

## DISTRIBUTIONAL NOTES ON SOME *RHODODENDRON* TAXA FROM ARUNACHAL PRADESH, INDIA

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*Rhododendron* L. is the largest genus in Ericaceae and represented by more than 1000 species in the world (Mabberley 2008). Maximum concentration of the species occurs in Eastern Himalaya, Xizang plateau, mountain ridges of Myanmar and South West China (Sastry & Hajra 2010). Mao (2010) recorded 120 taxa from India of which Arunachal Pradesh alone has 111 taxa.

During the botanical exploration in West Siang district of Arunachal Pradesh, authors collected some interesting taxa of *Rhododendron*. On perusal with the available literature (Chamberlain, 1982, Cullen, 1980, Mingyuan, 2005, Sastry and Hajra, 2010) the identity of these specimens are fixed as *Rhododendron stewartianum* Diels, *Rhododendron charitopes* subsp. *tsangpoense* (Kingdon-Ward) Cullen, *Rhododendron cerasinum* Tagg. and *Rhododendron concinnoides* Hutch. & Kingdon-Ward. The distribution of the former species is recorded first time for India, the second and third species are recorded here for its first authentic collections for Indian herbaria (Cox, 2004, 2006, Roy, 2010) and the fourth species was collected first time outside the type locality of Delei valley (Cullen, 1980). All the specimens are deposited in herbarium, Botanical Survey of India, Arunachal Pradesh Regional Centre, Itanagar. (ARUN).

All the four species are appended here with short descriptions for its easy identification

***Rhododendron stewartianum* Diels in Notes Roy. Bot. Gard. Edinburgh 5: 211. 1912. (Fig.1. A-B)**

Shrubs, 1-1.5m high; younger shoots glabrous. Stem bark rough, not peeling off. Leaves coriaceous, obovate to elliptic, 4-6.8 × 3-4.2cm, obtuse at base, obtuse to cuneate at apex, rarely apiculate; margin thick; abaxial surface mammillate, white; adaxial surface green, glabrous; midrib raised abaxially; lateral veins 8-12-paired. Petiole 10-18mm long, glabrous. Inflorescence terminal, 3-6-flowered; rachis 10mm long, glabrous. Pedicel 1.5-2cm long, glandular hairy. Calyx cupular, 5-lobed; lobes c. 6mm long, glandular hairy. Corolla campanulate, white, on maturity turns into pale yellow, to 3.5cm long; lobes 5, orbicular, c.1.5cm long, emarginate. Stamens 10, unequal, 1.5-2.5cm long; filaments pubescent at base. Ovary cylindric, 3-4mm long, densely glandular hairy; style 2.5-3cm long, glabrous; stigma capitate.

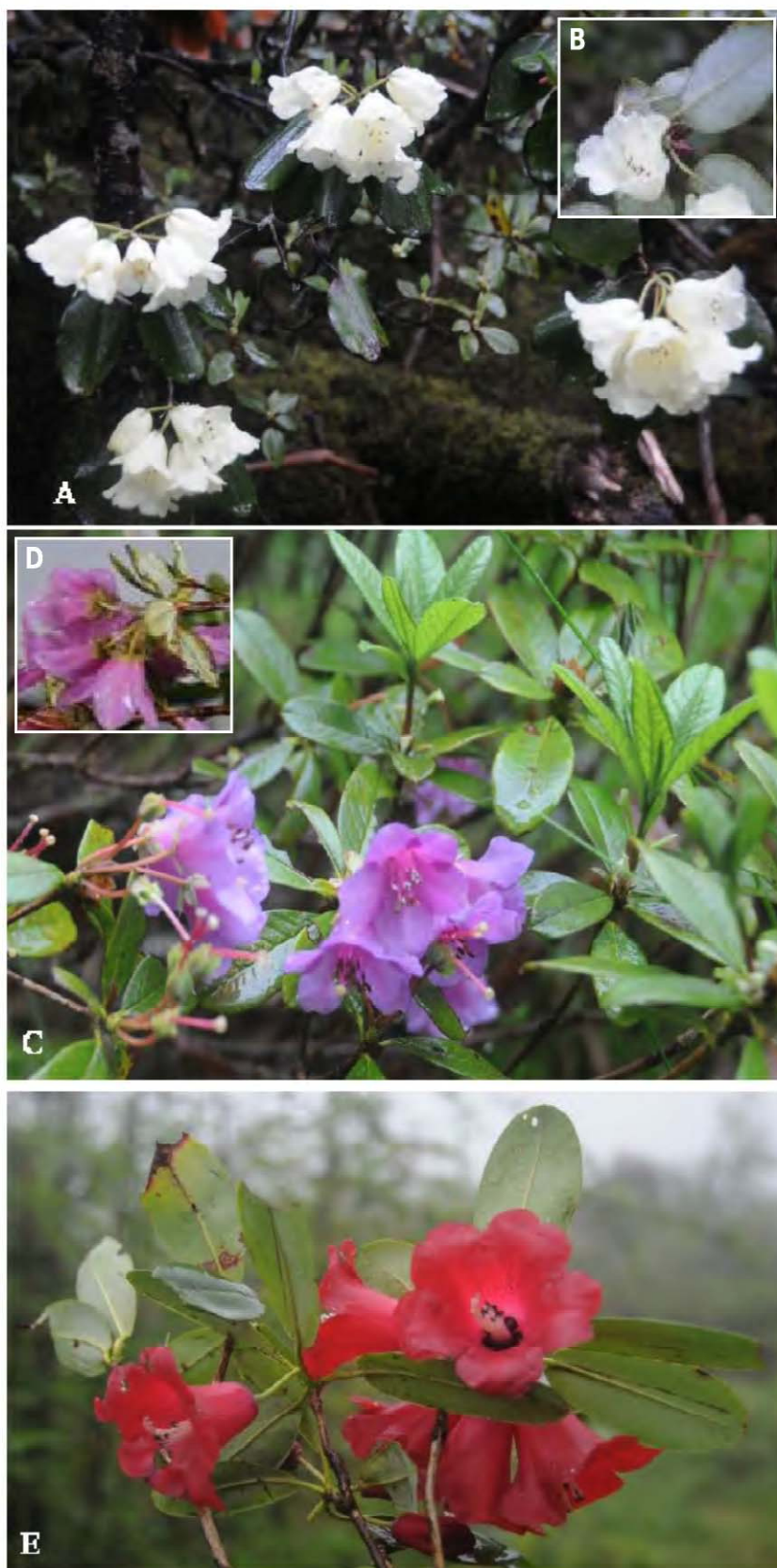
*Flowering* : June-July.

*Specimens examined*: Arunachal Pradesh, West Siang, Lamang- Lo La Pass, 3300m, 17.6.2012, Bhaumik-27845 & 27862 (ARUN).

*Notes* : This taxon has localized distribution, but well-populated. It grows in open valleys, slopes and is very diversified in habit form from small shrubs to medium size trees. Here it is reported as new distributional record for India.

***Rhododendron cerasinum* Tagg in J.B. Stevenson, Sp. Rhodod. 737. 1930 and in Notes Roy. Bot. Gard. Edinburgh 16: 188. 1931; D.F.Chamb. in Notes Roy. Bot. Gard. Edinburgh 39(2): 418.1982. (Fig.1. E)**

Shrubs, 2-3m high; stem smooth; bark peeling off. Leaves coriaceous, oblong-elliptic to narrowly obovate, 5-7.5 × 1.8-2.8cm, rounded at base and at apex, apiculate, glabrouscent on abaxial surface, glabrous on adaxial surface, hairy only along midrib; mid-rib raised abaxially; lateral veins 13 - 15 - paired. Petiole terete, 1 - 1.5cm long, pubescent. Inflorescence terminal, 3 - 6 - flowered; rachis conical, 2 - 4mm long. Pedicel 2-3cm long, glandular hairy. Calyx cupular, 5-lobed; lobes c. 2mm long, glandular hairy. Corolla campanulate, crimson to scarlet red, 3-3.8cm long, with distinct nectar pouches; lobes 5, rounded, c. 1.5cm long, emarginate. Stamens 10, unequal, 2-3cm long; filaments glabrous. Ovary c. 5mm long, densely stipitate glandular; style glandular upto tip; stigma lobulate.



**Fig. 1.** A-B. *Rhododendron stewartianum* Diels., C-D. *Rhododendron charitopes* subsp. *tsangpoense* (Kinddon-Ward) Cullen, E. *Rhododendron cerasinum* Tagg



**Fig. 2. A-J.** *Rhododendron concinnoides* Hutch. & Kingdon-Ward, **A.** Habit, **B-C.** A twig of the plant, **D.** Flower, **E.** Inner view of the corolla, **F.** Leaves, **G.** Stamens and Gynoecium, **H.** Stamens, **I.** Gynoecium, **J.** Fruiting twigs



*Flowering:* June-July.

*Specimens examined:* Arunachal Pradesh, West Siang, Lamang, 3000m, 16.6.2012, Bhaumik 27819 (ARUN); Lamang-Lo La Pass, 3300m, 17.6.2012, Bhaumik-27867 (ARUN).

*Notes :* Only two localities with 15 - 20 individuals were seen in temperate mixed Rhododendron, coniferous forest. This is the first authentic collection made for Indian herbaria.

**Rhododendron charitopes** subsp. **tsangpoense** (Kingdon - Ward) Cullen in Notes Roy. Bot. Gard. Edinburgh 36 (1): 114. 1978. *R. tsangpoense* Kingdon - Ward in Gard. Chron., ser. 3 86: 504. 1929.

(Fig.1. C-D)

Shrubs, 1-1.5m high; stem smooth; younger branches scaly. Leaves coriaceous, obovate to obovate-elliptic,  $2.8 - 4.7 \times 1.8 - 2.5$ cm, narrowly cuneate at base, obtuse at apex, mucronate; abaxial surface glaucous, scales, unequal, widely separated; adaxial surface dark green, scales scattered, not overlapping, smaller ones golden yellow, larger ones brownish black, raised from surface. Petiole 4-5mm long. Inflorescence 2-4 (rarely more) flowered. Rachis glabrous, 1- 2mm long. Pedicel 2-3cm long. Calyx 3-5mm long, deeply five lobed, ovate, rounded at apex, persistent, scaly; margin sparsely ciliate. Corolla broadly campanulate, pink to purple, 1.5-2cm long, tube 0.8-1.2cm long, rarely scaly. Stamens 10, included; filaments pubescent throughout. Ovary 2-3mm long, densely scaly; style stout, deflexed at top curve, 1-1.2cm long, glabrous, with few scales at base. Capsule oblong to cylindric, 3- 5mm long, scaly

*Flowering:* June - July

*Specimens examined:* Arunachal Pradesh, West Siang, Manigong, Nying camp-Detung mountain top, 3200m, 9.6.2012, Bhaumik - 27728 (ARUN); Lamang, 3000m, 16.6.2012, Bhaumik - 27812 & 27825 (ARUN).

*Notes:* This shrubby species are well populated along river banks of, forest margins along with *R. thomsonii* Hook. f. and *R. cerasinum* Tagg. This is the first authentic collection made for Indian herbaria.

**Rhododendron concinnoides** Hutch. & Kingdon - Ward in Notes Roy. Bot. Gard. Edinburgh 16: 180. 1931; Cullen in Notes Roy. Bot. Gard. Edinburgh 39 (1): 61. 1980.

(Fig.2. A-J)

Epiphytic, shrubs, 25-45cm high. Leaves elliptic-ovate, c.  $2.5 \times 1.2$ cm, acute at apex, with thick margin, cuneate at base, adaxial surface glabrous; abaxial densely lepidote,. Inflorescence terminal, solitary, rarely 2. Pedicel c. 6mm long, densely red punctate. Calyx minutely 5 - lobed, c. 1mm long; lobes orbicular. Corolla 2.-2.5cm long, tubular campanulate, pinkish-white; tube 1.5-2cm long, deep brown to yellowish spotted inside, scaly darker spots outside; lobes 5, pink to pinkish white,  $7-9 \times 7-10$ mm, orbicular. Stamens 10, unequal, 1.8-3cm long; filament, hairy at base, slightly curved at apex. Ovary oblong, 3-4mm long; style curved, 3 - 3.5cm long; stigma capitate. Fruit oblong, narrowly curved, c.  $1.8 \times 0.5$ cm, scaly.

*Flowering:* September.

*Specimen examined:* Arunachal Pradesh, West Siang, Trek junction, 3000m, 8.9.2012, Bhaumik - 29398 (ARUN).

*Note:* This taxon was known only by its type collection made from Delei Valley in 1927 by Kingdon-Ward and considered as endemic to this region, till it was recollected by Keith Ruthsford in 2006. The present collection shows an extended distribution from its type locality and an authentic collection for Indian herbaria.

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#### REFERENCES

- CHAMBERLAIN D. F. 1982. A revision of Rhododendron I. Subgenus Rhododendron, Sections, Rhododendron and Pogonanthum. *Notes Royal Botanic Garden Edinburgh* 39 (2): 209 - 486.

- COX, P. 2004. Arunachal Pradesh revisited. *Rhododendrons with Camellias and Magnolias*. RHS No. 55: 34 - 41. Royal Horticulture Society, London.
- COX, P. 2006. Return to Arunachal Pradesh. *Rhododendrons, Camellias and Magnolias Yearbook*. RHS No. 55: 34 - 41. Royal Horticulture Society, London.
- CULLEN, J. 1980. A revision of *Rhododendron* II. Subgenus *Hymenanthes*. *Notes Royal Botanic Garden Edinburgh* 39 (1): 1 - 207.
- MABBERLEY, D. J. 2008. *Mabberley's Plant Book*, A Portable Dictionary of the Plants, their Classification and Uses. Cambridge University Press, Cambridge, UK. p. 737.
- MAO, A. A. 2010. The genus *Rhododendron* in north-east India. *Botanica Orientalis - Journal of Plant Science* 7: 26 - 34.
- MINGYUAN, F., F. RUIZHENG, H. MINGYOU, H. LINZHEN, Y. HANBI AND D. F. CHAMBERLAIN 2005. '*Rhododendron*' in Flora of China 14: 260 - 455. Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.
- ROY, J. 2010. *Rhododendron* exploration in Arunachal Pradesh, India 2009. (reprinted The New Zealand *Rhododendron* Association No.99: 12-19. 2011).
- SASTRY A.R.K. AND P.K. HAJRA 2010. *Rhododendrons in India: Floral and Foliar Splendour of the Himalayan Flower*. B. S. Publications, Hyderabad, India.