Sustainable utilization of edible fruits by *Tangkhul Naga* Tribe in Ukhrul District, Manipur, North-east India

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Abstract

Ukhrul district of Manipur is mainly inhabited by *Tangkhul Naga* tribe. This tribe often uses an enormous range of wild plants to meet their daily requirements. An extensive survey was conducted to document the wild edible fruits used by this community during the years, 2011, 2012, 2013 in Ukhrul district, Manipur. From this study, a total of 25 Angiosperm plant species belonging to 23 genera and 17 families have been recorded. Most of these fruits are freshly consumed while some are taken in the form of pickles, juice, jam, candies, etc. More interestingly, some selected fruits are fermented and used as fruit beer. This fruit beer is offered after dinner in every household. Nowadays, it serves as important source of household income for the *Tangkhul* community. Among the fruits *Phyllanthus officinales*, *Ficus cunea*, *Musa sapientum*, *Prunus cerosoides*, *P. nepaulensis*, etc. are considered as income generating fruits as indigenous fruit beer are also prepared from this fruits. Many wild fruits that are abundantly found in their locality are also sold in local markets. Plantation of these fruit yielding plants in home gardens and farm areas has shown its commercial potential and steps for conserving economically significant diverse plants of this hilly region in a sustainable way. Thus the study reveals sustainable utilization of edible fruits by *Tangkhul Naga* Tribe of Ukhrul district, Manipur.

Key words: Edible fruits, *Tangkhul tribe*, Ukhrul, Sustainable, Fruit beer

INTRODUCTION

Ukhrul district which is the main home land of *Tangkhul Naga* tribe, makes its boundaries with the state of Nagaland in the North, Myanmar in the East, Chandel and Senapati districts of Manipur respectively in the South and West. It is situated in the Eastern part of Manipur state, India, covering an area of 4,544 sq km with the population of 1,83,115 (Anonymous 2011) which lies in between 23°13'2" N and 25°6'8" N latitudes and 94°20'2" E and 95°25'2" E longitudes and covering an altitudinal range of 913 m to 3114 m AMSL. The climate of the district is temperate in nature with a minimum and maximum temperature of 3° C to 33° C. The *Tangkhul* people of this region are simple, brave, reliable, generous, sincere and friendly. The majority of the people are agriculturist; rice is the staple food of the people. Mostly they depend on various wild edible plants, which contain necessary food values of a balanced diet. Every household collects wild fruits and maintain the areas where it grows. Among the fruit plants *Docynia indica*, *Myrica esculenta*, *Phyllanthus emblica*, *Prunus cerasoides*, *P. salicina*, etc. are considered as income generating fruits which is used for the preparation of indigenous fruit beer. A very little work has been done on wild edible fruits of Manipur state. Sharma *et al.* (2000) reported edible fruits used by the

Meitei community, and more recently Devi *et al.* (2012) reported edible fruits by *Kabui* tribe of Manipur. However, so far, no such attempt has been made to explore the wild edible fruit plants from this district. In the present paper, therefore, an attempt has been made by the authors to highlight certain unexploited wild fruit plants used by the *Tangkhul* tribe.

METHODOLOGY

In this study, an intensive ethnobotanical survey was conducted since 2011 among the *Tangkhul-Naga* tribe for gathering information on wild edible fruit plants traditionally used by them. At the beginning, mandatory PIC was obtained from the village heads. Along with the information suitable plant specimens were also collected for scientific identification. The authenticity of the uses was repeatedly verified by asking to the different informer. In case of contradictory information, efforts were made to get the correct information. Tribal market (Litan, Lambui, Kamjong, Ukhrul,) were also visited frequently to study the fruits sold there. Collected specimens were processed into mounted Herbarium-sheets following Jain & Rao (1977). The plants were identified with the help of published literature including, Hooker (1872 – 1897), Kanjilal *et al* (1934 – 1940), Singh & Arora (1978). For updated nomenclature and the family delimitation www.theplantlist.org was consulted. One set of herbarium specimens have been deposited in the Herbarium of the Department of Botany, Nagaland University and another set in the Life Sciences Department of Manipur University.

RESULTS

In the present paper, botanical names are arranged alphabetically along with the family, vernacular names and mode of usage by the *Tangkhul* tribe is mentioned and shown in the Table1.

Table 1. Recorded wild edible plants of Tangkhul tribe and their mode of uses

Botanical name [Family]; Exsiccatae	Vernacular name	Habit	Mode of use
<i>Ananas comosus</i> (L.) Merr. [Bromeliaceae]; <i>Salam</i> -505	<i>Chingomthei</i>	Herb	Eaten raw, jelly, juice, fruit beer
<i>Averrhoa carambola</i> L. [Oxalidaceae]; <i>Salam</i> - 962	<i>Heinoujam</i>	Tree	Eaten raw, jam and candy
<i>Calamus tenuis</i> Roxb. [Arecaceae] ; <i>Salam</i> - 977	<i>Mathirathe</i>	Climber	Eaten raw
<i>Choerospondias axillaris</i> (Roxb.) B.L.Burt & A.W.Hill [Anacardiaceae]; <i>Salam</i> -3558	<i>Khursongthei</i>	Tree	Eaten raw
<i>Citrus</i> sp. [Rutaceae]; <i>Salam</i> - 912	<i>Sagomthei</i>	Small tree	Eaten raw
<i>Docynia indica</i> (Wall.) Decne. [Rosaceae]; <i>Salam</i> - 567	<i>Theithukthei</i>	Tree	Eaten raw, roasted, candy, fruit beer
<i>Elaeocarpus floribundus</i> Blume [Elaeocarpaceae]; <i>Salam</i> -906	<i>Fashongthei</i>	Small tree	Eaten raw or cooked, pickles and fruit beer
<i>Ficus semicordata</i> Buch.-Ham. ex Sm. [Moraceae]; <i>Salam</i> -594	<i>Heirit</i>	Tree	Eaten raw, fruit beer
<i>Garcinia pedunculata</i> Roxb. ex Buch.-Ham. [Clusiaceae]; <i>Salam</i> - 919	<i>Theilungthei</i>	Tree	Eaten raw , cooked, dried

Botanical name [Family]; Exsiccatae	Vernacular name	Habit	Mode of use
<i>Juglans regia</i> L. [Juglandaceae]; Salam- 926	<i>Shirangthei</i>	Tree	Dried mature fruits eaten raw
<i>Morus nigra</i> L. [Moraceae]; Salam-1863	<i>Kaharathei</i>	Tree	Eaten raw
<i>Musa x paradisiaca</i> L. [Musaceae]; Salam-516	<i>Mothei</i>	Herb	Eaten raw, fruit beer
<i>Myrica esculenta</i> Buch.-Ham. ex D.Don [Myricaceae]; Salam-1867	<i>Mahuithei</i>	Small tree	Eaten raw, fruit beer
<i>Meyna spinosa</i> Roxb. ex Link [Rubiaceae]; Salam-1857	<i>Theibethei</i>	Tree	Eaten raw
<i>Passiflora edulis</i> Sims [Passifloraceae]; Salam- 550	<i>Sitapor</i>	Twiner	Eaten raw, fruit juice
<i>Phoenix sylvestris</i> (L.) Roxb. [Arecaceae]; Salam- 1883	<i>Khaneithei</i>	Under shrub	Kernel of the ripe fruits is eaten raw
<i>Phyllanthus emblica</i> L. [Phyllanthaceae]; Salam-1866	<i>Shakshathei</i>	Tree	Eaten raw, dried, pickles, fruit beer
<i>Prunus cerasoides</i> Buch.-Ham. ex D.Don [Rosaceae]; Salam-1874	<i>Saharthei</i>	Tree	Ripe blackish fruits are eaten raw
<i>P. napaulensis</i> (Ser.) Steud. [Rosaceae]; Salam- 3529	<i>Theikanthei</i>	Tree	Eaten raw, fruit beer
<i>P. salicina</i> Lindl. [Rosaceae]; Salam- 900	<i>Heikhathei</i>	Tree	Eaten raw, fruit beer
<i>Psidium guajava</i> L. [Myrtaceae]; Salam-554	<i>Pungdonrong</i>	Tree	Eaten raw
<i>Pyrus pashia</i> Buch.Ham. ex D.Don [Rosaceae]; Salam-3531	<i>Lam Kapaithei</i>	Tree	Eaten raw
<i>Rhus chinensis</i> Mill. [Anacardiaceae]; Salam3559-	<i>Khamkhuithei</i>	Tree	Eaten raw, juice, candy
<i>Rubus ellipticus</i> Sm. [Rosaceae]; Salam-3540	<i>Karathei</i>	Shrub	Eaten raw
<i>Syzygium cumini</i> (L.) Skeels [Myrtaceae]; Salam-3566	<i>Chomshathei</i>	Tree	Eaten raw, jam
<i>Tamarindus indica</i> L. [Leguminosae]; Salam- - 3568	<i>Mange</i>	Tree	Eaten raw

During the current survey 25 Angiosperm plant species belonging to 23 genera and 10 families were recorded from different areas and local market of Ukhrul District. Majority of the plants are trees (20 spp.) followed by herbs (2 spp.), shrubs, climbers and under shrubs with one species each. The price of fruits in local markets fluctuate from season to season depending mainly on their availability. Some significant fruits and their fruit beer bottles are shown in Figures1 & 2.

DISCUSSION

In addition to their daily meals, the *Tangkhul* people also mostly taken seasonal fresh fruits after every meal and have significant place in the dietary habits of *Tangkhul* community. Majority of the fruits are freshly consumed while some are taken in the form of pickles, juice, jam, candies, etc. The availability of fruit plants like *Citrus maxima*, *Phyllanthus*

Figure 1. Wild edible fruits used by *Tangkhol* community in the Ukhrul district of Manipur: **A.** *Garcinia pendunculata*; **B.** *Myrica esculenta*; **C.** *Prunus salicina*; **D.** *Prunus napaulensis*; **E.** *Calamus tenuis*; **F.** *Docynia indica*; **G.** *Ficus semicordata*; **H.** *Elaeocarpus floribundus*; **I.** *Meyna spinosa*; **J.** *Rhus chinensis*; **K.** *Passiflora edulis*; **L.** *Phyllanthus emblica*

Figure 2. Locally produced fruit beer available in local markets of Ukhrul district

emblica, *Passiflora edulis*, *P. cerasoides*, *P. napaulensis* etc. in the market is decreasing day by day due to over exploitation and people's increasing demand for daily consumption as well as for the preparation of traditional fruit beer to which these are raw materials. If proper strategies are proposed, including extensive cultivation of these fruit plants, these may become one important industry and will form a profitable part of *Tangkhol* economy. These fruits and fruit beer can also be marketed outside for better income generation. However, government and other local agencies need to come ahead with appropriate strategies.

Conclusion

During the study it was realised that the people of *Tangkhol* tribe has a rich stock of ethnic and traditional knowledge that need to be explored and recorded immediately. Further study in the district may lead to the recognition of many more wild edible fruits used by them. Emphasis must also be laid on the conservation on such plant wealth and their scientific exploitation. Their own knowledge can be their own way of improving the socio-economic conditions of this traditional community.

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LITERATURE CITED

- Anonymous 2011. *Census of Manipur 2011*. Directorate of Census Operations, Government of Manipur.
- Devi, M.R.; Singh, P.K. & Dutta, B.K. 2012. A case study on edible fruits used by the Kabui Naga Tribe of Manipur. *Symposium Proceeding: Biodiversity status & Conservation Strategies with reference to NE India*. CAS in Life Sciences, Manipur University. Pp. 94 – 97.
- Hooker, J.D. 1872 – 1897. *Flora of British India*, Vols. 1-7. L. Reeve & Co Ltd, Ashford, Kent, London.
- Jain, S.K. & Rao, R.R. 1977. *A Handbook of Field and Herbarium methods*. Today and Tomorrow's Printers and Publishers, New Delhi.
- Kanjilal, U.N.; Kanjilal, P.C.; Das, A. & Purkayastha, C. 1934. *Flora of Assam*. Vol. –I, Govt. of Assam, Shillong.
- Kanjilal, U.N.; Kanjilal, P.C. & Das, A. 1936. *Flora of Assam*. Vol. –II, Govt. of Assam, Shillong.
- Kanjilal, U.N.; Kanjilal, P.C. & Das, A. & De, R.N. 1938. *Flora of Assam*. Vol. –III, Govt. of Assam, Shillong.
- Kanjilal, U.N.; Kanjilal, P.C.; De, R.N. & Das, A. 1940. *Flora of Assam*. Vol. –IV, Govt. of Assam, Shillong.
- Singh, H.B. & Arora, R.K. 1978. *Wild Edible Plants of India*. ICAR, New Delhi.
- Sharma, H.M.; Devi A.R. & Sharma B.M. 2000. Contribution to the Edible Fruits of Manipur. In: J.K. Maheshwari (Ed.), *Ethnobotany and Medicinal plants of Indian sub-continent*. Scientific Publishers, Jodhpur, India. Pp. 615 – 623.
- www.theplantlist.org [accessed on 20.05.2019]