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New Distributional Record of *Stuckenia pectinata* (L.) Borner in Union Territory of Chandigarh, India

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ABSTRACT

Stuckenia pectinata has been reported for the first time from Sukhna Wetland, Chandigarh, India. It belongs to family Potamogetonaceae and has few morphological variants. It is a filiform, submerged, perennial and aquatic plant. Different plant parts are important as a source of food for many water fowls. It is believed that this species possibly has reached at the present study site through migratory birds.

Key words: Aquatic species, *Stuckenia pectinata*, Potamogetonaceae, Sukhna, Wetland.

INTRODUCTION

Stuckenia pectinata (L.) Borner (syn. *Potamogeton pectinatus*) is species of genus *Stuckenia*. It is commonly called as '*Sago pondweed*' or '*Fennel weed*' and distributed throughout the world. It is submerged macrophyte, occurring in a variety of habitats including eutrophic, stagnant to running water and in different types of ditches, lakes, ponds and rivers (Hulten & Fries 1986; Wiegleb & Kaplan 1998). The plants of this species were known to have phenotypic or ontogenetic variations (Idestam-Almquist & Kautsky 1995; Kaplan 2002). *Stuckenia pectinata* reproduces both by vegetative and sexual means. Vegetative reproduction occurs through tubers, which are produced from the underground rhizomes (van Wijk 1989).

According to Lone et al. (2013), *S. pectinata* has a potential to clean water by removing nutrients. Further, it has been shown to absorb heavy metals and clean the polluted sites (Demirezen & Aksoy 2004; Ren et al. 2006). Casagranda & Boudouresque (2007) suggested that *S. pectinata* can tolerate high salinity and heavy polluted conditions. It may likely be the reason for its wider adaptability in different water bodies.

Both seeds and tubers help the plants to survive in winters (Yeo 1965; Hangelbroek et al. 2003). These are also the main source of dispersal and important food for waterfowls due to their nutritional value. Leaves, stems and roots are also consumed by ducks and water fowls. This plant not only protects fishes, grass carp and invertebrates from predators but also provides a place for them to grow (Soszka 1975). The anthropogenic activities, hill water runoff and sewage discharge leads to the accumulation of nutrients into the water bodies and results in eutrophication, which enhances the growth of macrophytes and weeds and later becomes the reason for degradation of the aquatic ecosystem. This species is cosmopolitan in distribution. Because of its tolerance to different stresses, it has been adapted to diverse locations.

MATERIALS AND METHODS

Sukhna Lake is a fresh water wetland, located in the north-east part of Chandigarh, covering an area

of approximately 3 km^2. The present study is concerned with the documentation of flora of this wetland. *Stuckenia pectinata* has been recorded and collected from Sukhna wetland during 2016-2017 from different sites of the Lake. Herbarium sheets of the collected material were prepared and deposited in the PAN herbarium, Department of Botany, Panjab University, Chandigarh (PAN number 21151). Observations on the plant parts for their morphological details were recorded under a stereomicroscope at magnification of 10X to 40X. The specimen has been identified using different floras and by consulting online herbaria.

RESULTS

During documentation of floristics, *Stuckenia pectinata* has been found growing at different locations in Sukhna wetland. According to available literature, this plant species has not been recorded earlier from this place and hence is a new record. However, it was found growing in different parts of India (Fig. 1) It is a submerged, hemicryptophytic species (Fig. 2A), tolerant to poor quality water and can survive in highly eutrophic conditions. It acts as a nutrient buffer by absorbing nitrogen and phosphorus from water bodies for its growth. Further, it reduces the algal blooms by competing and restricting the nutrient availability to planktons. The plant produces good number of seeds but survive during winters mainly in the form of tubers.

The plant body is differentiated into root, stem and leaves. The stem is circular, flexible and covered by a sheath. It is profusely branched in the upper portion as compared to lower part. The length of internodes ranges between 0.1 to 9.5cm (average 3.96cm). Leaves show parallel venation, liner, entire, acute apex and length of the leaves including stipule vary from 0.6cm to 10.6cm (average 5.38cm) (Fig. 2B). Alternate, evergreen and simple leaves are ligulate, stipulate, adnate stipule (leaf sheath), green to olive green, leaf base cuneate and sessile (Fig. 3A). Flowers are arranged in whorls. The spike inflorescence is brown in color, submerged and located on flexible peduncles (Fig. 3B). Fruits are achenes, obovoid, shiny, compressed at their apices forming a beaked structure, produced in winters and are turgid (Fig. 3C-D). Rhizomes are strong and bear fibrous roots (Fig. 2C). Tubers can give rise to new plant independently (Fig. 3E-F).

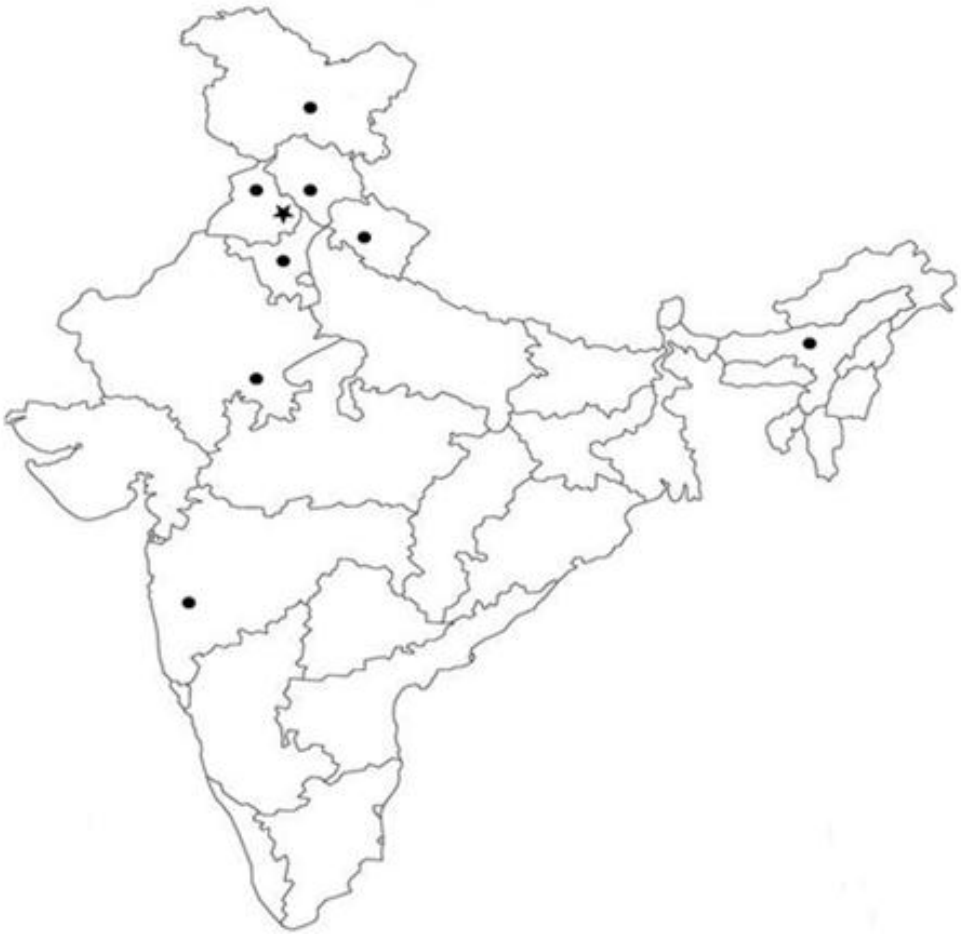

Fig. 1: Distribution of *Stuckenia pectinata* in India. (*=present record; •=earlier records)

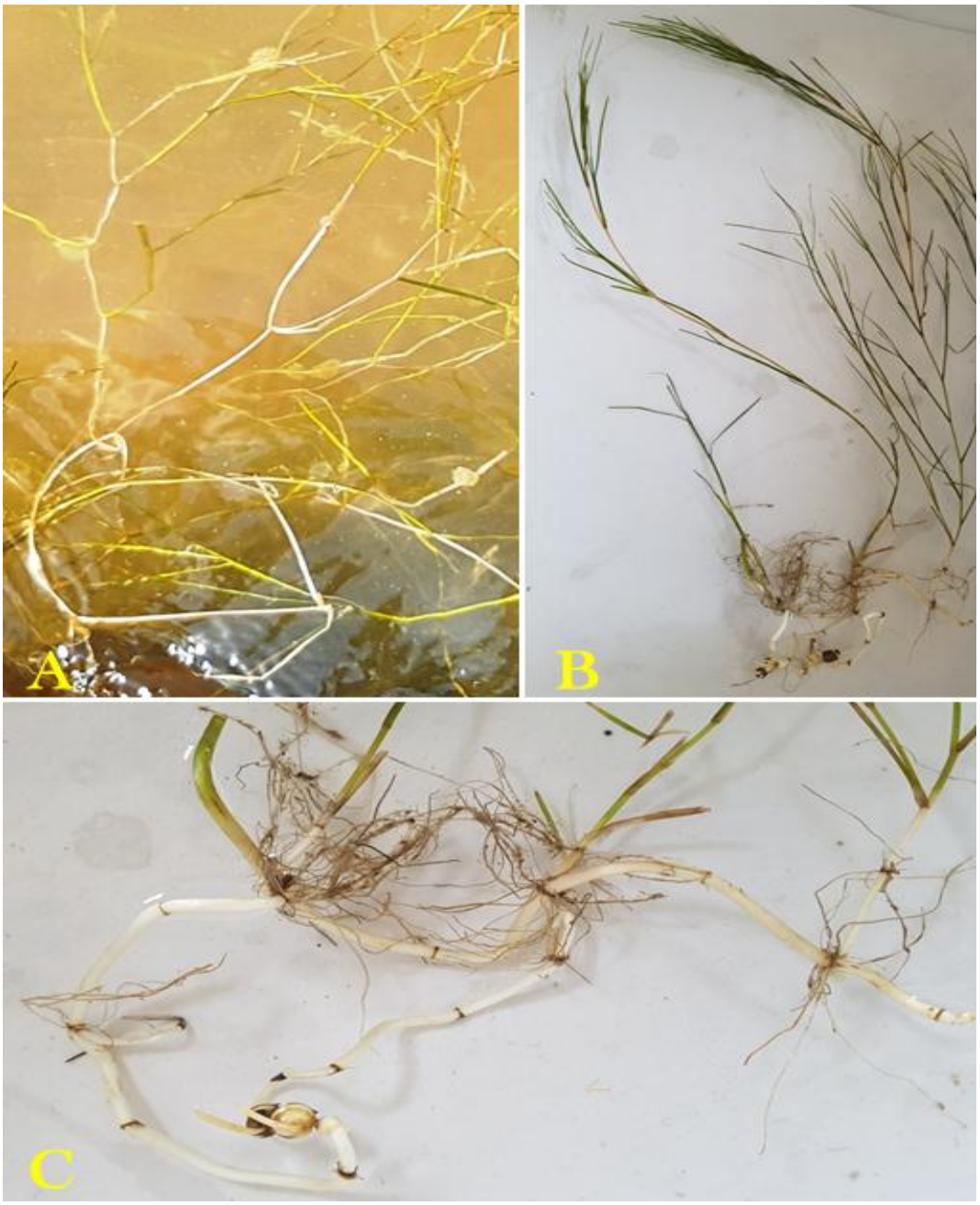

Fig. 2- *Stuckenia pectinata* **(A-C): A.** Submerged plant; **B.** Whole plant showing distichous arrangement of liner leaves; **C.** Rhizomes bearing roots and tubers.

DISCUSSION

Kaplan (2008) revised the taxonomic interpretation of genus *Stuckenia* in Asia and described morphological variations in six species of this genus at different levels. *Stuckenia pectinata* (*Potamogeton pectinatus*) has already been documented from different parts of India (Fig. 1) such as Punjab by Stewart 1869 (Punjab Plants) and Nair 1978 (Flora of the Punjab Plains). Collett (1902), Chowdhery & Wadhwa (1984) and Kumar (2001) also recorded this species from Himachal Pradesh and Haryana in "Flora Simlensis", "Flora of Himachal Pradesh Analysis" and "Flora of Haryana (Materials)", respectively. *Stuckenia pectinata* was also reported from Bhakra and Kota dam (Varshney & Rzoska 1973); Kalamba lake, Nerur-Par, Maharashtra (Pullaiah 2003); Baanganga reverine wetland (Adhikari 2008); Assam (Dixit & Bera 2012); Mula river, Pune (Kshirsagar & Gunale 2013) and Dodi Tal, Garhwal Himalayan region (Sharma & Singh 2017). It was studied by Purohit & Singh (1987) and Ganie et al. (2016) in Nainital Lake and fresh water ecosystems of Kashmir valley, respectively. According to the available literature *Stuckenia pectinata* is new to Union Territory of Chandigarh, India.

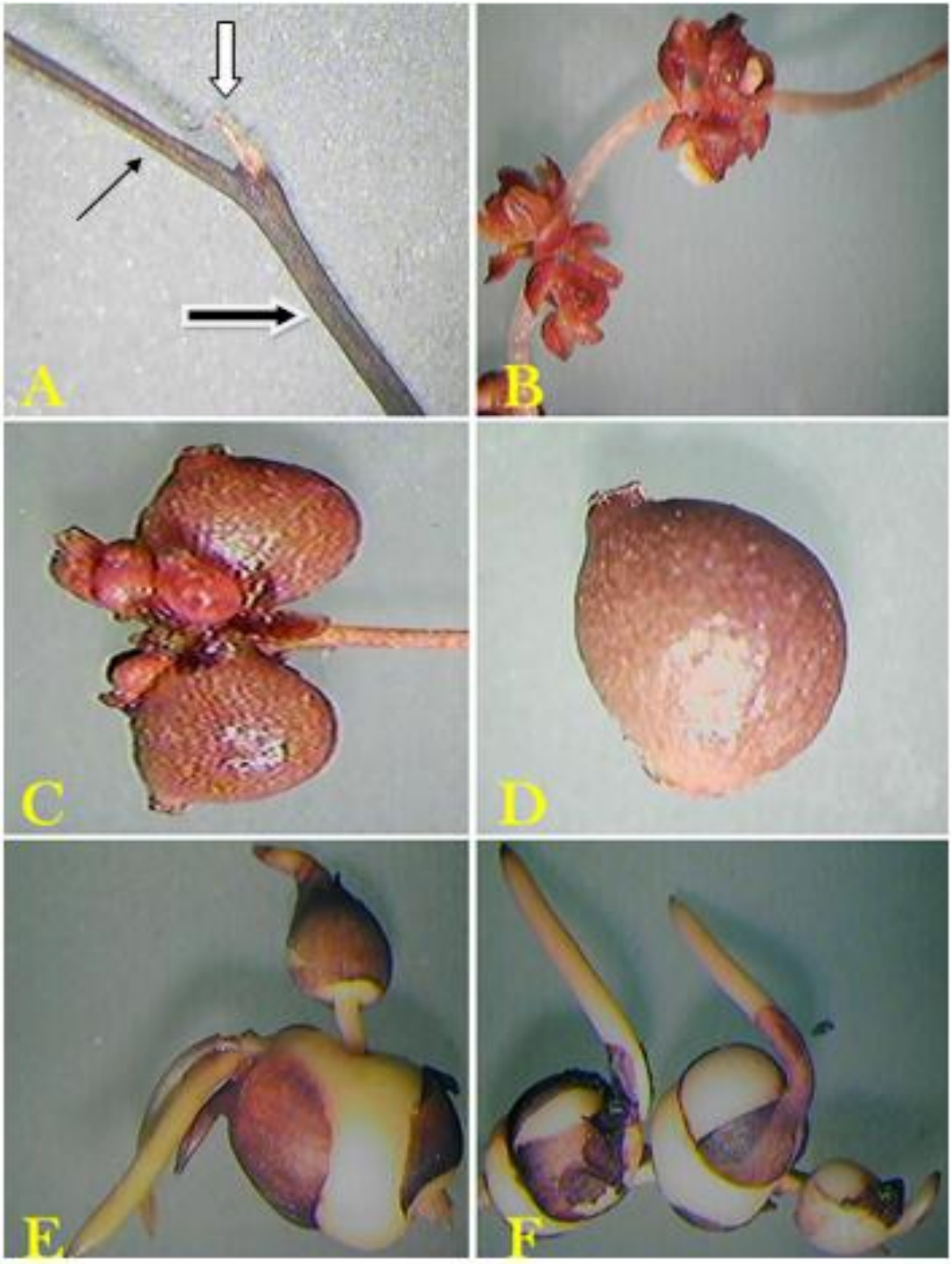

Fig. 3- (A-F): A. Line arrow= Leaf; White arrow= Ligule; Black arrow= Stipular sheath (leaf sheath); **B.** Flowers arranged in whorls on flexible peduncles; **C-D.** Beaked achenes; **E-F.** Propagules germinating from tubers.

CONCLUSION

Stuckenia pectinata, an aquatic plant, is a new record for Union Territory of Chandigarh. Although it is a weed species but its occurrence is very less as compared to other dominant weeds of this wetland. Seeds of this plant are protected by testa, which enable them to resist long submerged conditions. This wetland acts as home for a variety of plant and animal life, including many species of

birds. Waterfowl eat seeds and tubers of this species and carry them to faraway places to provide new destination.

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