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Medico ethnobotany and potential of some underutilized fruits of Sonbhadra district, Uttar Pradesh

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Abstract

The present article reveals the potential of underutilized fruits as well as awakening the consciousness for health and nutritional aspect when added to the food basket. The fruits like aonla, jamun, chironji, kamrak, chakotra and many more are not only highly rich in vitamins, minerals and dietary fibers but also are good source of livelihood for tribals and people living in rural areas. About 36 to 40 percent of the geographical area of Sonbhadra district is covered with dry mixed deciduous forest inhabiting several valuable tree species and medicinal plants. The forest is source of livelihood for many tribals living in that area and they are dependent on it for food, medicine and shelter. Some plants whose fruits are underutilized in urban areas but are of much use in areas where tribals are living are *Aegle marmelos* (L.) Corr, *Alangium salviifolium* L.f. (Wangerin), *Annona squamosa* L., *Atrocarpus lakoocha* Roxb., *Averrhoa carambola* L., *Carissa carandas* L., *Cordia dichotoma* G. Frost., *Feronia limonia* L. Swingle, *Grewia asiatica* L. etc. These plants are boon for tribals and rural people since they are very good source for food and medicines and can combat malnutrition. Bringing into light about these plants may help in understanding outstanding potential to mitigate nutritional deficiencies among vulnerable group. These plants products especially fruits are threatened by rising population due to clearing forest and converting them to farmlands.

Keywords: Underutilized fruits, nutritional value, medicinal plants, malnutrition

Introduction

India is called as botanical garden of the world. The use of plants as a source of livelihood, food, medicine and cattle feeding is in practice from time immemorial. All the food originated in wild from spontaneous vegetation. The fruits have received larger attention due to its nutritional value and taste. The farmers grow many fruit crops commercially and these are widely accepted all over the world for adding nutrition to the food bowl and revenue in pocket. Underutilized refer to species whose potential has not been realized. They may be growing in wild or less cultivated because they are found not competitive with plants which are grown for food supply, medicines supply etc. It has been very crucially observed that many underutilized fruits of plants play a major role in meeting the nutritional requirement of rural population living in the remote area.

Due to low dietary diversity large part of the population of Asian countries are sufferers of malnutrition. There is also emphasis on production of commercial fruit crops due to which the potential of wild growing and wide variety of underutilized crops, consumed locally are neglected. The abundance of such fruit plants in wild habitat are the source of livelihood and also add large nutritional benefit to the tribals and rural. A variety of underutilized crops which are not gaining attention commercially, nor traded on the large scale, are grown, commercialized and consumed locally (Meena *et al.*, 2022) [37].

In the current global hunger index (GHI), India secures 101 ranks of 116 countries which presents a gloomy situation in combating malnutrition affecting the socio-economic progress (Grebmer *et al.*, 2020) [11]. Therefore, 195 nations have decided to adopt sustainable development goals (SDG) for addressing the serious malnutrition problems with holistic approach by the year 2030 (Anonymous, 2016) [3]. Indigenous fruit crops prove to be superior because of adaptability to environmental conditions and for their nutritional value (Berwal *et al.*, 2021) [5]. It has been found that research has been neglected in this field for developing the production protocols and utilization of the underutilized fruit species.

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Several workers did a lot on traditional and medicinal use of plants of different families across the India including Rao (2021) [23], Jafri and Mishra (2022) [12], Mughal and Sheikh (2022) [17], Lal Mohan (2022) [15] and so on.

The district Sonbhadra is second largest district by area of Uttar Pradesh. It is the valley of river Son and Belan. The district lies in Vindhyan Plateau between 23° 45' to 24° 34'N latitude and 82° 45' to 83° 23'E longitude and elevation above the mean sea level ranges between 315m to 485m (Singh, 1991) [31]. The district Sonbhadra is rich in forest which covers about 70% of its total geographical area, which is tropical dry deciduous type. This area is inhabited by several tribes such as Gond, Mushar, Bhil, Agariya, Baiga, Bhuiya, Chero, Kharwar, Panika, Pahariya and Patari (Singh *et al.*, 2002) [29].

In general tribal and people from rural areas across the country are well acquainted with the use of ethnomedicines (Sharma and Pareek, 2021; Prakash and Verma, 2021) [28, 21]. The tribes of Sobhadra district have great knowledge of medicinal value that strengthens their link to natural world. During the course of ethnobotanical survey on tribals and rural inhabitants of Sonbhadra district useful information were gathered about the medicinal use and potential of the fruits which are underutilized. The information is gathered by adivasis like Kol, Gond, Musher, Baiga, Saharia, Kharwar and rural. There are many underutilized fruits which can be consumed fresh and also have large number of medicinal importance. The present paper enumerates the potential and ethnomedicinal importance of 15 underutilized fruit crops of Sonbhadra district, which is represented in table 1.

Table 1: Ethnobotanical and Potential uses of Underutilized Fruit Crops

S. No.	Botanical name & Family	Local Name	Ethnomedicinal use	Pharmacological constituent	Value addition
1.	<i>Aegle marmelos</i> (L.) Corr. Rutaceae	Bel	The pulp is mixed with jaggery and given to treat dysentery.	Coumarins, alkaloids, sterols, essential oils (Neeraj and Johar, 2017) [18]	Powder, nectar, toffee, candy (Dashora, 2017) [7]; wine, (Tomar <i>et al.</i> , 2022) [34]
2.	<i>Alangium salvifolium</i> L. f. (Wangerin) Cornaceae	Akola	Bark is mixed with warm milk and applied for pain relief in rheumatism.	Alangine, ankorine, tubulosine, alangicine and salocin (Tomar <i>et al.</i> , 2022) [34]	soup
3.	<i>Annona squamosa</i> L. Annonaceae	Sitaphal	Powdered seed is mixed with oil and applied to remove lice. Root is tied on the neck to treat epilepsy.	Phenolics, acetogenins, saponins, flavonoids, alkaloids, glycosides (Liu <i>et al.</i> , 2015; Senthil and Silambarasan, 2015) [16,27]	Perfume, soap, essential oils, hair lotions, massage oils, foot care cream (Zahid, 2018) [35]
4.	<i>Atrocarpus lakoocha</i> Roxb. Moraceae	Barhal	The fruit is given in case of loss of appetite.	Amyrin acetate, lupeol (Sitorus <i>et al.</i> , 2022) [32]	Chips, Soup.
5.	<i>Averrhoa carambola</i> L. Averrhoaceae	Kamrak	The fruit is given for deworming.	Oxalic acid and vitamin C (Lakmal <i>et al.</i> , 2021) [13]	Syrup, wine, candies
6.	<i>Carissa carandas</i> L. Apocyanaceae	Karonda	Crushed fruit is mixed with jaggery and given to treat constipation.	Vitamin C, Calcium, Magnesium, Potassium, flavonoids, steroids, carbohydrates, alkaloids (Panda <i>et al.</i> , 2014) [19]	Pickles, chutney, jellies, syrups, candies. Natural food colorant (Singh and Singh, 1998) [30]
7.	<i>Cordia dichotoma</i> G. Forst. Ehretiaceae	Lasora	The paste of the fruit is applied on the wound in case of leprosy.	Pyrrolizidine alkaloids, coumarins, flavonoids, saponins, terpenes, sterols (Jamkhanda <i>et al.</i> , 2013)	Candy, pickle.
8.	<i>Feronia limonia</i> L. Swingle Rutaceae	Kainth	The fruit is boiled in water and the extract is given to treat dysentery.	Essential oil, flavonoids, phenols, tannins, glycosides, saponins, gum. (Panda <i>et al.</i> , 2013) [20]	Wine, Jam
9.	<i>Syzygium cumunii</i> (L.) Skeels. Myrtaceae	Jamun	The dried seeds are given in case of diabetes.	Anthocyanins, myricetin, isoquercetin, glucoside, kaemferol (Sagrawat <i>et al.</i> , 2006) [26]	Brandy and distilled liquor Jambava (Dastur, 1943) [8]; Squash, Jam, juice.
10.	<i>Ziziphus nummularia</i> Burm.f. Rhamnaceae	Jharber	The paste of leaves are applied with <i>Curcuma longifolia</i> (haldi) to heal wounds.	Triterpenoids, alkaloids, saponins (Kumar <i>et al.</i> , 2011) [14]	Essential oil
11.	<i>Madhuca longifolia</i> (J.Konig) J.F.Macbr. Sapotaceae	Mahua	Oil extract from fruit is used for relief in arthritis.	Vitamin A, Vitamin C, Oleanic acid, aspinasterol, α amyryrin acetate, glycine, alanine, cysteine, leucine, isoleucine (Fowler <i>et al.</i> , 1920; Awasthi and Mitra, 1968; Roy <i>et al.</i> , 2010, Agarwal <i>et al.</i> , 2011; Roy <i>et al.</i> , 2008) [9, 4, 24, 1, 25]	Wine, Brandy, Sweets
12.	<i>Morus alba</i> (L.) Moraceae	Shahtut	Juice is given to treat diabetes.	Ascorbic acid, Folic acid, Vitamin B and D, succinic acid, tartaric acid, alkaloids, methyl-ethyl acetaldehyde (Anonymous, 1952)	Herbal tea, juice, natural dyes
13.	<i>Moringa oleifera</i> Lam. Moringaceae	Shahjan	Tender pods are crushed, boiled and given as calcium supplement.	Alkaloid, sirochin, moringene, moringinine (Bhattacharya <i>et al.</i> , 2018) [6]	Tea, Juice, leaf powder, pickle.

			Oil is applied in the case of arthritis.		
14.	<i>Phyllanthus emblica</i> L. Phyllanthaceae	Amla	Juice is given for gastrointestinal problems.	Lupine type triterpenoids (Ramasamy <i>et al.</i> , 2012) [22], Antioxidants like mallotusin, isomallotusin, isostrictinin, mallonin, phyllembilin, cinnamic acid, chebulagic acid (Ahmad <i>et al.</i> , 2021) [2]; Vitamin C (Bajgai <i>et al.</i> , 2006) [36] and some other vitamins as carotene, niacin, riboflavin, thiamine (Ghosal, 1996) [10]	Candy, jam, pickle, juice (Tomar <i>et al.</i> , 2022) [34]
15.	<i>Grewia asiatica</i> L. Malvaceae	Phalsa	Fruit juice is mixed with jaggery are given to treat fever.	Flavonoids, tannins, amino acids, vitamins, anthocyanin (Swain <i>et al.</i> , 2023) [33]	Juice, powder, candies, wine.

Conclusion

Underutilized fruit crops have multipurpose utilities like they can be used as ornamentals, for fencing, wind break, shelter tree, forest restoration etc. Natural farming, a centrally sponsored scheme also aims to promote cultivation of crops and fruit species. There should be development of policies providing monetary support and incentives for on-farm conservation and utilization of indigenous underutilized fruit plants. Training about value addition, technology adoption, packaging practices should be given to rural and tribals.

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