NEW RECORD

***Solanum villosum* Mill. (Solanaceae) – a new record for the flora of Arunachal Pradesh, India with notes on its distribution in Eastern India**

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Abstract

The annual herb *Solanum villosum* Mill. (Solanaceae) is reported here as a new distributional record to the flora of Arunachal Pradesh, India along with notes on its distribution in Eastern India. Detailed description of the species along with some coloured photographs and uses are provided here for its easy recognition in the field.

Key words: Solanaceae, *Solanum villosum*, Arunachal Pradesh, New Report, Distribution.

INTRODUCTION

Arunachal Pradesh is the largest state in Northeast India covering an area of 83,743 km² and is located within the Himalaya Biodiversity Hotspot that is one of the richest Hotspots in the world, (Mittermeier *et al.* 2005; Taram *et al.* 2018). About 5000 species of flowering plants belonging to 1295 genera and 190 families are estimated for the state flora (Dash & Singh, 2017; Kashung *et al.*, 2018).

The family Solanaceae is consisting of 98 genera and some around 2,700 species with a great diversity of habitats, morphology and ecology (Yadav *et al.* 2016). *Solanum* L. is the largest genus of the family and covers approximately 1500 species distributed in all the continents excluding Antarctica (Vorontsova *et al.* 2013; Murugan *et al.* 2017). In India the genus is represented by 48 species (Kumari 2004). Earlier, Chowdhery *et al.* (2008) recorded 12 species of *Solanum* for Arunachal Pradesh.

While working on the Ethnobotany of Upper Siang district of Arunachal Pradesh, authors have collected one species of *Solanum* from the post-harvest paddy fields at Geku during February 2019. After perusal of relevant literatures (Mill 2002; Murugan *et al.* 2017; Kumar *et al.* 2013; e flora of China; world flora online; Herbarium catalogue) the species is identified as *Solanum villosum* Mill. Now with the addition of *Solanum villosum*, the number of species of this genus is increases to 13 for Arunachal Pradesh.

The occurrence of *S. villosum* was not recorded by Prain (1903) from Bengal. But in efloraindia Surajit Koley uploaded some photos [*Solanum* sp. ID-01 25/02.2012 Hooghly (WB) SK] of its fruits. The plant is also found growing in some parts of West Bengal at

places like Kolkata, Siliguri and Balurghat. The third author (APD) has uploaded some photographs of ripe fruits from Kolkata (on May 07, 2019) for easy distinction of *S. villosum* from *S. americanum* in a Facebook group [‘Professor A P Das Students, Fand, and Followers’]. The same has been done by B.K. Saha on June 24, 2019 from the Balurghat area. While it is very common in Kolkata area (alt. 9 m), in Siliguri (alt. 135 m), so far, it is found only in the campus of North Bengal University.

Earlier, in 2001, R.R. Mill recorded the plant (single specimen) from the Thimphu district (2200 m) of Bhutan.

Taxonomic treatment:

Solanum villosum Mill., Gard. Dict. ed. 8. no. 2. 1768; Abedin *et al.* in Pakistan J. Botany 23: 271. 1991; Kumar *et al.* in Indian Forester 139(11): 1052 – 1053; Murugan *et al.* in Indian J. Forestry 40(1): 73 – 75. 2017.

Subsp. ***puniceum*** (Kirschleger) Edmonds, Botanical J. Linn. Soc., 78: 215. 1979; Mill in Grierson & Long, Fl. Bhutan 2(3): 1052. 2001. *S. nigrum* L. subsp. *puniceum* Kirschleger, Flore d’Alsace et des contrees limitrophes, 1: 532. 1852, pro *S. puniceum* C.C. Gmelin quod est nom. illegit.

Local Names: *Okomamang*, *Maali*, *Koieer* and *Yanga* by the different linguistic groups of *Adi* tribe in Arunachal Pradesh.

Specimen Examined: India, Arunachal Pradesh, Upper Siang District, Geku, 28° 27′ 48″ N & 95° 82′ 10″ E, elevation 350 m, February 12, 2019, *M. Taram-1804*. Thakurpukur, Kolkata, 9 m, April 12, 2017, *A.P. Das 7034* (CAL). North Bengal University, Siliguri, elevation 135 m, May 15, 2019, *CG.NBU-0327* (NBUTea).

Annual, erect, much branched herb, 40 – 70 cm tall. Stems pubescent, terete, often angular, light green, nodal regions purplish (sometimes stem, petiole, peduncle and pedicels purple). Leaves simple, alternate, exstipulate; petioles 4 – 12 mm; lamina 3 – 7 × 2 – 4, ovate–elliptic, nearly entire to moderately sinuate, acute, base unequal, cuneate, narrowly continued into the petiole, sparsely pubescent. Racemes supra-axillary, condensed, sub-umbellate with 3 – 8 flowers; peduncles form 90° with stem, erect, up to 20 mm long, unbranched; pedicels 4 – 11 mm, gradually thickened upwards, puberulent. Flowers pentamerous, actinomorphic; Calyx 0.3 – 0.4 × 0.1 – 0.2 cm, puberulent; lobes 5, reflexed, broadly subulate, entire, rounded-obtuse, slightly enlarged in fruit, sinuses rounded; Corolla white, 0.5 – 0.8 × 0.7 – 1 cm, lobes ovate-lanceolate, ca. 0.3 cm, with a purple longitudinal line, ciliate, strongly spreading and reflexed; Stamens 5, filaments 0.1 – 0.2 cm, pubescent, anthers ca. 0.2 cm. Ovary globose, glabrous, style 0.3 – 0.5 cm, pilose at base. Ripe berry globose, 0.6 – 0.8 cm in diameter, brightly orange to reddish-orange. Seeds discoid, compressed, ca. 0.1 cm in diameter, brownish yellow.

Flowers & Fruits: November – May (in Arunachal Pradesh); December – July (in West Bengal)

Taxonomy: The nomenclature of the species and its delimitation for subspecies rank was quite debatable. However, Edmonds (1979) discussed the problem in details and provided stability in nomenclature for the widespread population of this species. Both the populations of the species under consideration are eglandular and with orange to reddish-orange fruits and has been recognized as subsp. ***puniceum*** (Kirschleger) Edmonds (Edmonds 1979).

Distribution: The species is believed to have originated in Eurasia, and is sometimes considered to have a southern European origin. However, it is now distributed in **Micronesia**,

PLATE - I. *Solanum villosum* Mill.: A. Young plant at Siliguri; B. Fruiting plant at Geku; C. One matured leaf from Siliguri; D. A bunch of orange-red fruits from Kolkata; [E. Fruits of *Solanum americanum* Mill. in perfect umbel from Kolkata]

N. Africa to Eritrea and Mozambique, Europe, North America, Australia, China, Bhutan, and Arabian Peninsula (Kumar *et al.* 2013; Murugan *et al.* 2017). In India it is reported from Tamil Nadu, Odisha, Uttar Pradesh, West Bengal and Arunachal Pradesh.

Ecology: *Solanum villosum* in Arunachal Pradesh grows on open paddy fields upto 500 m elevation in association with *Solanum americanum* Mill., *Rumex maritimus* L., *Centella asiatica* (L.) Urb., *Bidens pilosa* L., *Duschesnia indica* (Jacks.) Focke, and *Oxalis corniculata* L. However, in Kolkata and Siliguri it grows only in terrestrial condition and in association with numerous local terrestrial herbs including *Solanum americanum* Mill., *Rumex dentatus* L., *Cynodon dactylon*, *Ageratum conyzoides* (L.) L., *Centella asiatica* (L.) Urb., *Oxalis corniculata* L., *Commelina benghalensis* L., etc.

Ethnobotanical Uses: In Arunachal Pradesh tender shoots are served as green-vegetable by local tribal communities.

Ethnotaxonomy: Local inhabitants differentiate it from *Solanum americanum* with the help of different color of the fruits, as the fruit of *Solanum villosum* is orange and for *Solanum americanum* it is dark black.

Market Value: Twenty Rupees per bundle of around 10 twigs and equally like *Solanum americanum*.

Note: In general, it is cultivated in many countries for its edible fruits. In Africa it is a preferred vegetable and eaten in different ways (<http://www.prota.org>).

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