

SHORT COMMUNICATION

Notes on the Distribution of a Rare and Little Known Species: *Allium fasciculatum* Rendle from Sikkim and West Bengal

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Germplasm of a rare and lesser-known species *Allium fasciculatum* Rendle was enriched through exploration undertaken in interior parts of North, South and West districts of Sikkim (1300-2600 m) and Darjeeling in West Bengal where it was reported for use as vegetable and condiment. This species, a rare and economically useful plant species growing in the kitchen gardens/backyards in the area of exploration, forms a new record on cultivation with addition to the germplasm holdings in field genebank at ICAR-NBPGR regional station at Bhowali, Uttarakhand.

Key Words: *Allium fasciculatum*, Distribution, Little Known Species, Sikkim

Indian gene center is considered rich in distribution of about 34 species of *Allium* with concentration of diversity in the western Himalayan and northeastern hill region (Baker, 1882; Stearn, 1947; Nasir, 1975; Pandey *et al.*, 2008). For past four decades, the ICAR-National Bureau of Plant Genetic Resources (ICAR-NBPGR) has taken a lead in assembling this diversity from these areas (Negi, 2006; Negi and Pant, 1992; Pandey *et al.*, 2008). Native as well as exotic wild species (30 species) have been maintained, characterized and evaluated at field gene bank (FGB) at Bhowali, Uttarakhand.

In order to enrich germplasm of *Allium*, an exploration was undertaken to interior parts of North, South and West districts of Sikkim (1300-2600 m) and Darjeeling in West Bengal during September 2012. During field survey and collection, the authors collected five accessions of a rare and lesser-known species of *Allium* growing in the kitchen gardens/backyards (Negi *et al.*, 2012). After critical morphological studies and comparison with the herbarium specimens preserved in Northern circle, Botanical Survey of India, Dehradun (BSD) and Forest Research Institute (Council of Forest Research and Education), Dehradun (DD) was confirmed as *Allium fasciculatum* Rendle (syn. *A. gageanum* W.W. Smith) and later validated with local flora and other

relevant literature available on this genus. This species was reported from higher altitude of Sikkim and adjoining parts of Bhutan, Nepal and China (Das Gupta, 2006; Noltie, 1994; Hara *et al.*, 1978). In earlier distributional records there was meager information on occurrence of this species from India (Chandel and Pandey, 1992; Arora and Pandey, 1996; Hazra and Verma, 1996; WOI, 1985; Das Gupta, 2006; Devi *et al.*, 2014; Pradheep *et al.*, 2016, 2017). There were no reports on edibility of the species for the reported (now) use from India (Arora and Pandey, 1996; WOI, 1985; Devi *et al.*, 2014). In area of collection *Allium fasciculatum* was reported for use as vegetable and condiment.

Allium fasciculatum Rendle (Alliaceae) was previously collected by Smith and Cavanilles, White, JC and Prain, D during 1809 to 1909 from Lhonk, Dongbong and Kambajong respectively (Herbarium no. CAL2130, 2132). Earlier collections on *Allium fasciculatum* Rendle were made from Dongdong, Kambajong, Lhonk and Nathula of Sikkim during 1809-1909 as per herbarium specimens available at Central National Herbarium, Kolkata, West Bengal; for more than a century, there were no records on the collection of this species from north-eastern region of India, specially from Himalayan region.

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Allium fasciculatum forms a new addition to the germplasm holdings in *Allium* FGB at ICAR-NBPGR regional station at Bhowali, Uttarakhand (Pandey *et al.*, 2008). This species is a rare and economically useful plant germplasm from Sikkim and parts of Darjeeling, West Bengal. Live material (vegetative propagule) collected from different locations were transplanted, multiplied and maintained in FGB (Negi, 2006).

Plant characters—leaf shape, size, inflorescence—shape, size, perianth—shape and curling nature at maturity were clearly matching with the protologue description. Observations recorded by the first author in field and during experimental fields at RS Bhowali showed no fasciculate roots at maturity and no evident vertical fibers on basal part which confused the identity and warranted further validation. In order to authenticate the correct identity the first and second authors undertook periodic observations at different growth stages under variable soil conditions during 2014-16 using original material from RS Bhowali and in pots under Delhi conditions. Presence of fasciculate roots were observed from two months up to pre-flowering stage; however the fibres were very scarce and were only visible at drying stage of plant. These characters were in complete agreement with the protologue description. The diverse material available in other national and International herbarium sources (FRI, CAL, P, K, E; *Allium fasciculatum*, Flora of China Illustrations vol. 24, fig. 168, 1-3 [line diagramme]. http://www.efloras.org/object_page.aspx?object_id=60223&flora_id=2.) also confirmed these observations. Herbarium vouchers of *A. fasciculatum* were deposited in NHCP (collector no. NH21818a, b; NG3165; 15.9.2012).

Description: *Allium fasciculatum* Rendle in J. Bot. 44: 42, 1906; Stearn in *Herbertia* 12:83, 1947 and *Bull. Brit. Mus. Nat. Hist.* 2: 183, 1960. Syn. *A. gageanum* W.W. Smith in *Rec. Bot. Surv. India* IV: 247-8, 1911.

Annual herb, upto 50 cm high; bulbs absent; roots 6-7 in number, fleshy, fusiform or cylindrical, 3-4.5×0.5 cm long; leaves basal, 1.0 to 1.5 cm above the base, flat, linear, 6-9 no, 25.0-40.0 × 0.8-1.0 cm., margin scabridulous. Umbles globose to sub-globose, 3.0-3.5 cm diameter, compact, numerous flowered; spathe broadly ovate, scape fistular, shorter than leaves (10.0-30.0 × 0.5-0.6 cm), acute; flowers campanulate, sweet-scented, pedicels 1.0-1.5 cm long; perianth linear-lanceolate, 0.5-0.7 × – 0.2-0.3cm, acute, tepal white-greenish white,

irregularly coiled at maturity; filaments linear 0.2-0.5 cm long, sub-equal; anthers yellowish-green, oblong, 0.3 to 0.5 cm; ovary obovoid, base narrowed to form a stipe, conspicuously 3-furrowed; style 1-2.5 mm. long; capsule obovoid, 0.3-0.4 × 0.3- 0.4 cm., trilobed, light brownish yellow, pericarp papery, locules 2-seeded; seeds ovoid-obovoid, 0.2-0.3 × 0.1 × 0.2 cm., concavo-convex, reticulated.

Specimens Examined: Tibet, Phari, July 1879, Dungboo s.n. (BM lecto., CAL); Sikkim – Lhonak 4500 m, 05.08.1909, Smith & Cave 2130 and 2132 (K, CAL); Ribu & Rhomoo, 2771 (CAL); Sikkim: Dongdong, 10.7.1906, JC White s.n. (CAL); Kambajang, September 1903; Prain s.n. (CAL); 15.08.1882, King's collector (CAL); Nathula 5500 m, September-October, 1809; Nagaland: Kohima, July 1886, D Prain (CAL).

Distribution Reported (now): details of collected germplasm are as follows: (i) NG-3165, Payal Kyong Upper, Tingbong, Passingdong, North Sikkim, 15.09.2012, alt. 1300m; (ii) NG-3176 and NG-3179, Namachi, South Sikkim, 16.09.2012, alt. 2100 m; (iv) NG-3183, Uppermuk, West Sikkim, 17.09.2012, alt. 1930 m; and (v) NG-3189, Tiger Hills, Darjeeling, West Bengal, 19.09.2012, alt. 2600 m.

Ecology: reported (now) under cultivation in kitchen gardens, backyards (altitude of 1300-2600 m).

Phenology: Flowering and fruiting in July-September

Uses: Locally called as “*Shanu Dungle*”; “*Romu or Rombu*” ; young leaves are cooked as pot- herb, aromatic vegetable is prepared mixing leaves with potato. Leaves are sun dried and used as condiment for later consumption.

The present paper contains detailed taxonomic description along with live photographs (Fig. 1) to facilitate field identification and collection of germplasm.

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Fig. 1. *Allium fasciculatum* (Shanu dungdunge) collected from Sikkim: (top row, left to right) plants growing in field margin, Sikkim; roots of two month old plants; roots at pre-flowering stage with fasciculate and normal roots; (bottom row, left to right) flower with narrow perianth; herbarium specimen deposited in NHCP; close up of vertical fibres

for carrying out experimental study; FRI and CAL for study on this species.

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