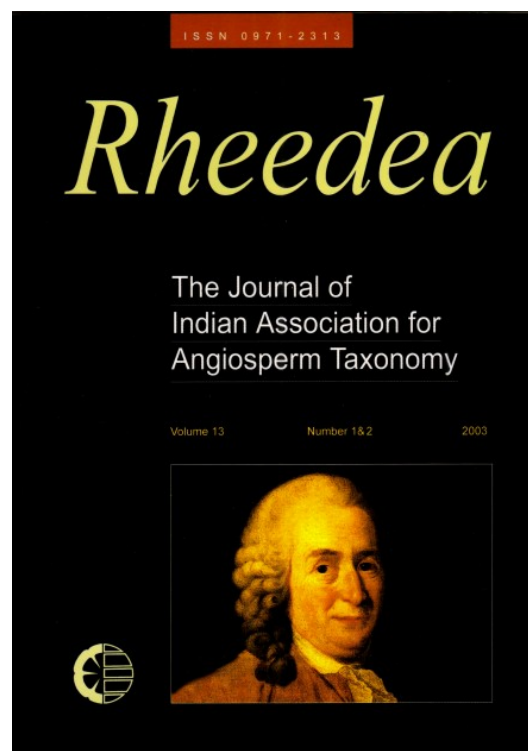




First Report of *Astragalus* L. (Fabaceae)
from Arunachal Pradesh, India
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First Report of *Astragalus* L. (Fabaceae) from Arunachal Pradesh, India

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Abstract

The genus *Astragalus* with its two species, *A. tribulifolius* Benth. ex Bunge and *A. xiphocarpus* Benth. ex Bunge, is reported for the first time from Arunachal Pradesh. The former is characterized by dense hairs and a few-flowered capitate racemes and the latter by minute, free stipules, caducous, non protruding bracts and short, linear calyx lobes. This paper provides the nomenclature, descriptions and illustrations of these two species.

Key words: Two *Astragalus* species, new reports, Kingdon-Ward's collection

Introduction

Astragalus L., with more than 2500 species in the world, is the largest genus among flowering plants (Podlech, 1986). In India, the genus has c. 76 species and 4 infraspecific taxa chiefly distributed in the Himalayan region (Chaudhary & Rao, 2002). Interestingly, no *Astragalus* has been reported so far from Arunachal Pradesh in North East Himalaya (Hajra *et al.*, 1996).

As part of the revisionary work on the *Astragalus* of India, the authors procured some specimens collected by F. Kingdon-Ward in 1950 from Walong (Arunachal Pradesh) on loan from Natural History Museum, London (BM). After a critical study, they were identified as *Astragalus tribulifolius* Benth. ex Bunge and *A. xiphocarpus* Benth. ex Bunge. This is the first generic record of the genus *Astragalus* from the present Arunachal Pradesh. *A. tribulifolius* has been recorded from Sikkim and Kashmir (Baker, 1876; Ali, 1961; Sanjappa, 1992) and *A. xiphocarpus* from Sikkim (Baker, 1876).

This paper provides correct nomenclature, detailed description and illustrations of both the species.

Astragalus tribulifolius Benth. ex Bunge, Mem. Acad. Sci. St.-Pet. ser. 7, 11: 4. 1868 & 12: 2. 1869; Baker in Hook.f., Fl. Brit. India 2: 120. 1876; Ali in Biologia 7: 10. 1961 & in Nasir & Ali, Fl. W. Pakistan 100: 125. 1977; Sanjappa, Legum. India 96. 1992. **Fig. 1.**

Perennial herb, prostrate or trailing. *Stem* densely tomentose, hairs minute, white, spreading; stipules, free, persistent, lanceolate with acuminate tip, 3-4 x 1 mm, ciliate along margins, sparsely pilose outside, glabrous inside, hairs white, spreading. *Leaves* imparipinnately compound, 3. 5-5 cm long; petiole minute to 6 mm long, densely tomentose; rachis 2.2 - 4 cm long, hairy; leaflets 10-14, subsessile, alternate to subopposite, usually obovate, sometimes oblong-obovate or obovate - elliptic, 8-12 x 4 - 6.5 mm, cuneate at base, entire, retuse, emarginate, truncate or obtuse with a minute mucro at apex, pilose beneath, glabrous to glabrescent above. *Racemes* c. 5 cm long, axillary, capitate, 1-4 - flowered; peduncles 15-25 mm long, more or less equal to subtending leaves, tomentose with mixed black and white hairs; bracts longer than pedicels, linear - lanceolate, c. 4 mm long, spreading white or mixed black and white hairy; bracteoles 2, situated at the base of calyx, 2-4 mm long, hairy outside. *Flowers* 14-16 mm long (excluding pedicels), violet or creamy; pedicels densely spreading black hairy, c. 2 mm long; calyx, campanulate, 8-9.5 mm long, spreading black and white hairy outside, throat black hairy inside, tube c. 4 mm long, lobes unequal, linear, dorsal one shorter, c. 3.5 mm long, ventral one 5-5.5 mm long; corolla glabrous; standard deflexed, lamina 10 - 12 x 11 mm, rounded to emarginate at apex, 14-16 mm long, claw c. 4 mm long; wing petals shorter than standard and

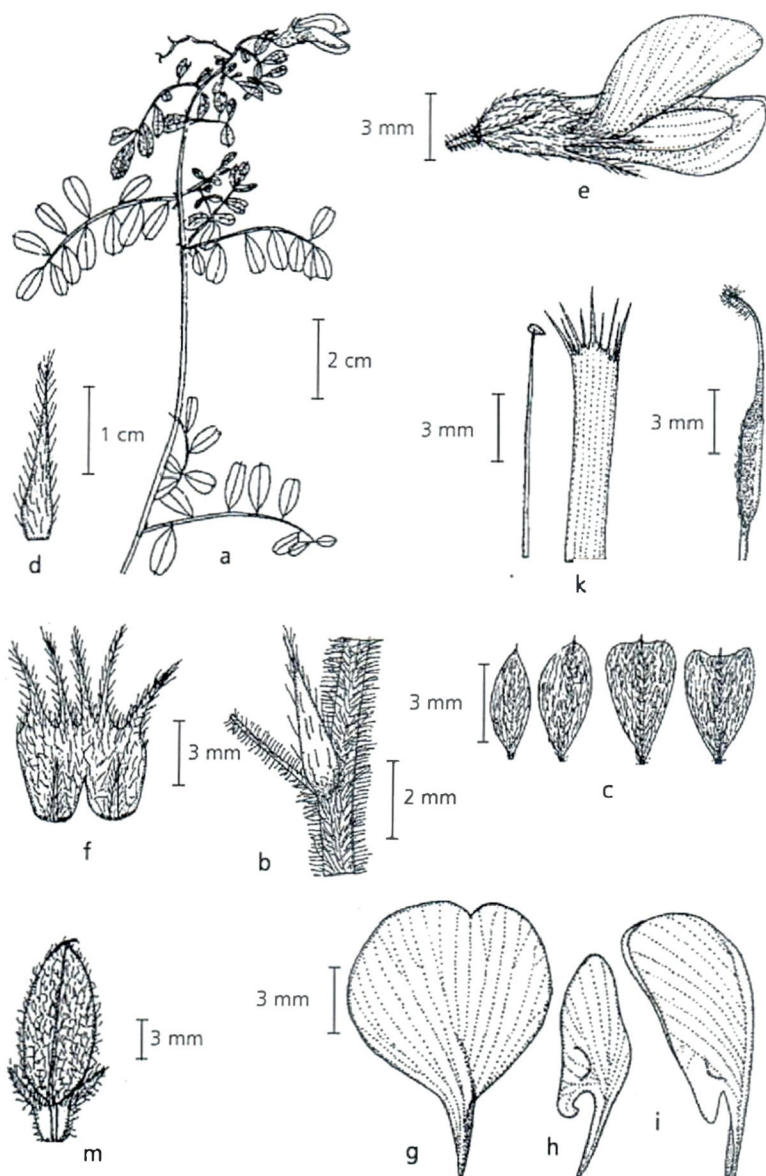


Figure 1. *Astragalus tribulifolius* Benth. ex Bunge – a. Habit; b. A portion of stem with stipule; c. Leaflets; d. Bract; e. Flower; f. Calyx (opened) with bracteoles; g. Standard; h. Wing petal; i. Keel petals; j. Vexillary filament; k. Staminal sheath opened; l. Carpel; m. Pod (a-l from F. Kingdon-Ward 20242; m. from B. M. Wadhwa 60156).

keel petals, 12-13 mm long, lamina 7.5 x 3.5 mm, upper auricle 1 mm long, hooked, lateral pockets present, claw c. 4.5 mm long; keel petals 14-15 mm long, lamina 9 x 5 mm, upper auricle 1.5 x 1 mm, lateral pockets present, claw c. 5 mm long, stamens 10, diadelphous, (9+1); vexillary filament c.11 mm long, free; staminal sheath c. 10 mm long, free filaments alternately shorter and longer, 1.5-2.5 mm long; ovary c. 6 x 1 mm, stipitate, many - ovuled, stipe c. 3 mm long, shorter than calyx; style 4 mm long;

stigma capitate, penicillate. Pods oblong, c. 15 x 7 mm (excluding stipes), turgid, pubescent with white spreading hairs, stipe c. 2 mm long.

Flowering: October (Arunachal Pradesh), March-August (Jammu & Kashmir).

Habitat: On rocks on a very steep pine - bracken slopes in open area at c. 2670 m altitudes.

Distribution: India (Jammu & Kashmir, Sikkim, Arunachal Pradesh), China.

Specimens Examined: INDIA, Arunachal Pradesh ('Assam'): Walong, 8,000 ft., 10. 10. 1950, *F. Kingdon-Ward* 20242 (BM). Jammu & Kashmir, Ladakh: Lorikung, 3900 m, 18. 03. 1980, *U. C. Bhattacharyya* 71729 (BSD); Muklj - Lukung, 3975 - 4175 m, 29. 08. 1976, *B. M. Wadhwa* 60156 (BSD).

Note: The description of pods is based on the specimen from Jammu & Kashmir as the specimen from Arunachal Pradesh is without pods.

Astragalus xiphocarpus Benth. ex Bunge, *Mem. Acad. Sci. St. - Pet. ser. 7, 11: 27. 1868 & 12: 32. 1869*; Baker in Hook. f., *Fl. Brit. India* 2: 129. 1876; Sanjappa, *Legum. India* 96. 1992. **Fig. 2.**

Trailing or erect herbs. Stem 30 - 45 cm long, grooved, pilose with somewhat spreading white or white and black hairs; stipules free, spreading or reflexed, linear-lanceolate, ciliate, 3 - 4 mm long, pilose outside with spreading, white hairs, glabrous inside. *Leaves* 7 - 13

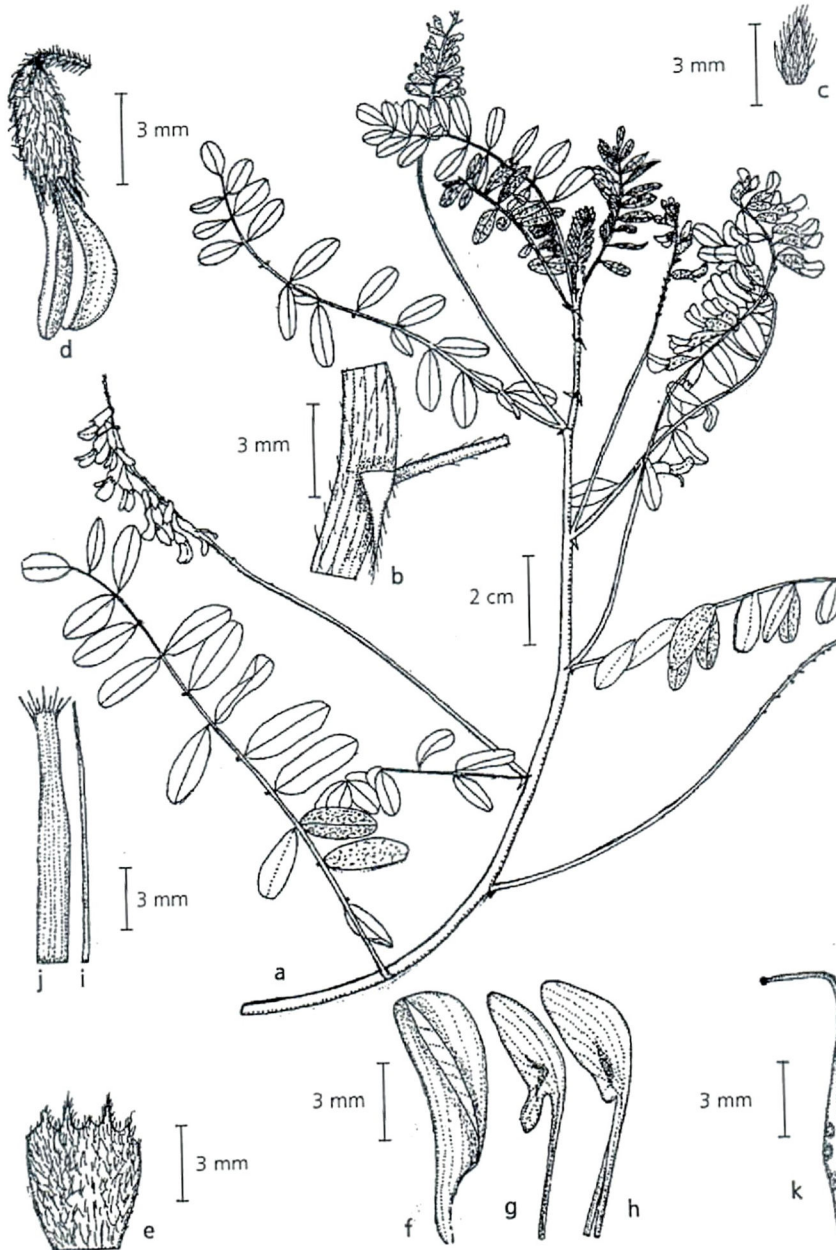


Figure 2. *Astragalus xiphocarpus* Benth. ex Bunge - a. Habit; b. A portion of stem with stipule; c. Bract; d. Flower; e. Calyx opened; f. Standard; g. Wing petal; h. Keel petal; i. Vexillary filament; j. Staminal sheath (opened) k. Carpel (all from *F. Kingdon-Ward* 20244).

cm long, imparipinnate; petiole 1-2 cm long; rachis 4.5-10 cm long, petiole and rachis densely pilose with spreading white or white and black hairs when young, sparsely so when old; leaflets 19-23, 9-22 x 4-9 mm, sparse, subsessile, opposite or subopposite, oblong or oblong - obovate, obtuse, truncate or retuse at apex, white pilose on both surfaces, hairs more dense on young leaflets; petiolules less than 1 mm long, pilose. *Raceme* 10-15 cm long, axillary, compactly flowered; peduncles 6.5-7.5 cm long, pilose with mixed white and black hairs; bracts c. 2.5 x 1 mm, caducous, almost equal to pedicels, not protruding to flower buds, ovate, pilose with mixed black and white hairs on upper surface; bracteoles 2, situated at the tip of pedicel, up to 1 mm long, linear, hairy. *Flowers* pink or purple, 10-11 mm long (excluding pedicels), noded; pedicels 2-2.5 mm long, densely hairy with spreading black and white hairs; calyx 6-7 mm long, tubular, persistent, oblique at apex, tube c. 5 mm long, velutinous with spreading black and white hairs outside, glabrous inside, lobes unequal, linear, densely velutinous with spreading black and white hairs on both surfaces, dorsal one minute to 1 mm long, ventral one 1.5-2 mm long; corolla glabrous; standard 10-11 mm long, lamina 7-8 x 5 mm, obovate, emarginate at apex, claw c. 3 mm long; wing petal lamina 4-5 x 1.5 mm, upper auricle 2 x 1 mm, lateral pockets present, claw c. 6 mm long; keel petals more or less equal to standard and wing, lamina 4-5 x 2 mm, upper auricle minute, lateral pockets present, claw 6 mm long; stamens 10, diadelphous, (9+1), vexillary filament c. 11 mm long, free; staminal sheath c. 10 mm long, free filaments, 1-1.5 mm long, alternately shorter and longer; ovary c. 6 mm long, glabrous, 4-ovuled, stipe c. 2 mm long, shorter than calyx; style c. 4 mm long, incurved, glabrous; stigma capitate, glabrous. *Young pods* glabrous, 4-seeded, stipe shorter than calyx. Mature pods not seen.

Flowering: October.

Habitat: Scattered on grassy and bracken slopes at c. 2,400 m.

Distribution: India (Sikkim, W. Bengal, Arunachal Pradesh), East Nepal.

Specimens Examined: INDIA, Arunachal Pradesh ('Assam'): Walong, 7250 ft., 10. 10. 1950, F. Kingdon-Ward 20244 (BM).

Notes: Baker (1876) mentioned that flowers were bright yellow in colour and stipe of pods as long as calyx in this species. However, in the specimen examined the stipe of young pods is shorter than the calyx and the flower colour is marked as pinkish or purplish.

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