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Astragalus uttaranchalensis (Leguminosae – Papilionoideae), a New Species from the Himalaya in India

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ABSTRACT: A new species of *Astragalus*, *A. uttaranchalensis* Chaudhary & Khan (from the Indian Himalayan State Uttaranchal) is described and illustrated. *Astragalus uttaranchalensis* is closely related to *A. emodi* Steud., but differs from the latter in shape of stipules, length of inflorescence, number of flowers in each raceme, nature of bracts and size of calyx teeth.

KEY WORDS: Leguminosae, New species, *Astragalus uttaranchalensis*, India.

INTRODUCTION

Astragalus L. with about 3,000 species in the world is considered the largest genus in angiosperms (Podlech, 1986; Zarre and Podlech, 1997). In India, the genus is represented by about 80 species, mainly distributed in temperate and alpine zones of the Himalayas (Sanjappa, 1992; Chaudhary and Rao, 2002; Kumar and Sane, 2003). The genus has not been thoroughly investigated from India after the work of Baker (1876). In view of this, a revisionary study of Indian *Astragalus* has been initiated recently.

In the course of revising the genus in India, a new species belonging to section *Chlorostachys* Bunge was discovered from Kumaon and Garhwal Himalayas (Uttaranchal State). The new species, *Astragalus uttaranchalensis* Chaudhary & Khan was compared with all other species available in the section *Chlorostachys* from Indian region (Baker, 1876; Ali, 1961, 1977; Grierson and Long, 1987; Wenninger, 1992) and was found quite distinct and new to science. *Astragalus uttaranchalensis* is described and illustrated below.

RESULTS

Astragalus uttaranchalensis Chaudhary & Khan, sp. nov. Figs. 1 & 2

Stipulae triangularis, inflorescentia folia breviores vel subaequilongi, racemi 2-6 cm longus, 10-20-flori, bracteae ovatus-lanceolatus, non superantes flos gemmae, calyx tentibus minutus.

Holotype: India, Uttaranchal, Uttarkashi: Chirbasa, 3500 m, 5 Sept. 2002, *Z. H. Khan* 223088 (LWG; isotypes LWG, CAL, BSD).

Perennial herbs, erect, 60-90 cm high, gregarious. Stem terete, hollow, branched, pubescent with minute, adpressed or spreading, white or mixed black and white hairs. Stipules 4-8 × 2-3 mm, free, spreading or deflexed, linear – triangular to triangular with acuminate tip, pilose with spreading, white or mixed black and white hairs outside, glabrous inside, ciliate along margins. Leaves 10-15 cm long, imparipinnately compound; petioles 1.5-3 cm long, rachis 8.5-11 cm long, pilose with white, spreading hairs or pubescent with adpressed, mixed black and white hairs; leaflets 19-24, 18-28 × 4-11 mm, alternate, subopposite or opposite, oblong or narrowly ovate, entire along margins, obtuse, truncate or retuse with a fine mucro at apex, glabrescent to thinly pilose above, pilose with spreading, white hairs below. Inflorescence axillary, peduncled raceme, 4.5-15 cm long, shorter than or equal to subtending leaves; peduncles 2.5-9 cm long, pubescent with spreading, white hairs or adpressed, black hairs; racemes 2-6 cm long, 10-20-flowered, close. *Bracts* 4-5 × 1 mm, not protruded beyond flower buds, almost equal to or slightly longer than pedicel, deciduous, ovate, lanceolate or narrowly lanceolate, pilose with mixed black and white hairs outside, glabrous inside, ciliate along margins. Flowers 11-12 mm long, yellowish white, becoming purple at maturity; pedicels 2-3.5 mm long, pubescent with black or brown, spreading hairs. Calyx 4-5 mm long, tubular, persistent, oblique at mouth, pilose with black or brown, adpressed hairs outside, glabrous inside, teeth very minute (less than 1 mm long). *Corolla* equal or subequal; standard ca. 11 mm long, lamina ca. 8 × 6 mm, oblong - elliptic with retuse apex,

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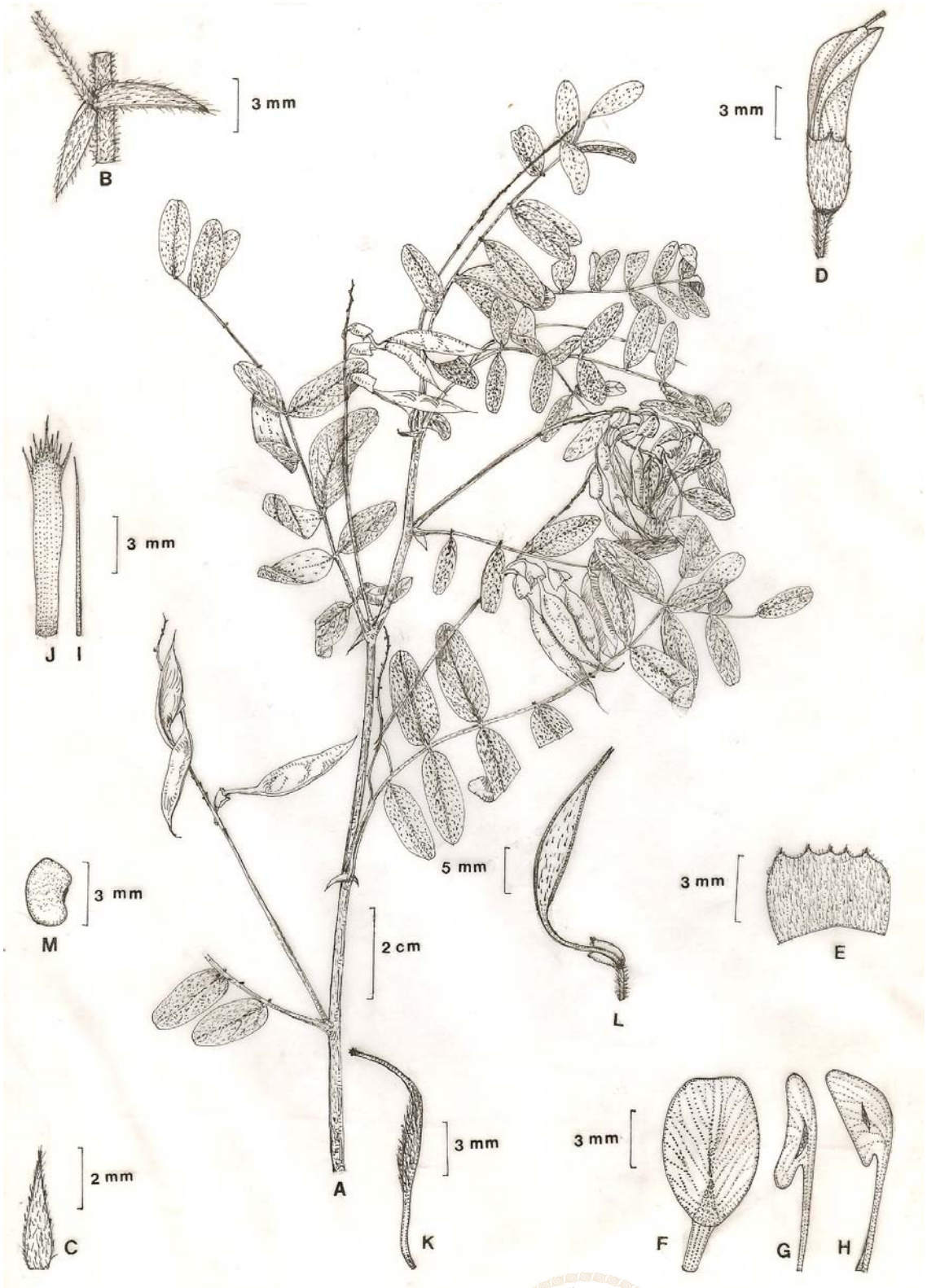


Fig. 1. *Astragalus uttaranchalensis* Chaudhary & Khan. A: Habit. B: A portion of stem with stipules. C: Bract. D: Flower. E: Calyx (splitted, outer surface). F: Standard. G: Wing petal. H: Keel petal. I: Vexillary filament. J: Staminal sheath. K: Carpel. L: Pod. M: Seed. (A, L-M from *Khan* 223089; B-K from holotype; same scale for F, G, H).

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Fig. 2. *Astragalus uttaranchalensis* Chaudhary & Khan.

claw ca. 3 mm long; wing petals 11-12 mm long, lamina ca. 6 × 2 mm, oblong, obtuse at apex, upper auricle ca. 2 × 1 mm, claw ca. 6 mm long; keel petal 10-11 mm long, lamina ca. 4 × 3 mm, upper auricle ca. 1 mm long, claw ca. 6 mm long. Stamens diadelphous, (9 + 1); vexillary filament ca. 11 mm long, free; staminal sheath ca.10 mm long, obtuse at apex, free filaments 1-2 mm long, alternately shorter and longer. Ovary ca. 4 mm long, sparsely to densely pubescent with adpressed, white hairs, stipitate (stipe ca. 5 mm long); style gradually curved from the base, glabrous; stigma capitate, very finely penicillate. Young pods pubescent with adpressed, white hairs. Pods 14-22 × 3-5 mm (excluding 2-4 mm long apical beak and 6-7 mm long stipe), partially reddish, oblong, straight or slightly falcate, turgid, pointed at both ends, stipitate, thinly pubescent to glabrescent with adpressed, white hairs (or occasionally becoming glabrous at full maturity), partially to completely bilocular, 2-5-seeded. Seeds 2.5-3 × 1.5-2 mm, reniform, subturgid to turgid, brown or brownish - black, smooth, glabrous.

Distribution: India (Uttaranchal) – Endemic.

Fl. & Fr.: July-Sept.

Ecology: Moist shady hill slopes, 3,200-3,500 m.

Additional specimens examined (Paratypes): INDIA, Uttaranchal, Garhwal, Uttarkashi: Gangotri, after 2 km towards Chirbasa, 5 Sept. 2002, *Z. H. Khan 223078* (LWG); Chirbasa, 5 Sept. 2002, *Z. H. Khan 223089, 223094, 223097* (LWG); Approach to Bhojwasa, 4 Sept. 1983, *U. C. Bhattacharyya 74873* (BSD); Bhojwasa – Gangotri, 31 Jul. 1987, *B. P. Uniyal & B. Balodi 80538* (BSD); Kumaon, Gori valley: Tola, 15 Aug. 1900, *Inayat 24307* (CAL); Parbhu, 12 Aug. 1900, *Inayat 24309* (CAL).

DISCUSSION

Astragalus uttaranchalensis Chaudhary & Khan was collected from different sites between Gangotri and Chirbasa in Uttarkashi District of Garhwal Himalaya. The study of herbarium specimens at BSD and CAL revealed that the species had already been collected from the same regions in Garhwal Himalaya as well as from other regions in Kumaon Himalaya more than hundred years ago, but were misidentified or unidentified. The new species is very close to *A. emodi* Steud., but differs by having stipules triangular, inflorescence shorter than or more or less equal to subtending leaf, racemes with about 10-20 flowers, bracts not protruded beyond flower buds and calyx teeth very minute. Wenninger (1992) has treated *A. emodi* Steud. as conspecific to *A. maxwellii* Royle ex Benth., while they can be distinguished by the difference in hairs of leaflets, ovary and pods, length of calyx teeth and stipe of pods. Three species can be differentiated by the key provided below.

The new species shows variations in the hairs and stipules on different plants within the same population. Generally, the hairs are spreading and white while in some plants, they are completely adpressed and mixed white and black. The stipules vary in length (4-8 mm long) and shape (linear-triangular to triangular). The pods are usually thinly pubescent to glabrescent, however, sometimes they become glabrous at full maturity due to deciduous nature of hairs.

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Key to the species

1. Calyx teeth very minute (less than 1 mm long) ……..…….. ……...……...……...…….. *A. uttaranchalensis*
1. Calyx teeth 2-4 mm long ….…… 2
   2. Stipules pilose outside, glabrous inside; leaflets pubescent on both surfaces; bracts protruded beyond flower buds; pod stipe longer than calyx ……..……...…… *A. emodi*
   2. Stipules almost glabrous; leaflets glabrescent to glabrous on upper surface, pubescent on lower surface; bracts not protruded beyond flower buds; pod stipe as long as calyx …. ...…….……...…..… *A. maxwellii*

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印度喜瑪拉雅山區黃著屬新種：*Astragalus uttaranchalensis* (Leguminosae－Papilionoideae)

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摘　　要

本文描述產於印度喜瑪拉雅山區 Uttaranchal 省黃著屬新種 *Astragalus uttaranchalensis* Chaudhary & Khan。本種與 A. emodi 類似，但可藉由托葉形態，花序長度，總狀花序上花的數目，苞片形態與花萼齒長短來區別。

關鍵詞：豆科、新種、*Astragalus uttaranchalensis*、印度。

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