 23 families and 28 genera. Moraceae, Euphorbiaceae and Flacourtiaceae were found to be the largest families, containing 3 species each, followed by Anacardiaceae, Boraginaceae, Dilleniaceae, Fabaceae, Myrtaceae, Rubiaceae and Sterculiaceae (2 species each), and the rest of the families were found in single species (Table 1). The collected plants are arranged in alphabetical order with their common name, tribal name, family, time of availability and mode of consumption (Table 1).

Table 1. List of wild edible fruits in Rowangchhari upazila of Bandarban Hill District

Sl. no.	Scientific name	Family	Common name	Tribal name	Time of availability	Mode of consumption
1.	*Alangium salvifolium* (L.f.)	Alangiaceae	Ankar kata	Ankura (Ch).	June-July	Ripen fruit pulp is eaten
2.	*Antidesma ghae-sembilla* Gaertn.	Euphorbiaceae	Elena	Parajam (Ch), Baro vongor (Ta).	July-August	Ripen fruit is eaten fresh, roasted or jams and jellies
3.	*Artocarpus chama* Buch.-Ham. *ex* Wall	Moraceae	Chapalish	Bon kanthal (Ma), Bathagola (Ch).	June-August	Young fruit is eaten by cooking
4.	*Artocarpus lacucha* Buch.	Moraceae	Dewa	Bhorta gula (Ma), Momichi (Ch).	June-July	Ripen fruit is eaten
5.	*Bouea oppositifolia* (Roxb.) Meissner	Anacardiaceae	Uriam	Uriaam (Ch), Jaraboo aam (Ma), Moyaam (Tr).	May-June	Ripen fruit is eaten raw, and young fruit is eaten as a vegetable.
6.	*Buchanania lanzan* Speng.	Anacardiaceae	Nala amsi	Pival (Ma).	April-May	Seed kernel is eaten raw
7.	*Calamus tenuis* L.	Arecaceae	Jali bet	Jai bet (Ch).	February-April	Ripen fruit is eaten raw

Sl. no.	Scientific name	Family	Common name	Tribal name	Time of availability	Mode of consumption
8.	*Cardiospermum halicacabum* L.	Sapindaceae	Noaphutki	Hedaboksa (Ch), Nala maiachi (Ma), Kerapoksak (Ta).	May-November	Ripen fruit is eaten raw
9.	*Citrus medica* L.	Rutaceae	Adha jamir	Haidda lebu (Ch).	September-November	Green fruit is eaten raw
10.	*Cordia dichotoma* G. Frost.	Boraginaceae	Kalauza	Chaine (Ma), Bohalli (Ch).	April-May	Ripen fruit is eaten raw and young fruit is eaten as a vegetable
11.	*Dillenia indica* L.	Dilleniaceae	Chalta	Ulugach (Ch), Kraaming (Ma), Thaiplaw (Tr).	July-October	Mature fruit is used in curries to add flavor and sourness
12.	*Dillenia pentagyna* Roxb.	Dilleniaceae	Hargeza	Ulu (Ch), Jange bring (Ma), Thaiplaw (Tr).	May-June	Ripen fruit is eaten raw and young fruit is used to make pickles or cooked
13.	*Diospyros malabarica* (Desr.)	Ebenaceae	Deshi gaab	Keth gula (Ch), kock (Tr), Gaab gaith (Ta).	June-July	Ripen fruit is eaten raw
14.	*Ehretia acuminata* R.Br.	Boraginaceae	Kala-huza	Kala-ujja (Ch).	May-July	Ripen fruit is eaten raw and young fruit is used to make pickles
15.	*Ficus racemosa* L.	Moraceae	Jagadumur	Noroputitida (Ch), Sanak (Ma).	May-August	Ripen fruit is eaten raw and young fruit is eaten in curries
16.	*Flacourtia indica* (Burm. f.) Merr.	Flacourtiaceae	Baichi	Benchi (Ch), Binja (Ma), Katai (Tr).	June-August	Ripen fruit is eaten raw
17.	*Flacourtia inermis* Burm.f.	Flacourtiaceae	Loai	Tomytomy (Tr).	May-December	Ripen fruit is eaten raw and young fruit is also cooked
18.	*Flacourtia jangomas* Lour.	Flacourtiaceae	Paniala	Painnya gula (Ch), Tamagry	July-August	Ripen fruit is eaten raw

Sl. no.	Scientific name	Family	Common name	Tribal name	Time of availability	Mode of consumption
				(Ma), Painna mola (Tr).		
19.	*Garcinia cowa* Roxb.	Clusiaceae	Kau	Kaogula (Ch), Tahgala (Ma).	June-August	Ripen fruit is eaten raw
20.	*Gardenia coronaria* Buch-Hum.	Rubiaceae	Kannyari	Rekphul gach (Ch), Rangkhu (Ma).	June-September	Ripen fruit is eaten raw
21.	*Haematocarpus validus* Bakh.f.*ex*	Menispermaceae	Lalgula	Roseco (Ch), Ranguichi (Ma).	July-August	Ripen fruit is eaten raw
22.	*Musa ornata* Roxb.	Musaceae	Bonkala	Bizi kola (Ch), Ramanigi bela (Ma), Li phang (Tr).	Through the year	Ripen fruit is eaten raw and young fruit is also cooked
23.	*Phyllanthus acidus* (L.) Skeel.	Euphorbiaceae	Arbori	Fungleosasi (Ch), Dendalum (Ma).	March-May	Fruit is used in curries to add a sour flavor
24.	*Phyllanthus emblica* L.	Euphorbiaceae	Amloki	Hadamola (Ch), Soi sha (Ma), Omloki (Tr), Kalamabagula (Ta).	September-November	Fruit is eaten raw or dried and is also taken as pickles
25.	*Pithecellobium dulce* Roxb.	Fabaceae	Khoiababla	Quamochil (Tr), Jilapi gach (Ch).	April-July	Fruit is eaten raw
26.	*Protium serratum* Wall. *ex* Colebr.	Burseraceae	Gutguttya	Gutguittiya (Ch), Shu dui shi (Ma), Thai cherem (Tr).	July-August	Fruit is eaten raw
27.	*Randia spinosa* Poir.	Rubiaceae	Monkata	Mainphal (Ch).	December-February	Mature seed is eaten after roasting
28.	*Solanum torvum* Sw.	Solanaceae	Tit begun	Bigal biji (Ch), Kajoba (Ma), Titar berul (Ta).	Through the year	Fruit is eaten fried as a vegetable

Sl. no.	Scientific name	Family	Common name	Tribal name	Time of availability	Mode of consumption
29.	*Sterculia foetida* L.	Sterculiaceae	Jangla badam	Yaa-hea (Ch), Letpan-show (Ma).	July-August	Mature seed is eaten after roasting
30.	*Sterculia villosa* Roxb. *ex*. smith	Sterculiaceae	Udal	Udal pata (Ch), Chambai (Ma), Naichini udal (Tr).	March-May	Ripen fruit is eaten raw
31.	*Syzygium clavifolium* Roxb.	Myrtaceae	Pania jam	Lamba jam (Ch).	May-June	Well ripe fruit is eaten raw
32.	*Syzygium frutocosum* Roxb.	Myrtaceae	Khidu jam	Potti jam (Ch), Ta sabbi (Ma).	May-June	Fruit is eaten raw
33.	*Tamarindus indica* L.	Fabaceae	Tentul	Tedoy (Ch), Gayosi si (Ma).	February-March	Both unripe and ripe fruit is eaten raw or as pickles
34.	*Terminalia catappa* L.	Combretaceae	Kat badam	Badam gach (Ch).	May-August	Seed kernel is eaten raw
35.	*Ziziphus oenoplia* (L.) Mill.	Rhamnaceae	Bon boroi	Si mo thaui (Ma), Mon boroi (Tr).	November-December	Ripen fruit is eaten raw

Based on habit, there are trees (70%) being the most commonly used plants, followed by shrubs (18%), herbs (7%) and climbers (5%) (Fig. 1).

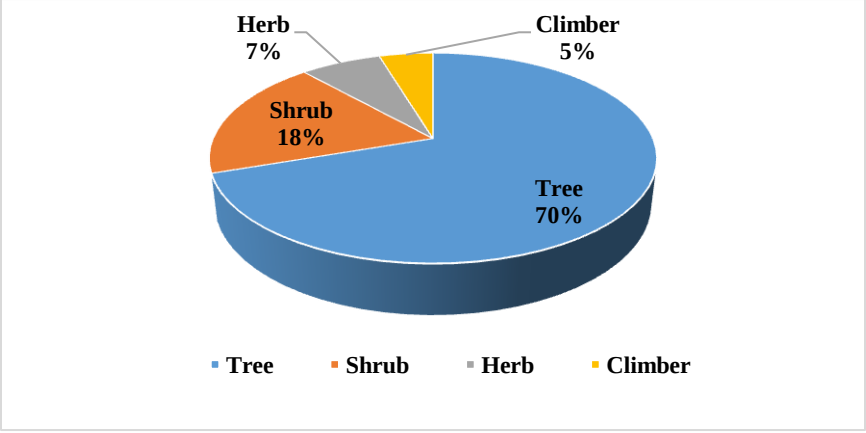

Fig. 1. Classification of wild edible fruits by its habit form

The abundance of wild edible fruits in Rowangchhari upazila of Bandarban Hill District varies with the seasons. During the study 19 fruit plant species were collected during the summer season (April-June); 09 fruit species in monsoon (July-August); 04 fruit species in winter (November-March) and 03 fruit species were collected round the year. Most of the fruits are only available in the summer due to their seasonality in fruiting. In Bangladesh, the main fruit season is summer and in winter, there are very few fruits available in Bangladesh (Pasha *et al*., 2015). The findings indicate that while people eat a sufficient amount of fruits during the summer and monsoon, there is a severe lack of local fruit during other seasons.

Das, (1987) reported that there are 60 wild edible fruit species in the forests of Bangladesh. Khatun, (2016) reported that the tribal people in Khagrachari District used 100 different species of wild fruit. Chowdhury, (2015) listed 400 fruits and medicinal plants, including herbs, climbers, shrubs, and trees from Bangladesh's southwest coast. Alam and Mohiuddin, (2021) documented 90 tree species, 84 herb and shrub species from Rowangcharri upazila of Bandarban district although there is no separate list for wild edible fruit. According to Paul *et al*., (2020) there are 49 species of wild edible fruits belonging to 25 families, most of which are consumed by tribal people in Bangladesh's Central and Highland Triangle. In the Shikkim Himalayas, Bhutia *et al*., (2015) recorded 26 wild edible fruits, 14 of which were identified as the most desirable. According to Singh *et al*., (2014), the Meitei population in Manipur's Imphal valley uses 39 types of small edible fruits from 29 genera and 23 families as medicine.

Since the world's population is expanding quickly at the moment, current agricultural production cannot meet everyone's food needs. Moreover, less land is being used for agriculture due to a variety of factors, including building and urbanization. The world will then be facing a nutrition and health crisis. Wild edible fruits species provide a superior source to meet the demand for food in these conditions. Wild edible fruits are a good source of vitamins and minerals and require little or no maintenance. Wild edibles were the only source of food during famines and before to the regularization of traditional agriculture. To ensure food security and sustainability in the near future, it will be crucial to document unconventional wild edible resources. It will provide for the nutritional needs of future generations. But regrettably, only the elderly remember this untamed treasure, and its existence is under jeopardy. The current study on edible wild fruit will contribute to the documentation of this unusual information and be useful in the development of domesticating these species for agricultural purposes, which will create jobs for those living in hilly areas.

Conclusion

Wild edible fruit plants are affordable, readily available, and extremely valuable to society because of their nutritional and therapeutic qualities. With the change in the socioeconomic situations of people during recent years, some of the information has been lost, and the population of some of the wild plant species is also shrinking due to habitat loss. Poor people rely on gathering these wild edible fruits for their livelihood since they sell them in the surrounding marketplaces. The population of wild edible fruit trees in Rowangchhari upazila of Bandarban Hill District is deteriorating primarily due to human

and livestock population pressure resulting from their overexploitation, severe forest degradation, and related agricultural expansion. Mass attention is needed to protect and popularize the wild edible fruit among the local tribal people. Therefore, it is necessary to address the conservation of these plant species and the popularization of their use.

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Conflicts of Interest

The authors declare no conflicts of interest regarding publication of this manuscript.

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