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DISCOVERY OF THREE ANGIOSPERM NEW RECORDS FOR BANGLADESH FROM MOULVIBAZAR DISTRICT

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Abstract

This paper deals with three angiosperm new records for Bangladesh from Moulvibazar district. These are *Clausena lansium* (Lour.) Skeels, *Cordia subcordata* Lam. and *Murdannia japonica* (Thunb.) Faden. Updated nomenclature, important synonyms, description, ecology, Distribution and photographs are provided for each species.

Introduction

Moulvibazar is in Sylhet division, a district to the North-East of Bangladesh. The area of the district is 2,707 sq. km. It is situated between 24˚.10´-24˚.35´ N latitude and 90˚.35´-91˚.20´ E longitude. It is surrounded by Sylhet district in the north, Habiganj district in the west and Indian states of Assam and Tripura in the east and south respectively. Moulvibazar district is very rich in floral diversity and has many forest areas like Lawachara National Park, Madhabkundo Eco-park, Rajkandi Reserve Forest etc. Madhabkundo Eco-park is a very popular tourists spot. It is located under Barolekha Upazila of Moulvibazar district with an area of 2.6568 sq. km. Adampur Forest is situated in the jurisdiction of Rajkandi Forest Range, under Kamalganj Upazila of Moulvibazar district. Total area of this forest is 52.93288 sq. km. and has three forest blocks.

Bangladesh National Herbarium (BNH) is involving in floristic survey of the country since 1970. As its regular work, botanical explorations in Madhabkundo Eco-park and Adampur Forest beat under Moulvibazar district three plant specimens belonging to the families Boraginaceae, Commelinaceae and Rutaceae have been collected. On examining the specimens under Boraginaceae, Commelinaceae and Rutaceae housed at Bangladesh National Herbarium (DACB), Bangladesh Council of Scientific and Industrial Research, Chittagong (BCSIRH), Herbarium of Bangladesh Forest Research Institute (BFRIH), Dhaka University Salar Khan Herbarium (DUSH) and Herbarium of Chittagong University (HCU) the specimens did not matched with any specimens stored at those herbaria. Later, these were identified as *Clausena lansium* (Lour.) Skeels (Rutaceae), *Cordia subcordata* Lam. (Boraginaceae) and *Murdannia japonica* (Thunb.) Faden. (Commelinaceae).

Materials and Methods

Botanical survey was conducted at different seasons from 2010 to 2012. The whole forest was surveyed through walking along with forest trails and springs (*Charas*) to ensure all species encountered. Specimens of each species encountered in flowering and fruiting condition were collected and preserved at Bangladesh National Herbarium (DACB). The photographs of fertile specimens in natural habitat were taken during the field trips. Both fresh materials and herbarium specimens were studied and examined by using long arm stereomicroscope. All available taxonomic resources *viz.* literatures, herbarium specimens and botanical illustrations were taken

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under consideration to identify the species. Digital images of the species are also used to supplement plant identification and document their habitats. The new records are deposited at DACB with proper labeling.

Results and Discussion

About five hundred plant specimens were collected from the study areas in the course of the taxonomic study during the period of 2010-2012. In the process, three angiosperm species were encountered for which no herbarium specimens had ever been collected from the country. Later on, those species have been identified as *Clausena lansium* (Lour.) Skeels, *Cordia subcordata* Lam. and *Murdannia japonica* (Thunb.) Faden. Three specific taxa in the following list belong to three genera and three families. These three species are being described here to be new report for Bangladesh as they have never been mentioned in any publication on the flora covering the present territory of Bangladesh *viz.* Hooker, 1872-1897; Kurz, 1877; Prain, 1903; Heinig, 1925; Cowan, 1926; Cowan and Cowan, 1929; Kanjilal *et al*., 1934-1940; Raizada, 1941; Datta and Mitra, 1953; Sinclair, 1956; Alam, 1988; Mia and Khan, 1995; Das and Alam, 2001; Rahman 2004a,b; Alam, 2007; Khatun, 2008; Ullah, 2009; Uddin and Hassan, 2010; Uddin, S. N. *et al.*, 2015a,b,c.

Taxonomic enumerations of these three new records are prepared. In the enumeration, each species is cited with updated nomenclature, synonyms, taxonomic description, ecology, Distribution, citation of voucher specimens and entries are arranged in alphabetical order.

1. Clausena lansium (Lour.) Skeels, Bull. Bur. Pl. Industr. U.S.D.A. 168: 31. 1909. **(Fig. 1)**

Rutaceae

Aulacia punctata Raeusch., Nomencl. Bot. ed. 3: 119. 1797.

Clausena wampi (Blanco) Oliv., Fl. Hongk. 50. 1861.

Cookia punctata Sonn., Voy. Indes Orient. 3: 258. 1782.

Cookia wampi Blanco, Fl. Filip. 358. 1837.

Quinaria lansium Lour., Fl. Cochinch. 272. 1790.

Sonneratia punctata (Sonn.) J.F. Gmel., Syst. Nat. 2(1): 675. 1791.

An evergreen and small tree, up to 12 m tall and usually low-branched, trunk diameter up to 40 cm. Leaves spirally arranged, 5-11 foliolate, up to 40 cm long; petiolules 5-9 mm long, pinnately compound; leaflet blades ovate to ovate-elliptic, 5-13×3-6 cm long, midvein often pubescent, base rounded to broadly cuneate, margin repand to crenulate. Inflorescences terminal, paniculate. Flowers subsessile, 5-merous, sweet-scented, whitish to yellow-green, globose in bud. Calyx small and lobes broadly ovate, ca. 1 mm long. Petals are five, white, and boat-shaped oblong, ca. 5 mm long. Stamens are 10 with conspicuous yellow anthers; filaments linear, basal portion slightly expanded. Ovary is five-celled, hirsute, covered with hairy nobs, and surrounded by a short style terminating in a rounded stigma. Fruit pale yellow, globose berry, ellipsoid or broadly ovoid, very slightly flattened at the base, somewhat rounded at the tip, and borne in bunches, 1.5-3×1-2 cm long, 1-4-seeded. *Flowering & fruiting:* April-August.

Ecology: Humid lowland woodland forests, forest edges, gallery forests, wooded grasslands and in secondary re-growth near villages.

Distribution: China, Vietnam, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore and Thailand.

Specimen examined: **Moulvibazar:** Madhabkundu eco-park, Barolekha, 20 v 2014, S.N. Uddin N5265 (DACB).

Note: *Clausena* N.L. Burman is a genus of about 15-30 species occurring in Africa, East, South and Southeast Asia, NE Australia, SW Pacific islands (Dianxiang and Hartley, 2008). From Bangladesh, Ullah (2009) listed three species under the genus.

Fig. 1. *Clausena lansium* (Lour.) Skeels

2. Cordia subcordata Lam., Tabl. Encycl. n. 1899. 1792. **(Fig. 2)**

Boraginaceae

Cordia banalo Blanco, Fl. Filip. 124. 1837.

Cordia campanulata Roxb., Fl. Ind. 2: 336. 1824.

Cordia hexandra Willd. *ex* Roem. & Schult., Syst. Veg. 4: 799. 1819.

Cordia ignota Blanco, Fl. Filip., ed. 2 88. 1845.

Cordia orientalis R.Br., Prodr. Fl. Nov. Holl. 498. 1810.

Cordia rumphii Blume, Bijdr. 843. 1826.

An evergreen and perennial small to medium sized tree, up to 3 m tall. The trunk is straight and erect, covered in grooves and fissures and with flaky, bark yellow-brown; branchlets glabrous. The leaves have rippled margins, prominent pale veins, and are large, green, leathery, smooth and shiny above, hairy on the veins below, alternate, and oval to egg-shaped. Petiole 3-6 cm long, glabrous; leaf blade ovate to narrowly ovate, 7-17×5-12 cm long, abaxially densely cottony in vein axils, adaxially ± spotted, base obtuse to rounded, rarely cordate, margin entire to subundulate, apex acuminate to acute. Cymes opposite leaves, ca. 12 cm long and wide at anthesis. Pedicel 3-6 mm long. Calyx cylindric, ca. 13×8 mm long, leathery; lobes irregular, short. The individual flowers are funnel shaped, 2.5-5 cm across, and have 5-7 irregular, heavily wrinkled lobes. Corolla orange, funnel form, 3.4-4.5 cm long; throat ca. 4 cm wide; lobes divaricate, orbicular. Drupes ovoid or obovoid, ca. 2.5 cm long, with corky mesocarp, enclosed by enlarged persistent calyx. *Flowering & fruiting:* April-September.

Ecology: Sandy, open woodland and fairly common in secondary forest and thickets along the sea shore.

Distribution: China, India, Indonesia, Thailand, Vietnam, Africa (E coast) and Pacific Islands.

Specimen examined: **Moulvibazar:** Madhabkundu eco-park, Barolekha, 20 v 2014, S.N. Uddin N5254 (DACB).

Note: *Cordia* Linnaeus is a genus of about 325 species occurring mostly in tropics of North and South America, poorly represented in Africa and Asia (Wu *et al*., 1995). From Bangladesh, Khatun (2008) listed seven species under the genus.

Fig. 2. *Cordia subcordata* Lam.

3. Murdannia japonica (Thunb.) Faden, Taxon 26: 142. 1977. **(Fig. 3)**

Commelinaceae

Aneilema elatum (Vahl) Kunth, Enum. Pl. 4: 70. 1843.
Aneilema herbaceum (Roxb.) Wall., Numer. List 5223. 1831.
Aneilema japonicum (Thunb.) Kunth, Enum. Pl. 4: 70. 1843.
Aneilema latifolium Wight, Icon. Pl. Ind. Orient. t. 2072. 1853.
Aneilema lineolatum (Blume) Kunth, Enum. Pl. 4: 69. 1843.
Commelina herbacea Roxb., Fl. Ind. 1: 179. 1820.
Commelina japonica Thunb., Trans. Linn. Soc. London 2: 332. 1794.
Commelina lineolata Blume, Enum. Pl. Javae 1: 3. 1827.
Dirtea japonica (Thunb.) Raf., Fl. Tellur. 3: 69. 1837.
Phaeneilema herbaceum (Roxb.) G.Brückn., Notizbl. Bot. Gart. Berlin-Dahlem 10: 56. 1927.
Tinantia lineolata (Blume) Hassk., Pl. Jav. Rar. 98. 1848.

An erect stout perennial herb. Roots tuberous and fibrous, ca. 2 mm in diam., slightly fusiform thickened. Main stem undeveloped and very short; fertile stems arising from base of main stems, erect, 20-40 cm×ca. 3 mm, glabrous or hispidulous near nodes. Leaves on main stems several, basal, rosulate; leaf blade narrowly elliptic, 7-14×(1.5-)2-5 cm long, glabrous, base cuneate or broadly cuneate, margin undulate, apex obtuse, acute, or shortly acuminate. Leaves on fertile stems several, cauline; basal leaf sheathlike, membranous, bladeless, 2-lobed, lobes subulate-triangular. Panicles terminal, consisting of several cincinni, glabrous throughout; cincinni to 3 cm, with several flowers, 2 to several fertile. Sepals narrowly elliptic, 0.5-6 mm, persistent.

Petals purple or blue, obovate-orbicular. Flowers 12 mm across, solitary or 2-3 together, pedicelled; sepals 4-5×2 mm long, oblong-obtuse, red-glandular; petals white, 6×4 mm long, obovate, obtuse, pale blue or white; stamens 3, filaments bearded; staminodes 2-lobed, bearded. Capsule globose, beaked, ca. 5×4 mm long, obtuse at both ends. Seeds 2-4 per valve, uniseriate, brown-gray, tetragonal, 3 sides flat, 1 slightly convex and verrucose. *Flowering & fruiting:* May-September.

Fig. 3. *Murdannia japonica* (Thunb.) Faden

Ecology: Humid forests, forest margins, thickets.

Distribution: Bhutan, China, India, Indonesia, Japan, Laos, Malaysia, Myanmar and Thailand.

Specimen examined: **Moulvibazar**: Rajkandi Reserve Forest, 12 ix 2012, S.N. Uddin, N5007 (DACB).

Note: *Murdannia* Royle is a genus of about 50 species occurring in tropical and subtropical regions, mainly in Asia (Chevalier *et al.*, 2000). From Bangladesh, (Alam, 2007) listed eight species under the genus.

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