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REVIEW ARTICLE

POTAMOGETON GRAMINEUS LINNAEUS (POTAMOGETONACEAE): A NEW RECORD FOR INDIAN SUB-CONTINENT WITH A COMPLETE MORPHOLOGICAL DESCRIPTION

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ABSTRACT

We present a new record of the pondweed (*Potamogeton gramineus* Linnaeus) (Potamogetonaceae Berchtold & J. Presl) from the sub-Himalayan wetland of West Bengal, India. This record extends the known geographical distribution of *P. gramineus* Linnaeus from Europe, North America, Russia, SW Asia (Iran), Japan, Mongolia, Pakistan, Kazakhstan, Turkmenistan, Uzbekistan and China, to sub-Himalayan region of West Bengal. This discovery modified the current distribution and floral diversity of India.

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INTRODUCTION

Wetlands are the richest ecosystem after the tropical rain forests of the world. The Indian Wetlands support 20 % of total biodiversity of the country (Deepa et al., 1999). In India floristic studies of aquatic macrophytic vegetation were initiated by Biswas and Calder (1936). Sub-Himalayan wetland in West Bengal region is generally extended from Darjeeling to the Eastern bank of the River Ganga. These areas include Hilly areas of Darjeeling; Terai and Duars of Jalpaiguri and low land floodplains, lakes, streams of different forests, beels, seasonal waterlogged areas etc. *Potamogeton* Linnaeus of the family Potamogetonaceae Berchtold and J. Presl is one of the important aquatic genus comprising of about 89 species, widely distributed in tropical and subtropical wetlands. According to Guha and Mondal 2005, so far, 17 of its species have been recorded from India.

MATERIALS AND METHODS

During the floristic exploration and biodiversity survey of sub-Himalayan wetlands in West Bengal, in March 2014, few specimens of *Potamogeton* Linnaeus were collected in reproductive state. After critical investigations with the help of various relevant literatures (Cook, 1996; Youhao et al, 2010),

matching specimens with herbarium (CAL), and digital herbarium sheets and expert consultation, the identification of one specimen of *Potamogeton* Linnaeus is confirmed as *Potamogeton gramineus* Linnaeus (commonly known as variable leaf pondweed) (Fig.1). The up-to-date nomenclature has been verified with the www.theplantlist.org (2014). Hence, the present report of the occurrence of this species in West Bengal forms a new distributional record to India. A full description of the species is provided along with color photographs of the plant habit with dimorphic leaf and identification key.

Systematic treatment of available *Potamogeton* Linnaeus in Terai and Duars regions

Key to the species

- 1b. Leaves monomorphic, all submerged 2
- 1a. Leaves dimorphic, both submerged and floating leaves present 3
- 2a. Lamina linear-oblong, margins serrate; fruit beak equal to or longer than body of carpel *P. crispus*
- 2b. Lamina narrowly linear, margins entire, white; fruit beak shorter than body of carpel *P. pectinatus*
- 3a. Floating lamina less than 24 x 12 mm; submerged leaves sessile, filiform *P. octandrus*
- 3b. Floating lamina more than 29 x 16 mm; submerged lamina petiolate or sessile 4
- 4a. Submerged lamina phyllodial *P. natans*

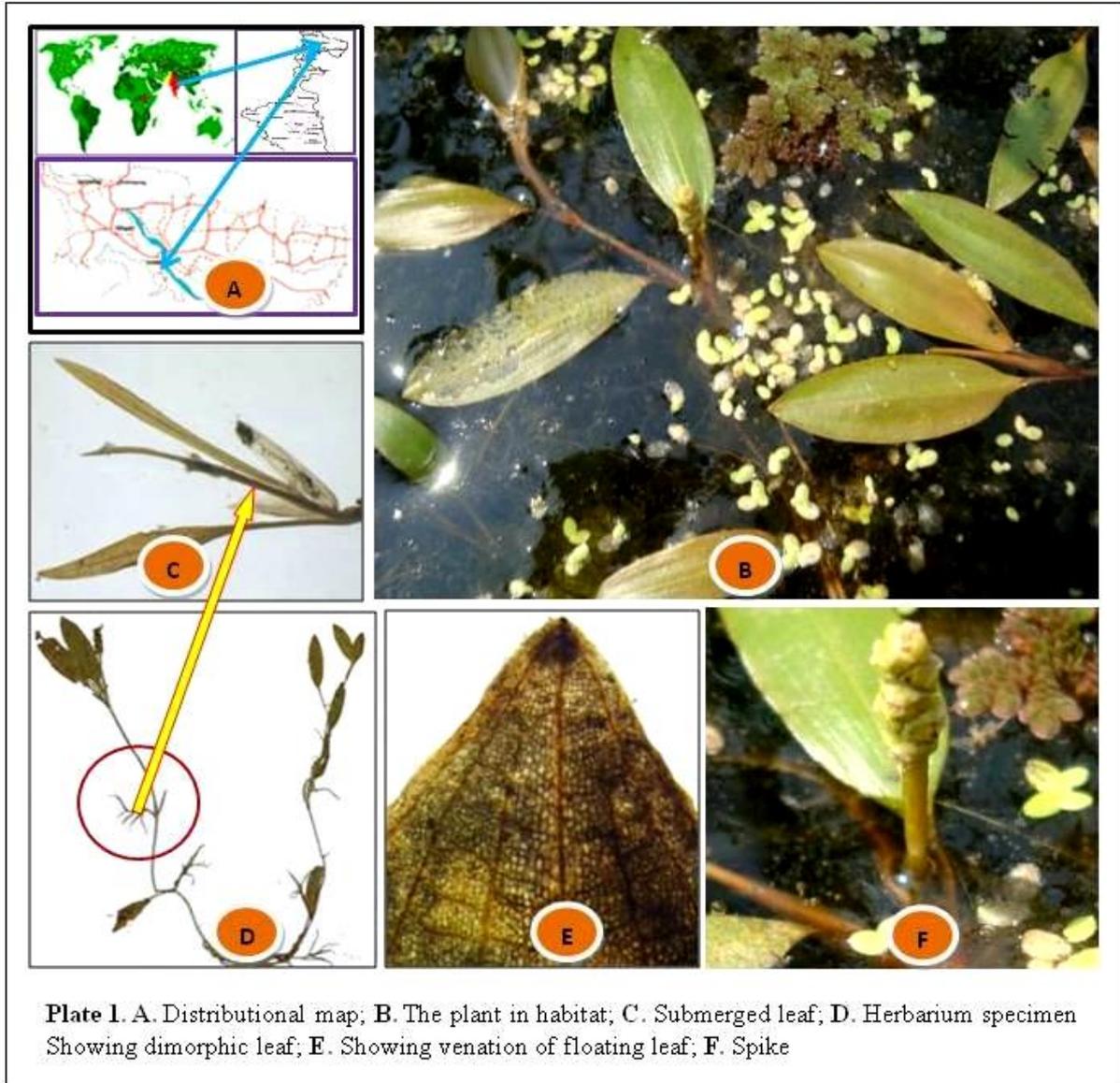
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- 4b. Submerged lamina with expanded blade..... 5
 5a. Submerged lamina petiolate *P. nodosus*
 5b. Submerged lamina sessile.....6
 6a. Plants usually unbranched, with distinct reddish tinge particularly when dry; submerged lamina 7-46 mm, 8-19 veined, margin entire, apex obtuse *P. alpinus*
 6b. Plants usually branched, without a distinct reddish tinge; lamina 20-35 mm, 7 veined, margin minutely denticulate, apex mucronate *P. gramineus*

Rhizome: slender, densely branched, with apical dormant buds.

Stem: terete, densely or sometimes sparsely branched, 1–1.5 mm in diam.

Leaves: dimorphic, floating lamina opaque, elliptic or ovate-elliptic to elliptic-lanceolate, leathery, 20 – 35 mm x 8 – 10 mm., 7 veined, base cuneate or rounded, margin entire, apex mucronate, petiole 12 – 10 mm; submerged leaves sessile, translucent, linear-oblong to oblanceolate, 12 – 16 mm x 1 mm., entire or minutely denticulate, mucronate, base cuneate,



Taxonomy

Potamogeton gramineus Linnaeus, Sp. Pl. 1: 127. 1753.
Potamogeton heterocaulis Diao, J. Yuzhou Univ., Nat. Sci. Ed. 11(1): 1 (3, 78; fig.). 1994. *P. heterophyllus* Schreber. Spicil. Fl. Lips. 21.1771.

Fresh water perennial soft herbs, anchored to the bottom at around 1.5 m depth.

herbaceous, petiole 8 – 10 mm. long; stipules axillary, convolute, conspicuous, 5.5–34 mm long, herbaceous, amplexicaule;

Spikes: cylindric, (13–36) mm long, densely flowered, with many whorls of opposite flowers; peduncles 13-17 mm. Stamens 4, united, anthers sessile; Carpels 4. Drupe with a short beak at tip.

Flowering and Fruiting: March – May

New Global Distribution: INDIA (West Bengal), Pakistan, China, Japan, Kazakhstan, Korea, Mongolia, Russia, Turkmenistan, Uzbekistan; SW Asia (Iran), Europe, North America.

Specimen examined: INDIA, West Bengal, Karala River, Kingshaheber ghat, at 26°28'43.04" N and 88°44'26.61" E, 21 March, 2014, Anurag Chowdhury and A.P. Das 03456 (CAL), Anurag Chowdhury and A.P. Das 03445 (NBU).

Ecological notes: It grows in water bodies such as ponds, lakes and streams. It may be found elsewhere as an introduced species. The species is growing in association with *Lemna sp*, *Spirodela sp*, *Azolla sp*, and also with the *P. pectinatus*. It is only known from a single locality in India apart from China and Pakistan.

Conservation status: This area increasingly facing several anthropogenic stresses and ultimately threatening its habitat. The key factors may be cited here as dense human population in catchments, urbanization, and various anthropogenic activities resulted in over exploitation of wetland resources leading to the large scale degradation in terms of their quality and quantity. Besides, unplanned fishing activities have degraded the wetland and its resources, so, some conservation strategies have to develop to save this species.

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