Cuscuta campestris Yunck. (Convolvulaceae): new addition to the alien flora of Assam, India

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Abstract

Cuscuta campestris Yunck. is a well known holoparasitic angiosperm of the family Convolvulaceae. Here, this species is reported as a new addition to the alien Flora of the Assam state. Detailed taxonomic description has been given along with relevant information and colour photographs for its correct identification.

Keywords

Assam, Convolvulaceae, Cuscuta campestris, flora, new addition

Introduction

The Genus Cuscuta L. is well known for its parasitic members. Earlier it was included in the family Cuscuteae, but from recent phylogenetic works and molecular analysis this genus has been shifted to the family Convolvulaceae (1). There are about 200 parasitic species of the genus (2); they are distributed throughout the temperate, tropical and sub-tropical regions of the world, Americas being the centres of diversity (3). All the species of the genus Cuscuta are usually achlorophyllous, rootless obligate parasites with reduced vegetative characters. These leafless parasitic species are only minimally photosynthetic, and totally dependent on their host (4). But interestingly they are found to self-parasitize as well as hyper-parasitize (5). The members of the genus Cuscuta reported to show homoplasy for morphological characters, like nature of dehiscence of fruit (6), features of pollen (7) and some characteristics of gynoecium (8).

In India there are about 7 species documented in Flora of British India (9). Cuscuta campestris Yunck. was reported first time for India from West Bengal (10). Subsequently, this species was also reported from various states of India like Madhya Pradesh (11), Uttar Pradesh (12, 13), Jammu and Kashmir (14), Tamil Nadu (15), Meghalaya (16) etc. In Assam only Cuscuta reflexa Roxb. has been reported till date; and this forms the first report of C. campestris from the state.

Out of 7 species of Cuscuta all over the country, in the state of Assam, single species i.e. C. reflexa has been reported and studied extensively so far. But surprisingly there is no report of the extensively spreading invasive parasite C. campestris or the Golden dodder plant from Assam in important floristic literatures (17-19) of the region till now. Like C. reflexa, it shows self-parasitism. This parasitic plant generally attacks herbaceous plants and trees of young stages.
Materials and Methods
Floristic survey was done consecutively for 2 years (2019-2021) for M. Phil degree of the first author. During that period, the authors observed a parasitic angiosperm infecting a wide range of host at various locations of districts like Kamrup (M), Barpeta, Nalbari, Morigaon etc. of Assam, India. The specimen was identified with the help of taxonomic literature and through virtual herbarium provided by KEW (K000195797, digital image). A voucher specimen (BD0016) was prepared by following the standard method (20) and submitted at GUBH. For palynological studies, pollens were collected and dried properly; after that SEM images were taken and measurements were recorded.

Taxonomic description
Cuscuta campestris

Achlorophyllous, leafless, twining much branched obligate stem parasite; stem ca. 0.7 mm in diameter, slender, very thin, yellow to light orange in colour, usually leafless or reduced to scale-like structures; inflorescence compactly clustered, lateral, 15–22-flowered, umbelliform; shortly peduncled, 1.4–2.0 mm long; Flower sessile or with short pedicel, actinomorphic, bisexual, whitish; bracts ca. 0.5 mm in length, light brownish, scaly; calyx cupular, 1.3–1.8 mm in length, gamosepalous, persistent, imbricate, 5-lobed, glandular, light green to creamish in colour, apex obtuse, outer surface ridged; corolla 1.5–2.6×0.4–0.8 mm in size, campanulate, gamopetalous, persistent, whitish to
cream in colour, 5-lobed, apex often inflexed, corolla tube ca. 1.1 mm long; infrastaminal scales ca. 0.6 mm long, fimbriate above, reaching up to stamens, base ovate; stamens persistent 0.4–0.6 mm long, epipetalous, filaments subulate, broad at base and gradually tapered towards apex, anthers 0.2–0.3 mm in length, yellow, ovoid-oblong, pollens colpate; gynoecium 1.8–2 mm long, ovary globose, style 2, filiform, stigma capitate ca. 0.2 mm long; capsule ca. 2.8 mm in diameter, membranous, subtended by withered corolla and calyx, irregularly dehiscent; seeds 2–4 per fruit, 1–1.5 mm in diameter, edospermous, flattened at one side, scabrous, brownish.

**Flowering & fruiting**
Throughout the year.

** Vernacular Names**
Akashilata, Amarlata, Swarnalata (Assamese); Golden dodder (English).

**Habitat**
A parasitic angiosperm found mostly in association with herbaceous plants.

**Distribution**
Native to Neartic region but introduced in other parts of the world including India.

**Fig. 2.** Cuscuta campestris: A. twig with capitate inflorescence; B. flower (top view); C. complete flower (side view); D. calyx; E. corolla with epipetalous stamens; F. infrastaminal scale; G. gynoecium.

**Fig. 3.** Pollen of Cuscuta campestris; A, B, C. Single pollen unit from different angles, D. Exine ornamentation.

**Table 1.** Morphological comparison between C. campestris and C. reflexa

<table>
<thead>
<tr>
<th>Characters</th>
<th>C. campestris</th>
<th>C. reflexa</th>
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<tbody>
<tr>
<td>Plant body</td>
<td>Much entangled, comparatively tough</td>
<td>Slender and delicate</td>
</tr>
<tr>
<td>Stem</td>
<td>Thin, bright orange to yellow in colour</td>
<td>Thick, yellowish green to light green in colour</td>
</tr>
<tr>
<td>Flower</td>
<td>Flowers born in clusters, small</td>
<td>Few flowers in cluster, comparatively large</td>
</tr>
<tr>
<td>Infrastaminal scale</td>
<td>As long as corolla tube, oblong in shape</td>
<td>Reaching middle of the corolla tube, ovate</td>
</tr>
<tr>
<td>Style</td>
<td>Style 2, filiform</td>
<td>Style 1, very short or absent</td>
</tr>
<tr>
<td>Stigma</td>
<td>Stigma capitate or globose</td>
<td>Stigma ligulate</td>
</tr>
</tbody>
</table>

**Specimen examined**
India, Assam, Kamrup Metro district, Jalukbari; 26°09’13.7” N 91°39’35.8” E, 04 December 2020, Barnali Das BD0016 (GUBH!).

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**Authors contribution**
BD & NN have prepared the manuscript for correspondence. BD had collected and identified the plant. Both authors read and approved the final manuscript.
**Compliance with ethical standards**

**Conflict of interest:** The authors have no competing interests.

**Ethical issues:** None.

**References**


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