

UNDERUTILIZED WILD EDIBLE FRUITS OF NUTRITIONAL AND MEDICINAL VALUE

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Abstract: Wild edible fruits can contribute significantly to the nutrition of rural inhabitants. Although these fruits can be consumed by people throughout the year in fresh and dried forms, reliance on these edible fruits increases during periods of cereal shortages. Wild edible foods include fruits, leaves, flowers and seeds from spontaneous trees and shrubs. Of these, fruits are receiving increase interest on wild edible plant species because of their nutritional value, vitamin and mineral contents. There are many wild edible fruits which are unknown despite their nutritional and medicinal values therefore, to explore the better utilization of medicinal value wild fruits tree species, the present check list has been compiled from the observation made by the authors as well as reports in literature. Some of the striking examples are *Artocarpus lakoocha*, *Aegle marmelos*, *Annona squamosa*, *Artocarpus heterophyllus*, *Artocarpus lakoocha*, *Averrhoa carambola*, *Carissa carandas*, *Cordia dichotoma*, *Eugenia jambos*, *Feronia limonia*, *Ficus palmata*, *Ficus roxburghii*, *Grewia subinaequalis*, *Manilkara hexandra*, *Moringa oleifera*, *Morus indica*, *Pithecellobium dulce*, *Schleichera oleosa*, *Spondias mangifera*, *Syzygium cumini*, *Tamarindus indica*, *Ziziphus mauritiana* etc. In the present paper some of the less known less utilized wild fruits tree species of medicinal value belonging to different families are dealt with. Biodiversity of all these species need to be conserved in well known about their uses in an organized manner to save them from extinction in the near future.

Keywords: Ayurveda Medicinal Fruits, Wild fruits, nutritional value, biodiversity, conserved, extinction, Therapeutic utility, Ayurveda, Siddha, Review, Traditional Medicine.

Introduction

Wild edible plants play a major role in meeting the nutritional requirement of the rural population. The use of wild plants by human as a source of food is in practice since time immemorial. During early civilization, before agriculture was practiced, man lived by hunting and fruit gathering collected from the wild. As such, most tribals still depend on wild fruit bearing plants for food, medicine and nutritional supplement. India harbours great diversity of flowering plants; among which many are fruit plants, and have great economic potential for the rural people.

Fruit plants provide huge opportunity for community development and livelihood improvement. It is felt that the abundance of such fruit plants in the wild habitat can be commercially cultivated with ease. In such cases, nutritionally rich fruit products in the form of jam, jelly, juice, pickle can be manufactured to generate income for poor rural people and reduce their economic and livelihood burden.

Fruits, leaves, nuts, gums, mushrooms, roots, tubers etc. from forest are important sources of food. Forests fill the gap in hungry season by supplying food during seasonal shortage periods and act as emergency food in times of drought or other crises. Fruit growing is playing an extraordinary role in the prosperity of many countries. There are many examples where the economy of a country is solely dependent on fruit culture eg. pineapple in Hawaii, banana in West Indies, oranges in Florida state of USA (Tomar and Kumar, 2012).

Like many developing countries, India has nutritional problems. The food on which the majority of Indians feed lacks essential nutrients. Consequently, many people especially children suffer from malnutrition. Reddish, Yellow and orange fruits provide carotene and many contain folic acid, calcium, iron, vitamin C and anthocyanins (UNICEF, 1998; McCance and Widdowson, 1991). Fortunately, India is endowed with many varieties of such

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Table-1. Underutilized Wild Edible Fruits Plants

S. No	Botanical Name	Common Name	Family	Flowering and Fruiting	Nutritional Value	Medicinal Uses	Reference
1.	<i>Aegle marmelos</i> , Corr.	Bael	Rutaceae	Fl: May-June Fr: Dec-May	Carbohydrate, protein, fat, fibre, Ca, P, K Vitamin A, B ₁ , B ₂ and C Amino Acids, 137K.cal	Constipation, diarrhea and dysentery.	H.H. Chandrakant <i>et al.</i> , 2012; K.K. Chaudhuri <i>et al.</i> , 2007 ; Sanjay Basumatary <i>et al.</i> , 2013
2.	<i>Ammona squamosa</i> L.	Sitaphal/ Sharifa	Annonaceae	Fl: April-May Fr: July-August.	Fe, Ca, Mg, fibre, Vitamin A, B ₅ and C quannocinin	antidiarrheal, and antidycentric	H.H. Chandrakant <i>et al.</i> , 2012
3.	<i>Artocarpus heterophyllus</i> Lam	Kathal	Moraceae	Fl: February to March Fr: July to September	Carbohydrate, protein, Fat, Fibre, Vitamin A, B ₁ , B ₃ and C Ca, P, K Na and 100K.cal	Coolant, aphrodisiac and antiscorbatic	Chopra <i>et al.</i> , 1999, H.H. Chandrakant <i>et al.</i> , 2012
4.	<i>Artocarpus lakoocha</i> Roxb	Barhal	Moraceae	Fl: Feb-March Fr: July-August	Protein, minerals and Vitamin C.	Antibacterial and antioxidant properties	Chopra <i>et al.</i> , 1999; Sanjay Basumatary <i>et al.</i> , 2013; H.H. Chandrakant <i>et al.</i> , 2012
5.	<i>Averrhoa carambola</i> Linn.	Anrakh	Averrhoaceae	Flowering continues throughout the year and fruit is available most of the year.	Carbohydrate, protein, fat, Vitamin, A, B ₃ , B ₅ , B ₆ , C and K, P, K, Zn and 31 K.cal	Coolant and used in Eczema. Treatment of jaundice	H.H. Chandrakant <i>et al.</i> , 2012; Sanjay Basumatary <i>et al.</i> , 2013
6.	<i>Carissa carandas</i> Linn.	Karounda	Apocynaceae	Fl: April-June Fr : Winter season	Carbohydrate, protein, fats, fibre, Vitamin, B ₁ , B ₃ , B ₅ , C, Ca, Fe, P Anthocyanin and 68 K.cal	Coolant, appetizer, skin diseases and scabies.	H.H. Chandrakant <i>et al.</i> , 2012
7.	<i>Cordia dichotoma</i> Forster f.	Lasoor	Boraginaceae	Fl: Mar-April Fr: July- Aug	Na, K, Ca and poor in other nutrients.	Indigestion and throat problems, treating anxiety and eczema.	Prachi <i>et al.</i> , 2012; L. Rasingam 2012; H.H. Chandrakant <i>et al.</i> , 2012.
8.	<i>Eugenia jambos</i> L.	Gulab Jamun	Myrtaceae	Fl :Feb -April Fr : June -July	Protein, fat, Ca, Fe, Mg, P, K, Na, Vitamin A B ₁ , B ₂ , B ₃ , B ₅ , B ₆ and C and 6 K.cal.	Eczema, malaria, respiratory disorders and infection diseases.	Aina, 2009 ; H.H. Chandrakant <i>et al.</i> , 2012
9.	<i>Feronia limonia</i> L.	Kaitha	Rutaceae	Fl :May -June Fr: Nov- Dec	Carbohydrate, protein, beta-carotene, Vitamin A, B ₁ , B ₂ and C and 140 K.cal.	Diarrhea and dysentery, tumors, asthma, wounds, cardiac debility and hepatitis.	H.H. Chandrakant <i>et al.</i> , 2012
10.	<i>Ficus palmata</i> Forsk.	Phedu, bedu	Moraceae	Fl : March-April Fr: June-July	Carbohydrate, sugar, pectin, Vitamin C, Ca, P, K, Mg, Fe.	Used in gastrointestinal, hypoglycemic, insulinase, anti tumour, anti -ulcer, antidiabetic, lipid lowering and antifungal activities.	Chopra <i>et al.</i> , 1999 ; Shah, 2007
11.	<i>Ficus roxburghii</i> Wall.	Gular	Moraceae	Fl : March-April Fr: June-July	Carbohydrate, sugar, pectin, Vitamin C, Ca, P, K, Mg, Fe.	Hyperactivity.	Chopra <i>et al.</i> , 1999 ; Shah, 2007, Deorani and Sharma, 2007
12.	<i>Grewia subinaequalis</i> Lin.	Phalsa	Tiliaceae	Fl: Feb-March Fr: May -June.	Protein, Mineral and Vitamin C	Urinary disorders	H.H. Chandrakant <i>et al.</i> , 2012

Table-1. Continued

Continued from Table-1. Underutilized Wild Edible Fruits Plants (Table-1 pg 2 of 2)

S. No.	Botanical Name	Common Name	Family	Flowering and Fruiting	Nutritional Value	Medicinal Uses	Reference
13.	<i>Martikara hexandra</i> (Roxb.)Dub.	Khirani	Sapotaceae	Fl: Dec-Apr. Fr: April	Protein, Fibre, Calcium, Phosphorous, Iron, Vitamin A and C	Coughs, colds and diarrhea. Useful to expel bladder and kidney stones. A paste of the seeds is applied on stings and bites from venomous animals. The latex is used in the tropics as a crude filling for tooth cavities.	Aima, 2009
14.	<i>Moringa oleifera</i> Lam.	Sahjan	Moringaceae	Fl: January to March. Fr: April to June	Carbohydrates, fat, protein, Vitamin B1, B2, B3, B5, B6 and Vitamin C. Ca, Fe, Mg, K, Na, Zn	Headache, cough, sex stimulant.	Prachi et al., 2012; L. Rasingam, 2012.
15.	<i>Morus indica</i> L.	Sahtoot	Moraceae	Fl: January to February Fr: March to April	Carbohydrate, protein, sugar and fats. Ca, Fe, Mg, K, Zn and Vitamins A, B1, B2, B6, C	To strengthen liver, useful in fever and cold.	Kanjilal, 2004
16.	<i>Phytocelllobium abulee</i> Roxb.	Jungle Jalebi	Fabaceae	Fl: March-April Fr: June	Proteins, fatty acids and essential elements, Zn & K. Amino acids.	Antimicrobial, astringent, and anti-inflammatory.	Kanjilal, 2004
17.	<i>Schleichera oleosa</i> (Lou.) Oken	Kusum	Sapindaceae	Fl: March -April Fr: July-Aug	Proteins, fibre, calcium, phosphorous	Analgesic, antibiotic against dysentery. Its oil is used for cure of itch, acne, burns and other skin problems. Also good for hair growth.	Negi et al., 2007; L. Rasingam 2012.
18.	<i>Spondias mangifera</i> Kurz.	Amara	Anacardiaceae	Fl: Feb-March Fr: Sept-Nov	Carbohydrate, protein, sugar, fiber, fat, Vitamin, A, B ₁ , B ₂ , B ₃ , B ₆ , B ₉ , C, Ca, Fe, Mg, P, K, Zn and 65 K.cal	Skin diseases, gastrointestinal disorders.	Sanjay Basumatary et al., 2013
19.	<i>Syzygium cumini</i> (L.) Skeel.	Jamun	Myrtaceae	Fl: March -May Fr: June-July	Protein, fat, Ca, Fe, Mg, P, K, Na, Vitamin A B ₁ , B ₂ , B ₃ , B ₆ and C and 6 K.cal	Dysentery, anti-ementic diabetes.	Chopra et al., 1999, Sanjay Basumatary et al., 2013 Tiwari et al., 2012
20.	<i>Tamarindus indica</i> L.	Imli	Fabaceae	Fl: May -June Fr: 9-10 months after flowering	Carbohydrate, Protein, fats, fiber, Vitamin A, B1, B2, B3, and C Cu, K, Ca, Fe, Se, Zn, Mg, limonene, geraniol, cinnamic acid, pectin and tannins and 239 K. cal.	Helpful in spleen problems, to reduce obesity.	Prachi et al., 2012; Sanjay Basumatary et al. 2013
21.	<i>Ziziphus mauritiana</i> Lam.	Ber	Rhamnaceae	Fl: July -Nov Fr: March -April	Carbohydrates, sugars, fiber, fat, protein, Vitamin B1, B2, B3, Ca, Fe, P and 5.92 K. cal.	Chicken pox and measles.	Sanjay Basumatary et al., 2013

indigenous food plants (WWF, 1993) that have an outstanding potential to alleviate nutritional deficiencies among vulnerable groups. Unfortunately, utilization of indigenous food plants has steadily declined mainly due to lack of knowledge of their nutrient value, resulting from limited research done (Kiremire *et al.* 2002).

These fruits are further threatened by population pressure and man's activities like clearing of forested areas to set up farmlands. A large proportion of Indians cannot afford to produce of by exotic fruits, due to input costs and price implications. This could partly be responsible for the observed high malnutrition especially in micronutrients. Hence wild fruits can also be potential food supplements so as to increase quality of daily food for the rural population (Glew, 2005). Many workers carried out work on wild edible fruits like Bist and Sharma (2005), Mengistu and Hager (2008), Nitzela, *et al.* (2007) Rashid *et al.* (2008), Sankaram, *et al.* (2006), Upadhye, *et al.* (1994), Wehmer (1996) and Tomar and Kumar (2012).

In the present paper some of the underutilized wild edible fruits of nutritional and medicinal value belonging to different families are dealt with.

Results and Discussion

First hand information collected on their vernacular names and plant parts used were documented and given in Table 1. (Figure 1-21) The present check list has been compiled from the observation made by the authors as well as reports in literature.

Research on wild fruits species is intended to promote the preservation of these twenty one species, presently under threat. In addition to their nutritional value, the preservation of these underutilized fruits also has economical advantages. These species population are fast declining because there has always been a trend of research on few favoured edible fruits trees in India. This has resulted in the neglect of other wild fruit species which have immense untapped commercial potential but are not well documented. Some of these fruits are of great importance due to their medicinal properties. Due to

our ignorance, the processing industries have interest only in conventional fruits and vegetables. Although these fruits can also be consumed by people throughout the year in fresh and dried forms.

In case of fruit crops, only few crops are commercially cultivated, there is no proper collection, improvement and agro-techniques for these crops. These fruits trees can be potential food supplements so as to increase quality of daily food for the rural population. An attempt can be made to utilize these wild fruits as a source of income, particularly for poor rural inhabitants and unemployed youths by making a variety of edible products from the wild edible fruits. With little efforts they can be semi-processed locally for supply to food industry. The medicinal values of these fruits have additional attraction and there is a tremendous scope for its further exploration. Well known tonics and appetizers have further scope of their popularity. These wild fruits can also be main ingredients. There is a need to conduct scientific studies to validate the traditional claims.

Conclusion

From the present documentation it is evident that, further studies to find more underutilized fruits is an urgent necessity, which will definitely enrich the fruit basket. Underutilized wild fruits provide nutrition for the forest dwellers and many of the marginalized rural communities since the common cultivar fruits are costly and unaffordable for them. Advocacy of wild edibles can definitely provide the economic support to the rural people. The current status of underutilised fruit plants calls for an urgent need of research and development effort for its conservation, bioprospection and sustainable utilization.

This will also helpful in further investigation of other underexploited potential of underutilized edible fruits. As a result, it may open avenues of opportunity for scientific validation creating awareness and improving the economy of ethnic community.

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Figure 1: *Aegle marmelos* Corr. (Bael),
Figure 3: *Artocarpus heterophyllus* Lamk (Kathal),
Figure 5: *Averrhoa carambola* Linn. (Amrakh),
Figure 7: *Cordia dichotoma* Forster f. (Lasoor),

Figure 2: *Annona squamosa* L. (Sharifa),
Figure 4: *Artocarpus lakoocha* Roxb (Barhal),
Figure 6: *Carissa carandas* Linn. (Karounda),
Figure 8: *Eugenia jambos* L. (Gulab Jamun)



Figure 9: *Feronia limonia* L. (Kaitha),
Figure 11: *Ficus roxburghii* Wall.(Gular),
Figure 13: *Manilkara hexandra* (Roxb.) Dub (Khirmi),
Figure 15: *Morus indica* L.(Sahtoot),
Figure 10: *Ficus palmata* Forsk. (Phedu),
Figure 12: *Grewia subinaequalis* Linn.(Phalsa),
Figure 14: *Moringa oleifera* Lam. (Sahjan),
Figure 16: *Pithecellobium dulce* Roxb.(Jungle Jalebi)



Figure 17: *Schleichera oleosa* (Lou) Oken (Kusum)

Figure 18: *Spondias mangifera* Kurz. (Amara)

Figure 19: *Syzygium cumini* (L).Skeel. (Jamun)

Figure 20: *Tamarindus indica* L. (Imli)

Figure 21: *Ziziphus mauritiana* Lam. (Ber)

Conflicts of Interest

The authors declare no conflict of interest.

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