Ephedra sumlingensis (Ephedraceae) - A new species from Himachal Pradesh, India

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Stapf (1889) in the monograph on Ephedra L., described 31 species found world over. These species were primarily recognised on the basis of nature of bracts of female strobili, focusing the division into three main sections and their subsequent tribes. Price (1996) brought the species number to 50 by listing the various explored species by the eminent scientists and took geographical distribution as a key factor in classification of species. Salini (1990) made an attempt to compile the description of eight Ephedra species (E. foliata Boiss., E. saxatilis Royle ex Florin, E. intermedia Schrenk & Meyer, E. gerardiana Wall. ex Stapf, E. pachyclada Boiss, E. nebrodensis Tineo, E. regeliana Florin and E. przewalskii Stapf) reported from hot desert of Punjab, Rajasthan, Gujarat and Cold deserts of Uttarakhad, Himachal Pradesh and Jammu & Kashmir. Florin (1933) segregated E. gerardiana var. wallichii, a distinct entity as E. saxatilis. To look into the current status of Indian Ephedras, the authors concentrated last seven years in exploring Western Himalayas, surveying and documenting each population from Spiti to Lahul in Himachal Pradesh. These field studies encompassed an attention-grabbing population in Sumling, district Spiti, Himachal Pradesh, rarely mixed with E. gerardiana. A detailed examination, evaluation and comparison of morphological characters of vegetative as well as reproductive parts of this population with live and the herbarium specimens of the other species housed at Forest Research Institute Dehra Dun (DD), Botanical Survey of India, Dehra Dun (BSD), literature on Ephedra taxonomy (Meyer, 1846, Stapf 1889, Pearson 1929, Florin 1933, Atal & Sood 1964, Salini 1990, Mikage & Kondo 1998) has led us to the conclusion that the Ephedra populations of Sumling should be segregated as a new taxon, which is described here as Ephedra sumlingensis sp. nov. This new species is closely related to E. intermedia. In the absence of type specimen of E. intermedia, the new species has been compared to its original description and in the field.

Ephedra sumlingensis P. Sharma & P. Uniyal sp. nov. (Fig. 1, Plate 1)

E. intermedia Schrenk & Meyer affinis, sed Masculus strobilus pedunculatus, plus minusve strictus elliptic, 6-8 × 4-4.5 mm, synangia 8, Femineus strobilus pedunculatus c. 6 × 4.5 mm. Semina 2 elliptic, maroonish frons, 4.5-5.0 × 2.5 mm differt.


Plants dioecious, erect, 0.5 - 0.7 m high. Bark brownish black, branchlets light green, 1-2 mm in diameter with ridges and furrows, internodes 2-4.5 cm. Leaves scaly usually two, sometimes three confined to the nodes, opposite decussate, turning brown at maturity, awl shaped, acuminate, 2-4.5 mm in length, mostly 3/4 connate, sheath membranous, later fissured. Male strobili stalked, narrowly elliptic, 6-8 × 4-4.5 mm with five pairs of flowers, bracts binate in five pairs, mucronulate, lower and middle pairs ¼ connate, upper ½ - ¾ connate, 1-3 × 1-2 mm, perianth almost equaling the subtending bract. 2-2.5 × 2 mm, synangiophore with synangia 4-5 × 0.5 mm, synangia 6-8, usually 4-inner sessile and 4-outer stipitate. Female strobili stalked, 6 ×

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Fig. 1. *Ephedra sumlingensis* P. Sharma & P. Uniyal sp. nov.: 

A & B. Habit male and female plant; C & D. Magnified portion of stem showing scaly leaves at the nodal region (front and side view); E. Male strobilus showing sessile and stipitate synangia; F. Bract enclosing perianth and synangiophore with synangia; G. Synangiophore with synangia (front and side view);

H & I. Mature female strobilus (front and side view highlighting the fleshy bracts enclosing the two maroonish brown colour seeds bearing twisted micropyyle & J. Seed with twisted micropyyle having oblique opening at the tip region. (Drawn by P. Sharma)

4.5 mm, three pairs of bracts, bracts mucronulate, connate, connation ranges from ½ in lower and middle, ¾ in upper bract, 3.5-5 × 3.4.5 mm. Seeds two, elliptic, maroonish brown, 4.5-5 × 2.5 mm, two enveloped, micropylar tube twisted, 1-3 mm long, exserted.

*Fl.*: June - July. *Fr.*: July - September.

*Distribution*: India: Western Himalayas (Himachal Pradesh).

*Habitat*: Open ground, dry gravel soil, of Sumling (Spiti district) above 3000 m elevation in the North West Himalaya.

*Etymology*: The new species is named after the place of occurrence where it was first located, Sumling (Spiti district) in Himachal Pradesh.

*Notes*: *E. sumlingensis* is closely related to *E. intermedia* in having strong woody habit, resinous brown pith, red fleshy bracts at the time of maturity of female strobili, twisted micropylar tube and biovulate strobilus bearing mostly two seeds. However, it differs markedly in having brownish black stem bark, light green thin branchlets, bigger scale leaves with acute to acuminate apex, bigger stalked, narrowly elliptic male.
Plate 1. E. sumlingensis P. Sharma & P. Uniyal sp. nov.:

A. Habit male plant;  B. A twig with female strobilus (Fs) at the node (arrow);  C & D. Scale leaf (Sl) with front and side view;  E, F & G. Close-up male strobilus having bract (Br) enclosing perianth (P) and Synangiophore (Sp) with synangium (Sn);  H & I. Female strobilus (Fs) showing characteristic fleshy bract (Fb) and seed having twisted micropyle (Tm) at the tip region (arrow).

strobili, having five pairs of flowers. Bigger stalked female strobilus having three pairs of bracts enclosing maroonish brown, elliptic seeds bearing twisted micropyle which used to get straight at the apex as compared to glaucous (greyish green or blue) branchlets, less acuminate triangular scale leaves (2 – 4 mm) categorically sessile, ovoid male strobili (6 - 7 × 3.5 - 4 mm) with four to five pairs of flowers, very broadly ovoid, sessile, female strobili (5 × 3.5 – 4 mm), having four pairs of bracts enclosing brownish black, ovoid seeds (4 - 5 × 2.5 mm) bearing highly coiled twisted micropyle (3 – 5 mm long) in E. intermedia.
Table 1. Comparison of reproductive character states of *Ephedra sumlingensis* P.Sharma & P.Uniyal sp. nov. with the closely allied species *Ephedra intermedia* Schrenk & Meyer.

<table>
<thead>
<tr>
<th>Character states</th>
<th>Ephedra sumlingensis</th>
<th>Ephedra intermedia</th>
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<td>P.Sharma &amp; P.Uniyal sp. nov.</td>
<td>Schrenk &amp; Meyer</td>
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**Male strobilus**
- **Shape**: Stalked, narrowly elliptic
- **Size**: 6-8 × 4.5-4.5 mm
- **Pairs of flowers**: Five

**Female strobilus**
- **Shape**: Stalked, ovoid
- **Size**: 6 × 4.5 mm
- **Pairs of bracts**: Three

**Seed**
- **Shape**: Elliptic
- **Colour**: Maroonish brown

**Micropyle**
- **Shape**: Twisted (one round then straight at apex)
- **Size**: 1-3 mm long

**Ephedra intermedia**
- **Shape**: Sessile, ovoid
- **Size**: 6-7 × 3.5-4 mm
- **Pairs of flowers**: Four

**Seed**
- **Shape**: Sessile, very broadly ovoid
- **Size**: 5 × 3.5-4 mm
- **Pairs of bracts**: Four

**Micropyle**
- **Shape**: Ovate
- **Size**: Brownish black
- **Size**: Highly twisted (two to three rounds)

**Micropyle**
- **Size**: 3-5 mm long

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