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**EVALUATION AND CHARACTERIZATION OF SOME IMPORTANT AND RARE PLANT SPECIES OF BOTANICAL GARDEN OF BANGLADESH AGRICULTURAL UNIVERSITY** M.A. SATTAR, M.M. RAHMAN, M.S.A. FAKIR, M.J. HOSAIN AND S.S.U. AHMED



# EVALUATION AND CHARACTERIZATION OF SOME IMPORTANT AND RARE PLANT SPECIES OF BOTANICAL GARDEN OF BANGLADESH AGRICULTURAL UNIVERSITY

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#### ABSTRACT

Sattar MA, Rahman MM, Fakir MSA, Hosain MJ, Ahmed SSU (2015) Evaluation and characterization of some important and rare plant species of Botanical Garden of Bangladesh Agricultural University. *Int. J. Sustain. Crop Prod.* 10(3), 32-44.

The research work was carried out with eleven important and rare plant species of Crescentia cujete, Saraca asoca, Careya arborea, Ficus cunia, Oroxylum indicum, Nephelium lappaceum, Cassia alata, Schleichera oleosa, Sterculia villosa, Pterospermum acerifolium and Brownea coccinea in the Botanical Garden, Department of Crop Botany, Bangladesh Agricultural University, Mymensingh. Trees are mostly used for timber purposes, but in the present article the utility of tree with respect to their importance in restoring, reclaiming and rejuvenating denuded and disturbed soil, their ecological, eco-development and environment use, and their educational and recreational value in gardening, landscaping and bio-ethetic planning is described. In addition, the importance of tree is discussed with reference to their value as a source of sustenance food, sugars, starches, spices and condiments, beverages, furniture, fatty oils and vegetable fats, wax substitutes, vegetable ivory, fodder, fuel bioenergy or biofuel, fertilizers, fiber, pulp and paper, tannins, dyes, rubber and other latex products, gums resins and cork, lastly, the food plants of mulberry and non-mulberry silk worms, which feed on the leaves of many forest trees, are mentioned. The combination of these data and methods can be useful for conservation planning and long-term monitoring, but it is important that ground-level local assessment is necessary to detect sublets of human-environment interaction that are required for conservation planning. Of the 275 plant species examined, 224 species have been used for treatment of specific human ailments such as allergies, burns, cuts and wounds, inflammation, leprosy, leucoderma, scabies, smallpox and sexually transmitted diseases. For sustenance of bio-resources and fulfill the objectives for which Bangladesh has been declared as the Biosphere Reserve, the following studies may be conducted. Regeneration behavior of rare and threatened plant species as described in the present work. It will help in adopting proper methods of their propagation and conservation.

Key wards: ethnobotany, species, conservation, rejuvenating and environment

# INTRODUCTION

Bangladesh is known to have a wide variety of plant species with Enormous genetic diversity. About 5700 species of higher plants have been recorded so far (Hossain et al. 1993). And of these, some 160 species are used as crops (Mondol 1990), the rest of the species are virtually left on growing wild in their natural habitats. But unfortunately, many of these wild plant genetic resources are becoming rare, and are on the verge of extinction due to overexploitation and loss of their natural habitats. It has been reported that 24 vascular plant species have been threatened in Bangladesh of which 1 species is extinct/endangered, 21 species vulnerable; 1 rare and 1 indeterminate (IUCN 1998). Some 45 wild plant species have been reported as threatened with extinction (Khan 1991; Huq and Banik, 1992), and many other wild and semi-wild medicinal, edible minor fruits, vegetables, fuel wood, fodder and timber species are also disappearing because of destruction and degradation of forests. It has also been aimed to meet the need for plant materials for teaching and research. The garden has succeeded in gathering and conserving many plant species from all over Bangladesh as well as outside the country. But unfortunately, there is little documented information on the ex situ plant holdings of the garden, particularly on the rare and endangered plant species conserved in the garden. Also there is little information exists about the Botanical and Ethnobotanical features of the rare plant species of the garden. So, the present research work was undertaken to evaluate the status of conservation of rare and endangered plant species conserved and prepare monographs of some rare plants and to help characterize and identify the plants in the Botanic Garden of Bangladesh Agricultural University.

#### MATERIALS AND METHODS

The experiment was conducted at the Botanical Garden of Bangladesh Agricultural University, Mymensingh, Bangladesh during the period from January to June 2005. The experimental site is located at 24 N latitude and 91 E longitude having an altitude of 8.3 m. Information related to monographs included the following aspects Scientific Name, English Name, Local Name, Family, Morphological description, Habitat, Distribution, Economic uses/ values/ harmful aspects, Ethnobotanical information. There are 74 no. of rare and endangered plant species are conserved in the Botanical Garden of Bangladesh Agricultural University classified according to IUCN Red list categories, out of those species 11 no. are collected by random selection for the experiment. The species are as follows with their local and scientific name. 1. Tanpura (*Crescentia cujete*), 2. Asoka (*Saraca asoca* Roxb.), 3. Kumbhi (*Careya arborea* Roxb.), 4. Udal (*Sterculia villosa* Roxb.), 5. Kuchul-la (*Ficus cunia* Ham.), 6. Kanaidinga (*Oroxylum indicum* L.), 7. Rambutan (*Nephelium lappaceum* L.), 8. Datmardan (*Cassia alata* L.), 9. Joina (*Schleichera oleosa* Lour.), 10. Muchkanda (*Pterospermum accerifolium* Willd.) and 11. Brownea (*Brownea coccinea*).

#### Sattar et al.

#### **RESULT AND DISCUSSION**

Eleven rare species are selected and describe their important characteristics under following headings.

| SI.<br>No. | Botanical name                    | English Name                     | Local name                  | Family                             |
|------------|-----------------------------------|----------------------------------|-----------------------------|------------------------------------|
| 1.         | Crescentia cujete                 | Calabash tree                    | Tanpura Calabazo,<br>cujete | Bignoniaceae                       |
| 2.         | Saraca asoca Roxb.                | Asoka (Asoka tree)               | Asok (Ashok)                | Leguminosae<br>(Caesalpiniceae)    |
| 3.         | Careya arborea Roxb.              | Patana                           | Kumbhi, Wild guava          | Lecythidaceae/<br>Barringtoniaceae |
| 4.         | Sterculia villosa Roxb.           | Udal                             | Udal                        | Sterculiaceae                      |
| 5.         | Ficus cunia Ham.                  | Kuchul-la                        | Kuchul-la                   | Moraceae                           |
| 6.         | Oroxylum indicum L.               | Indian trumpet tree              | Kanaidinga                  | Bignoniaceae                       |
| 7.         | Nephelium lappaceum L.            | Rambutan                         | Rambutan                    | Sapindaceae                        |
| 8.         | Cassia alata L.                   | Ringworm                         | Datmardan,<br>Dadmurdan     | Legumunosae<br>(Caesalpiniaceae)   |
| 9.         | Schleichera oleosa Lour.          | Lac tree or<br>Macassar oil tree | Joina or Kusun              | Sapindaceae                        |
| 10.        | Pterospermum<br>aceriflium Willd. | Muchkanda<br>(Maple twist)       | Kanakchampa                 | Sterculiaceae                      |
| 11.        | Brownea coccinea                  | Brownea                          | Brownea                     | Leguminose<br>(Caesalpiniaceae)    |

# 1. CRESCENTIA

Crescentia is named after, an Italian writer on agricultural. The genus consists of 5 trees, native to Central America. In Guatemala, three varieties are recognized (Zeven and Wet, 1982). Cujete is a Brazilian vernacular name. A tree of tropical and subtropical America, especially familiar in the West Indies, it is grown in the tropical gardens of the world for its peculiar form as well as the large-sized fruits (Bose and Chowdhury, 1991).

**Description:** A small tree of 6-10 m with a straight, brown trunk and wide spreading, scarcely divided branches with clusters of leaves at intervals on small knobs or swellings scattered along the twigs (Plate 1, AB). Leaves oblanceolate, 10-15 cm long, tapering at base with practically on stalks. Flowers bisexual, solitary, bad-smelling, pendulous, usually from trunks and thicker branches, calyx 2-parted; corolla tubular, yellowish with purplish veins, about 5 cm long, constricted below the middle, swollen above, the lobes cut (Plate 1, C). Fruits smooth, globose, 20 cm or larger, containing many seeds, set in soft pulp with a hard, and smooth cover and abundant carnose pulp (Plate 1, D-E). The fruits grow and ripen slowly, remaining on the tree for 6 to 7 months. Afterwards, they fall to the ground and degrade with time. As fruits ripen, the color changes from green to yellow. When they are over-ripe, their pericarp becomes reddish yellow and their pulp loses moisture. Each fruit contains numerous seeds. The seeds are obovate, with and emarginate apex, laterally flattened, 7.0 to 7.5 mm long 5.4 to 7.0 mm wide, and 1.0 to 2.0 mm thick. The seed coat is dark brown, furrowed with dots, opaque, and coriaceous. Some of the information on this plant was reported by Purseglove (1978).

**Habitat:** Leaves fall during cold season and new leaves appear in February – March. Flowers appear sometimes in rear branches and continue for a long time right into the rainy season. The tree is planted in gardens and parks mainly as a curiosity. It is propagated from seeds (Bose and Chowdhury, 1991).

Distribution: Tropical Americas, Native from Mexico through South America and the West Indies.

Economic Uses: The fruit pulp is used for respiratory problem (Asthma).

**Ethnobotanical Information:** *Crescentia cujete* is frequently cultivated as an ornamental. The ripe fruits once dry and clean inside, are used as containers to hold water. When they dry, clean fruits are cut in half, they have a variety of domestic uses, especially is containers to store salt and tortillas. They are valued in the manufacture of handicrafts and musical instruments (Purseglove 1978). The fruit pulp is used as a laxative, emollient, expectorant, and fever reducer. Fresh seeds are ground and mixed with water to make a refreshing drink. The drink has a sweet and pleasant taste. The wood has a specific gravity of 0.6 to 0.8. It is used for firewood and construction in rural areas and in the manufacture of handles for agricultural implements.

**Propagation:** Propagation is through seeds and cuttings. Information on morphological features, habitat, distribution, uses, and ethnobotany was very scanty in the Calabash tree. For example, some shoot characteristics were described by Purseglove (1978). Information on habitat and distribution of plants was given by Bose and Chowdhury (1991).

Evaluation and characterization of some important and rare plant species of Botanical Garden of Bangladesh Agricultural University



Plate 1. Photograph showing Tanpura or Calabash tree (A) Plant, (B) Shoot, (C) Clower and (D) Fruit

#### 2. SARACA

The species got its name from Sanskrit Asoka. The tree is found wild in India and also native to Sri Lanka, Burma as well as Malaysia. It is widely grown in the gardens, particularly adjoining to temples and monastery for its ornamental value and flowers (Bose and Chowdhury, 1991).

**Description:** A medium sized handsome evergreen tree up to 9m in height with numerous spreading and drooping glabrous branches, leaves pinnate, 30-60cm long having 2-3 pairs of lanceolate leaflets, flowers bisxual, orange or orange-yellow in dense corymbs, very fragrant; fruits flat black pods, leathery, compressed, seed 4-8 per pod, ellipsoid, oblong and compressed (Plant 2, A-D). The bark is brown to grey or black with a warty surface, fresh cut ends are pale yellowish red. The thickness of the bark varies from 5 to 10 mm. The entire cut surface turf reddish on exposure to air. Similar morphological description was also found in India Medicinal plants (Warrier *et al.* 1995).

**Habitat:** *Saraca asoca* is hardy and grows well in warm, humid climate of tropical and subtropical regions. It needs shelter from dry wind, prefers a semi-shady situation and a porous, moist soil. Easily propagated from seed, the tree comes to flowering when 4-6 years old. Major flowering season is from March to May. The tree looks marvellous when the bright scartled, ixora- like blooms are produced profusely. This tree is very suitable for all gardens and parks, big and small. *Saraca indica* is grown all over India. It occurs up to the altitude 600 meters. It is cultivated in many gardens because of its decorative orange red flowers and evergreen beautiful foliage.

Distribution: The tree is found wild in India and also native to Sri-Lanka, Burma as well as Malaysia.

**Economic Uses:** The bark is bitter astringent, sweet, refrigerant, authelminatic, styptic, stomachic, constipating, febrifuge and demulcent. It is useful in dyspepsi, fever, dipsia burning sensation, visceromegal, colic, ulcers, menorrhagia metropathy, leucorrhoea and pimples. The leaves are depurative and their juice mixed with cumin seeds is used for treating stomachalgia. The flowers are considered to be a uterine tonic and are used in vitiated conditions of pitta, syphilis, cervical adenits, hyperdipsia, burning sensation heamorrhoids dysentery, scabies in children and inflammation. The dried flowers are used in diabetes and haemorrhagic dysentery and seeds are used for treating bone fracture, strangury and vesical calculi (Warrier *et al.* 1995).



Plate 2. Photograph showing Asok or A soka tree (A) A plant, (B) A compound leaf, (C) Flowers and (D) Fruits

**Ethnobotanical Information:** Its use in treatment of excessive uterine bleeding is extensive in India. The plant is used also in dysmenorrhoea and for depression in women.

**Traditional ayurvedie used:** Menorrhagia (scant menses), dysmenorrhoea (paonful menses, menstrual cramps), depression, bleeding hemorrhoids, uterine fibroids, considered a uterine sedative and tonic.

**Indication:** Menorrhagia, Dysmen orrhoea, Haemorrhoids, Leucorrhoea. It is particularly adjoining to temples and monastery for its oranmental value and flowers.

Propagation: Easily propagated from seed.

Researches on *Saraca asoca* regarding morphological features, habitat, distribution, uses, ethnobotany was very meager. For example, some canopy characteristics and economic uses were described by Warrier *et al.* (1995). Literature on habitat, distribution ethnobotany and propagation of the plants was provided by Bose and Chowdhury (1991) and Anonymous (2005).

#### **3. CAREYA**

The genus is named after Wiliam Carey, the great scholar, educationist and founder of the Agri-Horticultural Society of India, Calcutta. A genus of 4 species, native of Australia and India. Arborea in latin meaning "like a tree" a native of warmer parts of India (Bose and Chowdhury, 1991).

**Discription:** Kumbi or patana oak (*Careya arborea* Roxb.) is a deciduous tree membranous, obovate, narrowed into a short marginate petioles, crenate, prominent, 10-12 pair. Flower bisexual, 2-4 in. across, sessile, with an unpleasant smell is supported by the unequal bracts, a few flower clustered at the ends of branchlets, patels white or greenish white 1-2 in. Long, filaments purple, ovules in two rows in each cell. Fruit green, fleshy 2-3 in. dia. (Plate 3, A-D).

**Habitat:** It prefers a moist soil and humid atmosphere. Leaves fall during winter and early spring and turns red or bright orange before falling down. Flowering occurs in early summer and the large rings of red or pink stamens carpet the ground beneath. The flower has a foul smell. The tree is planted in parks (Bose and Chowdhury, 1991).

Evaluation and characterization of some important and rare plant species of Botanical Garden of Bangladesh Agricultural University



Plate 3. Photograph showing Kumbhi or Wild guava (A) A plant, (B) A simple leaf, (C) Flowers and (D) Fruits

**Distribution:** Bangladesh, from sub-himalayan tracts to the Jumna eastwards throughout the Bengal, the central provinces, the Peninsula and Burma. A genus of 4 species, native of Australia and India (Kirtikkar *et al.* 1980).

**Econimic uses:** Fiber from bark is used for cordage and sacking, bark is also used as tan and dye and leaves are utilized for making bidis. Wood is used for tool-handles. Seeds are edible. The Bark is acrid, astringent, bitter, thermogenic, alexeteric, expectorant, anthelmintic, antipyretic and antipruritic, and is useful in tumours, cough, bronchitis, catarrh, dyspepsia, colic, haemorrhoids, intestinal worms, dysentery, diarrhoea, leucoderma, epileptic fit and eruptive fevers particularly snallpox. The leaves are useful in ulcers. Flowers are useful in healing vaginal ruptures caused by childbirth. The fruits are acrid, astringent, aromatic and anaphrodisiac, and are useful in dyspepsia and vitiated conditions of kapha.

Literature on morphological features, habitat, distribution, uses, ethnobotany in kumbhi tree was very scanty, for example, some canopy characteristics, economic uses/values were described by Warrier *et al.* (1995) and Dietrich Brandis (1978). Information on habitat was given by Bose and Chowdhury (1991), and distribution by Kirtikar *et al.* (1980).

# 4. STERCULIA

About 100 species of trees and shrubs natives of the tropic, especially of tropical Asia. The species *villosa* is derived from Latin meaning "shaggy".

**Description:** Tree, leaves deeply and palmately 5-7 lobed, under side soft velvety, lobes acuminated, deeply toothed; calyx 5 partite, patent; carpets coriaceous, rough, with stellate pubescence; flowers small, bisexual, pale yellow, scarlet (Plate 4, A-D). Fruits consist of several large, hairy capsules joined at the base and spreading outwards, turn a brilliant red when ripe and then split along their edge to show a number of large, black seeds.

**Habittal:** The tree is propagated from seeds. It is planted along roadside and in large public garden. A quick growing tree of elegant appearance.

**Economic used:** Bags and ropes are made of the fibrous bark. The bark is easily stripped off the whole length of the tree; finer ropes are made from the inner bark, not injured by wet and besides being strong and durable. It is the common rope used by all elephant hunters in the Himalaya, as well as in the Annamallay forests. In deyra dhoon, good paper has been made from it. The seeds of the *Sterculia villosa* are wholesome and when roasted are nearly as palatable as chestnuts. In Amboyna the pericarp is burnd to make a pigment called cassoumba (Warrier *et al.* 1995).

**Propagation:** The tree is propagated from seeds.

Information on morphological features, habitat, distribution, uses, and ethnobotany was very rare in the Udal plants, For example, some canopy characteristics and economic uses were described by Kirtikar *et al.* (1980). Information on habitat and propagation of the plants was provided by Bose and Chowdhury (1991).



Plate 4. Photograph showing Udal (A) A plant, (B) A simple leaf, (C) Inflorescence and (D) Hypanthodium

## 5. FICUS

Ficus is large genus of woody plants-trees, shrubs and climbers, with nearly 600 species grown in tropical and subtropical climate. This is an interesting genus where adventitious roots are freely formed. In some cases, these roots after touching the ground grow in thickness and serve as the secondary stems on which the primary branches put their weight and spread over a side area.



Plate 5. Photograph showing Kuchul-la (A) A plant, (B) A simple leaf and (C) Hypanthodium

**Description:** A small or medium sized tree of irregular habit, bark dark grey, young shoots pubescent. Leaves vary in size, usually 12.5-20 cm in length and 5-7.5 cm in width, elliptic or oblong-lanceolate, acuminate, entire or serrate, scabrid on both surfaces or pubescent beneath, occasionally smooth above, base very unequal, one side with a 3-4 nerved rounded lobe, lateral nerves 9-14 pairs, prominent, petiole 5-15 mm long, stout, scabrid, not jointed to the blade; stipules 1.8-2.5 cm long, linear-lance *Sterculia villosa* olate, Figs in pairs or small clusters on long leafless scaly shoots from the larger branches or from the main stem near the base, shortly pedunculate, 1-1.8 cm across, globose or pyriform, reddish brown when ripe. Male flowers near the mount of the receptacle, stamen one (Plate 5, A-C).

**Distribution:** Sub-Himalayan tract and outer hills from the Chenab eastwards 4,000 ft, Chota Nagpur, Eastern Stpura Hills. Khasia Hills, Chittagong, Burma. It is grown tropical and subtropical climate.

**Economic Uses:** The fruit is given in aphthous complaints. A bath made from the fruit and bark is a cure for leprosy. The juice from the roots is given in bladder complaints and, boiled in milk, in visceral obstruction. Literature on morphological features, habitat, distribution, uses, ethnobotany was very few in the Kuchul-la tree. For example, some shoot characteristics and economic uses/values were described by Kirtikar *et al.* (1980). Information in relation to habitat and distribution of the plants were provided by Bose and Chowdhury (1991).

#### 6. OROXYLUM

**Description:** A small to medium sized deciduous tree up to 12 m in height with soft light brown bark with corky lenticels, compound leaves are very large, 90-180 cm long, 2-3 pinnate with 5 or more pairs of primary pinnate, rachis very soft, cylindrical, swollen at the junction of the branches, leaflets 2-4 pairs ovate or elliptic, acuminate, glabrous, flowers are bisexual, lurid to reddish purple outside, dull or pale pinkish yellow, numerous in large erect racemes, fruits flat capsules, up to 1 m long tapering to both ends, woody seeds, flat, winged all round except at base (Plate 6, A-C). The fresh root bark is soft and cream yellow to grey in color. It is sweet, later becoming bitter. On drying, the bark shrinks, adheres closely to the wood and becomes faintly fissured.

**Habitat:** A tree of graceful appearance, it is planted in large gardens and attractive flowers appear from March to May.

Distribution: Throughout India in deciduous forests, in moist areas.



Plate 6. Photograph showing Kanaidinga (A) A plant, (B) Saplings, (C) Compound leaf and (D) Fruit

**Economic uses:** Roots, leaves, fruits, seeds from Kanaidinga are commonly used for the following purposes. The roots are sweet, astringent bitter, acrid, refrgerant, anti- inflammatory, anodyne aphrodisiac, expectorant, appetizing carminative, digestive, anthelmintic, constipating, diaphoretic, diuretic, antiarthritic, fevrifuge, and tonic. They are useful in vitiaed conditions of vata and kapha, inflammations, dropsy springs, neuralgia, hiccough, cough asthma, bronchitis, anorexia, dyspepsia, flatulence, colic, helminthiasis, diarrhea, dysentery, strangury, gout, vomiting, leucoderma, wounds, rheumatoid arthrites and fever. The leaves are stomachic and anodyne, and are useful in stomachalgia, flatulence, cephalalgia, ulcers, splenomegaly and vitiated conditions of Vata. The tender fruits are expectorant, carminative and stomachic, and are useful (Singh and Zaheer, 1998).

Ethnobotanical information: Medicines which cure the late infection of snakes poison. Juice of *Oroxylum indicum* is given at an interval of 30 minutes until the patient regains consciousness (Singh and Zaheer, 1998).

To remove heat from the lung and relive sore throat, cough and hoarseness of voice due to heat in the lung, epigastric pain.

Propagation: Propagated by seeds and cuttings.

Information on morphological features, habitat, distribution, uses, and ethnobotany was very rare in the Kanaidinga tree. For example, some shoot characteristics, distribution and economic uses/values were described by Kirtikar *et al.* (1980). Literature on habitat, chonobotany and propagation of the plants were given by Bose and Chowdhury (1991).

#### 7. RAMBUTAN

**Description:** Tree, about 9-15 m tall, Branchlets puberulous, Compound leaves 10-25 cm long, leaflets 4-6, elliptic or oblong obtuse, thinly coriaceous, 6.3-15 cm long, terminal and auxiliary, spreading. Flowers 2.5 mm across, white, often unisexual, in cymose fascicles. Sepals 4-6, petals 7, Stamens 10, Ovary 2-3 lobed, yellow to bright red, 3.8 cm long 1.2 cm width (Plate 7, A-C).

**Fruit:** The term Rambutan is derived from the Malay word "hair" which describes the numerous, characterizing long, soft, red or red and green colored spine like protuberances (spiterns) on the surface of the peel. The Pericarp of this attractive oval shaped fruit can be red, orange, pink or yellow in color and is removable by a twist of the hands. The edible, purplish white, juicy, crispy, sweet and subacid flavoured (sarcotesta) conceals a single seed with a thin, fibrous seed coat (testa).

**Origin and distribution:** Malaysian Rambutan is commonly cultivated throughout the archipelago and Southeast Asia (Abidin 1990). Many years ago, Arab traders introduced it into Zanzibar and Penba, there are limited plantings in India, a few trees in Surinam, and in the coastal lowlands of Colombia, Ecuador, Honduras, Costa Rica, Trinidad and Cuba. Some fruits are being marketed in Costa Rica.

**Economic uses:** Cultivated primarily for its fresh fruit, but also canned in syrup, cooked for stewed fruit and jams. The colorful fruits are frequently used in displays with flower and fruit arrangements. The pericarp of Rambutan contains tannin and saponin and is dried and used medicinally in java. In Malaysia, the roots are used in a decoction for treating fever, the leaves for poulticing and bark for an astringent for tongue disease. In china, the fruit is considered stomachache and anthelmintic. In Cambodia, the fruit is used as an astringent and febrifuge, the docoction is prescribed in diarrhea and fever .Young shoots are used to produce green color on silk that is first dyed.



Plate 7. Photograph showing Rambutan tree (A) A plant, (B) A compound leaf, (C) Inflorescence and (D) Flowers

The fruit dye is one of the ingredients to dye silk a black color. The seeds are edible when roasted, they are bitter and said to be narcotic. A tallow similar to cacao butter, with a high level of arachidic acid, can be rendered from the seeds. The Rambutan tallow is edible and can be used to make soap and candles. The reddish colored Rambutan wood is fairly hard and heavy, and reputed to be resistant to insects but not to fungi, however, tress is usually valued as timber.

**Toxicity:** There are traces of an alkaloid in the seed, and the testa contains saponin and tannin. The seeds are said to be bitter and narcotic. The fruit rain also is said to contain a toxic saponin and tannin. **Other uses** 

**Seed fat:** The seed kernel yields 37-43% of a solid, white fat or tallow resembling cacao butter. When heated, it becomes yellow oil having an agreeable scent. Its fatty acids are palmitic 2%, stearic 13.8%, arachidic 34.7%,

oleic 45.3%, and ericosenoic 4.2%. Fully saturated glycerides amount to 1.4%. **Wood:** The tree is seldom felled. However, the wood-red, reddish-white, or brownish-is suitable for construction though apt to split unless carefully dried.

**Medicinal uses:** The fruit (perhaps unripe) is astringent, stomachic, acts as a vermifuge, febrifuge, and is taken to relieve diarrhoea and dysentery. The leaves are poulticed on the temples to alleviate headache. In Malaya, the dried fruit rind is sold in drugstores and employed in local medicine. The astringent bark decoction is for thrush. A decoction of the roots is taken as a febrifuge.

**Ethnobotanical information:** Rambutans are most commonly eaten out of hand after merely tearing the rind open, or cutting it around the middle and puddling it off. It does not cling to the flesh. The peeled fruits are occasionally stewed as dessert. They are canned in syrup on a limited scale. In Malaya, a preserve is made by first boiling the peeled fruit to separate the flesh from the seeds. After cooling, the testa is discarded and the seeds are boiled alone until soft. They are combined with the flesh and plenty of sugar for about 20 minutes, and 3 cloves may be before sealing in Jars. The seeds are sometimes roasted and eaten in the Philippines, although they are reputedly poisonous when raw.

Propagation: Propagation by seeds and cuttings.

Researches on morphological features, habitat, distribution uses, ethnobotany was very scanty in the Rambutan plants. For example, some canopy characteristics were described by Kirtikar *et al.* (1980).

#### 8. CASSIA

Cassia is an ancient Greak name kasia for plants with therapeutic properties. This is a large genus containing about 400 specide of herbs, shrubs and trees, mostly natives of the Tropices, of which about 15 species are natives of India.

**Description:** A large shrub with very thick finely downy branches. Leaves compound, subsessile, 30-60 cm long. Leaflets 8-12 pairs, oblong-obtuse, 5-15 cm long, rigidly subcoriaceous, glabrous or obscurely downy beneath, broadly rounded, oblique at the base. Rhachis narrowly winged on each side of the face. Stipules deltoid, persistent, articulate 6 mm long, flowers are bisexul in short pedicels in spiciform, pedunculate racemes, the buds in yellow caduceus bracts. Sepals obtuse, petals bright yellow, with darker venis, broad ovate, 2-3 cm long. Stamens very unequal, perfect stamens 7 the anthers subequal or those of 2-3 lowest larger than the others. 3 posterior filaments with anthers (Plate 8, A-C). Pod long, ligulate with a broad wing down the middle of each valve, membranous, dehiscent, straight and glabrous, number of seeds 56.

**Distribution:** Very likely a native of the W. Indies. Introduced into India.



Plate 8. Photograph showing Datmardan (A) A plant, (B) A compound leaf and (C) Inflorescence

**Economic users**: The leaves are sour, cure vate itching cough, asthma, ringworm, skin diseases, vermicide (Ayurveda). The leaves of this plant are regarded as an excellent medicine for ringworm. They are also used in other skin diseases considered useful in snake bites. Internally, the leaves and flowers are prescribed as a tonic. The evidence collected is strongly in favour of its efficacy in ringworm. The best way to apply it is to bruise the spread upon the affected part. The leaves have also purgative properties. In eczema is found by washing the parts repeatedly with a strong decoction of the leaves and flowers. The bark has the same properties. In cases of bronchitis and asthma in herpetic constitutions. In Indo China and the Philippine Islands the leaves are considered most effective against herpes. The wood in decoction is used as a mild purgative. In Guinea, the pounded fresh leaves are rubbed on or applied to all kinds of skin affections. In the Gold Coast, the leaves are

#### Sattar et al.

crushed, mixed with black pepper and applied to dhobi itch crow-craw and ringworm on the skin. The infected place is rubbed until the blood comes and then the leaves are rubbed the palms and applied to the sores which are effectively cured. This is one of the most effective amongst native medicines. When boiled the leaves have a purgative effect. They are also boiled and drunk by women to hasten the delivery of children. The paste of the leaves was used as an external application in several cases of ringworm of the body and was found to be efficacious in recent cases, but in chronic cases the drug failed to bring about a cure. In snake bite the fresh leaves are given internally. For scorpion –sting any part of the plant is made into a paste and applied to the sting. The leaves are not an antidote to snake-venom.

**Ethnobotanical Information:** Abortifacient, (Stomach) Amygdalits, Antiodte, Ascites, Asthma, Bactericide Bite (Snake), Diuretic, Dysentery, Eczema, Fever, Fungicide, Gonorrhea, Herpes Insecticide, Itch Larvicede, Leprosy, Measless, Mycosis, Parturition, Piscicide, Poison, Poultice, Prurigo, Psoriasis, Purgative, Rheumatism, Ringworm, Scavies, Scurvy, Shingless, Skin, Soporific, Srore, Sudorific, syphilis, Taenifuge, Tattoo Tonic, Venereal, Vermifuge, Vitiligo and Vulnerary.

#### Propagation: Propagated by seed.

Literature on morphological features, habitat distribution, uses, ethnobotany was very few in the Dadmardan plant. For example, some shoot characteristics, distribution and economic uses were described by Kirtikar *et al.* (1980). Information on habitat of this plant was given by Bose and Chowdhury (1991) and ethnobotay was described from Anonymous (2005).

#### 9. SCHLEICHERA

Schleichera is named after J.C. Schleicher, a Swiss botanist. This genus contains only one species. Oleosa in Latin meaning `the rich in oil. The tree is indigenous to the sub-Himalayan tracts, central India, western peninsula, Sri Lanka, and Burma.

Description: Joina or Kusun or Lac tree or Macassar oil tree or Honey tree (Schleichera oleosa Lour.) is a large deciduous tree. Leaves compound, paripinnate, 20-45 cm long leaflets opposite, sessile, eliptic, the lowest pair 2-7 cm long, the terminal pair 15-22 cm long. Flowers are bisexual, minute, yellowish green patulous, fascicled on interrupted racemes the trees being polygamo-dioecoious, racemes 5-15 cm long (Plate 9, AB). Fruit indehiscent, drupaceous, smooth or echinate 2.5 cm long seed compressed, brown, 2 cm long. New leaves are light pinkish (Khan and Alam, 1996).

**Distribution:** Native of the low hills of the Himalayas, the Central and Western penninsular India, Myanmar and Sri Lanka.



Plate 9. Photograph showing joina or kusun (A) A plant (B) A compound leaf

**Habitat:** The plant is resistant to dry climate, but grows with ease in the moist tropical regions. Propagated from seed or root sucker. It is a slow growing tree. Leaves fall in winter, colorful new leaves (almost red). Appear along with flowers during spring and fruits mature during rainy season. It is a good tree for roadside planning, especially in dry areas. The lac cultured on this tree is the best in quality.

**Economic users:** An incandescent oil is extracted from seeds. Wood is used for beams and scantlings, grafts, shafts, naves, felloes of wheels and handles. It is a good tree for lac insect rearing. The fleshy arils of the seeds are edible. Bark oil are also useful. The bark is astringent and antipyretic, and is useful in pruritus, adenitis, notalgia, arthralgia, malaria, inflammations and ulcers. The seed oil is bitter, sour, sweet, stomachic, anthelmintic, purgative, trichogenous and tonic. It is useful in prorates, burns, acne, dermatopathy, scald, trichopathy, ulcers, cephalalgia and vitiated conditions of vata.

Propagation: propagated from seed or root sucker.

Researches on morphological features, habitat, distribution, uses, ethnobotany was very scanty in the joina tree. For example, some canopy characteristics and economic uses/values were described by Warrier *et al.* (1995), Khan and Alam (1996). Information on habitat and distribution of the plants was provided by Bose and Chowdhury (1991).

# **10. PTEROSPERMUM**

The genus is derived from Greek word meaning "winged seed". It includes about 25 species of trees and shrubs, all natives of tropical Asia of which about 11 species are found in India. Aceriflium means leaves like acer or maple.

**Description:** Muchkanda (*Pterospermum aceriflium* Willd.) is a tall evergreen tree, but smooth grey, thin, hardwood red. Branchlets and inflorescence clothed with ferruginous tomentum. Leaves were simple, large obovate to orbicular, blade 6-15, petiole 4-12 in. Flowers are bisexual, calyx segments linear up to 5 in long, petals pure white. Capsule brown-tomentose, pentagonal, 2-6 long, seeds numerous with large membranonus wings (plate 10, A-D). The capsule is believed to take more than 12 months to ripen (Dietrich Brandis, 1978).

**Habitat:** It prefers warm climate and high rainfall. Easily propagated from seed the tree is a quick grower, producing flowers from the third year under favorable conditions. Flowering occurs in spring and early summer and flowers retain the scent long after they are dry. Fruits take about a year to mature when they spilt releasing the winged seeds to float away in air current. This is a good tree on medium road and in large gardens and parks.



Plate 10. Photograph showing Muchkanda (Maple twist) (A) A plant, (B) Fruits with branch, (C) A simple leaf and (D) Flower

**Distribution:** sub-Himalayan tract and Outer Himalayan valleys and hills up to 4,000 ft. Chittagong Khasia Hills Manipur Tenasserim Burms, N. Kanara, extensively planted in the Bombay presidency.

**Economic uses:** Leaves are used as plates and for packing tobacco. Flowers are used as disinfectant. Wood is used for packing cases plunks, turnery articles and plywood. The flower is sharply bitter, acrid, tonic laxative, anthelmintic; removes kapha'; inflammation, blood troubles, abdominal pain ascites, cures ulcers leprosy urinary discharges and tumors (Ayurveda). The down on the leaves is used to stop bleeding in wounds. The flowers are used as general tonics in the konkan the flowers and bark charred and mixed with kamala are applied in suppurating small-pox.

#### Propagation: Easily propagated from seed.

Information on morphological features habitat, distribution uses ethnobotany was very scanty in the Muchkandu tree. For example, some canopy characteristics, economic uses and distribution were described by Dietrich Brandis (1978) and Kirtikar *et al.* (1980). Literature on habitat and propagation of the plants was given by Bose and Chowdhury (1991).

# 11. BROWNEA

Brownea is named after P. Browne, an English naturalist in the West Indies. A genus of about 10 species of trees natives to tropical America.

Coccinea in Latin meaning "scarlet". The tree is native of Jamaica. It is grown widely in the gardens of moist and warm areas due to the exquisite beauty of its flowers and foliage.

**Description:** A small evergreen tree of compact growth, 5-7 m high often branched near the base with dense foliage on spreading and drooping branches. Leaves compound, pinnate, nearly 30 cm long, leaflets elliptic 10-14 cm long and up to 12 cm wide, arranged in opposite pairs, petioles short, young leaves enclosed in pinkish

scales which fall to the ground to expose the leaflets hanging flaccid and colures from the end of the branches (plate 11, A-D) As the leaves mature, they become mottled with red or purple, finally glossy green and stand out stiffly from the midrib. Flower buds enclosed in pinkish bractlets. Flowers are bisexual, scarlet born in compact heads, about 10 cm across, on the lower side of branches and twigs, petals 5, tubular, 4-5 cm long, stamens 11 or 12, joined for about half length red conspicuous. Pods flat, about 20 cm long.



Plate 11. Photograph showing Brownea (West Indian mountain rose, scarlet flame bean) (A) A plant, (B) A compound leaf, (C) Twig and (D) Inflorescence

**Habitat:** The fruit-set is scanty and the growth of the seedling is slow they require 10-12 years to come to flowering. It is commonly propagated by layering; grafting can also be practiced. Vegetatively propagated plants come to flowering in 4 to 5 years. The plant should be grown in places sheltered from hot winds and in partial shade. Flowers appear in February- March, but can also be seen at other times especially in September. This handsome tree is good for all gardens big or small. In large gardens they may be planted in groups, particularly inside green lawns.

Distribution: Tropical American and West Indies.

Researches on morphological features, habitat, description distribution and use were very rare in the Brownea plants. For example some canopy characteristics habitat and distribution were described by Bose and Chowdhury (1991).

#### CONCLUSION

Plants play major roles in human life including health, income and cultural values and thus provide motivational forces for their conservation. These eleven valuable plant species have been identified in the Botanic Garden of Bangladesh Agricultural University and their usefulness by threatened and rare practitioners to be overemphasized. If we are able to nurture and propagate them and also adhere to proper harvesting techniques, their availability may be sustained. Seed maturity period as well as propagation methods have been documented. We hope that this paper becomes useful as various pieces of knowledge on their occurrence, uses, threats and propagation have been put together in the paper. We then have to take good care of them so they in turn take care of us.

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