

Notes on the distribution of *Salix eriostachya* Wallich ex Andersson (Salicaceae): an interesting species of Sikkim Himalaya

Sukla Chanda¹, A. Pramanik² and G. G. Maiti³

¹Scottish Church College, 1 & 3 Urquhart Square, Kolkata 700 006 (sukla_chanda@yahoo.co.in).

²Botanical Survey of India, AJCB Indian Botanic Garden, Howrah-711 103, W.B., India

³Department of Botany, Kalyani University, Kalyani -741 235, Nadia, W.B., India.

[Received revised 08.05.2011; Accepted 20.06.2011]

Abstract

Salix eriostachya Wallich ex Andersson is concentrated to its occurrence in the temperate regions of Central and Eastern Himalayas. In India this species is known to be present only in the Sikkim Himalaya. Moreover, the occurrence of this species is not so abundant in the field and is confined to some pockets. The species is thoroughly described with illustration along with the discussion of its distribution pattern.

Key words: *Salix eriostachya*, Description, Distribution

INTRODUCTION

Salix eriostachya Wallich ex Andersson (Salicaceae) was first described in 1851, based on the Wallichian name (*Wall. Cat. no. 3704*) collected from Gossain Than, Nepal. This species belongs to the section *Psilostigmatae* Andersson which is one predominant section of the genus *Salix* Linnaeus. The senior author was able to collect only a few specimens of *S. eriostachya* after extensive survey in different parts of Sikkim Himalaya during 2005 – 2008 under *Flora of India* project. However, there are a few specimens in CAL, DD and BSHC, but present survey and collections provided additional information for this species. The species is presented here along with description, illustration and representative specimens showing its occurrence in the Himalayas.

Salix eriostachya Wallich ex Andersson in Kongl. Svenska Vetenskapsakad. Handl. 1850: 493 1851, in J. Linn. Soc., Bot. 4: 46. 1860 and in DC., Prodr. 16(2): 270. 1868; Hook. f. in Hook. f., Fl. Brit. India 5: 633. 1888; Brandis, Indian Trees 637. 1906; C.K. Schneid. in Sarg.(ed.), Pl. Wilson. 3(1): 114. 1916; Bor, Man. Ind. For. Bot. 110. 1953; Kimura in H. Hara *et al.*, Enum. Fls. Pl. Nepal 3: 218. 1982; Grierson & Long in A.J.C. Grierson & D.G. Long (eds.), Fl. Bhutan 1(1): 67. 1983; C.F. Fang *et al.*, in C.Y. Wu & P.H. Raven (eds.), Fl. China 4: 229. 1999; Press *et al.*, Anno. Checklist Fls. Pl. Nepal 282. 2000. [Fig. I]

Type: “In Nepalia, ad Gossain Than”, 1821, Wall. Cat. Pl. Ind. Orient. n. 3704.- BM, Photo! CAL (Accn. no. 443844) !

Tree or shrub, to 8 m high; *bark* ash-grey or reddish-brown, subglabrous, smooth; *branches* divaricate, dark brown and quite glabrous, more or less glaucous; *vegetative buds* ovoid-conical, 3 – 5 mm long, chestnut-brown, glabrous, subadpressed. *Leaves* alternate, simple, erecto-patent; leaf blades broadly elliptic or lanceolate or oblanceolate, 5 – 11 x 1.5 – 3 cm, acute, entire or very smoothly undulated or very indistinctly denticulate, broadly cuneate, subcoriaceous, dark green and glabrescent to puberulose above, ashy and pubescent beneath; midrib distinct, ashy-grey-tomentose above, subglabrous beneath; secondary veins 12 – 20 pairs, alternate, distinct above; both midrib secondary veins raised beneath; petioles slender, 5 – 10 mm long, green, pubescent; *stipules* ovate, ca. 1 mm long, greenish-brown, glabrous. *Catkin* solitary, axillary, appearing simultaneously with leaves, slender,

provided with basal leaves; basal leaves 4 – 6, lanceolate, 1.5 – 5 x 0.7 – 1.5 cm, acute to acuminate, present at the non-flowering portion of the peduncle. *Male catkins* cylindrical, 3 – 5 x 0.5 – 0.7 cm, erect to suberect, compact, yellow, long pedunculate; rachis pubescent or velvety; *male flowers* sessile. *Bract* 1, broadly obovate, spatulate, 2 – 2.5 mm long and 0.8 – 1.3 mm wide above the middle, extending nearly to 1/2 of the length of the filaments, subtruncate to subrounded, entire or rarely incised, narrowed and finally truncate, brownish, glabrous at the ventral surface, silky-pubescent at the dorsal surface; 1-veined; vein branching upwards. *Glands* 2; one posterior and opposite to the bract, other anterior and hidden inside the bract; posterior gland narrow-oblong, cylindrical, tongue-like, larger and broader than the anterior gland, *ca.* 1 mm long; anterior gland narrow-linear, smaller, *ca.* 0.5 mm long; both obtuse at apex, sometimes notched, reddish-brown, fleshy and juicy; stamens 2; filaments free, 4.5 – 5 mm long, lower 1/2 (*ca.* 2.5 mm) silky-pubescent; anthers ovoid, yellow, basifixed, dehiscence longitudinal with distinct slits. *Female catkins* very slender, longer than the male catkins, 5 – 8 cm long and 0.6 – 0.8 cm diam, curved and spreading, compact, ashy-green, long pedunculate; rachis finely hirsute; *female flowers* sessile, angled. *Bract* 1, obovate to oblong-obovate, 1.5 – 2 mm long and 1 – 1.2 mm wide above the middle, extending to 1/3rd of the ovary length; subtruncate, entire, narrowed gradually towards base, chestnut-yellowish, thinly and sparsely pubescent at the ventral surface, densely silky villose at the dorsal surface; vein not prominent. *Gland* 1, posterior, opposite to the bract, attached at the base of the ovary, upper part free and distichous, narrowly ovoid, *ca.* 0.5 mm long, brownish, fleshy and juicy; carpels 2, lateral, syncarpous; ovary superior ellipsoid-cylindrical, 1.5 – 2 mm long, very densely white pubescent, sessile; style elongated, 1 – 1.5 mm long, deeply cleft from the base, chestnut-coloured, glabrous; stigmas 2, bifid; segments narrowly filiform. *Infructescence* very long and very thick, 10 – 16 cm long and 0.5 – 0.9 cm diam, dense, long pedunculate; capsules sessile, ovoid-conical, 4 – 6 mm long, 2-valved; each half navicular after dehiscence; dehiscence longitudinal, septicidal; wall greenish-brown to reddish-brown without and light brown within, pubescent, brittle; with persistent style, stigmas above and bract, gland at base; *seeds* 4, ellipsoid, 1.5 – 2 mm long, whitish, glabrous, with tufts of persistent hairs at base; hairs 2.5 – 3 mm long, flexible, spreading and exceeding seed length, silky-white.

Flowers & Fruits: May – August.

Habitat: Growing along the hill slopes of temperate regions, in the ranges of altitude of 2700 – 5000 m.

Distribution: INDIA (Sikkim); Nepal; Bhutan (?); China (?)

Exsiccatae: Sikkim: Patang, 10000 ft (3048 m), 16.07.1877, *King's collector* 4180 (+1 duplicate; male, CAL); Chola Range, 12,000 ft. (3657 m), 26.09.1892, *Gammie* 1308 (mature frt, CAL); Zemu valley, 12800 ft. (3891 m), 11.7.1909, *Smith & Cave* 1132 (male, CAL); Zemu valley, 11000 ft (3352 m), 16.07.1909, *Smith & Cave* 1665 (female, CAL); Sipukung, 25.11.1911, *Ribu & Rhomo* 5784 (DD); Lachung, 9000 ft (*ca* 2743 m), 12.05.1927, without any collector's name 138 (male, CAL); Changu, 13000 ft (3952 m), 13.7.1956, *Chatterjee's collector* 192 (female, CAL); Menmecho Lake surrounding, 3200 m, 4.6.1984, *Krishna & Singh* 3052 (frt; BSHC); Yakchey to Yumthang, 10.7.1986, *Raju & Singh* 5707 (frt; BSHC); Lukrip on way to Dzongri, 07.08.1987, *Raju & Singh* 8110 (frt; BSHC); On way to Chungthang from Lachen, 2700 m, 05.05.2006, *Chanda* 40350 (+2 duplicate; female) ; Lachen, 3000 m, 05.05.2006, *Chanda* 40351 (+3 duplicate; male).

DISCUSSION

The female catkin and female flowers are not matched with other species under the section *Psilostigmatae*. The non-flowering portions of the catkins is quite longer (which plays a key character in the field) in comparison with other species of *Acer* Linnaeus. Female flowers are larger and angled. Leaves are, however, common with *S. wallichiana* Andersson and *S. radinostachya* C.K. Schneider.



Fig. 1. *Salix eriostachya*: 1. Female twig; 1A. Female flower; 1Bi. Floral bract (dorsal view); 1Bii. Floral bract (ventral view); 1C. Gland; 1D. Fruit (dehisced); 1E. Seed; 2. Male twig; 2A. Male flower; 2Bi. Floral bract (dorsal view); 2Bii. Floral bract (ventral view); 2Ci. Posterior gland; 2Cii. Anterior gland.
[1 – 1E. Chanda 40351; 2. King's collector 4180; 2A – 2Cii. Chanda 40350]

In India the species is confined only to Sikkim. During the field and herbarium study it has been found that the species is not so abundant in a particular place in Sikkim, rather sparsely distributed. The species shows its distributional path from eastern parts of Sikkim like Menmecho Lake (*Krishna & Singh* 3052), Chola Range (*Gammie* 1308) towards the north-western part of Zemu valley (*Smith & Cave* 1132) and most often found in the northern part like Lachen (*Chanda* 40350 & 40351), Yakchey, Yumthang (*Raju & Singh* 5707) etc.

Although the distribution of this species has been shown to Nepal, India, Bhutan and China in different literature but its occurrence in the latter two countries create confusion. In *Flora of British India*, Sir J.D. Hooker (1888) was doubtful regarding the presence of this species in Bhutan as he put a question mark after the country's name. Moreover, in *Flora of Bhutan* the authors, A.J.C. Grierson and D.G. Long (1983) had mentioned the specimen only from Darjeeling district which is also a doubtful incident, because the altitude of its habitat (2700-5000 m.) does not match nicely as the highest altitude in Darjeeling district area is only 3660 m and the places above 2700 m is achieved only in limited regions. However, even then there is a possibility for the species to occur in Darjeeling hills. No herbarium specimen of *S. eriostachya* have been recorded from Bhutan and Darjeeling district of West Bengal in CAL, DD, BSHC, APFH and ARUN in the current account. C.K. Schneider (1916) mentioned this species in his book *Plantae Wilsonianae*, but he wrote only about the specimen of Wallich i.e. the type specimen collected from Nepal. In a recent work Fang *et al.* (1999) had mentioned that this species is distributed in China (Sichuan, Xizang) and Yunnan (India, Nepal). But there was another contradiction as made by A.K. Skovortsov, one of the co-author of that book by giving a note just after the description of *S. eriostachya*. He was of opinion that *S. eriostachya* as described in *Flora of China* may be a different plant i.e. *Salix ernestii* C.K. Schneider, as the former species is restricted to Himalayan zone only. After thorough study of Chinese material of the genus *Salix* in CAL, no specimens of *S. eriostachya* had been found. So the distributional pattern of *Salix eriostachya* is quite contradictory and it needs further study.

Acknowledgements

The first author is grateful to The Director, Botanical Survey of India for granting the financial support to conduct the tour in Sikkim. She is also thankful to the Joint Director and other staff members of Sikkim Himalayan Circle for their great support during the field tour and herbarium consultation.

LITERATURE CITED

- Andersson, N.J. 1851. Ost-Indiens hittils kända Pilarter (Salices). *Kongl. Svenska Vetenskapsakad. Handl.* vol. 1850: 463 – 502.
- Fang, C. F.; Zhao, S.D. & Skvortsov, A.K. 1999. *Flora China* vol. 4: 139-277. Science Press, Beijing, China and Missouri Botanical Garden Press, St. Louis, U.S.A.
- Grierson, A.J.C. & Long, D.G. 1983. Salicaceae in Grierson, A.J.C. and Long, D.G.(eds.), *Flora of Bhutan*. Royal Botanical Garden, Edinburgh. 1(1): 59 – 70.
- Hooker, J.D. 1888. *Flora of British India* vol. 5: 626 – 639. L. Reeve & Co. Ltd., Kent.
- Schneider, C.K. 1916. *Plantae Wilsonianae* vol. 3: 14 – 179, 455 – 456. The University Press, Cambridge.