N.E.S. SCIENCE COLLEGE NANDED

*** Project Work Book ***

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A

Project Report

On

TYPES OF AQUATIC WEEDS IN VISHNUPURI DAM

Submited to

Swami Ramanand Teerth Marathwada University,

Nanded – 431605

In partial fulfillment of the requirement for the award of degree in

MASTER OF SCIENCE

IN

ZOOLOGY

Submitted By

Miss. Joshi Janhavi Jayant

M.S.C. II year, Zoology

*Under the Guidance of *

Dr. K.S. Shillewar

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PG DEPARATMENT OF ZOOLOGY

N.E.S SCIENCE COLLEGE , NANDED

ACADEMIC YEAR 2020-2021

ACKNOWLEDGEMENT

I am first of all thank full to my guide Dr. kiran shillewar sir who gave me excellent directions for completing this project. I am also greatful to my teacher specially Dr. Kiran Shillewar sir, for their encouragement guidance for from time to time.

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I would like to thankful all my friends, who have been helped me directyly and indirectly for this project.

Miss. Joshi Janhavi Jayant

M.s.c. II nd year Zoology

Science college, Nanded

DECLARTATION

I declared that the project work entitled "***TYPES OF AQUATIC WEEDS IN VISHNUPURI DAM***" been completed under the guidance of Dr. kiran shillewar, N.E.S. Science College , Nanded. This project is original work done by me and my partner it had not been previously submitted to the university.

Name of the Guide	Name of the Student
Dr. Kiran Shillewar	**Joshi Janhavi Jayant**
N.E.S. Science college Nanded	M.S.C. II Year,Zoolgy Nanded

CERTIFICATE

This is certify to that Miss. Joshi Janahavi Jayant, has accomplished project entitled "***TYPES OF AQUATIC WEEDS IN VISHNUPURI DAM***".

In the subject of Zoology following the instruction of the university. The project is based on collected reference and is original work done by me and it not been previously submitted to university.

Dr. Kiran Shillewar
Head of the Department
Department of Zoology,
Science college Nanded.

Dr. D. U. Gawai
PRINCIPAL
Science college Nanded.

CERTIFICATE

This is certify that Miss. Joshi Janhavi Jayant, M.S.C. II year Zoology student has worked on the project entitled "***TYPES OF AQUATIC WEEDS IN VISHNUPURI DAM***".This is project has submitted for the zoology subject and completed under the instruction of the university. The project is based on collected reference and original work done by him and it had not been previously submitted to the university.

Name and signature of Guide

Dr. Kiran Shillewar
Head Department of Zoology
Science College Nanded

INTRODUCTION

Built on the Godavari River, it is the largest upsa irrigation project in Asia. This project is near Asarjan village. Km Is at a distance.

The project in Nanded city was completed in 1988. Backwater area 40 km. Is at a distance. Length of Godavari river. The cultural command area of the project is 23222 hectares. And the Irrigable Command Area is 19514 hectares. So far it has an irrigation capacity of 15856 hectares. Is created.

The command area of this project has been distributed in Nanded, Kandhar and Loha talukas of Nanded district. Of 0.79 M million cubic meters of direct storage of the project. 43.95.

One million cubic meters of water is reserved for drinking purposes in Nanded city and 10.26 million cubic meters of water is reserved for industrial purposes. The barrage has 18 vertical gates.

As there plenty of water availability in dam there are different types of aquatic weeds are found. We will study one by one below.

IMPORTANCE OF THE STUDY

What are aquatic weeds?

Aquatic plants are essential parts of natural aquatic systems and form the basis of a water body's health and productivity. Invariably aquatic plants become over abundant or unsightly and require control. Aquatic weeds are those unabated plants which grow and complete their life cycle in water and cause harm to aquatic environment directly and to related eco-environment relatively.

Aquatic plants are essential parts of natural aquatic systems and form the basis of a water body's health and productivity. On the other side, when aquatic plants become over abundant it requires control. Water is one of most important natural resource and in fact basis of all life forms on this planet. Therefore, appropriate O2 management of water from source to its utilization is necessary to sustain the normal function of life. It is an important part of the natural resource management. The presence of excessive aquatic vegetation influences the management of water in natural waterways; man made canals and reservoirs which amount to millions of kilometres of such water bodies. They pose serious threat to fish and fisheries.

Different types of aquatic weeds Proper identification of aquatic weeds is of primary importance for their control. They are classified according to various habitats which form their eco-environment and become conducive for their growth, reproduction and dissemination. Aquatic weeds can be divided into two botanical groups; algae and flowering plants. Algae are usually very simple in structure with no apparent leaves or stems. However, some (for example, Chara) can resemble flowering plants. For effective chemical control, it is essential that you distinguish between algae and flowering plants. Aquatic flowering weeds are broadly divided into **three** groups:

a. Emergent weeds – shore & marginal

b. Floating weeds - Free floating, rooted floating

c. Submerged weeds – Rooted and non-rooted

Material and Method

Material - 1) Plastic Jar

2) Foreshape

3) Scissor

4) net

Method - 1) Cutting

2) Hand picking

3) Washing

Classification-

NAME OF WEED	BIOLOGICAL NAME	FAMILY
1) Water Lily	Nymphaea	Nymphaeaceae
2) Watershield	Brasenia Schreberi	Cabombaceae
3) Phragmites	Phragmites australis	Poaceae
4) Algae(chara)	Chara vulgaris	Characeae
5) Duckweed	Lemna minor	Araceae
6) Water Lettuce	Pistia stratiotes	Pistieae
7) Hydrillia	H. verticillata	Hydrocharitaceae
8) CurlyLeafpodweed	Potamogeton crispus	Potamogetonaceae
9) Sago Pondweed	Stuckenia pectinata	Potamogetonaceae

RESULT & DISCUSSION

- **Emergent weeds –**

A. Water Lily-

The yellow water lily has large heart-shaped leaves between 8 and 16 inches that float on the surface. Leaf veins extend laterally from midrib. It's flower is bright yellow, with a single row of petals.

Water lilies are colonial plants rising from creeping stems called rhizomes, like a branching shrub on its side. The creeping rootstock of underground rhizomes is one means of reproduction to rapidly spread water lilies locally.

Water lilies can quickly ruin a pond or lake's visual and recreational benefits. Control is best achieved through killing of the root system by application of herbicide to the leaves above the water. Cutting water lilies under the waterline 2 or 3 times to drown them can actually stimulate growth. Pulling them out by the roots can be impractical.

The yellow water lily has large heart-shaped leaves between 8 and 16 inches that float on the surface. Leaf veins extend laterally from midrib. It's flower is bright yellow, with a single row of petals.

The white water lily has large, round, cleft (cut about halfway to the mid-vein) leaves, about 6 to 12 inches in diameter. The underside of the leaf is purplish-red and the flower is white with multiple rows of petals.

Water lilies are common in shallow water throughout the United States. They are sometimes intentionally planted for aesthetics or as a fish habitat, but can become quite prolific and create problems in some areas.

Both White Water Lily and Yellow Water Lily prefer a muck or silt bottom, and can withstand a wide variance in pH.

B. Watershield-

Watershield is a rooted plant that floats on the surface similar to water lilies. However, the leaves of watershield are much smaller than those of water lilies. Watershield leaves are typically between one inch and two inches across.

Early in the season, Navigate is an effective control solution. However, as the season progresses, watershield will typically form a jelly-like gel on the underside of its leaves.

Watersheild is a perennial aquatic plant with floating, peltate leaves and rhizomatous stems. It is identified by its bright green leaves, small purple flowers that bloom from June through September, and a thick mucilage that covers all of the underwater organs, including the underside of the leaves, stems, and developing buds. This mucilage may be an anti-herbivore defence trait,[9] perhaps to deter snail grazing. It grows in shallow water of lakes, rivers and beaver ponds, particularly those with somewhat acidic water.

C. Phragmites-

Phragmites were at one point considered an invasive and exotic species in North America, however, recent evidence has shown that the plants are actually native.Phragmites, also known as the common reed, is a large perennial grass typically found in temperate and tropical regions. Phragmites were at one point considered an invasive and exotic species in North America, however, recent evidence has shown that the plants are actually native.

Phragmites can sometimes be difficult to control. We recommend first trying our Phragmite Control Products and spray these directly onto the plants. The Glyphosate 5.4 herbicide is absorbed into the plants and kills the roots. Other methods for Phragmites control include mowing, disking, dredging, flooding, draining, burning, and grazing, but this can sometimes make the problem even worse, as the Phragmite roots are often left intact.

The most successful Phragmites control treatments to date have centered around the application of an aquatic herbicide followed by burning of the roots and stalks to prevent regrowth, which can lead to noticeable improvement in pond conditions for indigenous species and migratory birds.

- **Floating weeds-**

A. Algae-

Algae is commonly referred to as "pond scum" or "pond moss" and typically forms greenish mats upon the water's surface.

Algae control in ponds is a very important part of maintaining a healthy pond. In very high densities, algae blooms may discolor the water and out-compete, poison, or asphyxiate other life forms. Some algae are toxic to humans and dogs. Excessive algae growth can indicate problems with water quality. Water can become unsuitable for fish, swimming, and other animals.

Nutrient pollution such as excessive nitrogen, phosphorous, carbon, and potassium can originate from fertilizer, farm runoff, septic systems, and decomposing lawn clippings. Prevention along with a proper pond algaecide should be employed for optimum pond algae control.

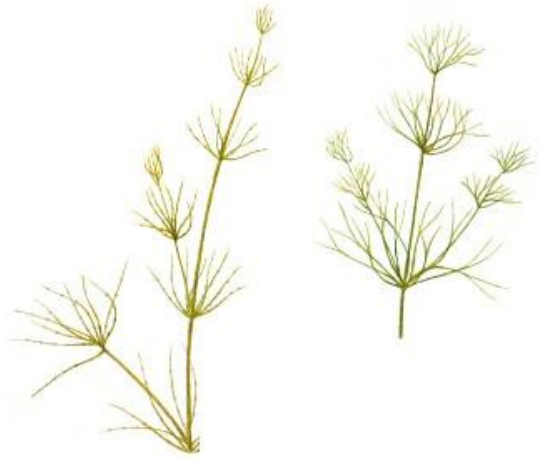
Identifying Algae

Algae is commonly referred to as "pond scum" or "pond moss" and typically forms greenish mats upon the water's surface. Algae usually begins its growth along the edges or bottom of the pond and "mushrooms" to the surface buoyed by the oxygen it has produced. Algae can also form fur-like growths on logs, rocks, and even the backs of turtles. The texture of these growths may be slimy, cottony, or coarse.

There are many groups of algae. The green group (clorophyta) has more than 7,000 species in a variety of habitats, including some of the most plant-like.

Algae can be found in almost any habitat on earth as long as moisture is there at some time, even if that time is very short.

Chara



There is one form of algae that resembles submerged plants. The common names for these are Chara and Stonewort.

Chara is very common on the bottom of lakes and ponds. Chara often looks like a matted tangle of plants, forming a carpet on the lake or pond bottom. It has a crusty, course texture and a musky odor when crushed in your hands.Chara has stem-like braches with forked leaves, and leaf-like structures that are whorled around the stem in fairly uniform intervals. Also look for little bumps or spots on the leaflets.

Chara can only be treated early in its growth cycle. Its course texture later in its growth cycle is caused by the absorbtion of mineral deposits. Once chara has absorbed these materials, it begins to have an innate resistance to algaecide. Because of this, we recommend that chara be treated for early in its growth cycle before it has a chance to absorb these mineral deposits.

Stonewort is similar, but has smooth branches and the stems are more translucent. The leaves also appear to be covered in a green gelatinous substance. Stonewort also lacks the musky odor found with Chara.

B. Duckweed-

Duckweed floats wherever the wind or currents take it, absorbing nutrients from the leaf undersurface and a very fine root hanging from it.

Duckweed is commonly spread by migratory birds flying between ponds with the tiny plants clinging to their feathers. Duckweed is very prolific, and given enough nitrogen and phosphorus nutrients, it is possible for a new duckweed plant to be produced every 24 hours. This means that in just two weeks, a single parent plant can result in up to 17,500 plants!

Extensive mats of duckweed colonies may cover an entire pond surface, depleting oxygen and blocking sunlight. Fish and submerged plants can be killed. Because of this, duckweed infestation often contributes to poor pond health.

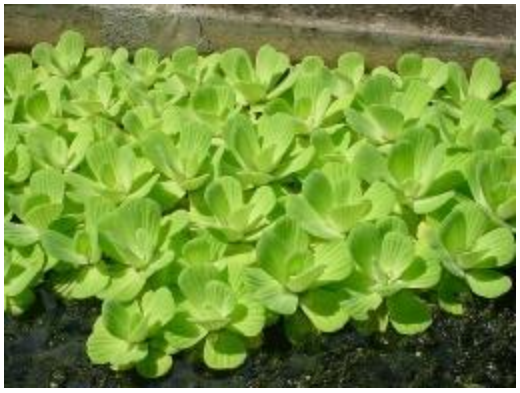
Duckweed can tolerate a wide range pH, between 4.5 and 7.5, as well as temperatures between 68F (20C) and 86F (30C), making duckweed a challenging aquatic plant management issue worldwide.

C. Water Lettuce-

Water lettuce is an aquatic weed commonly found in the southeast region of the United States. It grows in expansive mats that block sunlight to submerged aquatic plants, leading to lowered levels of bio-diversity.

Water lettuce is among the world's most productive freshwater aquatic plants and is considered an invasive species.In waters with high nutrient content, particularly those that have been contaminated with human loading of sewage or fertilizers, water lettuce can often exhibit weedy overgrowth behavior. It may also become weedy in hydrologically altered systems such as canals and reservoirs

Water lettuce is often used in tropical aquariums to provide cover for fry and small fish. It is also helpful as it outcompetes algae for nutrients in the water, thereby preventing massive algal blooms.



Water lettuce is an invasive plant that is commonly found in the southeast region of the United States. It has been known to clog waterways, making fishing, boating, and swimming difficult in affected areas. The plants grow in expansive mats that block sunlight to submerged aquatic plants, leading to lowered levels of bio-diversity.

- **Submerged weed-**

A. Hydrillia-

Hydrilla is a submerged aquatic plant from the genus Hydrilla. Hydrilla stems are up to 25 feet long and branched with oppositely arranged leaves at the bottom. Upper portions of the Hydrilla plant can have 2 to 8 whorls of leaves around the stem.

Hydrilla is very prolific. It can reproduce four ways: Fragmentation, Tubers, Turions, and Seeds (primary reproduction of Hydrilla is vegetatively with seeds being a minor means of reproduction).

Fragmentation is a very efficient means of reproduction that can occur from regrowth of a stem fragment with a single whorl of leaves (up to 50% of the time). Fragmentation is the main reproduction mechanism for Hydrilla.

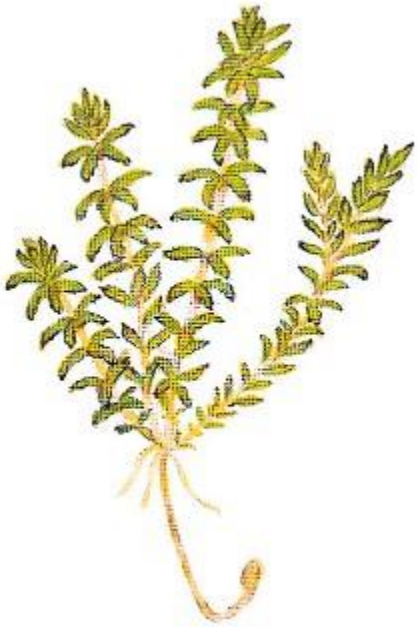
Hydrilla can also reproduce by potato-like **tubers** 1/2" long by 1/2" broad attached to the creeping root-like stem or rhizome found 30 cm deep in the mud. Hydrilla tubers can remain viable several days out of the water or for over four years in undisturbed sediment.

Dark green, cylindrical, auxiliary buds called **turions** (or winter buds) measuring about 1/4" at leaf axils are yet another way Hydrilla reproduces. There is evidence they can survive ingestion and regurgitation by waterfowl and herbicide applications.

Identifying Hydrilla

Hydrilla is a submerged plant from the genus Hydrilla. Hydrilla stems are up to 25 feet long and branched with oppositely arranged leaves at the bottom. Upper portions of the Hydrilla plant can have 2 to 8 whorls of leaves around the stem.

The small leaves are oval shaped with serrations at the margins and pointed spines on a reddish midrib underside. Hydrilla can be rough to the touch with profuse branching near the surface. Hydrilla has a creeping root-like underground stem or rhizome that is off-white yellowish.



Hydrilla tissue is 90% water with both male and female flowers on a single plant. The dense foliage of Hydrilla can form mats that intercept sunlight, thereby displacing native aquatic plants. Hydrilla is an agressive and competitive colonizer.

In the United States, Hydrilla is found primarily in the springs, ditches, marshes and lakes of southern states up to 40 degrees North latitude. This invasive, non-native is rapidly moving north

from present infestations in California, Arizona, Gulf Coast; and from Southeast states north to Washington D.C.

A wide variety of environmental conditions within flowing, stagnant, fresh, tidal, subtropical and temperate areas contain habitat suitable for Hydrilla. North and South America, New Zealand, Pacific Islands, Asia, Europe, Africa and Australia have Hydrilla.

Hydrilla can grow in oligotrophic (low nutrient) to eutrophic (high nutrient) chemical conditions. Hydrilla has a high resistance to salinity in tidal wave areas, up to 7% the salinity of sea water. Hydrilla can tolerate a wide pH range, but does best in pH 7. Hydrilla is found in light conditions as low as 1% of sunlight and depths of only a few inches to 50 feet.

B. Curly-Leaf Pondweed-

Curly-Leaf Pondweed appears reddish-brown in the water, but is actually green when examined out of water. Its leaves are wavy, stiff and crinkled, with a “crispy” texture (0.5 in. wide and 2-3 in. long).

Curly-leaf Pondweed is an aggressive invasive species. It begins to grow much earlier in the season than other weeds, leading to an uneven resource distribution that chokes out native species.

Curly-leaf Pondweed can be identified through a variety of physical characteristics. It appears reddish-brown in the water, but is actually green when examined out of water. Its leaves are wavy, stiff and crinkled, with a "crispy" texture (0.5 in. wide and 2-3 in. long). The leaves are arranged alternately around the stem and become more dense toward the end of the branches. The leaf tip is blunt and there are small teeth visible along the edge of the leaf (giving the leaf a serrated edge).

Curly-leaf Pondweed has slightly flattened stems and produces winter buds called turions (small, brown pine cones on shortened

branches along stem). Flower stalks, when present, stick up above the water surface in June. Curly-leaf Pondweed begins growing in early spring before most pondweeds (leading to a major competitive advantage) and can form dense mats early on in the spring, but by mid summer, it tends to die off a bit.

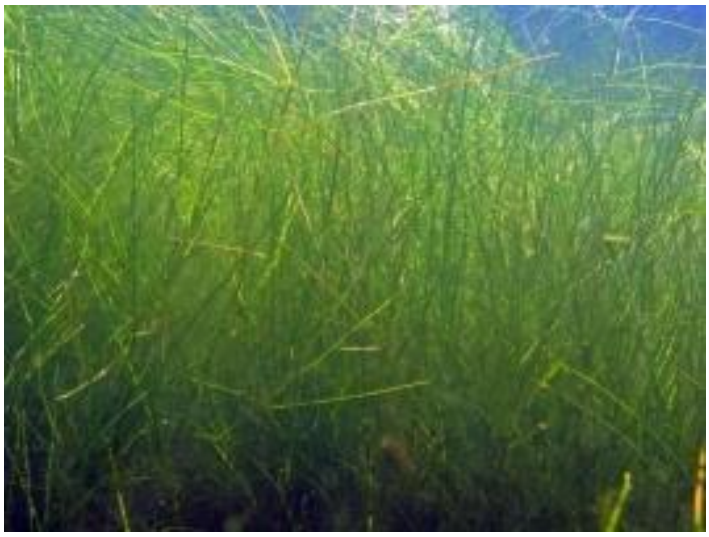
Curly-leaf Pondweed prefers a habitat where it can grow in depths of up to 15 ft. It also tolerates low water clarity and will readily invade disturbed areas.

Curly-leaf Pondweed is often confused with Clasping-leaf Pondweed, but the leaves of Curly-leaf have a serrated edge. It also has a unique life cycle (starts growing before most plants, dies off midsummer).

C. Sago Pondweed-

Sago Pondweed is a very common species of submersed plant that is found in both lakes and ponds. It's usually found in depths of 1-2 meters and is a bottom-rooting species.

Sago Pondweed is a very common species of submersed plant that is found in both lakes and ponds. It's usually found in depths of 1-2 meters and is a bottom-rooting species. It can grow in a variety of sediments and water conditions.



When viewed from the surface of the water, Sago Pondweed can resemble long strands of grass growing up from the bottom. Its leaves are 3-10 cm long and .5-1.5 mm wide.

The plant's flowers and fruit are produced on a slender stalk (3-10 cm long) that may be submersed or floating on the water surface. The flowers and fruit are arranged in small whorls that are slightly spaced apart on the stalk (creating the appearance of beads on a string).

Conclusion

It concluded that the Aquatic weeds plays a vital role in the ecological structure and ecosystem function in this dam.

Because of this weeds it's good ecological key to this dam as well as other connected tributaries.

Some aquatic weeds are feed like frogs fishes and others too.Weeds are good food bt they also damage the water too.

Because of this geographical condition this dam is beginning the center of attraction to people for their own purpose and specially for aquatic purpose..