

Review Article

Nutritional Value and Medicinal Uses of Minor Fruits: Burmese Grape (*Baccaurea ramiflora* Lour.)

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Abstract: This review paper discusses the multipurpose uses of minor fruit Burmese grape (*Baccaurea ramiflora* Lour.). Burmese grape is a tree of tropical region of South East Asia mainly grown in Nepal, Bangladesh, Thailand, Myanmar, Indonesia, India and Malaysia. The Burmese grape pulp contents high amount of vitamins and minerals. The fruit is a rich source of pectin. This underutilized fruit used to prepare jam, jelly and wine. The bark, roots and wood are used to prepare medicines.

Keywords: Burmese Grape, Underutilized Fruit, Medicinal Value, Importance

1. Introduction

Baccaurea ramiflora Lour., syn. *Baccaurea sapida* (Roxb.) Muell. Arg. known as Burmese grapes belongs to the family Euphorbiaceae and is native to Southeast Asia. The Asian region is rich in diversity of tropical fruit species, particularly in South and Southeast Asia. Fruits are very important sources of supplemental food, nutritionally balanced diets and help to protect from illness [1]. This tree is found in the tropical forests of South and South East Asia. The fruit of *B. ramiflora* is one of the valuable nutritional sources for human being and the hard durable wood is often used in furniture production [2, 3]. It is grown in Nepal, Bangladesh, Thailand, Myanmar, Indonesia, India and Malaysia. This minor fruit has multipurpose uses. Bangladesh is blessed with a huge diversity of fruits and about 70 various kinds of fruits grow in Bangladesh [4]. Minor fruit occupies 3.01% of area and 8.38% of production compared to the total fruit production of Bangladesh [5]. Bangladesh has a rich and prestigious heritage of herbal medicines among the South Asian countries. Traditional resources and ecological diversity indicate that

Bangladeshi plants represent an exciting resources of new pharmaceutical ingredients. [6].



Figure 1. Burmese grape plant.

About 80% people in developing countries depend on traditional plant based medicines for their primary health care [7]. Apart from nutritive value most people are familiar with

the medicinal properties of locally grown minor fruits. It lays emphasis on exploiting the versatile usefulness of these tremendous resources, in combating the challenges of nutritional security. It also exploiting medicinal attributes adding income generation for the better livelihood of the hills' tribal and rural people [8]. About 250 species of medicinal plants are used for the preparation of traditional medicines which is the half of total species of plants grown in Bangladesh [9]. Nature is the source of 87% of drugs used to treat different kinds of diseases and 25% of prescribed drugs originated from plants. Over 3000 species of plants have been reported for their anticancer property [6]. Natural products are vital in the treatment of cancer, as a number of important anticancer agents have been derived from natural products, including plant-derived agents such as the vinca alkaloids, taxanes and topoisomerase I inhibitors [10]. Lotkon (*Baccaurea ramiflora* Lour.) is a commercially important fruit and very popular to people of all ages in Bangladesh. By growing this crop farmers are now earning considerable amount of money [11]. This fruit crop prefers shade or semi shade condition for their growth, where no other fruit crop can be grown successfully. The delicious and juicy fruit small and round in size and just like a big marble. It generally grows on high fallow land and also homestead areas. The total production of this fruit is low but day by day increasing cultivation areas in Bangladesh. The main growing areas are Narsingdi, Gazipur, Manikgonj, Netrokona and Sylhet districts of Bangladesh. The pulp is eaten fresh directly. It is an acidic fruit so attempts may also be taken for preparation of beverages from fruit. Compared to other fruits, minor fruits possess high antioxidant activity and are naturally rich in a variety of phytochemicals, particularly phenolic compounds [12]. Many of the fruit species are threatened due to various human interventions as well as natural calamities. Plantation and management of new orchards and conservation of germplasm are very important [8]. Many wild and minor edible fruit plants are on the verge of extinction; these were supplementary fruit in addition to our elite table fruits. These fruit have tremendous health benefits and these have been used in medicine. The wild edible fruits with nutrients play an important role in maintaining livelihood security for many people in developing countries. Wild fruits provide vitamins, minerals, fiber, antioxidants and compounds of nutritional, gastronomic and social importance such as alkaloids, essential oils and phenolics [13]. Edible wild fruits have played a very vital role in supplementing the diet of the people of Indian Sub-continent. Apart from customary use as food, wild edible fruits have various health advantages as it potentially give immunity to many diseases. Major fruit crops are commercially cultivated while the wild edible fruits refer to species that are neither cultivated nor domesticated, but it come from their wild natural habitat and used as one of the sources of food [14]. Burmese grape is an underutilized fruit crop and still now there is very limited literature available regarding the uses of Burmese grape and its physicochemical properties [15].

2. Nutritional Composition



Figure 2. Burmese grape fruit.

The average fruit and peel weight is 9.0g and 3.75g respectively. Average yield varies from 70-80 kg/plant/year. Fruit shows around 10⁰ brix TSS, 4.42 percent total sugar and 2.1 percent acidity [16]. Fruits contain 5.5 percent protein, 178 mg vitamin C per 100g of pulp and among the minerals the fruit contains 169 mg calcium, 137 mg potassium, 177 mg phosphorous and 100 mg iron per 100g of fruit pulp [17]. It also estimated 5.34 mg of iron was found in 100g Burmese-grape. [1].

3. Medicinal Values

The plant has antioxidant property [18]. Vanilloid derivatives isolated from this plant [19]. In Chinese Dai medicine, the whole plant of *B. ramiflora* is utilized as an anti-inflammatory and anodyne against rheumatoid arthritis, cellulitis, and abscesses to treat injuries. The fruit juice is mainly used for the treatment of constipation [20]. The plant is also used as medicine by hill-tribes in Northern Thailand [21]. In India, fresh bark is chewed or juice is used orally for constipation [22]. The different fractions of ethanolic extracts of leaves and stems of plant *Baccaurea ramiflora* revealed promising cytotoxic activity [23]. *B. ramiflora* fruit finds its importance as a novel food additive because of its high content of vitamin C, protein and iron [24]. This fruit is suitable for making good wine. The wine is rich in natural antioxidants, including phenols, flavonoids, flavonols and proanthocyanidins, which in turn can have health benefits if consumed in limited amount [18]. The bark, roots and wood are harvested for medicinal uses. It is also reported from other parts of world that fruits are used as medicinally to treat skin disease [25].

4. Other Uses

The fruit is harvested and used locally, eaten as a fruit. Young leaves of *B. ramiflora* are used as vegetable, flavoring agent with curries and minced meat in Bangladesh [25]. In Bangladesh, apart from fresh consumption, it is cultivated chiefly for production of valuable dye annatto from seeds. Seeds contain 4.8- 6 percent annatto dye. Annatto is used for coloring silk, cotton and other textile materials for orange color [26]. The fruit is a rich source of pectin so an effort may be made to prepare the value added product like jam, jelly from this underutilized fruit crop. The peels of mature but unripe fruits yield 14.1 percent pectin and this pectin is useful in preparation of jellies and jams [27].

5. Conclusion

The pulp of Burmese grape is eaten fresh. This novel food additive contents high amount of vitamin C, protein and iron. This underutilized fruit used to prepare jam and jelly and also suitable for making good wine. The bark, roots and wood are harvested to prepare medicines. It is cultivated for production of valuable dye from seeds. In combating the challenges of nutritional security, it is the time to popularizing this valuable fruit through suitable production, processing and marketing strategies for improvement of socio-economic status of people.

References

- [1] Haque, M. N.; Saha, B. K.; Karim, M. R. and Bhuiyan, M. N. H. 2009. Evaluation of Nutritional and Physico-Chemical Properties of Several Selected Fruits in Bangladesh. Bangladesh J. Sci. Ind. Res. 44(3): 353-358.
- [2] Li, B. T. 1999. Flora of China. Science Press, Beijing, China. 44: pp. 131-2.
- [3] Sundriyal, M. and Sundriyal, R. C. 2003. "Underutilized edible plants of the Sikkim Himalaya: need for domestication," Current Science. 85(6): 731-736.
- [4] Hossian, M. A.; Bhuyan, M. A. J. and Islam, K. S. (eds). 2011. In Bengali: *Phal Utpadoner Unnoto Kalakoushal* (Modern Techniques of Fruit Production). Horticulture Research Centre, BARI, Gazipur, Bangladesh. P.163.
- [5] BBS. 2011. Statistical Yearbook of Bangladesh. Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the Peoples' Republic of Bangladesh, Dhaka.
- [6] Khatun, A.; Rahman, M.; Haque, T.; Rahman, M. M.; Akter, M.; Akter, S. and Jhumur, A. 2014. Cytotoxicity Potentials of Eleven Bangladeshi Medicinal Plants. E-Scientific World Journal. Pp.1-7.
- [7] Uddin, S. J.; Grice, I. D. and Tiralongo, E. 2011. "Cytotoxic effects of Bangladeshi medicinal plant extracts," Evidence-Based Complementary and Alternative Medicine. P.7. [Article ID 578092].
- [8] Rahman, M. and Rahman, J. 2014. Medicinal Value and Nutrient Status of Indigenous Fruits in Bangladesh. Nova Journal of Medical and Biological Sciences. 2(6): 1-19.
- [9] Ghani, A. 2003. Medicinal Plants of Bangladesh: Chemical Constituents and Uses (2nd edition). Asiatic society of Bangladesh, Dhaka, Bangladesh.
- [10] Washart M. L. 2014. *Anticancer* drug development: a global perspective. [<http://www.medscape.org/viewarticle/433928>].
- [11] Rahman, S. M. L.; Bhuyan, M. H. M. B.; Mustakim, A. A. M. M.; Sarker, J. C. and Hussain. M. A. 2014. Fruit characteristics, yield contributing characters and yield of some lotkon genotypes under north eastern region of Bangladesh. Int. J. Sustain. Crop Prod. 9(1): 8-10.
- [12] Francesca G.; Tulipani, S.; Alvarez-Suarez, J. M.; Quiles, J. L.; Mezzetti, B. and Battino. M. 2012. Minor fruits: Composition, nutritional quality, and impact on human health. Nutrition. 28: 9-19.
- [13] Paul, A. 2013. Minor and uncultivated fruits of Eastern India. Paper published in the Full Paper Proceedings of the 2nd International Symposium on Minor Fruits and Medicinal Plants for better lives, 20th Dec, 2013, F/Agriculture, University of Ruhuna, Mapalana, Srilanka, pp. 54-67.
- [14] Beluhan, S. and Ranogajec, A. 2010. Chemical composition and non-volatile components of Croatian wild edible mushrooms. Food Chemistry. 124: 1076-1082.
- [15] Deb, P. and Bhowmick, N. 2013. International Journal of Agriculture and Food Science Technology. 4 (5): 415-420.
- [16] Pal, R. K.; Bhowmick, N. and Suresh, C. P. 2008. Latka (*Baccaurea sapida* Muell. Arg.)-An under exploited minor fruit crop of West Bengal. Abstracted in 3rd Indian Horticulture Congress 2008: New R & D Initiatives in Horticulture for Accelerated Growth and Prosperity. November 6-9, 2008 held at OUAT, Bhubaneswar, p. 325.
- [17] Kermasha, S.; Barthakur, N. N.; Mohan, N. K. and Arnold, N. P. 1987. Chemical composition and proposed use of two semi-wild tropical fruits. Food Chemistry. 26 (4): 253-259.
- [18] Goyal, A. K.; Mishra, T. and A. Sen, A. 2013. Antioxidant profiling of Latkan (*Baccaurea ramiflora* Lour.) wine. Indian Journal of Biotechnology. 12(1): 137-139.
- [19] Yang, X. W.; He, H. P.; Ma, Y. L. and others. 2010. Three new vanilloid derivatives from the stems of *Baccaurea ramiflora*. Planta Medica. 76 (1): 88-90.
- [20] Lin, Y. F.; Yi, Z and Zhao, Y. H. 2003. Chinese Dai Medicine Colorful Illustrations. Yunnan Nationality Press, First Edition.
- [21] Yang, X. W.; Wang, J. S.; Ma, Y. L., Xiao, H. T., Zuo, Y. Q.; Lin, H.; He, H. P.; Li, L. and Hao X. J. 2007. Bioactive Phenols from the Leaves of *Baccaurea ramiflora*. Planta Medica. 73: 1415-1417.
- [22] Khan, B. 2008. Encyclopedia of Flora and Fauna of Bangladesh (1st edition). Asiatic Society of Bangladesh, Dhaka, Bangladesh. 7: 392-393.
- [23] Howlader, M. A.; Apu, A. S.; Repon Kumer Saha, R. K.; Rizwan, F.; Nasrin, N. and Asaduzzaman, M. 2012. Cytotoxic activity of *n*-hexane, chloroform and carbon tetrachloride fractions of the ethanolic extract of leaves and stems of *Baccaurea ramiflora* (Lour.). IJPSR 3(3): 822-825.
- [24] Peter, K. V. 2007. Underutilized and underexploited horticultural crops (Vol. 2). New India Publishing Agency, New Delhi, India.

- [25] Hasan, S. M. R.; Hossain, M. M.; Akter, R.; Jamila, M; Mazumder, M. E. H and Rahman S. 2009. DPPH free radical scavenging activity of some Bangladeshi medicinal plants. *Journal of Medicinal Plants Research*. 3(11): 875-879.
- [26] Abdullah, A. T. M.; Hossain, M. A. and Bhuiyan, M. K. 2005. Propagation of latka (*Baccaurea sapida* Muell. Arg.) by mature stem cutting. *Research Journal of Agricultural and Biological Sciences*. 1(2): 129-134.
- [27] Anonymous. 1988. *Baccaurea*. In: *The Wealth of India-A Dictionary of Indian Raw Materials and Industrial Products*, Raw Materials. 2(B): 1.