



Taxonomy and Medicinal Uses on Acanthaceae Family of Rajshahi, Bangladesh

A. H. M. Mahbubur Rahman^[1], M. Wahida Afsana^[2], A.K.M. Rafiul Islam^[3]

Plant Taxonomy Laboratory, Department of Botany, University of Rajshahi, Rajshahi-6205, Bangladesh

ABSTRACT

Taxonomy and medicinal uses on the family Acanthaceae growing throughout the Rajshahi, Bangladesh was carried out during September 2011 to August 2012. A total of 12 species under 10 genera belonging to the family Acanthaceae were collected and identified. Out of the total number of species *Andrographis paniculata* (Burm.f.) Wall ex Nees., *Barleria prionitis* L., *Hemigraphis hirta* T. Anders., *Hygrophila auriculata* (Schum.) Heyne., *Justicia adhatoda* L., *Ruellia tuberosa* L., *Justicia gendarussa* Burm.f. were common and *Barleria cristata* L., *Nelsonia canescens* (Lamk.) Spreng., *Rungia pectinata* (L.) Nees., *Thunbergia grandiflora* L. *Dipteracanthus prostratus* (Poir.) Nees in Wall. was rare species in the study area. For each species botanical name, local name, habit, habitat, phenology, status of occurrence, chromosome number and medicinal uses have been mentioned.

Keywords: Acanthaceae, Taxonomy, Medicinal plants, Folkloric uses, Rajshahi, Bangladesh

INTRODUCTION

Acanthaceae (the acanthus family) is a family of dicotyledonous flowering plants containing almost 250 genera and about 2500 species. Most are tropical herbs, shrubs, or twining vines; some are epiphytes. Only a few species are distributed in temperate regions. The four main centers of distribution are Indonesia and Malaysia, Africa, Brazil and Central America. The representatives of the family can be found in nearly every habitat, including dense or open forests, in scrublands, on wet fields and valleys, at the sea coast and in marine areas, and in swamps and as an element of mangrove woods. The group is mainly of horticultural interest and includes such ornamentals as bear's-breech (*Acanthus mollis*), clockvine (*Thunbergia*), shrimp plant (*Justicia brandegeana*), and caricature-plant (*Graptophyllum pictum*). The largest genera include *Justicia* (600 species; now comprising former segregate genera such as *Jacobinia* and *Beloperone*), *Ruellia* (355), *Strobilanthes* (350), *Barleria* (300), *Aphelandra* (170), *Staurogyne* (140), *Dicliptera* (150), *Blepharis* (130), *Lepidagathis* (100), *Hygrophila* (100), *Thunbergia* (90), and *Dyschoriste* (80). The small genus *Avicennia* contains at least eight species of ecologically important mangroves [16].

The main objectives of this work will be detailed study on the taxonomic and medicinal aspects of the family Acanthaceae occurring Rajshahi, Bangladesh.

MATERIALS AND METHODS

The present study is based on the intensive field of the area during the period of September 2011 to August 2012. A total of 12 species under 10 genera belonging to the family Acanthaceae 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 ailments 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 [1], [2], [4], [6], [8], [9], [10], [11], [12], [13], [14] and [15] were consulted. For the current name and up to date nomenclature [5], [1] and [7] were also consulted. All the collected plant specimens were kept in the Herbarium, Department of Botany, and University of Rajshahi, Bangladesh.

RESULT AND DISCUSSION

The present research work is based on the local knowledge of most commonly used medicinal plants of Acanthaceae family. Each Medicinal plant species is provided with its scientific name, local name, chromosome number [3], 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 pharmacological 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, abscess, anthelmintic, astringent, bronchitis, bedsores, cancer, cough, diuretic, diarrhea, dysentery, eczema, earache, headache, inflammations, jaundice, kidney disease, leprosy, paralysis, skin diseases, scabies, toothache, ulcers, ringworm and others.

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

1. *Andrographis paniculata* (Burm.f.) Wall ex Nees.

Taxonomic description: A very bitter branched, annual, erect herb, 30-90 cm high; branches sharply quadrangular. Leaves up to 6.25 cm long, lanceolate, acute. Flowers small, solitary, distant, in lax axillary and terminal panicles; corolla 1.25 cm, 2-lipped, white, spotted rose-purple. Capsules 18 mm long, linear-oblong, acute.



Local name: Kalomegh

Habit: Herb

Habitat: Gardens, homesteads and waste places.

Phenology: November to May

Chromosome number: $2n = 28, 50$

Status of occurrence: Wild

Medicinal Uses: The plant is febrifuge, hypoglycemic, stomachic, tonic, alterative, anthelmintic and cholagogue; used in general debility, dysentery and certain forms of dyspepsia and in liver complaints, mainly of children. It is a domestic medicine for flatulence and diarrhea of children. The plant is also used in spleen complaints, colic, and strangulation of intestine, constipation, diarrhea, cholera, phthisis and consumption. Juice of the leaves together with spices, such as cardamoms, cloves, cinnamons, etc., is dried in sun, and made into little globules, which are prescribed for infants to relieve griping, irregular stools and loss of appetite.

Voucher number: WA 11, 03-06-2012, Rajshahi.

2. *Barleria cristata* L.

Taxonomic description: An erect or diffuse undershrub. Leaves 7.5–10 cm long, elliptic-oblong, acute or acuminate, yellow-hairy or lineolate above. Inflorescence axillary and terminal short, dense spikes; outer sepals ovate-acuminate or lanceolate, toothed, softly hairy. Corolla 3.7 cm, purple-blue or white, upper half funnel-shaped, lobes ovate. Capsule 16 cm long, 4-seeded

Local name: Jhanti, Sada Jati.

Habit: Undershrub.

Habitat: Gardens.

Phenology: November to February.



Chromosome number: $2n = 30, 32, 40$

Status of Occurrence: Cultivated.

Medicinal Uses: The plant is used as a stimulant and demulcent. Root decoction is given in anemia.

Voucher number: WA 17, 02-05-2012, Rajshahi.

3. *Barleria prionitis* L.

Taxonomic description: *Barleria prionitis* L. is spine scent bushy shrub, up to 1.5 m high. Leaves up to 10 cm long, elliptic, acuminate, bristle-tipped. Flowers sessile, often solitary in the lower axills, becoming spicate above; corolla 3-4 cm, yellow.



Local name: Kanta-janti, Kurantak

Habit: Shrub

Habitat: Roadsides and waste places.

Phenology: November to February

Chromosome number: $2n = 30, 32, 40$

Status of occurrence: Wild.

Medicinal Uses: Root paste is applied to cure boils and glandular swellings, chewing of leaves relieves toothache. The plant is heating and appetizer; useful in diseases of the skin, itching, whooping cough and inflammations. The juice of the leaves is generally used in catarrhal affections of children accompanied with fever and much viscid phlegm. Leaves are chewed to relieve toothache. Dried bark is used in cough and juice of fresh bark in anasarca. The root is diuretic and tonic; paste of the root applied to disperse boils and glandular swellings; decoction is used as a mouthwash in toothache.

Voucher number: WA 19, 01-07-2012, Rajshahi.

4. *Dipteracanthus prostratus* (Poir.) Nees in Wall.

Taxonomic description: A much branched, prostrate to procumbent herb, up to 40 cm. long, stem 4-angled, leaves petiolate. Flower bluish in colour, solitary, sepal free, corolla funnel shaped. Fruit a capsule, seed thin, flat, orbicular 3-4 mm. in diameter, pale straw in colour, large.



Local name: Posta booti.

Habit: Herb.

Habitat: Wetlands, Roadsides.

Phenology: May to August

Chromosome number: $2n=34$

Status of occurrence: Wild

Medicinal Uses: Leaves are given with liquid copper as remedy for gonorrhoea also used as remedy for ear diseases.

Voucher number: WA 21, 03-08-2012, Rajshahi.

5. *Hemigraphis hirta* T.Anders.

Taxonomic description: A softly hirsute herb; stem 15-45 cm long, creeping in grass. Leaves small, 1.25-2.5 cm long, ovate crenate. Heads 2-6-flowered, axillary. Bracts 1.25 cm long, elliptic; sepals linear, or in fruit subspathulate; corolla 1.25 cm, subequal, pale lavender blue. Capsule 1.25 cm long, 12-seeded.



Local name: Buripana, Borati gas.

Habit: Herb.

Habitat: Moist lands.

Phenology: January to July.

Chromosome number: $2n = 30$.

Status of occurrence: Wild.

Medicinal Uses: Leaves are chewed with betel leaf which cures ulcer of the mouth and gums.

Voucher number: WA 25, 01-10-2-11, Rajshahi.

6. *Hygrophila auriculata* (Schum.) Heyne.

Taxonomic description: A stout herb with numerous fasciculate usually unbranched, subquadrangular, erect, stems, 0.6-1.5 m high, thickened at the nodes. Leaves oblong-lanceolate or oblanceolate, sparsely hispid on both sides, six at a node, the outer 2 large, reaching 15 cm long, each leaf bear straight, sharp, yellow, spines in its axil. Flowers purple-blue, 3.5 cm long, in a whorl of 8 at each node. Capsuls 8 mm long, linear-oblong, pointed.



Local name: Kanta Kalika, Talmakhna

Habit: Herb

Habitat: Moist places, on banks of ponds, ditches and paddy fields.

Phenology: October to January

Chromosome number: $2n = 32$

Status of occurrence: Wild

Medicinal Uses: Decoction of roots and leaves is diuretic and used in the treatment of dropsy, jaundice and urinogenital diseases. Leaves are tonic, aphrodisiac and hypnotic; useful in diarrhea, dysentery, thirst, urinary calculi, urinary discharges, inflammations, biliousness, anemia, constipation, anuria and cough; also applied for gleet, lumbago and pains in the joints. Seeds are cooling, tonic, aphrodisiac, and sedative to gravid uterus and constipating; given for gonorrhoea and spermatorrhoea. Decoction of the root is used as a diuretic in dropsy. The plant is used in cancer and tubercular fistula.

Voucher number: WA 07, 05-11-2011, Rajshahi.

7. *Justicia adhatoda* L.

Taxonomic description: A dense, much branched, evergreen herb or shrubs, upto 2.6 m high. Leaves large, elliptic or oblanceolate, acute, entire, subcoriaceous, minutely pubescent.



Local name: Basak.

Habit: Shrub.

Habitat: Homestead and gardens, moist places.

Phenology: January to April.

Chromosome number: $2n = 34$

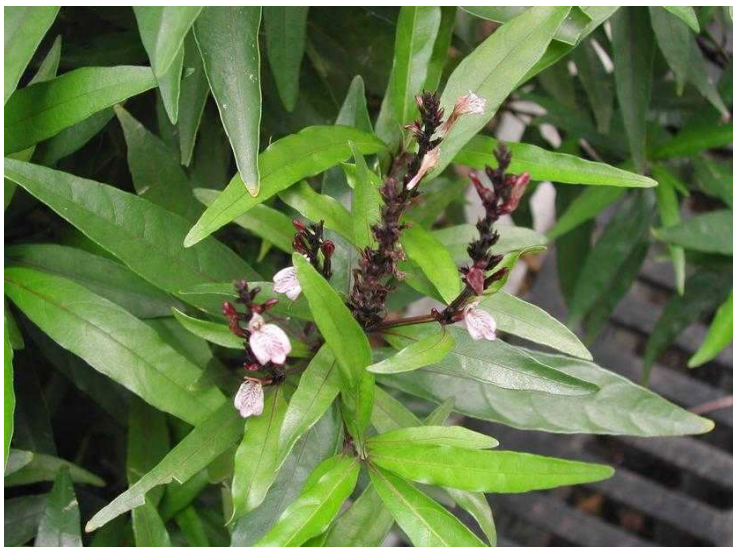
Status of occurrence: Wild/cultivated.

Medicinal Uses: Mainly used as medicine. Fresh and dried leaves constitute the drug vasaka, used in bronchial troubles and consumption. Leaf juice is used in diarrhea, dysentery, influenza and glandular tumours.

Voucher number: WA 31, 03-06-2012, Rajshahi.

8. *Justicia gendarussa* Burm.f.

Taxonomic description: An erect, slender undershrub, 0.6-1.2 m high. Leaves lanceolate or linear-lanceolate, 7.5-12.5 cm long. Flowers white, spotted purple within, in interrupted spikes, 5-12.5 cm long, from uppermost leaf axils and often forming terminal panicle. Corolla 1.3 cm long.



Local name: Jagathmadan

Habit: Undershrub.

Habitat: Waste places and also planted as a hedge plant.

Phenology: December to May

Chromosome number: $2n = 28, 30, 32$

Status of occurrence: Wild

Medicinal Uses: Paste of leaves applied to fractured bones. Leaf oil is useful in eczema. Plants are used as febrifuge and emetic; employed for rheumatic affections. Bark is a good emetic. Leaves are insecticidal; used in chest pain, rheumatism and eczema. An infusion of the leaves is given internally in cephalalgia, hemiplegia and facial paralysis. The leaves and tender shoots are diaphoretic; decoction is given in chronic rheumatism. The bruised leaves with little lime and tobacco leaf is tied over cuts to heal. The leaves with the fruits of *Piper nigrum* is used in leucorrhoea. A decoction of the root boiled in milk is given in rheumatism, dysentery and jaundice.

Voucher number: WA 35, 03-06-2012, Rajshahi.

9. *Nelsonia canescens* (Lamk.) Spreng.

Taxonomic description: A trailing or diffuse herb, stem 30-50 cm long. Leaves elliptic-oblong or suborbicular, obtuse to rounded at the apex, entire, rounded at the base, villous.



Local name: Paramul

Habit: Herb

Habitat: Waste places and plain lands.

Phenology: October to February

Chromosome number: 2n=72

Status of occurrence: Wild

Medicinal Uses: Leaf juice is used in earache.

Voucher number: WA 01, 10-10-2011, Rajshahi.

10. *Rungia pectinata* (L.) Nees.

Taxonomic description: A much-branched, annual, straggling weed. Leaves very variable in size, 1.3-6.3 cm, long, elliptic-lanceolate or oblong-lanceolate, acute or subobtuse. Flowers small, blue, in terminal and axillary 1-seeded subsessile spikes, 6-22 mm long. Capsules 2.5cm long ovoid, acute, compressed.



Local name: Pindi

Habit: Herb

Habitat: Warm moist shady places.

Phenology: November to May

Chromosome number: $2n = 26, 50$

Status of Occurrence: Wild

Medicinal Uses: Leaf juice is considered cooling and aperient; prescribed for children suffering from small-pox in doses of a tablespoonful or two, twice daily. Bruised leaves applied to contusions to relieve pain and swelling. Roots are given in fever. Juice of the leaves is cooling and is given to children suffering from small pox.

Voucher number: WA 05, 03-04-2012, Rajshahi.

11. *Ruellia tuberosa* L.

Taxonomic description: An erect, pubescent undershrub, 0.3-0.6 m high. Roots stout, often with fusiform swellings. Stems herbaceous, annually produced from a short creeping woody rhizome. Leaves lanceolate, elliptic or oblanceolate, the lower ones usually smaller. Flowers solitary, terminal, subsessile, 3.8 cm long. Corolla white, 3.8-5 cm, tube slender. Capsule 3.8 cm long, oblong, often tinged with purple.



Local name: Chatpoty

Habit: Herb

Habitat: Fallow land and moist walls.

Phenology: Almost throughout the year.

Chromosome number: $2n = 32, 34$

Status of occurrence: Common.

Medicinal Uses: Roots are used in gonorrhoea, syphilis and renal affections; the dried ground roots are taken in the pregnant women, causes abortion. Water extract of the dried roots are used as a wash to sore-eyes. The roots are emetic and purgative. It is also grown an ornamental plant.

Voucher number: WA 10, 02-07-2012, Rajshahi.

12. *Thunbergia grandiflora* Roxb.

Taxonomic description: A large climber. Leaves 15.25 by 7.6 cm, ovate or uppermost lanceolate, often angular or lobed, scabrid or pubescent. Racemes usually stout, pubescent, somewhat dense-flowered, or more slender, elongate. Flowers conspicuous, corolla blue, 5-7.6 cm long; tube ventricose, curved, limb oblique, lobes 5, rounded. Capsule 2.5-5 cm, globose, suddenly narrowed into a barren sword-shaped beak.



Local name: Nillata, Nallata.

Habit: Undershrub.

Habitat: Gardens, Roadsides.

Phenology: October to January.

Chromosome number: $2n=28, 56$

Status of occurrence: Wild/cultivated.

Medicinal Uses: Leaves are used as a poultice in stomach complaints. Watered down sap of the stem is used to treat eye diseases. Sap blown from the stem is given in eye pain; it has some cooling effect in the eyes. Leaves are used to treat stone in urinary bladder and elephantiasis.

Voucher number: WA 12, 01-06-2012, Rajshahi.

CONCLUSION

Taxonomy and medicinal uses on the family Acanthaceae growing throughout the Rajshahi, Bangladesh was carried out during September 2011 to August 2012. A total of 12 species under 10 genera belonging to the family Acanthaceae 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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