



Morinda pubescens Sm: A New Distributional Report for North- Western Uttar Pradesh

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Abstract

The study reports the occurrence of a taxon namely *Morinda pubescens* Sm. (Rubiaceae) collected and identified for the first time from Western Uttar Pradesh. It is characterized by presence of ovoid syncarp of pyramidal, 1-seeded coalescent, globose drupes and tomentose or pubescent tender branches and flowering twigs.

Keywords: *Morinda pubescens* Sm., syncarp, north- western Uttar Pradesh.

Introduction

India is one of the mega-diversity countries with a wide range of topography, climate and habitat. India has total of 18,532 flowering plant species of which 23.2% are endemic (Singh and Dash 2017). Uttar Pradesh is the fifth largest state in India. Spread over an area of 2, 40,927 km², divided into 75 districts and located between 23.052°N-31.028°N and 77.03°E-84.039°E. It is bounded in the north by the international boundary of Nepal, in the south by Madhya Pradesh, in the east by Bihar and Jharkhand and in the northwest, west and southwest by Uttarakhand, Haryana, Delhi and Rajasthan. Uttar Pradesh state can be physically divided into three regions viz., Terai, Gangetic plain and Deccan plateau.

Rubiaceae is the family of flowering plants comprising 611 genera and 13,150 species of herbs, shrubs, trees and lianas distributed worldwide but largely tropical, especially diverse in Madagascar and the Andes (Stevens, 2012). The genus *Morinda* was described by Linnaeus including three species, *M. citrifolia* L., *M. royoc* L. and *M. umbellata* L. *Morinda* is a largest genus of Rubiaceae family, and it comprises ca. 93 species which are widespread in tropical and subtropical regions of the World. In India, 11

species are found. Out of these, 8-9 species are found in central and southern India. Most species of this genus originate in the area of Borneo, new Guinea, Northern Australia and New Caledonia. *Morinda villosa* Hook. f., *M. umbellata* L., *M. angustifolia* Roxb., *M. persicaefolia* Ham. etc., are found in central and Southern India (Brandis, 1906). *Morinda citrifolia* L. and *M. pubescens* Sm. are found in north-west India.

Material and Methods

The study was conducted in western part of Uttar Pradesh including Saharanpur, Muzaffarnagar and Shamli districts which come under Saharanpur Forest Division. It lies in the Upper Gangetic Plain. District Shamli is located at 29.45370 N and 77.32 E. It has an average of 248 meters (813) feet. It is around 92 km from Delhi 38 km from Panipat, 66 km from Meerut, 40 km from Karnal (Haryana) and Saharanpur (Uttar Pradesh). Western Uttar Pradesh represents a wide variation in the topographical, geomorphological, edaphic and climatic features, and thus supports a wide range of forest types. The vegetation of terai region, Uttar Pradesh was categorized into eight groups in accordance to the classification of Champion and Seth, (1968). The vegetation type of this

region is characterized by a mixture of trees in the upper canopy which are deciduous. The common trees in study area are *Holoptelea integrifolia* (Roxb.) Planch., *Aegle marmelos* (L.) Correa, *Syzygium cumini* (L.) Skeels, *Mitragyna parviflora* (Roxb.) Korth., *Lannea coromandelica* (Houtt.) Merr., *Diospyros montana* Roxb., *Vachellia niotica indica* (Benth.) Kyar & Boatwr. *Trewia nudiflora* L. *Bombax ceiba* L., *Ficus racemosa* L., *Streblus asper* Lour etc. Besides there is plantation of *Tectona grandis* L.f., *Eucalyptus tereticornis* Sm. etc.

A perusal of literature reveals that although a number of investigators (Duthie, 1903-1929; Kanjilal, 1933; Gupta, 1961; Panigrahi and Saren, 1967; Panigrahi, et al., 1969; Tayal & Bhasin, 1970; Srivastva, 1976;; Singh, 1997; Saini, 2005; Singh, 2006, 2007; Pandey, et al., 2008; Maliya and Datt, 2010; Srivastava, 2011; Maliya, 2012; Kumar, et al., 2015; Bajpai, et al., 2015; Khanna, 2009, 2015a, 2015b, 2015c; Malik, et al., 2011, 2015;) have worked out the angiospermic plants of various parts of terai region but no consolidated efforts has been made to work out the angiospermic plants of terai region of Uttar Pradesh as whole. Hence, it has been considered worthwhile to study the angiospermic plants of north-west Uttar Pradesh and the results are presented in the Paper.

It lies to east of the Yamuna River which marks the borders of two Indian state Haryana and Uttar Pradesh. The district lies in the fertile doab region between the Ganga and Yamuna. Shamli is located along with Delhi - Saharanpur (National highway -709) Meerut - Karnal (National highway - 709A) and Panipat - Khatima (State highway - 12), highway the district lies in the fertile doab region and hence the major occupation is agriculture. The district was carved out from the Muzaffarnagar district on 28 September 2011 as Parbudh Nagar and renamed Shamli in July 2012. At present, district Shamli is divided in three tehsils viz. Shamli, kairana and Oon, and five blocks viz. Thanabhawan, Khandhla, Shamli, Oon, and Kairana.

Morinda pubescens Sm., is native to Eastern Asia. The species is distributed to India, Sri

Lanka, Thailand, Combodia, Laos, Vietnam, Indonesia etc. The species is usually found in dry forest in India and Sri Lanka. Its population status and distribution was ascertained along its habitat in shady forests, as well as on open rocky or sandy shores. Field surveys were carried out in Shamli, kairana and Oon tehsils respectively that lie between 29.199-29.7770 N and 77.2517-77.26200 E. Quadrates measuring 0.1ha area (31.7X31.7m) were established along the Oon, Kairana and Shamli Tehsil respectively to access the population of this species. Contiguous plots (each includes five number of quadrates) were established along 1.5km stretch for each tehsil. The number of individuals in each quadrat was enumerated along with their location, height, girth, phenological status and associated species. Geographical coordinates were recorded using Nikon D 5300 HD-SLR Camera with Geo Tag. Height and girth were measured by a measuring tape. Flowering and fruiting were observed by periodic field visits. Individuals which have grown more than 4-5 meter height are capable of producing flowers and fruits and hence considered as adults. There is no sapling in the study area.

During floristic explorations in north-west Uttar Pradesh, plant specimen belonging to the different genera of different families were collected. Among the collected specimens, authors reported a new collection on the basis of thorough scrutiny of literature like Flora of Upper Gangatic Plains, Flora of Delhi, Flora of British India, Indian Trees, Forest Flora of Dehradun, Chakrata and Saharanpur Forest division and a Check-list of Uttar Pradesh and it has been identified as *Morinda pubescens* Sm. of the family Rubiaceae. It is widely distributed in Assam, Meghalaya, Bihar, Maharashtra and Odisha in India. The species has also been collected and identified from Allahabad, Hamirpur, Kheri, Lucknow, Raebareilly, Sitapur and Bahraich in Uttar Pradesh by various workers. Thus this is the first report on occurrence, distribution and collection of *Morinda pubescens* Sm. from Bhari village (29°37'53" N & 77°7'41" E) of Shamli district in Oon tehsil in Uttar Pradesh,

India. This village is located in western part of Shamli district. Hence, in the present treatment, the species is reported as a new addition to the flora of north-west Uttar Pradesh. No specimen is available from this area in the Forest Research Institute, Dehradun and the Botanical Survey of India, Northern Circle, Dehradun. Therefore the present collection forms new distributional record for north-west Uttar Pradesh. A brief description along with ecology and photographs (Fig.1) is provided here to facilitate easy recognition of this species.

Nomenclature

Morinda pubescens Sm. in Rees, Cycl.; 24. n. 3: 1813; Verde., Kew Bull. 37; 543. 1983. *M. tomentosa* Roth. Nov. Pl. Spec.: 147. 1821. *M. coreia* Buch.-Ham. Trans. Linn. Soc. London 13(2): 537. 1822. *M. tictoria* Roxb., Fl. Ind. 1: 543. 1832; Hook. f., Fl. Brit. India 3: 156. 1880; Duthie, Fl. Gangatic Plain 1: 427, 1905. Aal.

Description

An evergreen large shrub or small tree, 3-8 m high, with crooked and spongy yellowish-brown, shallowly fissured, glabrous bark; branches 4-angled, tender branches tomentose. Leaves simple, opposite, 10-20 × 6-12 cm, broadly or narrowly elliptic, entire, acute at both ends, pinnately nerved, tomentose on both surface, not shiny; petiole 1-2 cm long, densely tomentose; stipule often bifid, 5-7 mm long, pubescence at apex, with narrow acute lobes, lobes hairy, sometimes variable in size and shape. Peduncle solitary, axillary or leaf-opposed, frequently in short trichotomous panicles at the ends of branchlets or occasionally in the axils of a reduced leaf, tomentose. Flowers scented, bisexual, in globose heads, usually 5-merous, creamy-white or pale yellow, connate by the calyces. Calyx hemispheric, 3-5 mm long, truncate. Corolla white or pale yellow, funnel-shaped, up to 2-3 cm long, wooly outside, lobes 5, 1-1.5 cm long, coriaceous, valvate in bud, oblong, obtuse or sub-acute. Stamens 5; inserted on the throat of corolla; filament short, pubescence; anthers linear to oblong. Ovary 2-celled or spuriously 4-celled, inferior,

ovule solitary; style slender, branches long or short; stigma 2-lobed, hairy. Fruit an ovoid syncarp of pyramidal, 1-seeded coalescent, globose drupes, 2-4×2-3 cm, yellowish-green; seeds black, with hard albumen and distinct air chamber.

Habitat & Ecology

M. pubescens Sm. can be found to tolerate a range of habitats. *M. pubescens* Sm. can be found growing in a wide range of habitats (e.g. from very dry to wet sites), disturbed forests, dry to mesic forests, deciduous forests, xerophytic habitats, grassland, open areas near shorelines, abandoned pastures, and coconut plantations. This plant species usually grows on shady forests, as well as on open rocky or sandy shores. From north-west Uttar Pradesh, it was collected for the first time from Shamli district, near the River Yamuna beds in wild state. The associated species in this locality are *Prosopis juliflora* (Sw.) D C., *Vachellia nilotica* Subsp. indica (Benth) Tyar & Boatwr., *Acacia leucophloea* (Roxb.) Willd., *Ehretia laevis* Sieber ex A.DC., *Trewia nudiflora* L., *Streblus asper* Lour., *Zizyphus mauritiana* Lam. Other associates were *Peristrophe bicalyculata* Nees in Wall., *Cayratia trifolia* (L.) Domin, *Coccinia grandis* (L.) Voigt, *Tinospora cordifolia* (Willd.) Hook. f. & Thomson etc.

Flowering & Fruiting: April-February.

Geographical Distribution: *M. pubescens* Sm. is native to Eastern Asia and now has a wide range of distribution. It is present throughout South-East Asia both in wild and cultivated states in many countries like Sri Lanka, India, Bangladesh, Thailand, Cambodia, Laos, Vietnam, Indonesia, Malaya Archipelago etc.

Etymology: The genus name *Morinda* is thought to be derived from the Latin words *morus* "mulberry" from the appearance of the fruits, and *indica*, meaning of "India". Its species name, '*pubescens*' is Latin for 'tomentose or pubescent' and presumably refers to its tender leaves, branches and flowering twig.



A. Twig



B. Leaf (Dorsal & Ventral View)



C. Stipule



D. Inflorescence



E. Flower



F. Fruit

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