

WILD EDIBLE FRUITS OF PALPA DISTRICT, WEST NEPAL

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ABSTRACT

This paper documents the wild edible fruits of tropical and subtropical forest of Palpa District, West Nepal. Thirty-seven plant species under 17 families and 27 genera were identified as wild edible fruit. Over 86% percent of them were trees and shrubs (32 species), 11% herbs (4 species) and the remaining 3% (1 species) woody climbers. Moraceae (9 species), Rosaceae (7 species), Anacardiaceae, Berberidaceae, Combretaceae, Fabaceae, Solanaceae and Rutaceae (2 species each) were the most common families constituting about 75.7% of edible plants. The remaining 24.3% (9 species) of edible plants were distributed among 9 families and 9 genera. A considerable number of wild fruits are sold in market. These are *Aegle marmelos*, *Artocarpus integra*, *Artocarpus lakoocha*, *Choerospondias axillaris*, *Myrica esculenta*, *Phoenix humilis*, *Phyllanthus emblica*, *Prunus persica*, *Pyracantha crenulata*, *Tamarindus indica*, *Terminalia bellirica*, *Terminalia chebula*, *Zanthoxylum armatum* and *Zizyphus mauritiana*. Medicinal uses of some major economically important fruits are also documented.

Keywords: tropical, subtropical forest, medicinal uses, wild fruits, sweet nuggets

INTRODUCTION

Wild edible fruits play an important role in the economy of rural people especially living in the hilly region by providing them food and also in generating side income. They collect the wild edible fruits from forest and sold in market regularly. The rural people have better knowledge of wild edible fruits as they visit the forest regularly and have constant association and dependence on these forests and its products for their livelihood. More often jams, pickles and curry are prepared from these fruits by local people (Maden, 1998). According to Cotton (1997) rural people not only depend on wild plants as sources of food, medicine, fodder and fuel, but also developed methods of resource management, which may be fundamental to the conservation of some of the world's important habitats.

Manandhar (2002) describes the uses of astonishing 1517 kinds of plants belonging to 858 genera and 195 families in his book Plants and People of Nepal. It is equal to perhaps one-fifth of the entire Nepalese flora. He reported 1002 medicinal plants, 651 food plants and 696 plants are used for a rich variety of the other purposes. He also reported that many of the plants have more than one application.

The study of wild edible fruits in Nepal was carried out by Bhandary (1978), Banerji (1995), Shrestha (1983), Bajracharya (1984) and Maden (1998).

MATERIALS AND METHODS

Study area

The study area is located in Palpa district (27°34' to 27°57' N latitudes and 83°15' to 84°22'E longitudes) (fig. 1). The topographical features of study area vary greatly from lowland of north foot of Churiya hill, inner mid-hills with terrace lowlands to high Mahabharat range. The altitude of this district varies from 300 m to 1900 m. It possesses tropical to subtropical types of climate. Throughout the hill regions loams and sandy loams are the most common soil types, both on sloping lands and on alluvial terraces. The majority of the forest soils belong to the brown forest soil category (Singh & Singh, 1992).

Palpa district enjoys a monsoon type of climate with wet summer and dry winter. Maximum percentage of rainfall occurs during the months of June to September. There is monsoon climate with hot, wet summer and mild warm dry winter up to 1000 m; but in the Mahabharat range between 1000 and 2000 m there is a warm temperate monsoon climate with warm and wet summers and cool and dry winters. During summer months (May and June) the maximum temperature is recorded as 28° and 32° C, while in winter months (December and January) the minimum temperature reaches to 4°-9°C. Relative humidity is normally highest during rainy season (June-September), often recorded from 80-87%.

Study areas

Five study areas were selected at different parts in Palpa district for the collection of plants being used as wild edible fruit on the basis of varied altitude and richness of species, which also comprised rich cultural diversity (fig.1).

- (a) Jhumsa area (350 m): Situated about 29 km south to Tansen at the foot of Churiya hill, 10 km north to Butwal, Rupandehi district.
- (b) Styabati lake (872 m): Situated within 25 km south to Tansen.
- (c) Prabas area (850 m.): Situated about 9 km south to Tansen, at the foot of the Shrinagar Dada.
- (d) Tansen area (1150-1370 m): District headquarter and surrounding areas of Palpa district, and
- (e) Shrinagar dada (1440 m): Situated on the west-north of main market of Tansen within two kilometer.

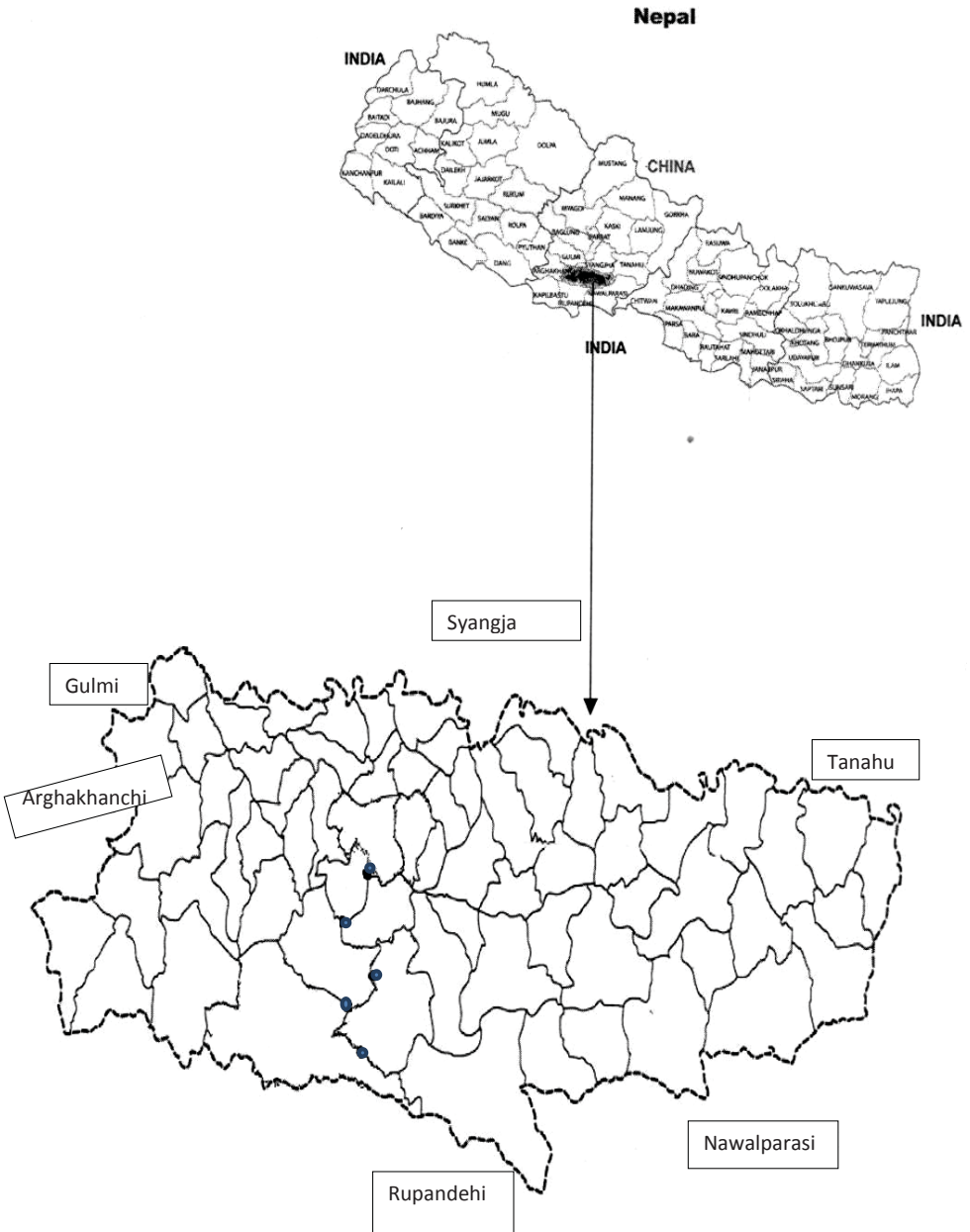


FIG.1. Map of Nepal showing Palpa district in detail.

Plant collection and identification

Plant specimens were collected from their natural habitats in two main seasons, each lasting three to four months at intervals of 15 days. First collection were made during monsoon (June to July) and after monsoon (August to November), because most of the plant flourish during these periods. Second collection was made before monsoon (March to May, 2004 and updated in 2012).

Rural people involved in wild fruit collection and knowledgeable villagers associated with forest are consulted and interviewed to collect the information about the wild edible fruits during the field trips. Ethnomedicinal uses of some economically important plants were collected with help of local healers (Dhami, Jhankari, Guruwa and Vaidya) during the field trips and also with the help of published literature (Mahato & Chaudhary, 2005).

The plant specimens and edible fruits were collected from the natural habitats, tagged properly and fruits were stored in plastic bags. The plants specimens were pressed, following the standard technique (Alexiades, 1996; Cunningham, 2001) for voucher specimen preparation. Some of the specimens were identified in field and those unidentified were identified at the National Herbarium and Plant Laboratories, Godawari and Central Department of Botany, Tribhuvan University, Kirtipur. The voucher specimens were deposited at Central Department of Botany, Tribhuvan University, Kirtipur.

Nomenclature of the plant species follows Hara *et al.* (1978, 1982), Hara & Williams (1979) and Press *et al.* (2000). The local names were noted in the field and also consulting the literature by Shrestha (1998), Grierson & Long (1983), Noltie (1994) were given. The plant species are arranged alphabetically followed by local name, family, growth form (GF), edible parts and fruiting season.

RESULTS

Thirty-seven plant species, distributed among 17 families and 27 genera were identified as wild edible fruits (table 1). Over 86% percent of them were trees and shrubs (32 species), 11% herbs (4 species) and the remaining 3% (1 species) woody climbers. These are *Aegle marmelos*, *Artocarpus integrus*, *Artocarpus lakoocha*, *Bauhinia vahlii*, *Berberis asiatica*, *Cannabis sativa*, *Castanopsis indica*, *Choerospondias axillaris*, *Diospyros malabarica*, *Duchesnea indica*, *Ficus auriculata*, *Ficus benghalensis*, *Ficus glaberrima*, *Ficus racemosa*, *Ficus semicordata*, *Ficus subincisa*, *Fragaria nubicola*, *Maesa macrophylla*, *Mahonia napaulensis*, *Morus serrata*, *Myrica esculenta*, *Phyllanthus emblica*, *Phoenix humilis*, *Prunus persica*, *Pyracantha crenulata*, *Pyruspashia*, *Rhus javanica*, *Rubus ellipticus*, *Rubus paniculatus*, *Solanum nigrum*, *Solanum torvum*, *Syzygium cumini*, *Tamarindus indica*, *Terminalia bellirica*, *Terminalia chebula*, *Zanthoxylum armatum* and *Zizyphus mauritiana*.

Discussion

Thirty-seven species of wild edible fruit were reported in Palpa district. Of them the family Moraceae with 9 species, Rosaceae with 7 species, Anacardiaceae, Berberidaceae, Combretaceae, Fabaceae, Solanaceae and Rutaceae with 2 species each. These were the most important families constituting about 75.7% of edible plants. The remaining 24.3% (9 species) of edible plants were distributed among 9 families and 9 genera. A considerable

number of wild fruits are sold in market for their fruits and medicinal value. These are *Aegle marmelos*, *Artocarpus integra*, *Artocarpus lakoocha*, *Choerospondias axillaris*, *Myrica esculenta*, *Phyllanthus emblica*, *Prunus persica*, *Pyracantha crenulata*, *Syzygium cumini*, *Tamarindus indica*, *Terminalia bellirica*, *Terminalia chebula*, *Zanthoxylum armatum* and *Zizyphus mauritiana* (table 2) .

Fruits of *Choerospondias axillaris* (Lapsi) are widely used in pickles, jam, candy and various kinds of sweet nuggets (Titaura) preparation. Fruits of *Phyllanthus emblica* (Amla) are used in sweets, sauce, pickles and various kinds of sweet nuggets preparation. Similarly, fruits of *Tamarindus indica* (Imali) are used in jam, pickles, sauce and various types of sweet nuggets preparation. These plants (*Choerospondias axillaris*, *Phyllanthus emblica* and *Tamarindus indica*) are employed on commercial level to prepare various kinds of sweet nuggets with different taste. Sweet nugget is sold in local market as well as exported to other parts of the country.

Fruits of *Myrica esculenta* (Kaphal) have characteristic taste and sold in market on large scale by different rural people. Ripe fruits are eaten raw with salt. The walking stick prepared from mature stem of *Pyracantha crenulata* is sold in market. Similarly, the fruits of *Zanthoxylum armatum* are sold in local market by various rural people. These are used as pickles and spices. Thus, the result shows that the wild edible fruits play an important role in the economy of rural people and a large number of people are involved in selling of wild fruits to fulfill their daily needs.

Medicinal uses of some major economically important fruits are also documented. These are *Aegle marmelos*, *Choerospondias axillaris*, *Myrica esculenta*, *Phyllanthus emblica*, *Tamarindus indica*, *Terminalia bellirica*, *Terminalia chebula* and *Zanthoxylum armatum* (table 2). Among them *Aegle marmelos*, *Phyllanthus emblica*, *Terminalia bellirica*, *Terminalia chebula* and *Zanthoxylum armatum* are the most common medicinal plants used in different parts of the district. Fruit of *Aegle marmelos* is used to cure constipation and dyspepsia. One fourth of an unripe fruit is taken orally to cure diarrhoea and root juice is used to cure fever (Mahato & Chaudhary, 2005). Dried fruit of *Phyllanthus emblica* is used to cure diarrhoea. Juice of fresh fruit is taken orally to cure indigestion, jaundice, anaemia and heart complaint (Mahato & Chaudhary, 2005). Roasted fruits of *Terminalia bellirica* are chewed to improve sore throats. They are eaten three times a day for a week to cure cough. Roasted fruits of *Terminalia chebula* are chewed to improve sore throats. They are eaten three times a day for a week to cure cough. Dried fruits of *Phyllanthus emblica*, *Terminalia bellirica*, *Terminalia chebula* are used in the preparation of triphalachuran (powder of three myrobalans) an Ayurvedic medicine used for liver and gastrointestinal troubles. The triphalachuran (powder of three myrobalans) is used throughout the country.

Decoction of fruit of *Zanthoxylum armatum* prepared in a cup of water with salt is taken warm before bedtime to relieve abdominal pain. Powder of fruit is taken orally with warm water to treat constipation, stomach disorder and toothache. These results were compared with Mahato & Chaudhary (2005).

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TABLE 1. Wild edible fruits of Palpa distict.

S.N.	Species	Local name	Family	GF	Edible part	Fruiting season	Elevation
1	<i>Aegle marmelos</i> (L.) Correa	Bel	Rutaceae	T	Fruit	April- September	870 m
2	<i>Artocarpus integra</i> (Thunb.) Merr.	Kathar	Moraceae	T	Fruit	April-June	350 m
3	<i>Artocarpus lakoocha</i> Wall. ex Roxb.	Badahar	Moraceae	T	Fruit	April-June	350 m
4	<i>Bauhinia vahlii</i> Wight and Arn.	Bhoralo	Fabaceae	WC	Seed	June-July	850 m
5	<i>Berberis asiatica</i> Roxb. ex DC.	Chutro	Berberidaceae	S	Fruit	April-May	1300 m
6	<i>Cannabis sativa</i> L.	Bhang	Cannabaceae	H	Seed	April-May	350 m
7	<i>Castanopsis indica</i> (Roxb.) Miq.	Dalne katus	Fagaceae	T	Fruit	November- December	1400 m
8	<i>Choerospondias</i> <i>axillaris</i> Roxb.	Lapsi	Anacardiaceae	T	Fruit	June- October	1200 m
9	<i>Diospyros malabarica</i> (Desr.) Kostel.	Khalluk	Ebenaceae	T	Fruit	December- February	1200 m
10	<i>Duchesnea indica</i> (Andrews) Focke Sarpe	Bhui kaphal	Rosaceae	H	Fruit	March-June	1300 m
11	<i>Ficus auriculata</i> Lour.	Nevaro	Moraceae	T	Fruit	November- December	1300 m
12	<i>Ficus benghalensis</i> L.	Bar	Moraceae	T	Fruit	December- January	850 m
13	<i>Ficus glaberrima</i> Blume	Pakhri	Moraceae	T	Fruit	December- January	870 m
14	<i>Ficus racemosa</i> L.	Dumari	Moraceae	T	Fruit	November- December	1100 m
15	<i>Ficus semicordata</i> Buch. -Ham. ex Sm.	Khanyu	Moraceae	T	Fruit	November- December	1100 m
16	<i>Ficus subincisa</i> Buch.- Ham. ex Sm.	Berulo	Moraceae	T	Fruit	December- January	870 m
17	<i>Fragaria nubicola</i> Lindl. ex Lacaita	Bhuiainselu	Rosaceae	H	Fruit	August- October	1300m

18	<i>Maesa macrophylla</i> A. Dc.	Bhogate	Myrsinaceae	S	Fruit	June-July	1100 m
19	<i>Mahonia napaulensis</i> DC.	Jamane mandro	Berberidaceae	S	Fruit	April-May	1300 m
20	<i>Morus serrata</i> Roxb.	Kimbu	Moraceae	T	Fruit	April-June	1200 m
21	<i>Myrica esculenta</i> Ham. Ex. D. Don	Kaphal	Myricaceae	T	Fruit	March- April	1400 m
22	<i>Phoenix humilis</i> Royle ex Becc. & Hook. f.	Thakal	Palmae	T	Fruit	March-May	350 m
23	<i>Phyllanthus emblica</i> L.	Amla	Euphorbiaceae	T	Fruit	September- November	350 m
24	<i>Prunus persica</i> (L.) Batsch	Aaru	Rosaceae	T	Fruit	July- September	1100 m
25	<i>Pyracantha crenulata</i> (D. Don) M. Roem	Ghangaru	Rosaceae	S	Fruit	July- September	1100 m
26	<i>Pyrus pashia</i> Buch.- Ham. ex D. Don	Mayal	Rosaceae	T	Fruit	September- October	1400m
27	<i>Rhus javanica</i> L.	Bhaki amilo	Anacardiaceae	T	Fruit	September- October	1300 m
28	<i>Rubus ellipticus</i> Sm.	Ainselu	Rosaceae	S	Fruit	March-April	1300 m
29	<i>Rubus paniculatus</i> Sm.	Kalo ainselu	Rosaceae	S	Fruit	August- October	1400 m
30	<i>Solanum nigrum</i> L.	Kamayo	Solanaceae	H	Fruit	Most of the year	350 m
31	<i>Solanum torvum</i> Swartz	Bin	Solanaceae	S	Fruit	August- September	850 m
32	<i>Syzygium cumini</i> (L.) Skeels	Jamun	Myrtaceae	T	Fruit	May-June	350 m
33	<i>Tamarindus indica</i> L.	Imali	Fabaceae	T	Fruit	June-July	350 m
34	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Barro	Combretaceae	T	Fruit	May-June	350 m
35	<i>Terminalia chebula</i> Retz.	Harro	Combretaceae	T	Fruit	May-June	350 m
36	<i>Zanthoxylum armatum</i> Dc.	Timur	Rutaceae	S/T	Fruit	May- October	870 m
37	<i>Zizyphus mauritiana</i> Lam	Baer	Rhamnaceae	S/T	Fruit	January- February	350 m

Abbreviation used in table 1. GF- Growth Form; H- Herb; S- Shrub; T-Tree; WC- Woody Climber

TABLE 2. Some of the major economically important fruits and their uses.

Species	Local Name	Uses
<i>Aegle marmelos</i>	Bel	Ripe fleshy part of fruit is eaten. In summer season sarabat is made from its edible fleshy part of fruits. Medicinal uses Root juice is used to cure fever. Half of a ripe fruit is eaten twice a day for 3-4 days to cure constipation and dyspepsia. One fourth of an unripe fruit is taken orally to cure diarrhoea and root juice is used to cure fever (Mahato & Chaudhary, 2005).
<i>Artocarpus integra</i>	Katahar	Ripe fleshy part of fruit is eaten. Raw fruits are eaten as vegetable and pickles.
<i>Artocarpus lakoocha</i>	Badahar	Ripe fleshy part of fruit is eaten.
<i>Choerospondias axillaris</i>	Lapsi	Ripe fleshy part of fruit is eaten. Its fruit is used in jam, pickles, candy and various kinds of sweet nuggets preparation. Medicinal uses Ash of seeds mixed with coconut oil is used to cure wounds and burns. Seeds are also used to remove cough.
<i>Myrica esculenta</i>	Kaphal	Ripe fruit is eaten with salt. Medicinal uses Bark decoction is used to cure diarrhoea, dysentery and chronic bronchitis (Mahato & Chaudhary, 2005).
<i>Phyllanthus emblica</i>	Amla	Its fruit is used in sweets, sauce, pickles and various kinds of sweet nuggets preparation. Medicinal uses Powder of dried fruit (two teaspoonfuls) is given twice a day for 7 days to cure diarrhoea and dysentery. About two teaspoonfuls juice of fresh fruit is taken orally twice a day for 15 days to cure indigestion, jaundice, anaemia and heart complaint. Dried fruit is used in the preparation of "Triphala" (powder of three myrobalans), an Ayurvedic medicine used for liver and gastrointestinal troubles (Mahato & Chaudhary, 2005).
<i>Prunus persica</i>	Aaru	Ripe fleshy part of fruit is eaten. Its fruit is used in jam and pickles preparation.
<i>Pyracantha crenulata</i>	Ghangaru	Ripe fruit is eaten. Its mature stem is used in walking stick preparation and sold in market.
<i>Syzygium cumini</i>	Jamun	Ripe fruit is eaten. Wood is used in furniture preparation.

<i>Tamarindus indica</i>	Imali	<p>Its fruit is used in jam, pickles, sauce and various types of sweet nuggets preparation.</p> <p>Medicinal uses</p> <p>Juice of ripen fruit is taken for 7 days for abdominal cooling property and digestive effect (Mahato & Chaudhary, 2005).</p>
<i>Terminalia bellirica</i>	Barro	<p>Fleshy part of fruit is eaten raw.</p> <p>Medicinal uses</p> <p>Two roasted fruits are chewed twice a day for 3 days to improve sore throats. They are eaten three times a day for a week to cure cough. It is one of the constituents of "Triphala"(powder of three myrobalans)which is used in liver and gastrointestinal troubles.</p>
<i>Terminalia chebula</i>	Harro	<p>Fleshy part of fruit is eaten raw.</p> <p>Medicinal uses</p> <p>Two roasted fruits are chewed twice a day for 3 days to improve sore throats. They are eaten three times a day for a week to cure cough. It is one of the constituents of "Triphala" (powder of three myrobalans) which is used in liver and gastrointestinal troubles.</p>
<i>Zanthoxylumarmatum</i>	Timur	<p>Fruit is eaten raw. It is mainly used as pickle and spices.</p> <p>Medicinal uses</p> <p>Decoction of fruit prepared in a cup of water with salt is taken warm before bedtime for 2-3 days to relieve abdominal pain. Powder of 2-5 fruit is taken orally twice a day for 7 days with warm water to treat constipation, stomach disorder and toothache (Mahato & Chaudhary 2005).</p>
<i>Zizyphusmauritiana</i>	Baer	<p>Matured and ripe fruit is eaten raw.</p>