

## ON THE IDENTITY AND OCCURRENCE OF *ORMOSIA ROBUSTA* (FABACEAE: SOPHOREAE) IN INDIA

Bipin Kumar Sinha<sup>3</sup>, Anupam Das Talukdar<sup>2</sup>, \*Dilip Kumar Roy<sup>1</sup>, Durgesh Verma<sup>1</sup> and  
Manabendra Dutta Choudhury<sup>2</sup>

<sup>1</sup>Botanical Survey of India, Eastern Regional Centre, Shillong, Meghalaya, 793 003 INDIA

<sup>2</sup>Department of Life Science & Bioinformatics, Assam University, Silchar, Assam, 788 011 INDIA

<sup>3</sup>Industrial Section, Indian Museum, Botanical Survey of India, Kolkata, 700016 INDIA

\*Author for Correspondence

### ABSTRACT

The paper deals with the revised taxonomic description of *Ormosia robusta* Baker along with photographic illustration based on live plant material, which is the first authentic report of its occurrence in Meghalaya and Mizoram.

**Keywords:** Revised Taxonomy, *Ormosia*, New Addition, Meghalaya, Mizoram

### INTRODUCTION

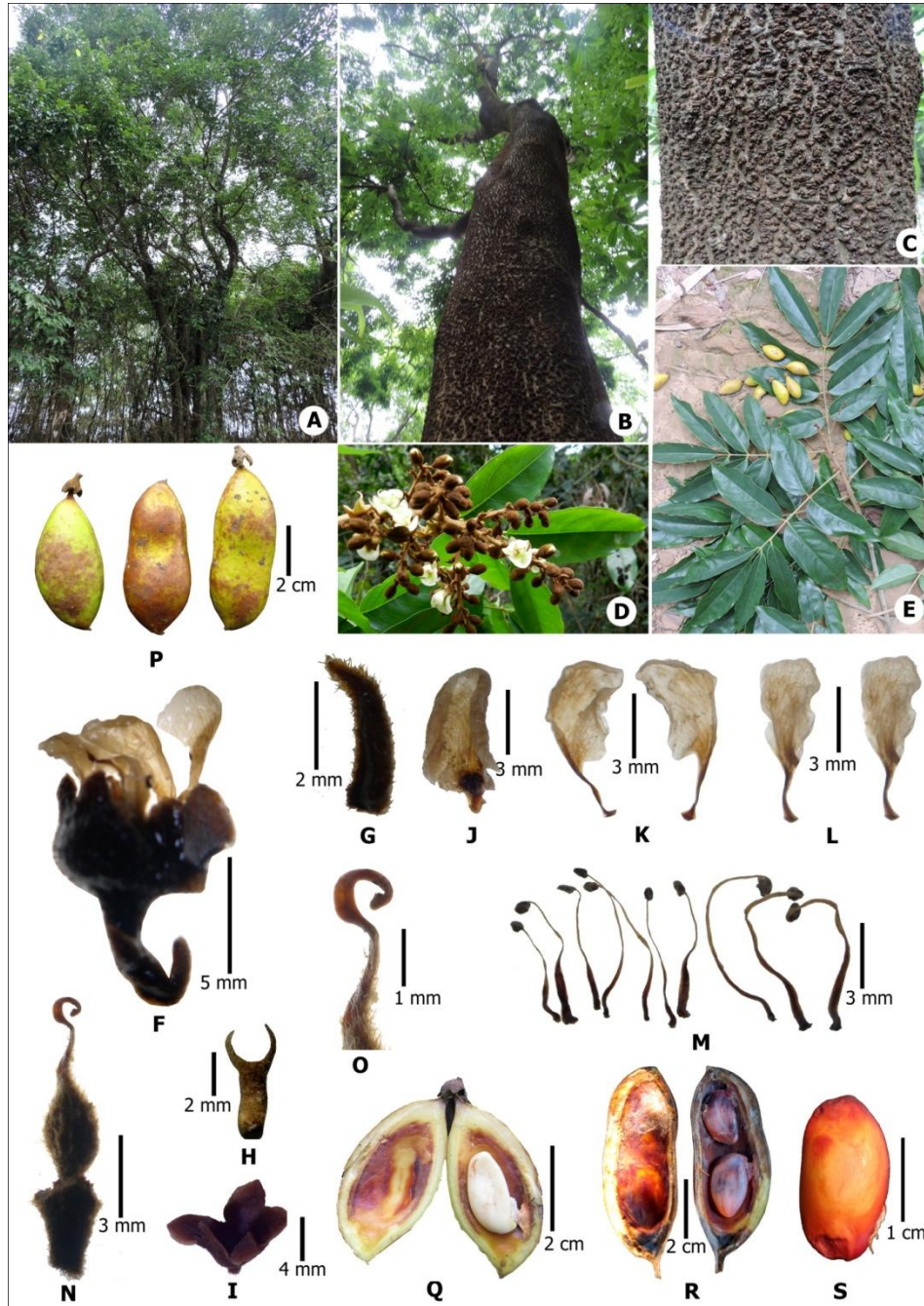
The woody papilionoid legume genus *Ormosia* (Fabaceae: Sophoreae) was established by G. Jackson (1811), comprises around 132 species, geographically distributed in tropical America, South East Asia and North Australia (Mabberley, 2008; Hang and Vincent, 2010; Meireles and De Lima, 2013; Deng, 2014). The genus can be diagnosed by the combination of its well-formed, clearly imbricate calyx lobes; ten free stamens, incurved style, with a terminal or oblique (usually bilobed) stigma, and seed with a hard testa, often red, black or bicolored (Rudd, 1965; Polhill, 1981). In India, the genus is represented by seven species viz. *O. assamica* Yokovlev, *O. coccinea* (Aubl.) Jacks. (probably introduced), *O. fordiana* Oliv., *O. glauca* Wall., *O. pinnata* (Lour.) Merr., *O. robusta* Baker and *O. travancorica* Bedd. (Kumar and Sane, 2003; Verma and Roy, 2014; Roy and Verma in press), of these *O. assamica* and *O. travancorica* are endemic to the country (Sanjappa, 1991).

During the floristic inventory in South Garo Hills district of Meghalaya, India (2012-2014), in connection with the Approved Research Programme of Botanical Survey of India, Eastern Regional Centre, several specimens belonging to genus *Ormosia* were collected from Balpakram National Park and Baghmara Pitcher Plant Wildlife Sanctuary. The flowers and pods were dissected and detailed morphological study was carried out from live specimens. Later on consultation of literatures (Baker, 1876; Oliver, 1896; Brandis, 1907; Fischer, 1927; Yakovlev, 1971; Ahmed *et al.*, 2009; Hang and Vincent, 2010) and comparison with herbarium specimens housed in ASSAM, CAL and DD, it became apparent that the specimens studied were of *Ormosia robusta* Baker, a new record to the Flora of Meghalaya. While studying the herbarium specimens of genus *Ormosia* housed in ASSAM, authors came across some specimens of *O. robusta* Baker, collected by G.K. Deka (Acc. No. 8622, 8623) from Lushai hills (present day Mizoram), but Singh *et al.*, (2002) did not recorded the species in Flora of Mizoram.

The taxon was established by Baker (1876) in J.D. Hooker's *Flora of British India* based on the collection of S. Kurz from Burma keeping *Arillaria robusta* Kurz and *Sophora robusta* Roxb. as the synonyms under it. He mentioned its distribution in Sylhet (present day in Bangladesh) and Burma (present day Myanmar). Later on Brandis (1907) reported its occurrence in Assam, India. Kanjilal *et al.*, (1942) also included the species in *Flora of Assam*, based on the collections made from **Sylhet** (Acc. No. 8603, 8604, 8610, 8615, *U. Kanjilal* 7838, 29.04.1925; Acc. No. 8606, *N.L. Bor* 13954, April 1937, ASSAM!); **Cachar** (Acc. No. 8612, 8617, 8618, *U. Kanjilal* 4721, 18.11.1914, ASSAM!); **Sibsagar** (Acc. No. 8605, 8608, 8614, *U. Kanjilal* 3481, 23.02.1914, ASSAM!). But all these mentioned specimens of *U. Kanjilal* except from Sylhet, housed in ASSAM were incorrectly identified as *O. robusta* instead of *O. pinnata* (Verma and Roy, 2014). *U. Kanjilal* also reported some specimens under the same name from **Nizamghat**, North-East Frontier Agency (Arunachal Pradesh) (Acc. No. 8611, 8616, 8620, *U. Kanjilal*

**Research Article**

3153, 7.12.1913, ASSAM!) having three seeded pods and are morphologically close to *O. pinnata*, but authors could not ascertain their identity due to insufficient materials (pers. obs.). Whereas, Joseph (1982) included the species in *Flora of Nongpoh and vicinity*, based on the collections made from Umsaw Reserve Forest, Ri-Bhoi District of Meghalaya deposited in ASSAM (Acc. No. 8609, 8613, 8621, 24 May 1940, G.K. Deka 19562; Acc. No. 860717, October 1940, S.R. Sharma 20187), but all these specimens were also wrongly identified as *O. robusta* instead of *O. fordiana* (Roy and Verma in Press).



**Figure 1: *Ormosia robusta* Baker: A & B. Habit; C. A portion of stem showing bark; D. Flowering twig; E. Fruiting twig; F. Flower; G. Bract; H. Pedicel with bracteoles; I. Calyx; J. Vexillum; K. Wing petals; L. Keel petals; M. Stamens; N. Pedicel with ovary, style & stigma; O. Style & stigma; P. Legumes; Q. Single seeded legume (cut opened); R. Two seeded legume (cut opened); S. Seed**

### Research Article

Moreover various taxonomic publications were made on *O. robusta* Baker from Asian countries [Bangladesh (Ahmed *et al.*, 2009), India (Brandis, 1907; Hajra *et al.*, 1996; Pal, 2013), Thailand (Niyomdham, 1980)] after its original publication, but none of them including protologue have thorough and detailed description. Original protologue has some dubious characters like absence of bracteoles and is lacking some important characters of the style. Therefore the present communication is made to clarify all these issues and a detailed taxonomic description followed by photographic illustration has been provided to facilitate easy and correct identification.

#### Taxonomic Treatment

***Ormosia robusta*** Baker, Fl. Brit. India 2:252. 1878; Kanjilal *et al.*, Fl. Assam 2: 118. 1938; Pal, Fl. Lower Subansiri district, Arunachal Pradesh 1: 256. 2013. *Arillaria robusta* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42: 71. 1873. *Sophora robusta* Roxb., Hort. Bengal. 31. 1814. *Placolobium robustum* (Roxb.) Yakovlev, Novosti Sist. Vyssh. Rast. 10: 191. 1973 (Figure 1).

**Vern. Names:** *Sanchi* or *Sanchi-bloma* (Garó).

A tall tree, up to 12 m; stem bark brown, warty, yellowish inside. Young branches densely brownish pubescent. Leaves imparipinnate, 30–40 cm; petiole 5.5–7.5 cm; rachis 8.5–14.0 cm; leaflets 7–9; petiolule 0.5–0.6 cm, grooved, brown, pubescent; blades ovate-lanceolate to oblong-lanceolate, terminal leaflet 15.0–18.5 × 4.5–5.5 cm, lateral leaflets 7.0–17. × 2.8–5.5 cm, thinly leathery, glabrous, entire, base rounded-attenuate, apex acuminate, midvein raised abaxially, impressed adaxially, lateral veins 6–13 pairs. Inflorescences terminal, 7.0–10.5 cm; peduncle and pedicel densely rusty pubescent. Pedicel 4–6 mm; bracts linear-lanceolate, 3–4 mm, densely rusty brown pubescent; bracteoles 2, at pedicel apex, lanceolate, ca. 2.0 mm, densely appressed rusty brown pubescent. Flowers creamy-white, 0.9–1.2 cm across. Calyx persistent, campanulate, 0.5–6.0 cm; teeth broadly triangular, 0.2–0.3 cm long, upper 2/3 of upper pair connate, ca. 1.0 mm, densely rusty pubescent. Corolla creamy-white; vexillum orbicular, 0.6–0.7 × 0.5–0.6 cm when flattened, deeply cucullate, margin crumpled, claw short, 1.0–1.5 mm; wings spathulate-obovate, 0.5–0.6 × 0.3–0.4 cm, uniauriculate, claw ca. 0.3 cm; keel broadly spathulate, 0.5–0.6 × 0.30–0.35 cm, claw ca. 0.3 cm. Stamens 10, unequal, all fertile; filaments 0.6–1.1 cm; anthers dorsifixed, ca. 1.0 mm long. Ovary densely pubescent, 0.3–0.4 × 0.20–0.25 cm; style ca. 0.4 cm long, densely pubescent at base, apical portion glabrous, curved, swollen, ca. 0.15 cm; stigma introse, bilobed. Legumes 1–2 seeded, cylindrical or slightly compressed between seeds, glabrous, yellowish-green, 4.5–8.0 × 2.0–3.0 cm, apex slightly beaked; valves woody, dehiscent, ca. 2 mm thick. Seeds oblong, ca. 1.8–2.2 × 1.1–1.3 cm, obtuse at ends; testa bright-red; hilum 0.5–0.6 cm.

**Flowering & Fruiting:** April–July.

**Ecology:** It was found growing on the hilly terrain of tropical semi-evergreen forest at ca. 110–370 m along with *Syzygium nervosum* A.Cunn. ex DC., *Planchonella grandifolia* (Wall.) Pierre, *Macaranga indica* Wight, *Croton joufra* Roxb., *Ampelocissus latifolia* (Roxb.) Planch., *Ixora acuminta* Roxb. and *Amorphophallus bulbifer* (Roxb.) Blume etc.

Note: Baker (1876) in original protologue mentioned that the species is devoid of bracteoles, while Ahmed *et al.*, (2009) mentioned, it being minute. However, our critical study on live plant materials and observation on herbarium specimens housed in ASSAM, CAL revealed the presence of 2 distinct bracteoles, ca. 2 mm. Moreover the species is characterized in having style of ca. 0.4 cm long, densely pubescent at base and curved, glabrous and swollen at apical half.

**Specimen examined:** INDIA: Meghalaya, South Garo Hills, Balpakram National Park, Hatisia Beat, 25°11'55.80"N & 90°51'34.70"E, 366 m, 27.04.2012, D.K. Roy 125524 (Flowering), 05.06.2014, D.K. Roy 130155 (Fruiting) (ASSAM!); Baghmara Pitcher Plant Wildlife Sanctuary, 25°11'53.30"N & 90°38'25.00"E, 111 m, 10.06.2014, D.K. Roy 130288 (ASSAM!). Mizoram, Aizwal, 17.02.1953, G.K. Deka s.n. Acc. No. 8622, 8623 (ASSAM!).

**Additional Specimen examined:** BANGLADESH: Sylhet, Lawa Chera, April 1937, N.L. Bor 13954, Acc. No. 8606; Raghunanda, 29.04.1925, U. Kanjilal 7838, Acc. No. 8603, 8604, 8610, 8615; Chittagong hill tracts, March 1886, King's collector 441, Acc. No. 133583 (CAL!). MYANMAR: Tavoy, May 1901, S. Mokim 717, Acc. No. 133590; Pegu Yomah, E. & W. Slopes, ??, S. Kurz, s.n., Acc. No. 133588 (CAL!).



### Research Article

INDIA: Assam, Karimganj, Patharia forest, March 1886, T.K. Gupta s.n. Acc. No. 8602 (ASSAM!); Mizoram, Aizwal, 05.03.1953, G.K. Deka Misc/1 Acc. No. 117248 (DD!);

**Distribution:** India (Assam, Arunachal Pradesh, Meghalaya, Mizoram), Bangladesh, Myanmar, Thailand.

**Uses:** As timber and fire wood. The extract of bark (soaked in water overnight) is used in treatment of Jaundice by the Garos.

### ACKNOWLEDGEMENT

The authors are thankful to the P. Singh, Director, Botanical Survey of India, Kolkata and A.A. Mao, Scientist-E & HoO, Botanical Survey of India, Eastern Regional Centre, Shillong for facilities and encouragement. Authors extend their sincere thanks to Gwilym P. Lewis, Head of Legume Section, Herbarium, Royal Botanic Gardens, Kew, UK and Manas Bhaumik, Scientist-D, BSI, APRC, Itanagar for their valuable suggestions.

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**Research Article**

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