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TYPES OF VEGETATION USED IN CONSTRUCTED WETLAND

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Abstract

Vegetation plays important role in waste water treatment wetlands. Plants provide a substructure for micro-organisms, which are the most important processors of wastewater contaminants. Plants also provide micro-organisms with a source of carbon. Stands of vegetation reduce current velocity, allowing solids to settle out of the water column. Plants consumption nutrients, but as the plants senesce, some nutrients are released back into the water. A portion of the nutrients is retained in the under composed fraction of the plant lit. and accumulates in the soils. Plants oxygenate the root zone by release of oxygen from their roots, and provide aerobic micro-organisms a habilitated within the reduced soil. Plants have additional site-specific values by providing habitat for wildlife and making wastewater treatment systems most thetical amiable. Wetland species of all growth forms have been used in treatment wetlands. Their are most robust species are commonly used as of emergent plants, such as the common reed, cattail and bulrush.

Keywords: *Aquatic plant, Macrophyte, Nutrient removal, Phytoremediation, Wetland*

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1. INTRODUCTION

1.1 General

Wetland systems, including constructed wetlands for wastewater treatment, wetland are vegetated by wetland plants. The ability of wetlands to transform and store organic matter and nutrients has resulted in a use of wetland for wastewater treatment. Wetland plants are an important component of wetlands, and the plants have different roles in relation to the wastewater treatment processes. The role of the wetland plants in constructed wetlands. Reduce water column mixing and suspension and, in turn, increase sedimentation. Provide more surface area in the water column, which will increase biomass. This will result in greater pollutant uptake and particle interception. Reduce algal growth by providing shade over the water column . Cause flocculation of smaller colloidal particles into larger, settled particles. Since biological transformations within the wetland are largely a function of available area for biofilm growth, the creation of surface area by emergent aquatic plants and associated leaf litter is an important contribution to biological treatment process in FWS wetland

1.2 Importance of Waste Water Treatment

Wastewater treatment can be an effective way to protect the environment and public health, especially when waste water is reused for crop production. Treatment systems based on natural degradation processes, such as stabilization ponds and constructed wetlands, are particularly used for domestic wastewater treatment where sufficient land is available, because they require little or no energy, are relatively simple to operate, and show reliable treatment performance.

2. LITERATURE SURVEY

2.1 Vegetation

Vegetation is an assemble of plant species and the ground cover they provide. It is a general term, without specific refer to particular taxa, life forms, structure, spatial extent, or any other specific geographic characteristics. It is an broader than the term flora which refers to species composition. Prolapse the closest synonym is plant community, but vegetation can, and often does, refer to a wider range of spatial scales than that term does, including scales as large as the global. Perenial redwood forests, coastal mangrove stands, sphagnum bogs, desert soil crusts, roadside weed patches, wheat fields, cultivated gardens and lawns; all are comperhend by the term vegetation.

The vegetation type is defined by characteristic dominant species, or a common aspect of the assemblage, such as an elevation range or environmental commonality. The current use of vegetation approximates that of ecologist Frederic Clements' term earth cover, an expression still used by the Bureau of Land Management. Natural vegetation refers to plant life undisturbed by humans in its growth and which is controlled by the climatic conditions of that region.

2.2 Natural Vegetation

1. It refers to a plant community which has grown naturally without human aid and has been left undisturbed by humans for a long time.
2. Cultivated crops and fruits, orchards form part of vegetation but not natural vegetation
3. The virgin vegetation, which are purely Indian are known as endemic or indigenous species but those which have come from outside India are termed as exotic plants.
4. The term flora is used to denote plants of a particular region or period. The species of animals are referred to as fauna.
5. Natural vegetation are gifts of nature. They grow naturally. They follow the climatic variables. Due to a changes of climates, a wide range of natural vegetation grows in India. Types of natural vegetation vary according to climate, soil and altitude. A study of the distribution of the forests in India reveals that there is a marked relation between the rainfall zones and their belts of natural vegetation.

2.3 Types of Natural Vegetation

The types of natural vegetation in India and their characteristics

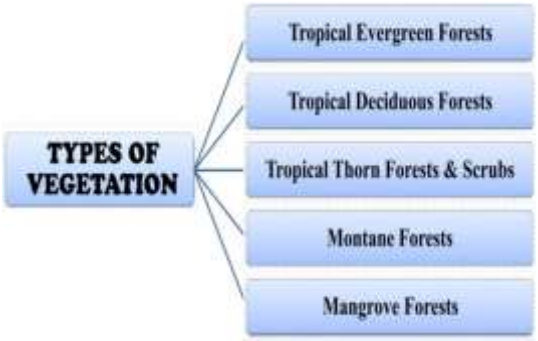

Fig. 1: Types of vegetation

3. TYPES OF VEGETATION USED IN CONSTRUCTED WETLAND

Following are some of types of vegetation used in constructed wetland

3.1 Typha Latifolia

Broad leaf cattail, bulrush, common bulrush, common cattail, cat-o'-nine-tails, greatreedmace, cooper's reed, is a perennial herbaceous plant in the genus Typha. Typha is found as a native plant species in North and South America, Europe, Eurasia, and Africa. In Canada, broadleaf cattail occurs in all provinces and also in the Yukon and Northwest Territories, and in the United States, it is native to all states except Hawaii.

a) Typhalatifolia has been found in a variety of climates, including tropical, subtropical, southern and northern temperate, humid coastal, and dry continental. It is found at elevations from sea level to 7,500 feet.

b) Typhalatifolia is an "obligate wetland" species, meaning that it is always found in or near water. Species are grows in flooded areas where the water depth does not exceed 2.6 feet. However, it has also been reported growing in floating mats in slightly deeper water. It is mostly grows in fresh water but also occurs in slightly brackish marshes.

c) The plant is 1.5 to 3 metres high and it has 2–4 cm broad leaves, and will generally grow out in to 0.75 to 1 metre of water depth.

d) Typhalatifolia is called totora, espadanacomún, tuleespidilla,

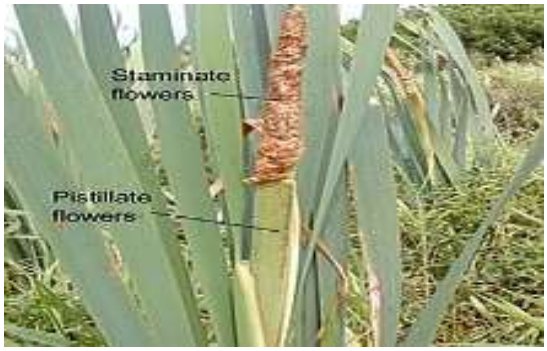

Fig. 2: Typhalatifolia

Typhalatifolia can be used as:

a) Traditionally, Typhalatifolia has been a part of many native North American cultures, as a source of food, medicine, and for other uses. The rhizomes are digestable after cooking and removing the skin, while peeled stems and leaf bases can be eaten raw, or cooked. Young flower stick are edible as well. Some cultures make use of the roots of it is as a poultice for boils, burns, or wounds.

3.2 Scirpus Lacustris

Schoenoplectuslacustris grows up to 3.5 metres tall, with stems 5–15mm thick. Most of the leaves of S. lacustris are reduced to bladeless sheaths around the stem, but blades of leaf up to 100 centimetres long can be formed under water. The inflorescence appears at the top of the stem, and comprises 3–10 branches, each of which is up to 10 cm long and may be again divided into shorter branches. The flowers are in the form of spikelets, each of which is 6 to 15mm long by 3 to 5 mm wide. The stems of S. lacustris are round in cross-section, in contrast to the rounded-triangular stems of other species in the genus, such as S. triqueter and S. pungens. The stems of S. tabernaemontani are also round, but S. tabernaemontani is a smaller plant, less than 1.5 m tall, with only two stigmas per flower.

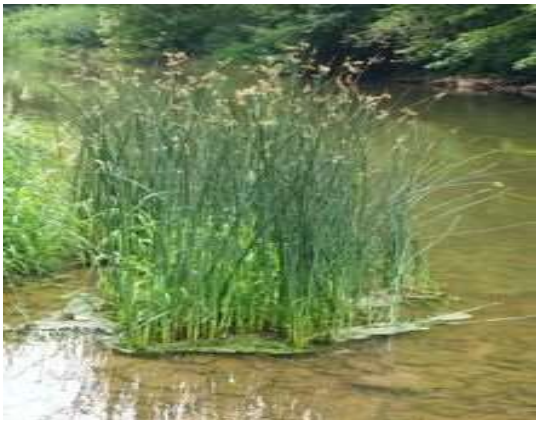

Fig. 3: ScirpusLacustris

3.3 Iris Pseudacorus

Iris pseudacorus (yellowflag, water flag, leverspecies in the genus iris, of the family iridaceae. It is native to Europe, western Asia and northwest africa. Its specific epithet, meaning "false acorus", refers to the similarity of its leaves to those of acoruscalamus, as they have a prominently veined mid-rib and sword-like shape.

It is an herbaceous flowering perennial plant, growing to 100–150 cm or a rare 2 metres tall, with erect leaves up to 90 cm long and 3 cm broad. The flowers are bright yellow, 7–10 cm across, with the typical iris form. The fruit is a dry capsule 4–7centimetres long, containing numerous pale brown seeds. I. Pseudacorus grows best in wet conditions, and is often common in wetlands, where it tolerates submersion, low ph, and anoxic soils. The plant spreads quickly, by rhizome and water-dispersed seed. It fills a similar niche to that of typhaand often grows with it, though usually in shallow water. While it is primarily an aquatic plant, the rhizomes can survive prolonged dry conditions.

Large

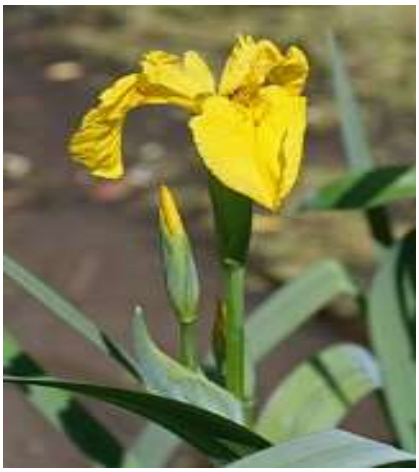

Fig. 4: Iris Pseudacorus

Iris Pseudacorus can be uses as

a) The rhizome has historically been used as an herbal remedy, most often as an emetic. when applied to the skin and inhaled, the tannin-rich juices can be acrid and irritating.
b) This plant has been used as a form of water treatment since it has the ability to take up heavy metals through its roots and is featured in many as level biology practical as its ability to grow in low ph levels makes it a useful indicator.

3.4 Glyceria Maxima

Glyceriamaxima Holmb.(syn. G.Aquatica (L.) Wahlenb.; G.Spectabilismert,&W.D.J.Koch; Moliniamaxima Hartm.; Poaaquatica L.), commonly known as great Manna Grass, Reed Manageress, and Reed Sweet-grass, is a species of rhizomatous perennial grasses in the manageress genusto Europe and Western Siberia and growing in wet areas such as river banks and ponds. It is highly competitive and is often considered to be a noxious weed outside its native range.

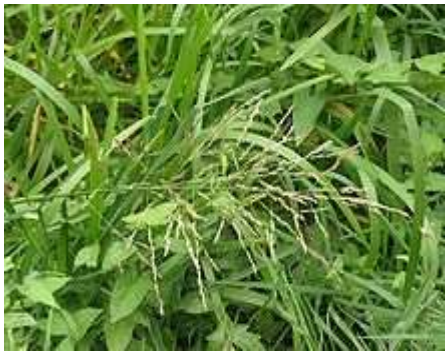

Fig. 5: Glyceria maxima

4. CONCLUSION

Identify different wetland plants including aromatic grasses to increase Fertility of soil through constructed wetlands. Study the growth plants and their effects on wastewater treatment in constructed wetlands. Grow the plants which may be directly utilized as commercial crops, such as manufacturing paper, tapping glue or rubber, lavender, timber for construction, henna for hand sand natural fibres. Use different combination of wetland plants and non-wetland plants to aim for zero pollutants in effluentsple to operate, and although researchers agree that plants have a generally positive effect on wastewater treatment in constructed wetlands, the practical planning and maintenance of plantations is still premature as we lack the appropriate knowledge to direct these endeavors. This clarifies the necessity of widening the scope of knowledge regarding the practical use of plants in constructed wetlands, which will lead to their better use in the treatment process.

(1)Concentrating on specific species and their mechanisms in constructed wetlands dynamics and (2) in practice, being more mindful when planning the use of plants. Such plan should include choosing the species, oftheir composition, the order of planting and their spatial arrangement, as well as the educated practice of a harvest plan. The use of constructed wetland plants for commercial purposes should also be considered. These new perspectives expand the potential use of plants in constructed wetlands and add more factors to consider when planning vegetation and management practices for constructed wetland Show reliable treatment performance

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