ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

Taxonomy and Traditional Medicinal Plant Species of Myrtaceae (Myrtle) Family at Rajshahi District, Bangladesh

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Manuscript Info

Manuscript History:

Received: 18 August 2015
Final Accepted: 19 September 2015
Published Online: October 2015

Key words:

Myrtaceae, Taxonomy, Medicinal Plants, Traditional Uses, Rajshahi, Bangladesh

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Abstract

Taxonomy and traditional medicinal plant species of the family Myrtaceae growing throughout the Rajshahi district, Bangladesh was carried out during August 2013 to July 2014. A total of 8 species under 3 genera belonging to the family Myrtaceae were collected and identified. Out of the total number of species *Callistemon citrinus* (Curtis) Skeels., *Eucalyptus citriodora* Hook., *Eucalyptus camaldulensis* Dehnh., *Psidium guajava* L., *Syzygium cumini* (L.) Skeels., *Syzygium fruticosum* (Roxb.) DC., *Syzygium samarangense* (Blume) Merr. & Perry was common and *Syzygium jambos* (L.) Alston. was rare species in the study area. For each species botanical name, taxonomic description, local name, habit, habitat, flower colour, flowering season, specimen examined and medicinal uses have been mentioned.

INTRODUCTION

Myrtaceae family of about 140 genera and 3,400 species distributed mainly subtropical and tropical regions of the world. Myrtaceae family is particularly abundant in Australia where some Eucalyptus trees are world's tallest angiosperms. Myrtaceae is represented in India by about 15 genera and over 170 species. Beautiful pinkish flowers of *Myrtus communis* are considered highly sacred among Greeks, Egyptians, Jews, and Persian, and used in religious rites and ceremonies. Some of the larger genera of Myrtaceae along with their number of reported species include *Eugenia* (1000), *Eucalyptus* (500), *Syzygium* (500), *Myrcia* (500), *Psidium* (140), *Myrtus* (100) and *Melaleuca* (100) (Sharma, 2004).

The importance of studying local floristic diversity and medicinal uses has been realized and carried out in Bangladesh by Anisuzzaman et al (2007), Rahman et al (2006), Rahman et al (2007a, 2007b, 2007c) Rahman et al (2008a, 2008b, 2008c, 2008d), Rahman et al (2011, 2012, 2013a, 2013b, 2013c, 2013d,), Rahman and Akter (2013), Rahman and Khanom (2013), Rahman (2013a, 2013b, 2013c, 2013d, 2013e, 2013f, 2013g, 2013h, 2013i, 2013j, 2013k), Rahman (2014a, 2014b, 2014c, 2014d), Rahman and Debnath (2014a, 2014b), Rahman and Keya (2014a, 2014b), Rahman and Gulshana (2014), Rahman and Rahman (2014), Rahman and Rogonigondha (2014), Rahman et al (2014a, 2014b, 2014c), Rahman (2015a, 2015b), Rahman and Debnath (2015), Rahman and Keya (2015), Rahman and Jamila (2015), Uddin and Rahman (1999), Uddin et al (2014) and Yusuf et al (2006). The main objectives of this work were detailed study on the taxonomic and medicinal aspects of the family Myrtaceae occurring Rajshahi district, Bangladesh.

Materials and Methods

The present study in based on the intensive field of the area during the period of August 2013 to July 2014. A total of 8 species under 3 genera belonging to the family Myrtaceae were collected and identified. The methods employed during the study were designed with the sole purpose of eliciting the precious wealth of information on the medicinal uses of plants practiced by the local people. Detailed survey has made in gathering information regarding use of medicine has been documented. Usually, the survey in each locality started with the interview of elderly and experienced members, locally known as Hakims. Besides, this the common people of the surveyed localities who themselves have used these plant-based for health treatments were interviewed to prove veracity of the curative features of plants. Medicinal uses and data about the treatment of various alignments based on the information gathered by using questionnaires are given subsequently.

The collected specimens were identified studying related taxonomic books and booklets from the library of Rajshahi University. The major collected materials were identified and described up to species with the help of Ahmed et al (2009), Hooker (1961), Prain (1963), Kirtikar and Basu (1987) were consulted. For the current name and up to date nomenclature Huq (1986), Ahmed et al (2009) and Pasha and Uddin (2013) were also consulted. All the collected plant specimens were kept in the Herbarium, Department of Botany, and University of Rajshahi, Bangladesh.

Results and Discussion

The present research work is based on the local knowledge of most commonly used medicinal plants of Myrtaceae family. Each Medicinal plant species is provided with its scientific name, local name, plant parts (Such as leaf, root, stem, fruit, latex, whole plant, seed, inflorescence and bark) mostly used and uses. The result obtained in the investigation need to be rigorously subjected to pharmachemical analysis in order to validate their authenticity and future prospects. The paper has only documented the herbal health remedies presently in vogue in the region and does not prescribe or recommend for their use till further determination by the pharmacologist. Data have been gathered on the traditional uses of plant species, especially for asthma, anthelmintic, astringent, bronchitis, carminative, colic, cholera, eyesores, cough, diuretic, diabetes, diarrhea, dysentery, jaundice, laxative, stomach pain, toothache, ulcers, wounds and others.

Based on this study, a preliminary list of the family Myrtaceae at Rajshahi, Bangladesh conducted during August 2013 to July 2014. The collected information is comparable with the result of other studies in Bangladesh. A total of 2 species belonging to 2 genera were recorded in Satchari National Park (Arefin et al, 2011). A total of 6 species belonging to 2 genera were recorded in Khagrachhari district (Islam et al, 2009). A total of 7 species belonging to 3 genera were recorded in Munshiganj district (Rahman et al, 2013). A total of 4 species belonging to 2 genera were recorded in Teknaf Wildlife Sanctuary (Uddin et al, 2013). No published information recorded on the family Myrtaceae at Rajshahi, Bangladesh.

By examining the plant materials collected from the study area using the identification methods and medicinal information was accumulated and described below.

1. ***Callistemon citrinus*** **(Curtis) Skeels.**

Taxonomic description: A small or large tree. Flower sessile, bracteate, bracts leafy, green, bracteolate, two bracteoles, hermaphrodite, actinomorphic, complete, epigynous, pentamerous, cyclic. Androecium: Indefinite stamens, monadelphous, scarlet red, filaments very long slightly connate at the base, anthers dorsifixed, bicelled, dark brown, dehisce longitudinally, introrse. Gynoceium: The number of carpel's varies from 2-4 even in the different flowers of the same spike, syncarpous, ovary inferior, 3 or 4 chambered according to the number of carpels, axile placentation, many ovoules in each locule, style long, stigma capitates.

***Callistemon citrinus* (Curtis) Skeels.**

Local name: Bottle Brush
Habit: A small or large tree
Habitat: A wide variety of soil and is well adapted to wet zone and other climatic conditions.
Flower color: Red
Flowering season: January to June
Medicinal Uses: Cultivated as an ornamentals plant. The wood is used for agricultural instruments, handles of tools, for pillar and charcoal.
Specimens examined: RZ 01, Rajshahi University Campus. 05-09-2014.

2. *Eucalyptus citriodora* Hook.

Taxonomic description: Erect, aerial woody, branched, cylindrical, and solid, gladrous, and white. Leaves caulie and ramal, simple, alternate, Petiolate, falcate, gland dotted, atromatic, entire, glaucous, acute, unicostate reticulate. Inflorescence cymose, umbllate clustered cyme. Androecium: Stamens indfinite, polyandrous, attached on the rim of calyx cap, folded in wards in bud condition anthers dorsifixed, disedous, small introrse. Gynoecium: 3 carpels, syncarpous, ovarytrilocular, inferior, style single, stigma minut, terminal, axile placentation ,many ovules in each locule, ovary wall gland-dotted.

***Eucalyptus citriodora* Hook.**

Local name: Eucalyptus.
Habit: A large tree with whitish bark.
Habitat: It is commonly cultivated in parks, gardens, roadsides, river banks and other places.
Flower color: Whitish
Flowering season: Throughout the year.

Medicinal Uses: Cultivated as a shade tree, as an ornamental tree and source of fire wood. The timber is valued for ship building, coach building and making the handles of tools.
Specimens examined: RZ 02. Kazla gate, 06-09-2014.

3. ***Eucalyptus camaldulensis* Dehnh.**

Taxonomic description: A large tree. Leaves peliolate, midrib slender, prominent on both surfaces. Inflorescence axillary umbel, peduncles, terete. Androecium: stamens numerous, anthers versatile, obovate opening in parallel slits. Gynoecium: ovary 5-celled, each celled with many ovules, stigmas capitates.

***Eucalyptus camaldulensis* Dehnh.**

Local name: Eucalyptus.
Habit: Small to large dense-crowned tree.
Habitat: Low lands and hilly forests where it is cultivated. It can tolerate seasonal water-logged conditions.
Flower color: Whitish.
Flowering season: Throughout the year.
Medicinal Uses: In south East Asia. It is widely planted for shade, shelter and amenity purposes and as a source of nectar to produce high quality honey. It is cultivated mainly for firewood, charcoal, poles, posts and paper pulp. It is also used for hard board, fiberboard and particle board. Logs may be sawn for construction timber (especially for bridges, wharves and ships), railway sleepers, furniture, flooring and packing cases, although the quality is sometimes pm. The bole has potential as a substrate for shitake mushroom cultivation and yields a gum which can be used as a dye.
Specimens examined: RZ-03. Besides of the Kazla gate, 06-09-2014.

4. ***Psidium guajava* L.**

Taxonomic description: A small evergreen tree with smooth, pinkish-brown bark. Leaves opposite 6-15 cm long, oblong or elliptic-oblong, entire, pubscent beneath. Flowers 2.5-5 cm across, white on 1-3 flowered auxiliary peduncles. Fruit a globose or py*ri*form berry, 5-10 cm or more long.

***Psidium guajava* L.**

Local name: Piyara, sabri
Habit: Medium sized tree with whitish bark.
Habitat: Homesteads, roadsides and forests.
Flower color: whitish
Flowering season: Almost throughout the year.
Medicinal Uses: Decoction of the root bark is astringent and employed in diarrhea; root paste mixed with water is also used to treat diarrhea and dysentery. Flowers are used in bronchitis and eye sores. Fruits are tonic, cooling and laxative; good for colic and bleeding gums. Fruits and its conserve are also astringent and used in diarrhea and dysentery. Leaves are used for wounds, ulcers, and as an astringent to bowels; said to relieve toothache when chewed; decoction is used in cholera. Juice of the young leaves is drunk to cure diarrhea. Young leaf extract of the plant possesses antibacterial and antifungal properties.

Specimens examined: RZ 04.Botanical garden. 06-09-2014.

5. *Syzygium cumini* (L.) Skeels.

Taxonomic description: A large evergreen or semi-deciduous tree. Leaves elliptic-oblong, 6-15 cm long, acuminate, entire, secondary veins closely parallel. Flowers greenish white, sessile in compound trichotomous cymes on previous years branches. Fruit a berry, about 2.5 cm long, oblong, black, and juicy.

***Syzygium cumini* (L.) Skeels.**

Local name: Jam, Kalojam, Kalajam
Habit: Tree
Habitat: It is found in a variety of situations, cultivated in villages, gardens, roadsides and other places.
Flower color: Whitish
Flowering season: March-June.
Medicinal Uses: Bark is anthelmintic and astringent to the bowels; good for sore throat, bronchitis, asthma and dysentery; used in the preparation of gargles and mouth–wash. The bark is also used for toothache and blood dysentery. Bark juice along with equal amount of fresh milk is taken in the early morning for three days to cure dysentery. The fresh bark juice is taken for stomach pain. Leaves are astringent; juice along with other astringents cures dysentery. Juice of the ripe fruit is general tonic, tonic to the liver, stomachic, carminative and diuretic. Vinegar, prepared from the juice of ripe fruit, is stomachic, carminative and diuretic. Seeds are astringent to the bowels and diuretic; good for diabetes; it is also used for Jaundice.

Specimens examined: RZ 05. Botanical garden. 06-09-2014.

6. *Syzygium fruticosum* (Roxb.) DC.

Taxonomic description: A small to medium-sized, much branched, evergreen tree. Leaves elliptic-oblong, 5-13 cm long, gradually acuminate, base narrowed to a short petiole, lateral veins closely parallel. Flowers white, small in much branched trichotomous cymes from the scars of fallen leaves. Fruit a globose berry, the size of a pea, black or purple when ripe.

***Syzygium fruticosum* (Roxb.) DC.**

Local name: Bon-jam, kak-jam
Habit: A large shrub to a small tree.
Habitat: wet to semi-dry soil, villages, gardens, parks roadsides and smaller hill tracts and naturalized along the forest margins.
Flower color: whitish
Flowering season: not on record.
Medicinal Uses: Juice of the tender leaves with rice water is taken in blood dysentery. It is mostly used as fuel wood. Leaves are used as fodder. Sometimes it is planted as an ornamental tree. Fruit are edible.
Specimens examined: RZ 06. Botanical garden. 06-09-2014.

7. *Syzygium jambos* (L.) Alston.

Taxonomic description: A medium-sized tree. Leaves 11-20 cm long, narrowly oblong-lanceolate to lanceolate, tapering to an acuminate apex, glabrous. Flowers white, about 4 cm across in few flowered, terminal, raceme-like cymes. Berry about 3 cm across, white or yellowish when ripe, globose or pyriform.

***Syzygium jambos* (L.) Alston.**

Local name: Golapjam.
Habit: A small or medium-sized evergreen tree.
Habitat: It is found in variety of situation but most preferably in moist places,.It is mainly cultivated in the home gardens.
Flower color: White
Flowering season: March-June
Medicinal Uses: The bark is astringent to the bowels; used in asthma, fatigue and dysentery. The leaves are boiled and used in sore-eyes. Fruits are brain tonic; possesses antibacterial properties; Seeds are astringent to the bowels. Ethanol extract showed significant biological activity against Mycobacterium tuberculosis.

Specimens examined: RZ 07. Botanical garden. 06-09-2014.

8. *Syzygium samarangense* (Blume) Merr. & Perry

Taxonomic description: A small to medium sized tree. Stem: Erect, woody, branched, bark smooth grey and dense crown. Leaf: sub-sessile, elliptic oblong, thingly coriaceous. Inflorescence:Cymes. Androecium:Stamens numerous, anthers lanceolate, or ovoid, dorsifixed, dehiscence, longitudinal. Gynoecium: Ovary 2 locular each with many ovules.

***Syzygium samarangense* (Blume) Merr. & Perry**

Local name: Jamrul
Habit: A small to medium sized tree.
Habitat: Home gardens
Flower color: Whitish
Flowering season: March to July
Medicinal Uses: The fruit although juicy and refreshing, are almost tasteless, and not much eaten except by poor people. Wood is used occasionally for building purposes for the handles of tools, and charcoal.
Specimens examined: RZ 08. Botanical garden. 06-09-2014.

Conclusion

Taxonomy and traditional medicinal uses on the family Myrtaceae growing throughout the Rajshahi, Bangladesh was carried out during August 2013 to July 2014. A total of 8 species under 3 genera belonging to the family Myrtaceae were collected and identified. The present study may be a preliminary contribution of this area using standard research methods, focusing on medicinal plants and their local uses for the healthcare. This detailed information will be helpful for the pharmacognosist, botanist, ethno-botanist and pharmacologist for the collection and identification of the plant for their research work and isolation of plant products benefitting human health.

Acknowledgements

The authors are grateful to the local people of Rajshahi for their co-operation and help during the research work.

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