

Eichhornia crassipes

Introduction

Eichhornia crassipes (Mart.) Solms, the water hyacinth, is recorded as the world's worst waterways weed. It affects traffic in waterways, clogs up irrigation channels and contaminates fish farms and aquaculture ponds. The weed is a threat to agricultural production, urban water supplies, limits recreational water use and can alter the aquatic environment. The plant is a common weed in paddy fields throughout the rice areas of the world. The rapid multiplication of the weed can suppress rice growth. It interferes both with irrigation and crop growth, causing serious economic losses.

Identity

Authority	: (Mart.) Solms – Laub.
Classification	
Kingdom	: Plantae
Phylum	: Angiospermophyta
Class	: Monocotyledonae
Family	: Pontederiaceae
Genus	: <i>Eichhornia</i>
Species	: <i>crassipes</i>
Synonyms	: <i>Hydrothrix brazil</i> , <i>Eurystemon</i> (Somther ,USA), <i>Monochoria</i> , (Asia & Africa), <i>Schollerapis</i> (Africa). <i>Pontederia azurea sensus</i> (Maye), <i>Piaropus crassipes</i> (Mart).
Common names	: Water hyacinth, Alligator's spoon, Nile lily
Role	: Pest

Morphology

A shiny glabrous, aquatic, perennial herb, with inflated leaf stalks and stolons, about 20-30 cm high (Fig. 1). Stems are submerged in water or substrate, with dark coloured fibrous roots, stoloniferous, about 80-90 cm long. Leaves are more or less rounded, shiny, smooth, with entire margins, about 10-12 cm long and 10-12 cm wide on short petioles, usually inflated at lower parts; inflorescence - axillary spike with few to many violet or bluish flowers on a long peduncle, usually longer than leaf stalk; flowers solitary on the main stalk, perianth violet or bluish, with yellow spot on the upper petal; perianth lobes joined in a tube at the base.

Biology & Ecology

The plant is a major weed of aquatic systems, both natural and artificial waterways, and irrigated crops. The vigorous production of vegetative matter creates problems in both crops

and aquaculture situations. The thick waxy leaves often make it difficult to control with chemicals. The weed is propagated by seeds and stolons and is spread largely with the help of man throughout the tropical and subtropical world. Taking advantage of its free-floating habit, rapid vegetative propagation, and the ability to survive on mud during periods of low water level, water hyacinth has naturalized in a wide variety of aquatic habitats. The development of excessively large populations has caused serious problems for man in his utilization of water resources, besides several other adverse effects on the natural environment.

Dispersal / vectors

The weed is propagated by seeds and stolons. It is spread by water from contaminated areas. Present day distribution has been immensely influenced by man who has served as the chief dispersal agent. Brazil is considered the place of origin, but Puerto Rico is the main center of dispersal. Early spread has been through horticultural exhibits and plant souvenirs.

Management

Physical control

Non-chemical/mechanical methods have proven to be unsatisfactory due to the high cost of labour and machines and because of the fragmentation that eventually causes more rapid spread of the weeds.

Chemical control

Herbicides used in water is to be avoided wherever possible, since the risk of contaminating domestic water supplies is often too great. The most used herbicides to control this weed are 2, 4 – D amine, endothal, dicamba.

Biological control

- a. The only promising biological control agent is the **grass-carp**. However manatees graze on the weed in Guyana. This has not proven to be sufficient to restrict the spread of the weed.
- b. Mycoherbicides - e.g. *Cercospora rodmanii*.

Pest Significance

The weed tends to act as a filter for organic pollutants and creates septic and odorous conditions in aquatic environments. It also provides breeding places for insects and other pests, meanwhile decreasing the desirable aquatic life in fresh water bodies. The weed is known to host plant pathogens which infect agricultural crops.

Fungi: *Rhizoctonia solani*

Bacteria: *Azotobacter chroococcum*

Azospirillum lipoferum

Psuedomonas sp.

It also serves as a host for molluscs, invertebrates, crustaceans and gastropods. The extracts of the weed were found to display allelopathic potential and inhibit germination and seedling growth in radish.

On the other hand, the weed has tremendous potential as an ornamental in ponds, lakes and aquaria. It provides a source of food for manatees and carp. The dried material can be used as mulch material and as source of fiber. The weed has been proposed as a source of fertilizer which otherwise would be lost. The uses to which the weed can be put are summarized as follows:

Aquarium plants, leaves and flowers – food, mats and handicraft, fish traps, compost – mushroom forms –bedding mattress, animal feed for pigs, poultry and fish; mulch, paper and boards, control of water pollution, removal of nutrients and heavy metals from waste water.

Inspection procedures

The weed's spread is mainly through aquatic means or animal/fish that have been reared in open systems that may be contaminated. It may be difficult to detect seeds or stolons if ingested by animals. Imported tropical fishes can be a potential method of spread if the water has been from a contaminated source.

The introduction of the plant for horticultural exhibitions should be closely monitored. In this regard, a number of laws have been enacted internationally to prevent the entry and spread of the weed e.g.

- i The River and Harbor Act 1899 - USA**
- ii The Waterhyacinth Ordinance #4 1922 - Sri Lanka**
- iii Plant Protection Ordinance #10 1974 – Thailand**
- iv Burma Waterhyacinth Act 1917 – Burma**
- v Dacca District Board Byelaw 1919 – India**
- vi Bengal Waterhyacinth Act 1936 – Bengal**
- vii Agricultural Pest and Noxious Plants Ordinance # 5a 1953 - Malaysia**

Host Notes

E. crassipes is a common weed in paddy fields throughout rice areas, fish farms.

Distribution

E. crassipes is neotropical in origin, with six (6) species confirmed in South America. It is endemic to Venezuela and Brazil. It is also found in the following Caribbean states: - Cuba, Guyana, Jamaica, Puerto Rico and Trinidad. The weed has also spread to Africa, Asia, Oceania and Europe.

Bibliography

- Gopal, B. (1987) *Water Hyacinth Aquatic Plant Studies 1*. Elsevier, New York. 471 pp.
- Haflinger, E., B & H Scholz (1981) *Monocots weeds*. Documenta, CIBA – GEIGY, Berlin.
- King, L.J. (1966) *Weeds of the World. Biology and Control* Hill, London, 526 p..



Fig. 1: *Eichhornia crassipes*
(Haffinger, E., B & H Scholz (1981))