ALLIGATOR WEED (ALTERNANTHERA PHILOXEROIDES) A POTENTIAL INVADER IN GHARANA WETLAND JAMMU, J&K, INDIA

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ABSTRACT

Alligator weed Alternanthera philoxeroides (Mart.) Griseb (Amaranthaceae) is a noxious invasive weed native of Trop. America and widespread throughout the world. Because of its invasiveness, potential for spread and economic and environmental impacts it is a weed of national significance. It is an especially troublesome weed because it invades both land and water, and is very hard to control. When growing on land it displaces other more favourable plants such as crops or native vegetation, and can be harmful to animals. The present study deals with the first time report on the presence and impacts of A.philoxeroides in Gharana wetland reserve of Jammu region which is an important wetland reserve and serves as wintering ground for large number of migratory water birds during their palaearctic to oriental migration.


INTRODUCTION

Invasive species have earned the distinction as the second greatest cause of species extinction. Introduction of species from their native regions to new and previously unoccupied areas, intentionally or unintentionally, dates back to the times when humans started travelling over and between land masses. However, rapid globalization and fast growing transnational trade and commerce have exacerbated the rate and magnitude of alien species introductions several fold, thereby making it a cause of ecological concern globally. The spread of invasive species beyond their home range has many underlying mechanisms and such species are generally detrimental to native biodiversity and ecosystem functioning in the introduced regions, inflicting huge socio-economic damage. Invasive non-native species inflict harmful ecological and economic impacts upon ecosystems in non native regions (Pimentel et al. 2005; Meyerson and Mooney 2007). Of these and other threats, biological invasion has emerged as the most severe one causing substantial damage with
cascading effects on structural organization and functional integrity of freshwater ecosystems. Early detection and timely exclusion are the most cost effective methods of controlling and preventing invasive species. Control measures often come into play only after the alien species has spread to nuisance proportions (Boylen et al. 2006). Gharana Wetland located close to Indo-Pak border in Jammu district has been notified as a protected water body and declared as Important Bird Area, rich in biodiversity. During the past several decades, there has been continuous introduction of non-native species into the region and A. philoxeroides is one among them. Occurrence of alligator weed A. philoxeroides was recorded during the vegetation survey of Gharana wetland reserve. Alligator weed is known as an invasive species in many parts of the world having a tremendous potential for vegetative reproduction. In India, the species has been reported from Assam, Bihar, West Bengal, Tripura, Manipur, Andhra Pradesh, Karnataka, Maharashtra, Delhi and Punjab (Pramod et al. 2008). The purpose of this paper is to note the invasion of Alternanthera philoxeroides in Gharana wetland and to present some considerations about its potential problems and management.

RESULT AND DISCUSSION
Wetlands are among the most productive ecosystems of the world with specific ecological characteristics, functions and values. They are essential life- supporting systems providing a wide array of benefits to human kind. Their high productivity places them among the richest and most biologically diverse ecosystems in the world. Gharana Wetland an important wetland reserve is situated at Indo-Pak International border in Ranbir Singh Pura sector, Jammu and is about 35 km south of the main Jammu city. Gharana Wetland has derived its name from the village known as ‘Gharana’ situated on one side of the wetland. The wetland is located at 70° 7’ N longitude and 32° 34’ S latitude. Sandwiched between India and Pakistan. Gharana Wetland is a shallow water body having mean maximum depth of 62.5 cm in monsoon season. Shallow water depth attracted large number of water birds as shallowness of the wetland made the benthic food easily accessible to them. Gharana Wetland attracts thousands of migratory birds from various parts of the globe during winter every year. Alternanthera philoxeroides (Mart.) Griseb. of the family Amaranthaceae is an invasive weed originally from South America (Vogt et al. 1979) and is now widespread throughout the world (Buckingham 1996) is highly invasive in Gharana Wetland. It is a stoloniferous, perennial, mesophytic herb capable of aquatic and terrestrial growth. The stems are prostrate,
decumbent or ascending, simple or branched and forming dense mats. At maturity stems are hollow and produce roots at nodes. Leaves are opposite, elliptical-oblanceolate and glabrous measuring 2.5–5.0 cm × 0.6–1.7 cm. The inflorescence consists of head with a solitary peduncle at leaf axils, globose; 0.8–2.0 cm in diameter (Fig-1 and 2). One of the reasons that alligator weed poses such a dramatic threat is its ability to live in both aquatic and terrestrial habitats. It can tolerate brackish (slightly salty) water but thrives in nutrient-rich water. Ideal terrestrial habitats include places that are regularly inundated or that have high rainfall or irrigation. It spreads through vegetative reproduction, when fragments containing at least one node are moved from one place to another and take root in suitable habitat. It is commonly spread downstream when the plant is broken up into smaller fragments (e.g by floods, or following mechanical or chemical control). During the vegetation survey of the wetland, Alternanthera philoxeroides was observed in all the four stations made depending on the presence or absence of anthropogenic activities along with disposal of house-hold and agricultural waste in Gharana wetland. When growing on land Alternanthera philoxeroides displaces other more favourable plants such as crops or native vegetation, and can be harmful to animals. When growing in fresh water, alligator weed can cover the entire water surface, preventing flow, blocking up drainage channels and potentially increasing flood damage. Alligator weed forms large floating mats in the wetland (Fig-3 and 4). Alternanthera philoxeroides forms dense mats and thereby disrupts the aquatic environment by impeding penetration of light and gaseous exchange as well as promoting sedimentation. The weed also provides habitat for mosquitoes. It is an especially troublesome weed and is very hard to control. Alligator weed can be controlled by three principal means; biological, chemical and mechanical. Alligator weed infestations can be reduced with weed harvesters or by manual removal, but small fragments are inevitably left behind or dislodged. These fragments readily create new infestations. In water alligator weed can be treated with a registered herbicide. However, this rarely kills the entire plant, which often breaks up into smaller pieces. These smaller pieces can drift downstream and lead to new infestations. The biological control using the flea beetle Agasicles hygrophila has been quite successful in aquatic ecosystems of warm temperate regions (Centre for Weed Management 2003). The adults and larvae reduce the growth of alligator weed by feeding on the underside of the leaves and aerial parts of the plant. Chemical control using 1% glyphosate for free floating alligator weed was effective, but owing to its weak translocation through roots and stems, it was not effective in terrestrial plants (Ensbey 2005). In Gharana wetland only manual procedures to control alligator weed
has been attempted as yet. The weed is extremely difficult to control once established and eradication is very expensive, especially in developing countries (Sainty et al. 1998). Proactive inspection and surveillance programs should be encouraged to detect the weed before it becomes established. Awareness programs should be a priority for the locals and those who are registered with the fisheries department can be quite helpful. Unfortunately, there is no aquatic weed management strategy in place for the wetland despite the evident damage to the ecosystems. It is the time to develop and implement the management plan for alligator weed before it assumes nuisance proportions.

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Invasion of Alternanthera philoxeroides
REFERENCES


