

**Research Article**

## **WATER HYACINTH (*EICHHORNIA CRASSIPES* (MART.) SOLMS.) – AN INVASIVE AND VALUABLE AQUATIC WEED**

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### **ABSTRACT**

Water hyacinth is very remarkable and vigorous growing angiospermic plant of fresh water aquatic habitat belonging to family Pontederiaceae. It is commonly called the world's worst aquatic weed, sometimes termed as, *economic drain* due to its ability to cover whole waterways. The Survey was done in various aquatic sites of Jamtara District of Jharkhand State and it was found that besides so many pernicious and troublesome negative role, it also shows some valuable and remarkable positive effects in aquatic habitat in particular and whole ecosphere in general. It is an angiospermic, free floating perennial herb that grows throughout Indian Sub-Continent. The present work compiles an account of documentation and brief descriptions of *E.crassipes* and its economical impact. A field survey of the research sites was carried out regularly to know the floristic features. The floristic data consists of habitat, botanical name vernacular name, family and their brief description.

**Keywords:** Aquatic Weed, Jalkumbhi, Troublesome, Jamtara, Jharkhand

### **INTRODUCTION**

Water hyacinth is a free floating perennial aquatic plant native to the Amazon Basin in South America. But now a day it has become pantropic with remarkable and significant appearance in most of the aquatic habitat forming dense mats above the surface of water. It grows in still or slow flowing fresh water in tropical and temperate climate. This flora can be seen gregariously on the canals, ditches, lakes, less used ponds or near any other waste aquatic habitat. It grows well at temperature of between 23°C and 30°C and does not tolerate high temperature.

It survives well under diverse nutritional conditions in abundance of inorganic minerals like nitrogen and phosphorous. Its growth is not favored in saline or sea water.

Water hyacinth is a monocot angiosperm belonging to family Pontederiaceae and is commonly known as “Jalkumbhi” by most of the people. It contains fibrous roots upto one metre length. The stem is mostly of stolon type. It is a very impressive plant with sympodial rhizome creeping in mud. The terminal end of each sympodial branch bears a rosette of broad spoon – shaped leaves with very turbinate swollen petioles. Petioles are mostly bulbous and spongy but sometimes they seem to be non – bulbous also. The leaves are smooth, glossy and bright green in color having rusty yellow appearance on their edges. From the centre of the rosette arises a sheathed scape about 6 – 12 inches high of violet blue, funnel shaped flowers. Flowers are bisexual, zygomorphic, distinctly gamophyllus bearing 6 stamens. It reproduces primarily by asexual means i.e. by stolons, which form daughter plants. It has 3 – celled fruits and small, ovoid and ribbed seeds. Each plant produces thousands of seeds every year.

### **MATERIALS AND METHODS**

Jamtara district lies between 23°10' and 24°05' north latitudes and 86°30' and 87°15' east longitudes. It is located at a lower altitude of Chhotanagpur Plateau. The present work is a part of regular visit of the research sites, preferably at the interval of 15 – 20 days for collection and identification of plants for further study. During the survey, samples were collected, photographed and identified as per the rules and guidelines of Botanical Survey of India. They were dried and preserved by using standard herbarium techniques. Botanical names, common names, families, and floral characters were also recorded. Some stress was given on their ethnomedicinal and economic importance also. The information's collected for

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*E. crassipes* (Mart.) Solms. Commonly known as “Jalkumbhi” had been documented with botanical name, family name, common name, taxonomic descriptions and economic impacts in various fields.

### RESULTS AND DISCUSSION

This aquatic flora has been considered as a serious pest in this locality due to its dense and profuse growth. The infestation of water hyacinth increases most rapidly by the production of new daughter plants. Infestations can be dispersed to new locations during high water flows and flooding. It has both negative and positive role in aquatic habitat and for mankind also. It causes flood and affects drainage of cultivated lands. Besides these, it blocks irrigation channels and rivers, restricts livestock access to water, destroys natural wetlands, eliminates native aquatic plants, reduces infiltration of sunlight, changes the temperature, pH and oxygen level of water, reduces gaseous exchange at water surface, increases water loss through transpiration and reduces aesthetic value aquatic habitat. Fishes and wild aquatic resources of lakes and rivers are also affected by its remarkable appearance. Sometimes it invades paddy fields affecting their productivity. This flora forms a centre for breeding of mosquitoes also.

But on the other hand, it is also boon for mankind in so many respects. During Ethnobotanical study it was found that it contains astringent properties. Some of the native people use dry plant as fuel. It is also used as buffalo and pig fodder. Its young leaves and petioles are cooked as vegetables. Its leaves are very rich source of protein and may be used as supplement in human diets. They are said to be a very strong antioxidant. The protein obtained from the leaves can be classified between that of egg protein and leguminous protein (Mahapatra & Chakraborty, 1977). Very recently a series of growth promoting substances have been isolated from this species which can widely be used in the production of rice, jute, gram and brinjal (Naskar, 1990).

Besides these Water hyacinth is used for making compost, for generating methane biogas and for removing toxic chemicals from water. Because of its extremely high rate of development, it is an excellent source of biomass and is used in the production of ethanol, natural gas, fertilizers etc. It has a great value in manure (Naskar *et al.*, 1986). There are so many recent studies on utilizing *E. crassipes* for bioenergy. Hussain *et al.*, (2013) converted *E. crassipes* biomass into liquid hydrocarbon fuel by the process of catalytic pyrolysis. Sudhakar *et al.*, (2013) recorded bioelectricity production using its biomass. The roots of *E. crassipes* naturally absorb pollutants like Lead and Mercury. So it is also used for sea wage and waste water treatment. Its fast growth rate and high absorption of nutrients and heavy metals could make it a cheap and largely environmentally benign form of decontamination. It is also used in treatment systems for textile mill effluents.

#### List of studied ponds of Jamtara District.

Raja Bandh Talab	Kishori Talab
Sarkar Bandh Talab	Chat Talab Sahana
Vaishnavi Talab	Kal pokhra Talab
Dhobna Talab	Sarkheldih Talab

### Conclusion

Based on above mentioned studies it may be concluded that Water hyacinth is a significant and remarkable aquatic weed being both ban and boon for the environment and human population. In spite of a number of pernicious and troublesome roles, its appearance in aquatic habitat cannot be ignored at any cost. It is impossible to illustrate its impact in a confined arena. More research is needed to make use of this obnoxious weed in various fields of both plant science and human welfare.

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