

AN ENUMERATION ON SOME OF THE COMMERCIALIZED ETHNO-VEGETABLES PLANTS OF ARUNACHAL PRADESH: A PRELIMINARY STUDY

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Abstract

Arunachal Pradesh is the largest in area-wise amongst the state of North-east India. The state is inhabited by 25 major tribes and more than 106 sub-tribes. Each tribe has its own vast indigenous knowledge on the uses of wild plants. Traditionally, they use wild plants as vegetables, foods, ethno-medicines, etc. It is inferred that these wild vegetables were the rich sources of vitamins, fats, proteins and other biological micro-nutrients for the tribal. This made the tribal healthy and strong. Some of these wild indigenous vegetable plants had taken into commercially important today especially seen in the town and city vegetable markets of Arunachal Pradesh. Increase in human population has increased the demands of wild indigenous vegetables in the market. And as such, no policy has evolved to study the habitats, conservation or cultivation practices and population status by any agencies. In this paper, the author mentioned few prominent indigenous vegetable species that are often sold in and around markets of the twin capital cities of Arunachal Pradesh. The author has also suggested habitat conservation and cultivation in conclusion. In the enumeration, 21 indigenous vegetable plants species are listed.

Keywords: Commercialized; Ethno-vegetables; Wild vegetables

INTRODUCTION

Arunachal Pradesh is the largest state in north east India covering an area of 83,743 sq. km. It is located between 26° 28' N - 29° 31' N latitude and 91° 30' E - 97° 30' E longitude. The state is predominantly mountainous running in east-west direction with varying altitude ranging from 50 msl to 7,060 msl. The state has large number of rivers and tributaries, streams, rivulets forming drainage system. The drainage system provides various types of agro-climatic conditions for growing wild vegetable plants (Haridasan, 2001). There are more than 5500 flowering plants occurring in the state and many new plant species is still reported (Banik et al., 2003). These floras are distributed in over 20 different forest types according to categorization done by Champion and Seth (1968) and Kaul and Haridasan (1987).

The state is inhabited by 25 major Tribes and more than 106 sub-tribes viz. *Adi, Apatani, Aka, Galo, Mishmi, Monpa, Nocte, Nyishi, Tagin, Tangsa, Wancho*, etc. They are mostly agrarian by profession and indispensably dependent on wild or indigenously cultivated plants in their day to day life (Haridasan et al., 2006). Each tribe has its own rich indigenous knowledge on uses of the wild plants (Pal, 1984 and 1992; Nag, 1988). They use wild plants mostly as vegetables, foods, ethno-medicines, for building materials, craft making, ropes, fibres, firewood, etc. It is inferred that the wild vegetables eaten by the tribes of Arunachal served as rich source of vitamins, fats, proteins and others biological micro-nutrients required for development of body. Due to this food habit it has made the tribals of Arunachal Pradesh healthy and strong even without accessing to modern medicine (Kohli, 1983, 1995, 1996a). The wild vegetables like

Houttuynia cordata (Heya), *Solanum nigrum* (Hor), *Plantago major* and *P. minor* (Mip-yaru), *Centella asiatica* (Ngulyikhek), *Clerodendrum colebrookianu* (Poto O, Oyin, Ongin), *Piper pedicellatum* (Rar, Raru), etc. used by the tribal have medicinal values (Nath and Bordoloi, 1989; Rawat and Choudhury, 1998; Gajurel, 2002) and helps in development of immune system.

Now-a-days, traditionally used vegetables have turned into a commercially important in the vegetable markets of Arunachal Pradesh. Some of these wild indigenous vegetable plants like *Diplazium esculentum* (Hoka pada), *Elatostema sessile* (Hopi-hojap), *Houttuynia cordata* (Heya), *Oenanthe javanica* (Babu), *Piper pedicellatum* (Rar, Rare, Raru), *Solanum nigrum* (Hor), *Plantago major* and *P. minor* (Mip-yaru), etc. are often sold in the vegetable markets. It had taken into a commercially important today especially observed in the town and city vegetable markets of Arunachal Pradesh. These vegetables are directly plucked or extracted from natural habitats. Due to increase in population, there is quantum increased in demands of wild indigenous vegetables in the market. And as such no policy has evolved so far for conservation, cultivation, population and habitats study by any agencies. In this paper the author has an insight view on the status of folk or ethno-vegetable plants, its future strategy for conservation, cultivation and commercialization prospects.

METHODOLOGY

The survey has been done in the twin capital city of the state by regular observation on the indigenous edible plants being sold in the markets and also in other important local vegetable markets. Survey was done in Itanagar, Naharlagun and in district headquarters. After several years of surveying,

following mentioned ethno-vegetable plants are sold frequently in the markets and had made a presence felt.

The identification of plant specimens was done by consulting herbarium of State Forest Research Institute (APFH), Itanagar and also from available literature viz. Hooker (1872-97), Kanjilal et al., (1930-34), Panigrahi and Joseph (1966), Deb and Dutta (1971), Chuahan et al, (1996) and Haridasan and Rao (1985-87).

The enumeration provides botanical names arranged in alphabetical order, followed by family name, available local name(s) with tribe, edible part(s) and its habitat conservation status.

1. *Alpinia malaccensis* (Burm.f.) Rose.

[Zingiberaceae]

Local Name(s): Papi, Bolo - Nyishi, Jakar - Galo

Collection period: March - April

The flower buds are collected and made into variety of food items like vegetables, chutney, etc. It grows in moist, shady and partially open forests. No domestication and conservation practice have introduced so far.

2. *Amaranthus spinosus* L. [Amaranthaceae]

Local name(s): Pachu koyu - Nyishi

Collection period: Throughout the year except at flowering and fruiting stage

Young shoots are eaten as vegetable. It grows in *jhum* fallow and abandoned kitchen gardens. No domestication practices have adopted. However, regeneration is vigorous and need not much care.

3. *Cardamine hirsuta* L. [Cruciferae]

Local name(s): Piidii sorum - Nyishi

Collection period: Throughout the year

Usually grows in dump, moist soil, paddy field and in steam bank. Whole plant part is boiled

and eaten as vegetable. As such no cultivation practices has introduced for this plant. It is observed that it needs peculiar natural conditions for proper growth.

4. *Centella asiatica* (L.) Urban. [Umbelliferae]

Local name(s): Ngulyikheq - Nyishi.

Collection period: Throughout the year

Whole plant part is boiled and eaten as vegetable. It is used in various Ayurvedic formulations and also as brain tonic. Usually grows in dump, moist soil, paddy field and in steam bank. It multiplies by runners and no cultivation practice is adopted.

5. *Clerodendrum colebrookianum* Walp.

[Verbenaceae]

Local name(s): Poto - Nyishi, Ongin - Adi, Oyin - Galo

Collection period: February - July

Tender leaves are eaten as vegetable after boil. It is supposed to control high blood pressure. It grows in open forest and *Jhum* fallows. It is widely cultivated by tribal of Arunachal Pradesh due to its valued folk vegetable and medicinal properties.

6. *Diplazium esculentum* (Retz.) Swartz.

[Athyriaceae]

Local name(s): Hoka pada - Nyishi, O taka - Galo

Collection period: Throughout the year

Its tender circinate leaves are used as vegetable. It grows in open disturb forest area. Highly demanded in market by tribal and non-tribal consumers that results in over extraction and dwindling in its population. No cultivation practice has adopted.

7. *Elatostema sessile*. Forst. [Urticaceae]

Local name(s): Hopi-hojap - Nyishi

Collection period: December - April

It is a moist and shade loving succulent herb. Grows in undisturbed moist forest and streams on stones. Its tender leaves are often picked

and eaten as vegetable. There is no cultivation technique available. Need to protect forest coverage for its conservations.

8. *Houttuynia cordata* Thunb. [Saururaceae]

Local name(s): Heya O - Nyishi

Collection period: February - May

Its root, stem and leaves are eaten as vegetable, salad and chutney. It is a primitive, small sized herb and has medicinal properties. It grows well in cool and shady soil. Traditionally, it is not cultivated but because of its importance as folk vegetable, the tribal town dwellers are now cultivating it.

9. *Litsea cubeba* (Lour.) Pers. [Lauraceae]

Local name(s): Sen Teyir - Nyishi; Tayir - Galo

Collection period: April - June

A beautiful medium sized tree, its fruits are eaten directly or used as spices and made into chutney. Over consumption may induce sleepiness. Forest fire, *jhumming* and unscientific extraction are the factors leads to depletion of this plant.

10. *Mussaenda roxburghii* Hook.f.

[Rubiaceae]

Local name(s): Taksap - Galo

Collection period: December - March

A small sized shrub and its tender leaves are used as vegetable by boiling with meat. It grows in shade and open forest area. As such no cultivation practices has adopted but its varieties are cultivated as ornamental plants.

11. *Oenanthe javanica* DC. [Umbelliferae]

Local name(s): Babu - Nyishi

Collection period: December - March

It is a small sized herb found growing banks of streams and rivulets. Whole plant is used as vegetable and salad. There is no adopted cultivation practice.

12. *Phoebe goalparensis* L. [Lauraceae]

Local name(s): Sichir or sangchar - Nyishi, Hiichir - Galo

Collection period: October - December

It is a medium sized beautiful tree and fruits are loved by hornbill. Brownish ripened fruits are eaten by tribal as chutney. It occurs in undisturbed dense forest and presently propagation and plantation is going under Silviculture programme.

13. *Piper pedicellatum* C.DC. [Piperaceae]

Local name(s): Rare, Rar, Raru, Lyer - Nyishi, Rar - Galo

Collection period: March - August

It is a beautiful herb growing under the undisturbed forest or bamboo bracks. Its tender leaves and shoots are boiled and eaten as vegetable. The young shoots are used as medicine to relieve body ache. The population in the natural habitat is depleting fast due to over exploitation even during reproductive period. So far, there is no cultivation technique is developed.

14. *Plantago major* L. [Plantaginaceae]

Local name(s): Mip-yaru - Nyishi, Mipa Hamang - Apatani

Collection period: November - March

A small herb growing in an open area and paddy field. Its tender shoots are eaten as vegetable. There is no domestication practice for this species.

15. *Pilea scripta* (Buch-Ham. Ex D.Don) Wedd. [Urticaceae]

Local name(s): Gugi O - Nyishi

Collection period: December - March

It is a fleshy succulent herb growing in marshy and swampy soil. Its tender leaves are eaten as vegetable. Its habitat needs to be preserved.

16. *Pouzolzia indica* (L.) Gaud. [Urticaceae]

Local name(s): Hoyik - Nyishi, Oyik - Adi & Galo

Collection period: Throughout the year

It is a creeping herb, grows in an open area with other grasses. Its tender shoots are eaten as vegetable. No cultivation practice is adopted.

17. *Sarcochlamys pulcherrima* Gaud. [Urticaceae]

Local name(s): Bola sen - Nyishi

Collection period: Throughout the year

An elegant large shrub with oblong-lanceolate leaves. Its tender shoots are eaten as vegetable by boiling with pork.

18. *Solanum indicum* L. [Solanaceae]

Local name(s): Byak - Nyishi, Bak - Adi & Galo

Collection period: Throughout year

It is a semi domesticated small shrub. Naturally, it grows in an open area and in *Jhum* fallow. Its fruits is boiled and used as vegetable or made into chutney. It is commonly grown in kitchen garden.

19. *Solanum nigrum* L. [Solanaceae]

Local name(s): Hor, Hore - Nyishi, Peta bak - Galo

Collection period: Throughout the year

It is small herb; often found growing in *Jhum* field and an abandoned cultivated field. Its shoots are eaten as vegetable and also used in various Ayurvedic formulations. Due to its valued folk vegetable, it is widely grown in kitchen in town and cities.

20. *Solanum torvum* Swartz. [Solanaceae]

Local name(s): Nyora byak - Nyishi, Bangko - Adi

Collection period: September - November

Commonly growing in an open areas and in abandoned field. Its fruits are used as vegetable after fry or boil. There is no conservation or cultivation strategy developed for this species.

21. *Zanthoxylum oxyphyllum* Edgew. [Rutaceae]

Local name(s): Honyir - Nyishi, Onyor - Galo & Ongeyr - Adi

Collection period: February - November

A small sized tree with prickles present in bottom of stem and leaves. The tender leaves are used as vegetable and its dried fruits are used as spices. It grows in *Jhum* fallow and partially open forest. It is over exploited due to high demand in local market. There is an urgent need of development of cultivation technique.

DISCUSSION

From the above enumeration, it is known that there are various folk vegetables eaten by tribes of Arunachal Pradesh and that are not familiar to non-indigenous people (Murtem, 2000). However, many of folk or ethno-vegetables are now adopted by non-local people due to its medicinal properties like *Clerodendrum colebrookianum* (for pressure), *Houttuynia cordata* (for gastrics and stomache), etc. (Rawat and Choudhury, 1998; Kohli, 1996b). In the above mentioned 21 ethno-vegetable plants; of which in 11 species leaves are used, in 5 species whole plant is used, in 4 species fruits are used and in 1 species flower bud is used. It is observed that only 5 species namely *Clerodendrum colebrookianum*, *Houttuynia cordata*, *Phoebe goalparensis*, *Solanum indicum* and *Solanum nigrum* partially cultivated and rest are extracted from the wild.

It reveals that over exploitation for commercial purposes and habitat destruction may jeopardize the survival of folk vegetables plant species in their natural habitats. We need to conserve our rich natural bio-resources. And planned policy should be made to encourage tribal for cultivation, development of crop calendar etc. Henceforth, proper research and development of cultivation technique of each species; judicious and improvement in

extraction technique will help in conserving these species.

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Alpinia malaccensis (Burm.f.) Rose.



Amaranthus sp.



Clerodendrum Colebrookianum Walp.



Diplazium esculentum (Retz.) Swartz.



Houttuynia cordata Thunb.



Oenanthe javanica DC.



Pouzolzia indica (L.) Gaud.



Plantago major L.



Solanum indicum L. (Solanaceae)



Solanum nigrum L.



Zanthoxylum oxyphyllum Edgew.