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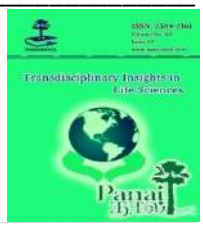

RESEARCH ARTICLE

A Preliminary Taxonomic account on the family Solanaceae at Rajshahi Metropolitan area of Bangladesh

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ABSTRACT

A preliminary taxonomic investigation on the family Solanaceae growing at Rajshahi metropolitan area of Bangladesh was carried out from September 2022 to June 2023. A total of 19 (Nineteen) species under 9 (Nine) genera of the family Solanaceae were collected and identified. Out of the recorded species, *Capsicum frutescens* L., *Lycopersicum esculentum* Mill., *Nicotiana plumbaginifolia* Viv., *Petunia hybrida* Hort., *Physalis minima* L., *Solanum melongena* L., *Solanum nigrum* L., *Solanum sisymbrifolium* Lamk., *Solanum torvum* Swartz., *Solanum tuberosum* L., *Solanum villosum* Mill., *Solanum violaceum* Ortega., was common and *Capsicum annuum* L., *Cestrum nocturnum* L., *Datura metel* L., *Physalis angulata* L., *Solanum spirale* Roxb., *Solanum virginicum* L. and *Withania somnifera* (L.) Dunal, was rare species in the study area. *Physalis angulata* L. and *Solanum villosum* Mill., has been reported for the first time in the study area. A complete taxonomic account of each species is given with current nomenclature, synonyms, local name, English name, brief taxonomic description, status of occurrence, distribution, chromosome number; flowering time and uses were provided. Photographs of all species are also provided. The present study will help in identifying the major Solanaceae species for further investigation.

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Introduction

General information: A family of about 90 genera and 2800 species are distributed in both tropical and temperate regions. Central and South America are the chief centres of distribution where over 40 genera are found. About 15 genera and over 90 species have been reported from India. Some of the larger genera along with their approximately world over reported species (Hickey and King, 1988) are *Solanum* (1700), *Cestrum* (150), Physalis (100), *Lycium* (80-90), *Nicotiana* (66), *Capsicum* (50), *Petunia* (40), *Hyoscyamus* (20) and *Datura* (10). *Solanum tuberosum* (potato) and *Nicotiana tabacum* (tobacco) are the two most utilized plants of Solanaceae (Sharma, 2004). Ahmed et al.,

(2009), reported 13 genera and 37 species from Banagladesh.

Systematics and Phylogeny: Variously placed under Polemoniales (Bentham and Hooker), Solanales (Hutchinson, Cronquist, and Thorne) and Scrophulariales (Takhtajan), the family Solanaceae has been divided by Bentham and Hooker into 5 tribes (Solaneae, Atropeae, Hyoscyameae, Cestrineae and Salpiglossideae). Wettstein divided Solanaceae into 5 different tribes namely Nicandreae, Solaneae, Datureae, Cestreae and Salpiglossideae. Solanaceae is allied closely to Convolvulaceae in both having pentamerous flowers, persistent calyx and bicarpellary ovary. However, Solanaceae possess obliquely placed ovary, and are predominantly erect whereas these characters are absent in Convolvulaceae. In certain characters Solanaceae is closely allied to Scrophulariaceae, Boraginaceae and Polemoniaceae. Hutchinson has raised the tribe Salpiglossideae to the rank of an independent family Salpiglossidaceae (Sharma, 2004).

Economic importance: The Solanaceae are of great economic importance to the human race. They contribute several important food and drug plants, tobacco and many ornamentals: (a) Food plant: Tubers of *Solanum tuberosum* (potato) are used throughout the world as a common vegetable and also used for the production of starch, dextrin, several alcohols and some other industrial products; *Lycopersicum esculentum* (tomato) are used as a delicious vegetable and eaten raw; *Solanum melongena* (brinjal) are eaten as vegetable; *Capsicum annuum* (ball peppers and chilli papers) *C. frutescens* are used as spices and *Physalis peruviana* (cape gooseberry) yield the delicious edible fruits. (b) Medicinal plants: *Atropa belladonna* (deadly nightshade): Obtained from root is used in belladona plasters, tinctures etc for relieving pain and also for dilating pupils of eyes for eye testing. *Datura stramonium*: Stramonium drug obtained from the leaves and roots used to treat asthma and whooping cough. *Solanum trilobatum*: Obtained from leaves, flowers and berries used to treat cough. *Withania somnifera* (ashwagandha): Obtained from roots used in curing cough and rheumatism. (c) Tobacco: *Nicotiana tabaccum*: Used in cigarette, beddi, hukkah, pipes as well as for chewing and snuffing, alkaloids like nicotine, nornicotine and anabasin are present in tobacco. (d) Ornamental plants: Common plants of ornamental value of Solanaceae are *Brunfelsia calycina* (fragrant flowers), *Cestrum diurnum* (day jasmine), *Cestrum nocturnum* (night jasmine), *Nicotiana alata* (white-flowered), *Petunia hybrida* (Pink flowered), *Solanum dulcamara* (violet-coloured): Grown in garden as ornamental plants for their aesthetic nature (Sharma, 2004).

Similar research was carried out in Bangladesh by Zahra & Rahman (2018), Uddin & Hassan (2010), Uddin et al., (2013), Sultana & Rahman (2016), Sarker & Rahman (2016), Rahman & Debnath (2014), Roy & Rahman (2018), Rahman et al., (2014), Rahman (2021), Debnath & Rahman (2017), Sarker & Rahman (2019), Zahra & Rahman (2018), Sarker & Rahman (2017), Rahman & Mamun (2017), Nahar & Rahman (2016), Roy & Rahman (2018), Rahman & Jamila (2015), Rahman & Mahfuza (2015), Uddin et al., (2014), Rahman & Rahman (2014), Rahman et al., (2014), Kona & Rahman (2015), Nahar & Rahman (2016), Rahman et al., (2015), Faria et al., (2021), Khatun et al., (2022), Islam & Rahman (2023) and Keya & Rahman (2017). The present research was to record the diversity of the family Solanaceae in Rajshahi metropolitan area of Bangladesh.

Materials and Method

Study area

Rajshahi is a metropolitan city and a major urban, commercial and educational centre of Bangladesh. The Rajshahi municipality was constituted during the British Raj in 1876. It was a divisional capital of the Bengal Presidency. Rajshahi is a significant administrative, educational, cultural, and business centre in Bangladesh. It is a historic center of silk production. Varendra Research Museum, the oldest of its kind in Bangladesh, is located in the city. The city is home to many renowned educational institutions of Bangladesh. The head office of Rajshahi Agricultural Development Bank

and Barind Multipurpose Development Authority (BMDA) is situated in the city. The Shah Makhdum Airport serves Rajshahi. According to The Guardian it is the cleanest city in Bangladesh (The Gurdian, 2016).

Methodology

The work is based on fresh materials collected during twenty seven visits to Rajshahi metropolitan area of Bangladesh from September 2022 to June 2023 to cover the seasonal variations. The visits covered all types of habitats, particular riverbank; char land area, slope, village grove, fruit gardens, fallow lands, crop fields, roadsides of the study area (Fig 1). Plant parts with either flowers or fruits were collected using traditional herbarium techniques to make voucher specimens for documentation (Fig 2).

Fig 1. Field observation and plant sample collection in the study area.

Fig 2. Preparation of herbarium sheet in the Plant Taxonomy Laboratory.

Identification

Collected plant species were authentically identified with the help of various books (Hooker, 1877; Prain, 1903; Ahmed et al., 2009). For the current name and up-to-date nomenclature Huq (1986) and Pasha & Uddin, (2013) were also consulted.

Results and Discussion

In the present survey, a total of 19 fresh plant species under 9 genera of the family Solanaceae have been recorded from Rajshahi metropolitan area (Fig 3). Out of the recorded species, *Capsicum frutescens* L., *Lycopersicum esculentum* Mill., *Nicotiana plumbaginifolia* Viv., *Petunia hybrida* Hort., Physalis minima L., *Solanum melongena* L., *Solanum nigrum* L., *Solanum sisymbrifolium* Lamk., *Solanum torvum* Swartz., *Solanum tuberosum* L., *Solanum villosum* Mill., *Solanum violaceum* Ortega., was coomon and *Capsicum annuum* L., *Cestrum nocturnum* L., *Datura metel* L., *Physalis angulata* L., *Solanum spirale* Roxb., *Solanum virginicum* L. and *Withania somnifera* (L.) Dunal was rare species in the study area. *Physalis angulata* L. and *Solanum villosum* Mill. has been reported for the first time in the study area. The study area was previously very rich in plant species diversity but due to different development activities and human interfere. Many species either became threatened or extinct from the area. However no taxonomic study has been conducted so far in the study area. Hence, a detail taxonomic study is essential for knowing the species of the study area. Taxonomic study of Solanaceae of the area will contribute much toward that study. The genera and species are arranged alphabetically.

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

1. *Capsicum annuum* L.
Synonym: Not known
Local name: Misti Morich, Lanka
English name: Chili, Red Pepper
Brief description: An erect shrubby herb, up to 1 m high, very variable in height, usually laxly branched. Stem is irregularly angular to subterete. Leaves are solitary or paired, very variable in size, 3-8 x 2-4 cm, broadly lanceolate to ovate. Flowers are usually solitary, bisexual. Fruit a berry, up to 2 cm long, glabrous, pendulous or erect, very variable in size, colour and degree of pungency, unripe fruits green or purplish, ripening to red, orange, yellow, brown to purplish or white. Seeds are pale yellow.
Flowering time: Throughout the year.
Status of occurrence: Rare
Distribution: A native of Central America, now widely cultivated throughout various parts of the world. In Bangladesh, it is widely cultivated all over the country (Ahmed et al., 2009).
Chromosome number: 2n = 12, 24 (Fedorov, 1969).
Uses: Chili fruits are consumed fresh, dried or processed form. More commonly they are added to curries for stimulating appetite.

2. *Capsicum frutescens* L.
Synonym: Not known
Local name: Morich
English name: Spur Pepper
Brief description: A shrubby perennial, up to 2 m high, with angled or grooved stem and trailing or loosely spreading branches. Leaves are solitary or paired, very variable in size, broadly ovate, acuminate. Flowers are bisexual, 2 or more together at each node, sometimes up to 5. Fruit a berry, 07-2.5 x 0.3-1.0cm, usually shorter than pedicels, oblong, always erect, red or yellow, many seeded. Seeds are orbicular, pale yellow.
Flowering time: Throughout the year.
Status of occurrence: Common
Distribution: A native of tropical America, now widely grown throughout the world, including Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 24 (Fedorov, 1969)
Uses: Fruits are used as spice, most commonly consumed in Bangladesh.

3. *Cestrum nocturnum* L.
Synonym: Not known
Local name: Hasna Hena
English name: Night Jasmine
Brief description: A profusely branched shrub, up to 2.7 m high, branches terete, very slender, glabrous or glabrescent. Leaves are 10-15 x 3-5 cm, elliptic, entire, acuminate, and glabrous. Flowers are 1.5-2.0 cm long, tubular, greenish white, night blooming, very fragrant. Fruit a spongy berry, 0.5-1.0 x 0.5-0.7 cm, ovate-oblong,

creamy-white on ripening. Seeds are few or reduced to one, 0.5 cm long, boat shaped, black.
Flowering time: Throughout the year.
Status of occurrence: Rare
Distribution: A native of West Indies. It is planted throughout the Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 16 (Fedorov, 1969)
Uses: An ornamental plant with very sweet smelling flowers.

4. *Datura metel* L.
Synonym: *Datura fastuosa* L.
Local name: Dhutra
English name: Thorne apple
Brief description: A robust herb or under shrub, up to 2 m tall, glabrous or minutely pubescent, branches green or purplish, spreading, often somewhat zigzag, green or tinged red to almost black. Leaves are 8-17 x 4-12 cm, ovate to angular or broad ovate, entire, sinuate or deeply toothed, acute to acuminate. Flowers are axillary, solitary, pedicels 1-2 cm long, Calyx 3-8 cm long, tubular, glabrous or minutely hairy. Fruit a globular capsule, deflexed when mature, with numerous conical tubercles of approximately equal length. Seeds are 0.4-0.5 cm long, many, compressed, roughly triangular, brown, rugose.
Flowering time: January to December.
Status of occurrence: Rare
Distribution: Probably of American origin, widely cultivated and naturalized in all tropical and subtropical regions, it is naturalized in Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 24 (Fedorov, 1969)
Uses: Dried leaves are traditionally used as "asthma cigarettes" to relieve asthma.

5. *Lycopersicum esculentum* Mill.
Synonym: *Solanum lycopersicum* L., *Lycopersicum lycopersicon* (L.) Briton & Brown, *Lycopersicon lycopersicum* (L.) Farwell
Local name: Tomato, Bilati Begun
English name: Tomato
Brief description: A viscidly pubescent, branched, annual herb, up to 1 m tall with long pointed trichomes on stem, petioles and peduncles. Stem is solid but weak and trailing. Leaves are arranged spirally, up to 30 cm long, imparipinnate, lyrate or sometimes only slightly lobed, ovate. Flowers are bisexual, 1.5-1.7 cm across, pendent, yellow. Fruit a berry, normally up to 10 cm broad, depressed-globose, smooth or furrowed, sometimes oblong, juicy, brick-red to deep red or yellowish in colour, many seeded. Seeds are 3-5 x 2.0-2.4 mm, flattened ovoid, and light brown.
Flowering time: September to April
Status of occurrence: Common
Distribution: A native of Central and South America extensively cultivated throughout the world, including Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 12, 24, 36, 48 (Fedorov, 1969)
Uses: Tomato is eaten raw or cooked. It is consumed fresh in salads or cooked in sauce and used as flavoring in soups and meat of fish dishes.

6. *Nicotiana plumbaginifolia* Viv.
Synonym: Not known
Local name: Non Tamak
English name: Not Known
Brief description: A slender, erect, viscidly pubescent, branched, annual herb, up to 90 cm tall. Leaves are oblong, elliptic or ovate with cuneate base, entire, obtuse, lanceolate, undulate, acute. Flowers are 2.5-4.0 cm long, pedicels 0.5 cm long, white. Fruits are capsule. Capsules are 1 cm long, fruiting sepals enlarged up to 0.7 cm. Seeds are small, many, dark brown.
Flowering time: March to December
Status of occurrence: Common
Distribution: A native of Mexico and the West Indies, an introduced weed elsewhere in the world. In Bangladesh, it is found throughout the country (Ahmed et al., 2009).
Chromosome number: 2n = 20 (Fedorov, 1969)
Uses: Not known.

7. *Petunia hybrida* Hort. ex Vilm.
Synonym: Not known
Local name: Petunia
English name: Petunia
Brief description: A viscidly pubescent herb, prostrate or erect, up to 1 m tall. Leaves are up to 7.5 x 5.0 cm, ovate to ovate-elliptic, entire, softly pubescent, obtuse, and almost sessile to petiolate. Flowers are 2.5-4.5 cm long, white, purple, pink or

violate. Fruits are capsule. Capsules are 1.3 cm long, cylindric, glabrous. Seeds are less than 0.1 cm long, brown.
Flowering time: February to June.
Status of occurrence: Common
Distribution: The garden Petunias have originated from the crossing of two South American species. In Bangladesh, it is widely cultivated in gardens (Ahmed et al., 2009).
Chromosome number: 2n = 21, 28 (Fedorov, 1969)
Uses: It is cultivated as an ornamental plant.

8. *Physalis angulata* L.
Synonym: Not known
Local name: Fotka
English name: Gooseberry, Hogweed, Balloon Cherry
Brief description: An annual herb, 10-100 cm tall. Stem hollow, quadrangular, lower branches sometimes prostrate and rooting at the node, green, glabrous. Leaves are simple, alternate, ovate, acute, margin irregularly toothed, petioles slightly hairy. Flowers are pedicellate, glabrous, complete, greenish violate. Fruit a globose berry with 10 distinct angles, enveloped in the bladder-like enlarged calyx. Seeds are many, brown.
Flowering time: February to August
Status of occurrence: Rare
Distribution: Native to tropical America now distributed pantropically, including Malesia. In Bangladesh, it occurs throughout the country (Ahmed et al., 2009).
Chromosome number: 2n = 24, 48 (Fedorov, 1969)
Uses: In Malesia, the aerial parts, including the fruits are used to cure digestive and intestinal problems and various skin problems such as sores, boils and cuts.

9. *Physalis minima* L.
Synonym: *Physalis hermanni* Dunal, *Physalis pubescens* Dunal.
Local name: Kopal Phutki, Fotka
English name: Insipid Physalis
Brief description: An annual herb, up to 90 cm tall, rather diffusely branched and straggling, patent villous. Stem and branches angular. Leaves simple, elliptic, or ovate to ovate-lanceolate, shallowly toothed to entire, acute to acuminate. Flowers are solitary, axxilary, pedicels 0.5 cm long, fruiting pedicels up to 1 cm long, yellow. Fruit a berry, 1 cm across, ovoid, with 5 distinct angles, fruiting calyx enlarging to form almost globular bladder, 1.5 cm in diameter around the small berry, reticulately veined. Seeds are many, discoid or reniform, pale yellow.
Fruiting time: January to December
Status of occurrence: Common
Distribution: A widely distributed weed in tropical parts of Asia, Africa and Australia. In Bangladesh, it is sparsely occurs throughout the country (Ahmed et al., 2009).
Chromosome number: 2n = 48 (Fedorov, 1969)
Uses: In Idonesia, the fruits are considered diuretic, alterative, purgative and aperients. In Java, the root is eaten as a vermifuge and an extract of the root is taken for fever.

10. *Solanum melongena* L.
Synonym: *Solanum insanum* L., *Solanum coagulans* Forssk., *Solanum esculentum* Dunal, *Solanum pressum* Dunal.
Local name: Begun
English name: Brinjal, Egg Plant
Brief description: A woody herb or undershrub, up to 1.5 m or more tall, often much branched, armed with prickles or unarmed. Leaves are simple, alternate, stipules absent. Flowers usually solitary or in 2-5 flowered cymes, some being sterile, 2-3 cm across, blue, pedicels 1-3 cm long. Fruit a large pendent berry, depressed-globose to ellipsoid, ovoid or obovoid, up to 40 x 20 cm, but very variable, smooth, shiny, purple or purplish violet, green, yellow, white, black or mixed colored. Seeds are numerous, lenticular to reniform, light brown.
Flowering time: October to March
Status of occurrence: Common
Distribution: A native of South Asia now cultivated in all the warmer parts of the globe, including Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 24, 36, 48 (Fedorov, 1969)
Uses: The unripe fruits of brinjal are used as vegetable when they are used as vegetable when they are attractively coloured and glossy. Brinjal are also used in traditional medicine in the

treatment of diabetes, asthma, cholera, bronchitis and dysuria.

11. *Solanum nigrum* L.
Synonym: Not known
Local name: Tit-begun
English name: Black Nightshade
Brief description: An annual herb, erect or suberect, up to 1 m or more tall, indumentums of simple eglandular and glandular hairs. Leaves 5-12 x 2-8 cm, ovate or elliptic, margin entire or bluntly toothed. Inflorescence racemiform. Flowers are campanulate. Fruit a globose or ellipsoid berry, 5-7 mm across, 2-locular, glabrous, dull purple-black with sepals adhering to it when ripe. Seeds are 25-35 per fruit, discoid, compressed, light brown.
Flowering time: January to December
Status of occurrence: Common
Distribution: Throughout India, Pakistan and Sri Lanka. In Bangladesh, it is found throughout the country (Ahmed et al., 2009).
Chromosome number: 2n = 72 (Fedorov, 1969)
Uses: The whole plants are used as an emollient and antialargic in itching, burns and neuralgic pains and are also considered expectorant and laxative. The fruit is considered to be a cure for diabetes.

12. *Solanum sisymbrifolium* Lamk.
Synonym: *Solanum balbisii* Dunal.
Local name: Kanta Begun
English name: Prickly brinjal
Brief description: A viscoid and very prickly erect herb or under shrub, up to 1.2 m tall with spreading branches, covered with stellate hairs, prickles straight, yellowish, up to 7 mm or more long. Leaves 10-12 x 5-8 cm, sinuately lobed or deeply pinnatifid, pinnae lobed, petioles 2-5 cm long. Flowers up to 2 cm across, white. Fruit a berry, 1-2 cm across, globose, glabrous, scarlet, covered by enlarged and reflexed calyx lobes. Seeds many, 2 mm in diameter, compressed.
Flowering time: January to December
Status of occurrence: Common
Distribution: A native of tropical America at higher elevations, but naturalized in many other tropical countries. It is common all over Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 24 (Fedorov, 1969)
Uses: Not of any significant economic importance.

13. *Solanum spirale* Roxb.
Synonym: Not known
Local name: Bagna
English name: Spiral Solanum
Brief description: A glabrous shrub, up to 3.5 m tall. Leaves are 20 8 cm, elliptic, entire, acute, attenuate at the base, glabrous or scarcely puberulous, petioles 1,6 cm long. Flowers are 1 cm across, white. Fruit a globose berry, 0.8-1.5 cm across, smooth, orange-red when ripe. Seeds are 5 cm across, ovoid-reniform, compressed, smooth.
Flowering time: May to September
Status of occurrence: Rare
Distribution: North east India and Myanmar. In Bangladesh, it has been reported from Sylhet and Tangail districts (Ahmed et al., 2009).
Chromosome number: Not known
Uses: The root is given in as a narcotic and diuretic.

14. *Solanum torvum* Swartz.
Synonym: *Solanum ferrugineum* Jack., *Solanum largiflorum* C.T. White, *Solanum filicifolium* sensu Abeywick.
Local name: Gota Begun, Tit Begun
English name: Devil's fig, Cherry Eggplant, Pea Eggplant
Brief description: A spreading or scrambling slender shrub, up to 3 m tall, with scattered prickles on stem, branches and leaves ultimate branches pubescent with stellate hairs. Leaves are alternate, solitary or in unequal pairs, 12-15 x 7-10 cm, stipules absent, petioles 2.0-2.5 cm long, leaf blade ovate, usually coarsely and sinuously 7-lobed with triangular, acute to obtuse lobes, somewhat sagittate to auriculate at the base. Flowers are bisexual, white. Fruit a globular berry, 1.0-1.5 cm in diameter, yellowish, many seeded. Seeds 300-400 per fruit, discoid, flat, 1.5-2.0 mm long, brownish.
Flowering time: January to December
Status of occurrence: Common
Distribution: A native of Central and South America, but is now a pantropical weed. Occasionally it is also cultivated, especially in

South, South East and East Asia. In Bangladesh, it occurs throughout the country (Ahmed et al., 2009).
Chromosome number: 2n=24 (Fedorov, 1969)
Uses: The fruits are eaten as a vegetable and said to be good for enlargement of the spleen.

15. *Solanum tuberosum* L.
Synonym: *Solanum esculentum* Neck, *Solanum cultum* (A.DC.) Berth.
Local name: Alu
English name: Potato
Brief description: An unarmed, viscoid herb with numerous, fleshy, branched stem, up to 60 cm or more tall and with underground stem tubers. Tubers are globose to ellipsoid, very variable in size, weight and colour and with skin almost impermeable to chemicals, gases and liquids, providing good protection against microorganisms and water loss. Leaves alternate, petiolate, 12-20 cm long, pubescent, pinnate, pinnae dimorphic, longer ones elliptic. Flowers are white or white suffused with pink or violet, typically with greenish yellow. Fruit a subglobose berry, 5-10 mm long, up to 2 cm in diameter, yellowish-green, poisonous. Seeds are many, 1-3 mm across, discoid.
Flowering time: January to march
Status of occurrence: Common
Distribution: The cultivated potato originated in South America at least 8000 years ago and spread through the Andean highlands during ancient civilization (Flach and Rumawas, 1996). It was introduced into Europe in the latter half of the 16th century and in the tropical and subtropical countries during the 18th and 19th centuries. Potato is now cultivated throughout the world (Ahmed et al., 2009).
Chromosome number: 2n = 24, 36, 48, 72, 96 (Fedorov, 1969).
Uses: Tubers of potato are used for human consumption worldwide. They form staple food or cooked as a vegetable in various ways. Potato may be boiled, roasted or steamed and mashed with mustard oil, soybean oil, margarine or butter, and is part of various curry dishes in most of the Asian countries. Large quantities are consumed fried as chips or as thinly sliced crisps.

16. *Solanum villosum* Mill.
Synonym: *Solanum rubrum* Roxb.
Local name: Tit Begun
English name: Orange Nightshade
Brief description: An annual herb, erect or suberect, up to 1 m tall, indumentums of simple eglandular and glandular hairs. Leaves are 5-12 x 2-8 cm, ovate or elliptic, bluntly toothed, membranous, glabrous or minutely pubescent, base attenuate and decurrent along the petioles, apex acute to obtuse. Flowers are pedicillate, bisexual, pentamerous, white with green base. Fruit a globose to ellipsoid berry, 5-7 mm across, 2-locular, glabrous, yellow or orange-red when ripe. Seeds are 25-35 per fruit, 1.8-2.2 mm long, discoid, compressed, light brown to orange-red.
Flowering time: February to August
Status of occurrence: Rare
Distribution: Throughout India. It is commonly distributed in all temperate and tropical parts of the world. It is very wide occurrence in Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 48 (Sultana and Alam, 2007).
Uses: The fruit is considered to be a cure for diabetes. The whole plants are used as an emollient and antialargic in itching, burns and neuralgic pains and are also considered expectorant and laxative.

17. *Solanum violaceum* Ortega
Synonym: *Solanum indicum* L.
Local name: Byakur, Gurkamai
English name: Solanum
Brief description: A very prickly undershrub, up to 1.5 m tall, branched above from the single main stem, covered with a fine, grey stellate indumentums, and prickles stout, compressed and recurved. Leaves are 7-15 x 5-12 cm, very variable in shape, broadly ovate in outline, sinuate to deeply 2-3 pinnately lobed with acute to acuminate apex, petioles and nerves with scattered almost straight prickles, petioles 2-3 cm long. Flowers are distichous, pedicels stellately wooly. Fruit a globose berry, 5-10 mm in diameter, yellow. Seeds are 2 mm across, discoid, glabrous, yellow.
Flowering time: January to December

Status of occurrence: Common
Distribution: Sri Lanka, Tropical India, ascending to 1500m, extending eastwards up to China and the Philippines. It is very common as a weed along roadsides in Bnagladesh (Ahmed et al., 2009).
Chromosome number: 2n = 24 (Fedorov, 1969).
Uses: Tender boiled fruits are sometimes eaten at times of food scarcity.

18. *Solanum virginianum* L.
Synonym: *Solanum surattense* Burm f., *Solanum xanthocarpum* Schrad & Wendl.
Local name: Kantakari
English name: Solanum
Brief description: A very prickly, diffuse herb, up to 50 cm high, with procumbent branches, bearing numerous, compressed, straight and bright yellow prickles. Leaves are 10 x 9 cm, elliptic, very prickly, deeply pinnately lobed with sinuous outlines to the lobes, very unequal at the base. Flowers are pentamerous, bisexual, purplish-blue to violet, glabrous. Fruit a supherical berry, 2 cm across, white with green markings when young but light yellow or whitish when ripe. Seeds are 0.2 cm in diameter, glabrous, discoid, compressed, and faintly reticulate.
Flowering time: January to February
Status of occurrence: Common
Distribution: Throughout India, Pakistan, Sri Lanka, Myanmar and extending to South East Asia and Tropical Australia. It is occurs in all parts of Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 24 (Fedorov, 1969)
Uses: Roots bruised and administered in fever. The fruit is boiled in ghee and given in coughs and toothache or dried fruit placed in hot water and the steam inhaled (Khan and Mia, 2002).

19. *Withania somnifera* (L.) Dunal in DC.
Synonym: *Physalis somnifera* L.
Local name: Assagandha
English name: Winter Cherry
Brief description: A suffruticose, erect, unarmed undershrub, thinly wooly, reaching a height of 1.5 m, elliptic-ovate, entire, base equal or slightly unequal, slightly attenuated, tip subacute to acute, finely stellate-pubescent especially beneath, petioles 2.0-2.5 cm long, channlled above. Flowersare axillary, greenish. Fruit a globose berry, 6-8 mm in diameter, glabrous, enclosed by the fruiting calyx, yellow or orange-yelow. Seeds are many, 2 mm in diameter, reniform, yellowish-brown.
Flowering time: November to December
Status of occurrence: Rare
Distribution: Mediterranean region, Cannaries and Cape of Good Hope. It is mostly cultivated in Bangladesh (Ahmed et al., 2009).
Chromosome number: 2n = 18, 24 (Fedorov, 1969)
Uses: Roots and leaves are applied to carbuncles, ulcers and painful swellings. Fruit is diuretic. Seeds are hypnotic, diuretic and used for coagulating milk (Vasishta, 1972).

A preliminary taxonomic investigation on the family Solanaceae growing at Rajshahi metropolitan area of Bangladesh was carried out from September 2022 to June 2023. A total of 19 (Nineteen) species under 9 (Nine) genera of the family Solanaceae were collected and identified. The collected information is comparable with the result of other studies in Bangladesh. A total of 9 species was recorded at Ishwardi Proshova of Pabna district, Bangladesh (Roy & Rahman, 2018). A total of 8 species was recored in Teknaf wildlife sanctuary, Bangladesh (Uddin et al., 2013). A total of 8 species was recorded at Rajshahi University Campus (Ara et al., 2011). A total of 14 species was recorded in Narsingdi district of Bangladesh (Debnath & Rahman, 2017). A total of 11 species was recorded in Gobindaganj Upazila of Gaibandha district, Bangladesh (Sarker & Rahman, 2019). So far the information available no published data on the family Solanaceae at Rajshahi metropolitan area of Bangladesh. The present study will also help in identifying the plant species of Solanaceae family for future investigation.

Capsicum annuum

Capsicum frutescens

Cestrum nocturnum

Datura metel

Lycopersicum esculentum

Nicotiana plumbaginifolia

Petunia hybrida

Physalis angulata

Physalis minima

Solanum melongena

Solanum nigrum

Solanum spirale

Solanum sisymbrifolium *Solanum torvum*

Solanum tuberosum *Solanum villosum*

Solanum violaceum *Solanum virginicum* *Withania somnifera*

Fig 3. Photographs of Solanaceae Species

Conclusion

Taxonomically and medicinally important on the family Solanaceae at Rajshahi metropolitan area was carried out. A total of 19 species under 9 genera belonging to the family Solanaceae were collected and identified. The older people of the area knew the importance of these plants and they transfer their knowledge to the younger. This is the first research work on Solanaceae family attempt in this area in which medicinally important plants were identified, classified and collected. The result showed that this area contain a valuable plant species which need conservation and proper management.

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Ethical approval

The family Solanaceae from Rajshahi metropolitan area of Bangladesh was observed in this study. The ethical guidelines for plants & plant materials are followed in the study for sample collection & identification.

Informed consent

Not applicable.

Conflicts of interests

The authors declare that there are no conflicts of interests.

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Data and material availability

All data associated with this study are present in the paper.

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