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Note on the presence of *Spiranthes himalayensis* (Orchidaceae) in the state of Assam, India

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Abstract

Spiranthes himalayensis is reported here as a new record from the state of Assam. The presence of the plant in this state, suggested in 1986 by two authors, is confirmed. The species has been recorded in two rice fields near the town of Kokrajhar. A description and notes on ecology, distribution and associate plant species are provided along with photographs for easy identification in field.

Résumé

Spiranthes himalayensis est signalé ici pour la première fois dans l'état d'Assam. La présence de la plante dans cet état, suggérée en 1986 par deux auteurs, est confirmée. L'espèce a été observée dans deux rizières près de la ville de Kokrajhar. Une description et des notes sur l'écologie, la distribution géographique, les espèces végétales associées et des illustrations sont fournies pour faciliter l'identification du taxon sur le terrain.

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Mots clés : Inde du Nord-Est, Kokrajhar, orchidée terrestre, Spiranthinae.

Introduction

Northeast India is considered as a mega-diversity area due to wide range of physiography and eco-climatic conditions and is one of the richest centers in the Indian subcontinent (Clarke, 1889; Hooker, 1906; Chatterjee, 1962; Rao, 1968; 1974). This region is very rich in orchid species. About 856 species have been reported among which 34 are identified as threatened species (De & Medhi, 2014). The state of Assam in Northeast India is blessed with various noticeable features of vegetation that harbors a wide range of epiphytic and terrestrial orchid species. Though the majority of orchids are epiphytic the humus rich forest floor and grassland are favorable habitats for terrestrial species (Williams, 1978; Dressler & Dressler, 1993; Ramírez *et al.*, 2007). In Assam, about 39 genera of terrestrial orchids have been recorded. The diversity and taxonomical status of these taxa are still far from being updated due to lack of proper study.

From February 2019 to March 2021, we worked on the floral diversity of the district of Kokrajhar, Assam. This district is the most westerly of the state. It is located at the West Bengal border to the west and the international border with Bhutan to the north. The vegetation is mostly made of deciduous trees with some patches of semi-evergreen to evergreen forest. Dominant tree species include *Shorea robusta* Gaertner (1805: 48), *Dillenia pentagyna* Roxburgh (1795: 20), *Phoebe goalparensis* Hutchinson (1916: 190), *Tetrameles nudiflora* R. Brown (1844: 17), *Duabanga grandiflora* Walpers (1843: 114) and *Lagerstroemia speciosa* Persoon (1806: 72) etc. Many trees house different species of epiphytic orchids, and the soils of these forests provide a suitable environment for the growth of terrestrial and saprophytic orchids. During our observations we came to discover a terrestrial species belonging to the genus *Spiranthes* Richard (1817: 36) and still unknown in the state of Assam: *Spiranthes himalayensis* Surveswaran, Kumar & Mei Sun (2017: 115).

Methods

The collected specimen was preserved using standard method (Jain & Rao, 1977) and deposited in APRFH (Ambika Prasad Research Foundation, Odisha, India). The morphological characters of *S. himalayensis* were

carefully analyzed and then compared with specimens of *S. sinensis* and data found in the literature (Hooker 1890a; Kumar & Manilal, 1994; Misra, 2007; Ames, 1908; Persoon, 1807; Surveswaran *et al*., 2017).

Taxonomic treatment

Spiranthes himalayensis Surveswaran, Kumar & Mei Sun, *PhytoKeys* 89: 115–128 (2017)

Material studied: INDIA, Assam, Kokrajhar, 26.393529 N; 90.257526 E & 26.426189 N; 90.266886 E, elevation 120 m alt., 6 March 2021; *Raju Das 10445* (APRFH).

Description (Fig. 1 & 2): Terrestrial herb, 15-30 cm tall. Stem erect with a cluster of leaves near the base. Rhizome 2-4 mm diameter, perennating. Plant glandular, long stem, wider towards the base. Leaves 2-4, linear to lanceolate, 3.0-7.0 x 1.2-2.0 cm, with 3 vein depressions on upper surface. Inflorescence up to 30 cm long, pubescent. Flowers spirally arranged and clustered in the middle, widely open, 0.4-0.5 cm long and 0.2-0.3 cm wide, white, glandular. Floral bract green, ovate-lanceolate, 0.4-0.5 cm long, acuminate, pubescent on the outer surface. Flower white, sepals and petals glandular at the base. Dorsal sepal triangular, 0.3-0.4 cm long, obtuse. Lateral sepals obliquely elliptic, 0.3-0.4 cm long, obtuse. Petals obliquely quadrangular, apex truncated, ca. 0.4 cm long. Lip distinctly divided into hypochile and epichile with a constriction in the middle, glandular on the outer surface, ca. 0.5 cm long in total; hypochile concave, ca. 0.30 cm long, 0.30–0.34 cm wide, attached at the base of the column foot, with one semi-globular gland on each side, margin entire and raised upwards till the constriction; epichile, flabellate, ca. 0.2 cm long, margin undulate, slightly dentate with some papillae on the front part. Column green-white, obconical, quadrangular, 0.2 cm long, with a short foot, stigma trapeziform, shiny, broad towards the base. Rostellum well developed with two semi-transparent projections, clavate, projecting in the front above stigma. Pollinarium yellow, ovate. Operculum yellow-brown, partly embedded in the upper part of column, convex. Ovary sessile with inconspicuous pedicel, densely glandular, fusiform. Fruits obliquely clavate, densely pubescent.

Flowering: March – April

Habitat: *Spiranthes himalayensis* was found in lowland marshy areas near paddies on the bunds made to irrigate fields. Associated herbs like *Cynodon dactylon* (Linnaeus 1753: 58) Persoon (1805: 85); *Centella asiatica* (Linnaeus 1753: 234) Urban (1879: 287); *Commelina benghalensis* Linnaeus (1753: 41) were found.

Distribution: China and India (Assam, Karnataka, Manipur, Tamil Nadu).

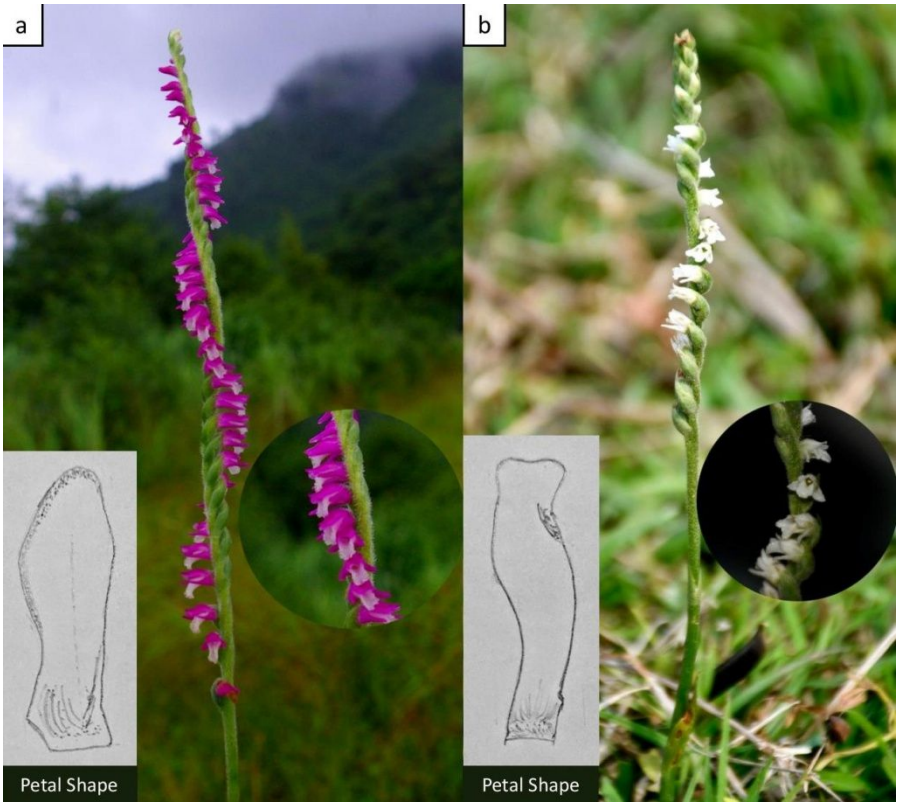

Fig. 1: Comparative illustration of inflorescences and petals
(A) *Spiranthes sinensis*; (B) *Spiranthes himalayensis*

Notes: *Spiranthes himalayensis* has close similarities to *Spiranthes sinensis*. The former has petals obliquely quadrangular and truncated at the apex (*versus* subspatulate, rounded), lip pubescent on the outer surface (*versus*

glabrous), distinctly divided into an hypochile and an epichile with constriction (*versus* obscurely divided, without constriction) and an obconical column (*versus* conical) attached to the front part of operculum (*versus* attached to the top of operculum). In addition, molecular results confirmed the recognition of two different species (Surveswaran *et al*., 2017).

This glandular *Spiranthes* species has been reported by various authors as *Spiranthes sinensis*, *Spiranthes spiralis* K. Karl (1849: 290) or *Spiranthes australis* Lindley (1824: t. 823) (Hooker, 1890b; Deva & Naithani, 1986; Kumar & Manilal, 1994; Misra, 2004; 2007) but unfortunately no clear difference between the collected specimens and these taxa was published. (Surveswaran *et al.* 2017) and no specimen could be located in the different herbaria. Deva and Naithani (1986) reported *S. sinensis* and *S. spiralis* from Himalyan regions and, according to Surveswaran *et al.* (2017), *S. himalayensis* could have been collected and recorded under the name of *S. spiralis*.

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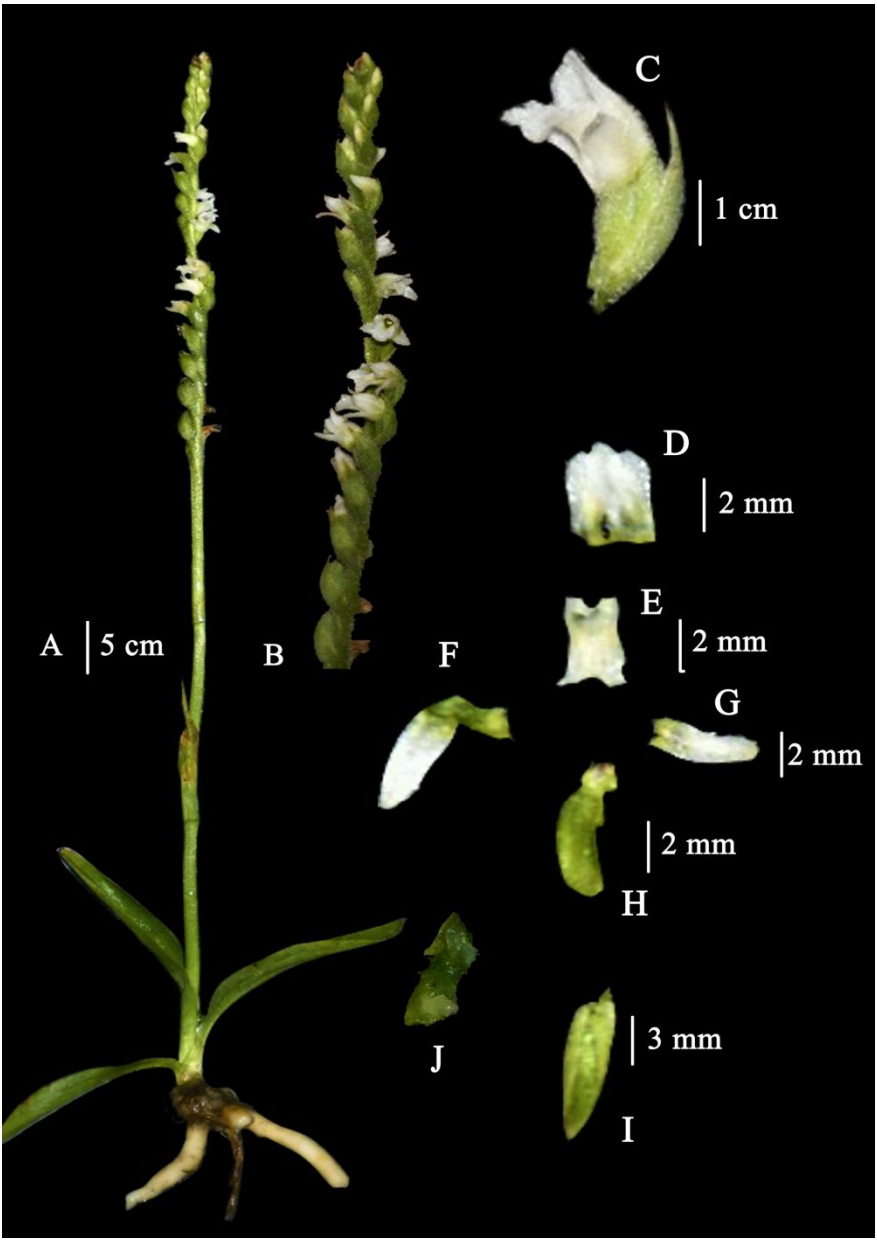

Fig. 2: ***Spiranthes himalayensis***

A) plant, B) inflorescence, C) flower, D) petal, E) lip, F-G) sepals, H) ovary with column, I) floral bract, J) side view of the pollinarium

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