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MINOR EDIBLE FRUITS OF BANGLADESH

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Abstract

Minor edible fruits are the genetic resource of a country, playing a vital role as food, nutrition and medicine. Bangladesh having both tropical and sub-tropical climatic condition possesses a large number of species that produce minor edible fruits. The present study represents 255 species of minor edible fruit yielding plants of Bangladesh. Of them, 242 species belong to 58 families of Magnoliopsida and 13 species to three families of Liliopsida. The large minor fruit yielding families are Euphorbiaceae (20 spp.), Myrtaceae (18 spp.), Moraceae (15 spp.), Arecaceae (11 spp.), Sapindaceae (11 spp.), Anacardiaceae (10 spp.), Annonacae (10 spp.), Rutaceae (8 spp.), Verbenaceae (8 spp.) and Vitaceae (8 spp.). Three species are aquatic in nature and about 50 species are herbs, including 31 species of climbers or lianas, and 49 are shrubs and the remaining 156 species are trees. About 48 species are cultivated for fruits and the 35 species are both cultivated and wild. The remaining species are exclusively wild. A total of 53 exotic species are included in the cultivation. In most of the species, pericarp with mesocarp or the whole part of fruit is edible. In few cases either seed or kernel is edible, or in others the non-carpel part of flower. Summer is found as the most and winter as the least suitable fruit yielding seasons in a year.

Introduction

Fruits are eaten raw and their nutritive value lies in the presence of good amount of organic acids, carotenoids, vitamins and minerals. Fruits are an integral part of food needed to meet the mineral requirements of human body and to strengthen body defense mechanisms against various biotic and abiotic stresses and for proper health per capita requirement of fruits is 115 g. On an average, fruits have been contributing to about 4% to human nutrition (APCAEM, 2007). Utmost rural houses possess a home garden with fruit and timber plants that act as a source of income for many families and became the safety net during in hardship and natural disaster. The planting intensity has increased at least four folds in 65% of households during the last few years (Rahman and Rahman, 2014). Botanically fruit is the matured or ripe ovary. Sometimes thalamus, calyx and epicalyx, inflorescence or seeds are also developed as the major part of a fruit. Out of about 2,50,000 species in Magnoliophyta, about 30,000 species have been identified as edible fruit yielding, of which about 7,000 species have found cultivated in the World (Wilson, 1992). Minor fruits are those that are consumable to the human beings but are relatively less palatable than other mainstream fruits, which have lesser demand in the market and are grown to a limited extent only (Srivastava *et al.,* 2017). Many of the minor or under-utilized fruits are important in social, economic, biodiversity and conservation aspects on a regional and local basis. They also provide the source of nutrition of wild animals and birds.

Many floristic works in this region mentioned about the edible fruits of Bangladesh (Humphrey *et al.*, 1921; Heinig, 1925; Siddiqui *et al.*, 2007 and Ahmed *et al.*, 2008-2009) and its surrounding areas (Grierson and Long, 1983-1991; Guha-Bakshi, 1984; Naskar, 1993, and Noltie, 1994).

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The first comprehensive record about the edible fruits of Bangladesh was published by Khan (1974), who reported 43 species of fruits that are cultivated. Das (1982) recorded 60 species of fruits which are growing only in wild state. Later on, Rashid *et al.* (1987) recorded 40 cultivated fruits of Bangladesh. Subsequently Begum (2004) reported 55 species, which are only in cultivation. Finally, Roy (2007) made an extensive record of fruits, which are both cultivated and wild, numbering a total of 120 species. Rahim *et al.* (2011) reported 67 minor fruit yielding plants of Bangladesh that are growing in the Germplasm Centre at Bangladesh Agriculture University. The minor fruits contributed about 8.38% production of the total fruit yield of Bangladesh (BBS, 2011).

There are 250 edible fruits in the Philippines (Hill, 1951). In Malaysia, there are about 500 species of fruit plants of which 100 species are cultivated (Zakri and Mohammad, 1997). On the other hand, Joshi (1998) reported 162 species and Suresh *et al.* (2014) reported only 21 species of minor fruit yielding plants from India.

New scope and possibility about utilization of wild fruits is increasing. At least 30 species are already known in Bangladesh for their therapeutic values apart from their nutrition values (Rahman and Rahman, 2014). Some are antidiabetic and antioxidant. Quite a few of these have excellent flavors and attractive colour. Many natural food colours, mostly anthocyanins, are now demanding. Furthermore, many minor fruits may be valuable for food processing like jam, jelly, sauce, pickles, juice and food additives.

A preliminary botanical survey has been done by us and the study indicated that many more species are yet to be recorded or compiled for full listing of the minor fruit yielding plant resource of Bangladesh. Therefore, this study aims at providing and updating available taxonomic information of the minor edible fruit yielding plants of Bangladesh.

Materials and Methods

An extensive field survey has been conducted in different localities of 14 districts of Bangladesh namely, Chittagong, Rangamati, Bandarban, Khagrachari, Kumilla, Brahmanbaria, Mymensingh, Khulna, Jeshore, Satkhira, Sylhet, Moulavibazar, Rajshahi and Bogura districts (Fig. 1) from 2006 to 2018 following group discussion, household survey and market survey techniques. In addition, primary information on minor and wild fruit was collected from different secondary resources (scientific papers, books, internet etc.). The collected samples were identified by consulting the available relevant literatures. Furthermore, the specimens located at the herbaria CUH, BFRIH and DACB were also studied. In order to accommodate vast array of information, a small representative list of wild and minor fruits has been prepared with their up-to-date nomenclature (Pasha and Uddin 2013 and www.theplantlist.org). Information on the availability, habit condition and status of the plants was also collected.

Results and Discussion

A total of 255 minor edible fruit yielding species belonging to 149 genera under 61 families have been presented alphabetically (Table 1). 15 of these species under three families belong to the Liliopsida and the remaining species under 58 families belong to Mangnoliopsida. The Euphorbiaceae is recorded as the largest minor fruit yielding family (20 spp.), which is followed by Myrtaceae (18 spp.), Moraceae (15 spp.), Arecaceae (11 spp.), Sapindaceae (11 spp.), Anacardiaceae (11 spp.), Annonacae (10 spp.), Rutaceae (8 spp.), Verbenaceae (8 spp.) and Vitaceae (8 spp.) families. These ten large families constitute about 47% of the total species found as minor fruit yielding (Fig. 2).

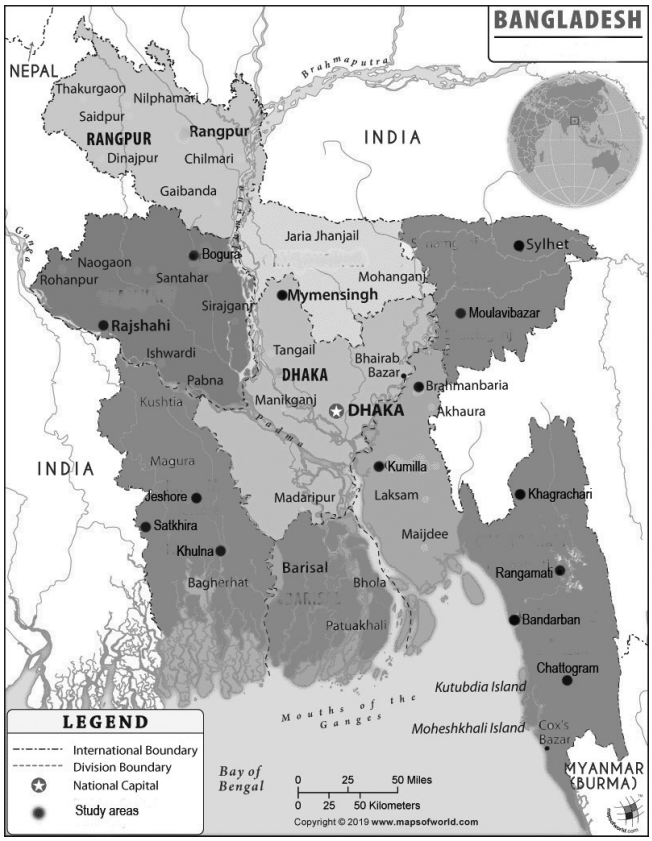

Fig. 1. Map of Bangladesh showing the study areas (Source: www.mapsofworld.com).

Fig. 2. The ten large minor fruit yielding families of Bangladesh.

Table 1. The list of minor fruit yielding plant species of Bangladesh.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
1.	*Acronychia pedunculata* (L.) Miq.	Rutaceae	Bon jamir	Small tree	W	In
2.	*Aglaia perviridis* Hiern	Meliaceae	Sabuj amoor	Medium tree	W	In
3.	*Alangium salviifolium* (L.f.) Wangerin	Alangiaceae	Ankora, Akarkanta	Medium tree	W	In
4.	*Aleurites moluccanus* (L.) Willd.	Euphorbiaceae	Akhrot	Medium tree	W	Ex.
5.	*Allophylus cobbe* (L.) Raeuschel var. *villosa* (Roxb.) Prain	Sapindaceae	Chita, Rakhal chita, Aita chita	Shrub or small tree	W	In
6.	*Alphonsea lutea* (Roxb.) Hook.f. & Thomson	Annonaceae	Fonseti	Small tree	W	In
7.	*A. ventricosa* (Roxb.) Hook.f. & Thomson	Annonaceae	Fonsetricosa	Small tree	W	In
8.	*Ampelocissus barbata* (Wall.) Planch.	Vitaceae	Jarila lahari	Herbaceous climber	W	In
9.	*A. latifolia* (Roxb.) Planch.	Vitaceae	Gowalia lata, Govila, Peribel	Herbaceous climber	W	In
10.	*Ampelygonum chinense* (L.) Lindley	Polygonaceae	Mohicharan sak, Kaker bantabhat	Herbaceous climber	W	In
11.	*Anacardium occidentale* L.	Anacardiaceae	Kaju badam	Small tree	C	Ex
12.	*Annona muricata* L.	Annonaceae	Muri at	Small tree	C	Ex
13.	*A. reticulata* L.	Annonaceae	Nona ata	Small tree	C	Ex
14.	*A. squamosa* L.	Annonaceae	Sharifa	Small tree	C	Ex
15.	*Anthocephalus cadamba* Miq	Rubiaceae	Kadam	Large tree	C & W	In
16.	*Antidesma acidum* Retz.	Euphorbiaceae	Amrul, Chutki	Small tree	W	In
17.	*A. acuminatum* Wall.	Euphorbiaceae	Shial buka	Small tree	W	In.
18.	*A. bunius* (L.) Spreng.	Euphorbiaceae	Banshial buka	Small tree	W	In
19.	*A. khasianum* Hook.f.	Euphorbiaceae	Khasia jam	Small tree	W	In
20.	*A. montanum* Blume var. *montanum*	Euphorbiaceae	Shial buka	Small tree	W	In
21.	*Aporosa octandra*(Buch.-Ham ex D.Don) Vickery	Euphorbiaceae	Pat kharolla	Small tree	W	In
22.	*A. aurea* Hook.f.	Euphorbiaceae	Kechuan	Small tree	W	In
23.	*Artocarpus chama* Buch.-Ham. *ex* Wall.	Moraceae	Chaplash, Chambal	Large tree	W	In
24.	*A. lacucha* Buch.-Ham.	Moraceae	Deophal	Large tree	W & C	In
25.	*Averrhoa bilimbi* L.	Oxalidaceae	Bilimbi	Small tree	C	Ex
26.	*A. carambola* L.	Oxalidaceae	Kamranga	Small tree	C	Ex
27.	*Avicennia alba* Blume	Verbenaceae	Sada baen, Maricha baen	Large tree	W	In
28.	*Baccaurea ramiflora* Lour.	Euphorbiaceae	Latkan, Bhubi	Medium tree	W& C	In
29.	*Bauhinia vahlii* Wight & Arn.	Caesalpiniaceae	Lata-kanchan	Climbing shrub	W & C	In
30.	*Bouea oppositifolia* (Roxb.) Meissner	Anacardiaceae	Bhallam, Uriaam	Medium tree	W	In
31.	*Bridelia retusa* (L.) A.Juss.	Euphorbiaceae	Kata kushui, Akdana	Small tree	W	In
32.	*B. stipularis* (L.) Blume	Euphorbiaceae	Pat khowi, Harinhara	Climbing shurb	W	In

Table 1 Contd.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
33.	*Buchanania lancifolia* Roxb.	Anacardiaceae	Cheerojee oil plant	Small tree	W	In
34.	*B. lanzan* Spreng.	Anacardiaceae	Piyal	Small tree	W	In
35.	*Caesalpinia digyna* Rottler	Caesalpiniaceae	Kochoi, Teri pods	Shrubby climber	W	In
36.	*Calamus latifolius* Roxb.	Arecaceae	Kerak bet, Budum bet	Extensive climber	W & C	In
37.	*C. longisetus* Griff.	Arecaceae	Uddum bet	Robust shrub	W & C	In
38.	*C. tenuis* Roxb.	Arecaceae	Jali bet, Sanchi bet	Climbing shrub	W & C	In
39.	*C. viminalis* Willd.	Arecaceae	Bara bet, Khor khoijja bet	Climbing shrub	W & C	In
40.	*Callicarpa arborea* Roxb.	Verbenaceae	Bormala, Khoja, Makanchi	Small tree	W	In
41.	*Calophyllum polyanthum* Wall. *ex* Choisy	Clusiaceae	Kamdob	Medium tree	W	In
42.	*Canarium bengalense* Roxb.	Burseraceae	Dhuna rata	Buttressed tree	W	In
43.	*Capparis zeylanica* L.	Capparaceae	Kalookra	Large shrub	W	In
44.	*Carallia brachiata* Roxb.	Rhizophoraceae	Roskao, Lotkao, Matan	Small tree	W	In
45.	*Careya arborea* Roxb.	Lecythidaceae	Kumba bidipata,	Medium tree	W	In
46.	*Carissa carandas* L.	Apocynaceae	Karamcha	Bushy shrub or small tree	C	Ex
47.	*C. spinarum* L.	Apocynaceae	Misti karamcha	Shrub	W	In
48.	*Cassytha filiformis* L.	Lauraceae	Akasbel	Annual herb	W	In
49.	*Castanopsis indica* (Roxb. *ex* Lindl.) A.DC.	Fagaceae	Batna, Shil batna, Khiri badam	Medium tree	W	In
50.	*C. purpurella* (Miq.) N.P. Balakr.	Fagaceae	Kata shingu, Batna	Medium tree	W	In
51.	*C. tribuloides* (Sm.) A.DC.	Fagaceae	Sili batna, Bara hinguri	Medium tree	W	In
52.	*Chrysophyllum cainito* L.	Sapotaceae	Taroka phol	Medium tree	C	Ex
53.	*Chylocalyx perfoliatus* (L.) Hassk. *ex*. Miq.	Polygonaceae	Kanta tokpata	Annual herb	C& W	In
54.	*Citrus assamensis* S.Datta &S.C.Bhattacharya	Rutaceae	Ada jamir	Large shrub	C	In
55.	*C. aurantium* L.	Rutaceae	Satkora, Kaffir lime	Medium tree	C	In
56.	*Cordia dicotoma* G.Forst.	Boraginaceae	Bohal, Kalahuza	Medium Tree	W	In
57.	*Daemonorops jenkinsiana* (Griff.) Mart.	Arecaceae	Golla bet, Maj jenkins	Climbing shrub	W & C	In
58.	*Dillenia indica* L.	Dilleniacae	Chalta	Medium tree	W & C	In
59.	*D. pentagyna* Roxb.	Dilleniacae	Banchalta	Medium tree	W	In.
60.	*Dimocarpus longan* Lour.	Sapindaceae	Ashphal, Kathlichu,	Medium tree	C & W	In
61.	*Diospyros blancoi* A.DC.	Ebenaceae	Beelati gab	Medium tree	C	Ex
62.	*D. malabarica* (Desr.) Kostel.	Ebenaceae	Deshi gab	Medium tree	W & C	In
63.	*D. melanoxylon* Roxb.	Ebenaceae	Bidipata, Tendupata	Medium tree	W	In

Table 1 Contd.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
64.	*D. toposia* Buch.-Ham.	Ebenaceae	Katgula, Toposi, Gab gulal	Medium tree	W	In
65.	*Dodonaea viscosa* (L.) Jacq.	Sapindaceae	Paniaphul	Small tree	C	Ex
66.	*Drypetes assamica* (Hook.f.) Pax & K.Hoffm.	Euphorbiaceae	Ban bokul	Medium tree	W	In
67.	*D. subsessilis* (Kurz) Pax & K. Hoffm.	Euphorbiaceae	Chato drypet	Small tree	W	In
68.	*Duchesnea indica* Andt.	Rosaceae	Jongli strawberry	Perennial herb	W	In
69.	*Ehretia serrata* Roxb.	Boraginaceae	Kala huja	Medium tree	W	In
70.	*Elaeagnus latifolia* L.	Elaeagnaceae	Bonjara	Scandent shrub	W	In
71.	*Elaeocarpus angustifolius* Blume	Elaeocarpaceae	Rudraksha	Medium tree	W	In
72.	*E. tectorius* (Lour.) Poir.	Elaeocarpaceae	Tekopai olive	Medium tree	W	In
73.	*Embelia ribes* Burm.f.	Myrsinacreae	Biranga	Scandent shrub	W	In
74.	*Eriglossum rubiginosum* Blume	Sapindaceae	Baraharina, Pitha, Ritha	Medium tree	W	In
75.	*Eriobotrya japonica* (Thunb.) Lindl.	Rosaceae	Loquat	Small tree	C	Ex
76.	*Eugenia roxburghii* DC.	Myrtaceae	Hijli jam, Menadi	Small tree	W	In
77.	*Euryale ferox* Salisb.	Nymphaeaceae	Makhna, Makana,	Floating herb	W	In
78.	*Ficus auriculata* Lour.	Moraceae	Baradumur	Medium tree	W	In
79.	*F. benjamina* L.	Moraceae	Pakur	Medium tree	W	In
80.	*F. hispida* L.	Moraceae	Dumur, Khoksa	Small tree	W	In
81.	*F. lanceolata* Buch.-Ham.	Moraceae	Buti dumur, Erigachh	Medium tree	W	In
82.	*F. oligodon* Miq.	Moraceae	Oligo dumur	Medium tree	W	In
83.	*F. pumila* L.	Moraceae	Lata dumur	A climbing Shrub	W	In
84.	*F. racemosa* L.	Moraceae	Jagya dumur	Medium tree	W	In
85.	*F. rumphii* Blume	Moraceae	Gai aswathwa	Medium sized tree	W	In
86.	*Firmiana colorata* (Roxb.) R.Br.	Sterculiaceae	Ujal	Medium tree	W	In
87.	*F. obovata* Wall.	Sterculiaceae	Dima huri	Medium tree	W	In
88.	*Flacourtia indica* (Burm.f.) Merr.	Flacourtiaceae	Boicifol, Paniala	Large shrub	W	In
89.	*F. inermis* Roxb.	Flacourtiaceae	Loai	Small tree	W	In
90.	*F. jangomas* (Lour.) Raeusch.	Flacourtiaceae	Painna gola, Paniala	Small tree	C & W	In
91.	*Fragaria vesca* L.	Rosaceae	Strawberry	Annual herb	C	Ex
92.	*F. indica* Andr.	Rosaceae	Indian strawberry	Annual herb	W	In
93.	*Garcinia cowa* Roxb. *ex* DC.	Clusiaceae	Kau, Kao-gola	Medium tree	W & C	In
94.	*G. lanceaefolia* Roxb.	Clusiaceae	Thisuru	Large Shrub	W	In

Table 1 Contd.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
95.	*G. pedunculata* Roxb. *ex.* Buch.-Ham.	Clusiaceae	Tikul, Tikur, Bor thekera	Medium tree	W	In
96.	*G. xanthochymus* Hook. f. *ex* T.Anderson	Clusiaceae	Tamal, Dem-gola	Medium tree	W	In
97.	*Garuga floribunda* Decne. var. *gambei* (King *ex* W.W.Sm.) Kilkman	Burseraceae	Jongli jiga, Garuga	Medium tree	W	In
98.	*Glochdion khasicum* (Muell.Arg.) Hook.f.	Euphorbiaceae	Khasia kachua	Small tree	W	In
99.	*G. zeylanicum* (Gaertn.) A.Juss.	Euphorbiaceae	Siloni kachua	Shrub or small tree	W	In
100.	*Glycosmis pentaphylla* (Retz.) A.DC.	Rutaceae	Ash-sheora, Datmajani	Bushy shrub	W	In
101.	*Gmelina arborea* Roxb.	Verbenaceae	Gamar	Medium tree	W & C	In
102.	*G. asiatica* L.	Verbenaceae	Bhadhra	Medium tree	C	In
103.	*Grewia abutilifolia* Vent.	Tiliaceae	Kowri, Notk	Small tree	W	In
104	*G. asiatica* L.	Tiliaceae	Phalsa, Sakri, Pisla, Phalsa	Small tree	C	In
105.	*G. hirsuta* Vahl	Tiliaceae	Kukurbicha	Large shrub	W	In
106.	*G. sapida* Roxb. *ex* DC.	Tiliaceae	Chuhura	Herb	W	In
107.	*G. sclerophylla* Roxb. *ex* G.Don	Tiliaceae	Phalsa	Large Shrub	W	In
108.	*G. tiliifolia* Vahl	Tiliaceae	Dhomoni, Pholsa	Small tree	W	In
109.	*Haematocarpus thomsonii* Miers	Menispermaceae	Agniphol	Woody climber	W	In
110.	*H. validus* (Miers) Bakh.f. *ex* Forman	Menispermaceae	Agni foli	Woody climber	W	In.
111.	*Helicia erratica* Hook.f.	Proteaceae	Kharo pakan	Small tree	W	In
112.	*Hibiscus sabdariffa* L.	Malvaceae	Lal mesta	Large herb	C & W	Ex
113.	*Hovenia dulcis* Thumb.	Rhamnaceae	Raisil gaas	Medium tree	W	In
114.	*Hylocereus undatus* (Howorth) Britton & Rose	Cactaceae	Dragon fruit	Spiny shrub	C	Ex
115.	*Ixora pavetta* Andr.	Rubiaceae	Sweet rangan, Gandha irangan	Bushy shrub	W	In
116.	*Lantana trifolia* L.	Verbenaceae	Tinpata Lantana	Perennial herb	W	In
117.	*Leea crispa* L.	Leeaceae	Kukura	Large shrub	W	In
118.	*L. indica* Merr.	Leeaceae	Kukur gibba	Large shrub	W	In
119.	*L. macrophylla* Roxb. *Ex* Hornem.	Leeaceae	Hostikorno	Large shrub	W	In
120.	*Lepisanthes rubiginosa* (Roxb.) Leenh.	Sapindaceae	Rubiharina	Small tree	W	In
121.	*L. senegalensis* (Poir.) Leenh.	Sapindaceae	Gotaharina, Amjam	Small tree	W	In
122.	*Limonia acidissima* L.	Rutaceae	Koethbel	Medium tree	C	In
123.	*Litsea cubeba* (Lour.) Pers.	Lauraceae	Kubahoria	Large shrub	W	In
124.	*L. glutinosa* (Lour.) L.B. Rob.	Lauraceae	Kukur chita, Menda	Medium tree	W	In

Table 1 Contd.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
125.	*Maclura cochinchinensis (*Lour.) Corner	Moraceae	China maclur	Large shrub	W	In
126.	*Madhuca longifolia* (J. Koenig *ex* L.) J.F.Machr.	Sapotaceae	Mohua, Mohwa maul	Medium tree	W & C	In
127.	*Maesa chisia* Buch.-Ham. *ex* D.Don	Myrsinaceae	Bilouni, Gangu loda	Large shrub	W	In
128.	*M. ramentacea* (Roxb.)A.DC.	Myrsinaceae	Moricha, Noa moricha	Small tree	W	In
129.	*Malpighia coccigera* L.	Malpighiaceae	Kanta malpighia	Dwarf shrub	C	Ex
130.	*M. glabra* L.	Malpighiaceae	-	Bushy shrub	C	Ex
131.	*Mangifera sylvatica* Roxb.	Anacardiaceae	Uriaam, Jangli	Large tree	W	In
132.	*Manilkara hexandra* (Roxb.) Dubard	Sapotaceae	Khirni, Khir khejur, Khiluni	Large tree	W	In
133.	*M. zapota* (L.) P.Royen	Sapotaceae	Sofeda, Sapodilla	Small tree	C	Ex
134.	*Melastoma malabathricum* L.	Melastomataceae	Ban-tejpata, Datranga	Large shrub	W	Ex
135.	*Meliosma pinnata* (Roxb.) Walp.	Sabiaceae	Bativa, Adalia	Small tree	W	In
136.	*Meyna spinosa* Roxb. *ex* Link	Rubiaceae	Maina, Mainakata	Small tree	W	In
137.	*Microcos paniculata* L.	Tiliaceae	Asar, Tarah, Pesondi, Pichunti	Small tree	W	In
138.	*Miliusa tomentosa* (Roxb.) J.Sinclair	Annonaceae	Lom tasbi	Erect shrub	W	In
139.	*M. velutina* (Dunal) Hook.f. &. Thomson	Annonaceae	Gandhi gajari, Bul gajari	Small tree	W	In
140.	*Mimusops elengi* L.	Sapotaceae	Bokul, Elengi	Medium tree	C	In
141.	*Mischocarpus pentapetalous* (Roxb.) Radlk.	Sapindaceae	Miskaphal	Medium tree	W	In
142.	*Monstera deliciosa* Liebm.	Araceae	Makhna	Epiphytic climber	W	In
143.	*Morinda citrifilia* L.	Rubiaceae	Naniphal	Large shrub	C & W	In
144.	*Morus alba* L.	Moraceae	Tunt, Tuti	Small tree	C	Ex
145.	*M. indica* L.	Moraceae	Deshi tut	Large shrub	C	Ex
146.	*M. macroura* Miq.	Moraceae	Himalyan tut	Large shrub	C	Ex
147.	*M. nigra* L.	Moraceae	Kalo tut	Large shrub	C	Ex
148.	*Muntingia calabura* L.	Tiliaceae	Suji phal	Small tree	C	
149.	*Murraya koenigii* (L.) Spreng.	Rutaceae	Kari pata	Bushy shrub	W & C	In
150.	*M. paniculata* (L.) Jack	Rutaceae	Kamini,	Tall shrub	C	In
151.	*Myrciaria cauliflora (*DC.) Berg	Myrtaceae	Jaboticaba	Small tree	C	Ex
152.	*Myrica nagi* Thumb.	Myricaceae	Kayphol	Small tree	W	In
153.	*Nauclea orientalis* (L.) L.	Rubiaceae	Nukli	Erect shrub	W	In
154.	*Nelumbo nucifera* Gaertn.	Nelumbonaceae	Padma, Lotus	Perennial aquatic herb	W & C	In
155.	*Nephelium rambutan-ake* (Labill.) Leenh.	Sapindaceae	Rambutan	Medium tree	C	Ex

Table 1 Contd.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
156.	*Nypa fruticans* Wurmb.	Arecaceae	Golpata, Gulga, Gabna	Erect shrub	W	In
157.	*Nyssa javanica* (Blume) Wangerin	Nyssaceae	Malatilata	Tree	W	In
158.	*Olax scandens* Roxb.	Olacaceae	Koko aru	Climbing shrub	W	In
159.	*Opuntia dellenii* Haw.	Cactaceae	Phanimanasa	Under shrub	C & W	Ex
160.	*Ottelia alismoides* (L.) Pers.	Hydrocharitaceae	Panicola	Perennial aquatic herb	W	In
161.	*Oxystelma secamone* H. Karst.	Asclepiadaceae	Dudhia lata, Dudh lata	Woody climber	W	In
162.	*Parkia roxburghii* G.Don.	Mimosaceae	Kuki tetoi, Sapota	Small tree	W	In
163.	*Passiflora edulis* Sims.	Passifloraceae	Tang, Passion fruit, Granadilla	Tendril climber	C	Ex
164.	*P. foetida* L.	Passifloraceae	Jhumka lata	Climbing herb	W	Ex
165.	*P. quadrangularis* L.	Passifloraceae	Misriphal	Large climber	C	Ex
166.	*Persea americana* P. Mill.	Lauraceae	Avocado	Medium tree	C	Ex
167.	*Phoebe attenuata* (Nees) Nees	Lauraceae	Bonsum	Large tree	C	Ex
168.	*Phoenix acaulis* Roxb.	Arecaceae	Khudi khejur	Erect shrub	W	In
169.	*P. dactylifera* L.	Arecaceae	Arabi khejur	Thorny tree	C	Ex
170.	*P. paludosa* Roxb.	Arecaceae	Hatal, Hintal	Erect shrub	W	In
171.	*P. rupicola* T.Anderson	Arecaceae	Kola khejur	Small tree	C	Ex
172.	*P. sylvestris* (L.) Roxb.	Arecaceae	Deshi khejur	Small tree	C & W	In
173.	*Photinia arguta* Wall.*ex*Lindl.	Rosaceae	Fotini	Small tree	W	In
174.	*Phyllanthus acidus* (L.) Skeels	Euphorbiaceae	Amla, Orbori	Small tree	C.	Ex
175.	*P. emblica* L.	Euphorbiaceae	Amloki	Small tree	W & C	In
176.	*P. urinaria* L.	Euphorbiaceae	Hazarmani	Annual herb	W	In
177.	*Physalis minima* L.	Solanaceae	Fotka	Annual herb	W	In
178.	*P. peruviana* L.	Solanaceae	Tepari	Annual herb	C	Ex
179.	*Pithecellobium dulce* (Roxb.) Benth.	Mimosaceae	Khai babla, Jilapi phul	Medium tree	W & C	Ex
180.	*Polyalthea cerasoides* (Roxb.) Benth. & Hook.f. *ex* Bedd.	Annonaceae	Marmi	Small tree	W	In
181.	*Polyalthia suberosa* (Roxb.)Thwaites	Annonaceae	Murmuri, Kukuriam	Small tree	W	Ex
182.	*Pouteria campechiana* (Kunth) Baehni	Sapotaceae	Jaman phol	Small tree	C	Ex
183.	*Premna bengalensis* C.B.Clarke	Verbenaceae	Banglalatana, Koya jarul	Large shrub	W	In
184.	*P. herbacea* Roxb.	Verbenaceae	Bhuijam, Mati jam	Undershrub	W	In
185.	*Protium serratum* (Wall. *ex* Coelbr.) Engl.	Burseraceae	Chitrica, Gutgutya, Hajna	Medium tree	W	In
186.	*Psidium araca* Raddi	Myrtaceae	Tock piyara	Large shrub	W	Ex / In
187.	*P. chinense* Lodd. *ex* Loud.	Myrtaceae	Chinese piyara	Large shrub	C	Ex

Table 1 Contd.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
188.	*Pterygota alata* (Roxb.) R.Br.	Sterculiaceae	Buddha narical	Large tree	W & C	In
189.	*Punica granatum* L.	Punicaceae	Dalim, Bedana,	Large shrub	C	Ex
190.	*Randia angustissima* Wall.	Rubiaceae	Belong, Moncata, Piralo	Tree or large shrub	W	In
191.	*R. dumatorium* (Retz.) Lam.	Rubiaceae	Moncata, Mainphal	Small tree	W	In
192.	*Rhaphidophora pertusa* (Roxb.) Schott	Araceae	Tusafido	Epiphytic climber	W	In
193.	*Rhizophora mucronata* Lam.	Rhizophoraceae	Khamo	Small tree	W	In
194.	*Salacia chinensis* L.	Hippocrateaceae	Madhu phal, Chota boroi	Woody climber	W	In
195.	*S. salacioides* (Roxb.) Rolla Rao & Hemadri	Hippocrateaceae	Sala madhu phal	Woody climber	W	In
196.	*Sambucus canadensis* L.	Caprifoliaceae	American elder	Erect shrub	W	Ex
197.	*S. javanica* Reinw. *ex* Blume	Caprifoliaceae	Hoklati	Small tree	W	Ex
198.	*S. nigra* L.	Caprifoliaceae	Sambucas	Small tree	C	Ex
199.	*Sandoricum indicum* Cav.	Meliaceae	Santol	Medium tree	C	Ex
200.	*Sarcolobus globosus* Wall.	Asclepiadaceae	Baoli-lata, Baoli-phal	Large shrub	W	In
201.	*Saurauia roxburghii* Wall.	Theaceae	Dalup	Large shrub	W	In
202.	*Sauropus androgynus* (L.) Merr.	Euphorbiaceae	Mithapotro	Large shrub	W	In
203.	*Schleichera oleasa* (Lour.) Merr.	Sapindaceae	Kusum, Joyna	Medium tree	C	In
204.	*Semecarpus anacardium* L.f.	Anacardiaceae	Bhela, Beda	Medium tree	W	In
205.	*S. nigroviridis* Thwaites	Anacardiaceae	Kattula	Medium tree	E	In
206.	*Shorea robusta* Gaertn.f.	Dipterocarpaceae	Shal, Gazari	Medium tree	W & C	In
207.	*Solanum americanum* Mill.	Solanaceae	Tit begun	Annual herb	W	In
208.	*S. lasiocarpum* Dunal	Solanaceae	Kantha sola	Herb or Undershrub	W	In
209.	*S. trilobatum* L.	Solanaceae	Trikun pata	Herb or Undershrub	W	In
210.	*Solena amplexicaulis* (Lam.) Gandhi	Cucurbitaceae	Kundri, Rakhal gota	Climbing herb	W	In
211.	*Sonneratia caseolaris* (L.) Engl.	Sonneratiaceae	Ora, Orali, Orcha, Shoila	Large tree	W	In
212.	*Spodius dulcis* Parkinson	Anacardiaceae	Bilati amra	Small tree	C	Ex
213.	*S. purpurea* L.	Anacardiaceae	Beelati amra	Medium tree	C	Ex
214.	*Sterculia foetida* L.	Sterculiaceae	Jangli-the	Medium tree	W	In
215.	*Stixis suaveolens* (Roxb.) Pierre	Capparaceae	Madhumalati	Woody climber	W	In
216.	*Suregada multiflora* (A. Juss.) Baill	Euphorbiaceae	Ban naranga	Medium tree	W	In
217.	*Syzygium aqueum* (Burm.f.) Alston	Myrtaceae	Jamboo, Pani jam	Medium tree	W	In
218.	*S. balsameum* (Wight) Wall. *ex* Walp.	Myrtaceae	Buti jam	Large Shrub	W	In

Table 1 Contd.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
219.	*S. claviflorum* (Roxb.) Wall. *ex* A.M.Cowan & Cowan	Myrtaceae	Lamba nali jam,	Small tree	W	In
220.	*S. cymosum* (Lam.) DC.	Myrtaceae	Khudi jam, Khurijam	Small tree	W	In
221.	*S. formosum* (Wall.) Masam.	Myrtaceae	Paniya jam, Phuljam, Natla	Medium tree	W	In
222.	*S. fruticosum* (Roxb.) DC.	Myrtaceae	Ban jam, Kak jam, Puti jam	Small tree	W	In
223.	*S. jambos* (L.) Alston	Myrtaceae	Gulap jam	Small tree	C	Ex
224.	*S. macrocarpa* Roxb.	Myrtaceae	Chalita jam, Bon jam	Medium tree	W	In
225.	*S. malaccense* (L.) Merr. & Perry.	Myrtaceae	Jamrul	Medium tree	C	Ex
226.	*S. nervosum* (DC.) A. Cunnex DC.	Myrtaceae	Boti jam, Dapha jam, Goda jam	Small tree	W & C	In
227.	*S. oblatum* (Roxb.) A.M. Cowan & Cowan	Myrtaceae	Gola jam	Medium tree	W	In
228.	*S. praecox* (Roxb.) Rathakr & N.C.Nair	Myrtaceae	Poora jam	Medium tree	W	In
229.	*S. samarangense* (Blume) Merr. & L.M.Perry	Myrtaceae	--	Medium tree	C	Ex
230.	*S. tetragonum* (Wight) Wall. *ex.* Kurz	Myrtaceae	Gonojam, Charjam	Medium tree	W	In
231.	*Tamarindus indica* L.	Caesalpiniaceae	Tentul, Tentuli	Large tree	C & W	Ex
232.	*Tapiria hirsuta* Hook.f.	Anacardiaceae	Lomam	Scandent shrub	W	In
233.	*Termilania bellirica* (Gaertn.) Roxb.	Combretaceae	Bohera, Boyra	Medium tree	W & C	In
234.	*T. catappa* L.	Combretaceae	Kathbadam	Small tree	C & W	Ex
235.	*T. chebula* (Gaertn.) Retz.	Combretaceae	Haritoki	Medium tree	W & C	In
236.	*T. citrina* (Gaertn.) Roxb. *ex* Fleming	Combretaceae	Hatiyal, Haritaki, Harra	Medium tree	W	In
237.	*Tetrastigma angustifolim* (Roxb.) Planch.	Vitaceae	Nekung riubi, Sarupatilata	Herbaceous climber	W	In
238.	*T. bracteolatum* (Wall.) Planch.	Vitaceae	Golgoli lata	Herbaceous climber	W	In
239.	*T. dubium* (Lawson) Planch.	Vitaceae	Kuannia, Riam lata	Climbing herb	W	
240.	*T. leucostaphyllum* (Den.) Alston.	Vitaceae	Horina lata	Climbing herb	W	In
241.	*T. serrulatum* (Roxb.) Planch.	Vitaceae	Koratilata	Climbing shrub	W	In
242.	*Trapa bispinosa* Roxb.	Trapaceae	Paniphal	Floating aquatic herb	W & C	In
243.	*T. maximowiczii* Korshinsky	Trapaceae	Paniphal, Kata singhara	Floating aquatic herb	W	In
244.	*Triphasia trifolia* (Burm.f.) P. Wilson	Rutaceae	Cheeninarangi	Small tree	W	In
245	*Uvaria ferruginea* Buch.-Ham.	Annonaceae	Bon khajur	Large shrub	W	In.
246.	*Vitex glabrata* R.Br.	Verbenaceae	Ashal	Medium tree	W	In
247.	*Vitis lanata* Roxb.	Vitaceae	Sonalata, Rangobhuttu	Climbing shrub	W	In

Table 1 Contd.

Sl. No.	Botanical Name	Family name	Local Names	Habit	Cultivated (C)/ Wild (W)	Indigenous (In)/ Exotic (E)
248.	*Willoughbeia edulis* Roxb.	Apocynaceae	Lata aam, Lati aam	Climbing shrub	W	In
249.	*Xerospermum laevigatum* Radlk.	Sapindaceae	Bonlichu	Small tree	W	In
250.	*X. noronhianum* (Blume) Blume	Sapindaceae	Bonlichu, Noronlichu	Medium tree	W	In
251.	*Ziziphus funiculosa* Buch.-Ham. *ex* Wall.	Rhamnaceae	Bon-boguri	Large shrub	W	In
252.	*Z. galabrata* Heyne *ex* Roth	Rhamnaceae	Rata boroi, Jangli kul	Small tree	W	In
253.	*Z. oenoplia* (L.) Mill.	Rhamnaceae	Sial kul, Jangal kul, Bon boroi	Straggling shrub	W	In
254.	*Z. rugosa* Lam.	Rhamnaceae	Jangli boroi, Rug boroi	Straggling shrub or small tree	W	In
255.	*Z. xylopyrus* (Retz.) Willd.	Rhamnaceae	Jhangli boroi	Large shrub	W	In

Table 2. Some promising wild minor fruit yielding plant species of Bangladesh.

	Name of the species	Edible part		Name of the species	Edible part
1	*Alangium savifolium*	Pulp	23	*Hovenia dulcis*	Pulp
2	*Antidesma acidum*	Fruit	24	*Morinda citrifolia*	Thalamus
3	*A. ghaesembilla*	Pulp	25	*Morus macroura*	Ripe fruit
4	*Arocarpus chama*	Pulp	26	*Murrya koenigii*	Pulp
5	*Bauea barmanica*	Pulp	27	*Paramigyna citrifolia*	Pulp
6	*Bauhinia vahlii*	Immature seed	28	*Parkia roxburghii*	Pulp
7	*Buchanania lanzan*	Fruit & Nut	29	*Passiflora foetida*	Ripe fruit
8	*Caesalpinia digyna*	Immature seed	30	*Phoebe attenuta*	Pulp
9	*Carissa spinarum*	Pulp	31	*Photina arguta*	Ripe fruit
10	*Castanopsis indica*	Matured seed	32	*Physalis minima*	Ripe fruit
11	*C. purpurella*	Matured seed	33	*Randia dumetorium*	Matured fruit
12	*Cirus assamensis*	Juice	34	*R. spinosa*	Matured fruit
13	*Cleistocalyx operculata*	Seed kernel	35	*R. uliginosa*	Matured fruit
14	*Cordia dichotoma*	Pulp	36	*Salacia salacioides*	Matured fruit
15	*Diospyros peregrina*	Pulp	37	*Sambucus canadensis*	Matured fruit
16	*Duchesnia indica*	Matured thalamus	38	*S. javanica*	Matured fruit
17	*Erioglossum rubignossum*	Pulp	39	*S. nigra*	Matured fruit
18	*Eryobotrya javanica*	Pulp	40	*Schleichera oleosa*	Arillous pulp
19	*Euryale ferox*	Immature seed	41	*Sterculea foetida*	Kernel
20	*Firmiana colorata*	Matured seed	42	*Sysyzium formosum*	Pulp
21	*Garcinia xanthochymus*	Pulp	43	*S. aqueum*	Pulp
22	*Haematocarpus validus*	Pulp	44	*Willoubeia edulis*	Pulp

Among the species recorded, a total of 50 species are herbs, including 31 species of climbers or lianas, and 49 species are shrubby in nature. The remaining 156 species are trees. About 48 species are cultivated for fruits and the 35 species are both cultivated and wild. The remaining species are exclusively wild. A total of 53 exotic species are included in the cultivation state. Only 3 species are found growing in aquatic condition.

Almost all the species produce true fruits and only five species produce false fruits. Few species are considered as nut or kernel producing tree. Only 15 species produce fruits that are completely edible and 13 species produce such fruits only the kernel or nut of which are edible. In other cases, all the structural portions except the seed(s) are edible.

Almost all the exotic species are cultivated and considered as promising fruit yielding plants. Some native wild and minor cultivated plants are also found promising fruit yielding in their taste and colour also. In this study, 44 species have been recognized as promising minor fruit yielding species because they are comparatively widely used and popular in consumption (Table 2).

The flowering and fruiting time of the edible fruit yielding plant species was found as remarkably variable (Table 1). The fruits were more or less available throughout the year (Fig. 3). The majority of minor fruit yielding plants were found with fruiting in the months between March and September. The richest fruit yielding month was June (11.51%) and the poorest was January (5.50%).

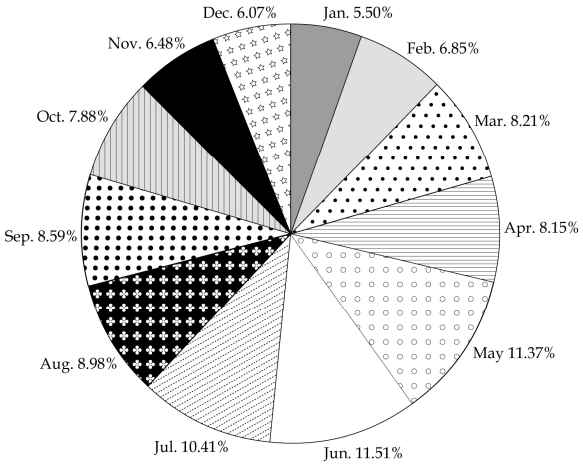

Fig. 3. Availability percentage of the edible minor fruits per month in a year in Bangladesh**.**

The edible fruits occur in a vast number of families in the World. Hill (1951) recognized the families Anacardiaceae, Annonaceae, Myrtaceae, Rutaceae, Sapotaceae and Sapindaceae as particularly important in yielding the fruits. This study has also found some similar important families.

In few reports some minor fruits are evaluated as promising in many aspects (Bose, 1985; Rahim *et al*., 2011; Frncesca *et al*., 2012). Many of the minor edible fruits are with little pulp and larger seed size with less palatable. However, the edibility and nutritional value and economic value of different minor edible fruits can be improved. On the other hand, most of the major fruits are available in the month of May to July, but minor fruits are available throughout the year. The minor fruits can play a great role in improving the social and economic status of the local people. They also can significantly contribute in the conservation of biodiversity. Minor fruit production

may support the livelihood of the producers and side by side can increase the demand of the consumers. Many edible minor fruits can contribute as the remarkably promising fruit recourses in multifarious way if proper research is conducted for their exploration, selection, improvement and large-scale cultivation.

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