

# REVIEW ON PHYTOREMEDIATION PROCESS TO TREAT WASTEWATER

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**Abstract** - One of the most serious problem being faced by the world today is wastewater. The growing scarcity of water along the rapid population increase in urban areas gives reason for concern and the need for appropriate water management practices. Nowadays many technologies are used for treatment of wastewater and Phytoremediation is going to get converted into eco-friendly technology from green technology with the help of researches done by scientists. As an emerging and eco-friendly green engineering technology Phytoremediation uses natural properties of plant to treat contaminated soil, water and sediments. Due to low remediation efficiency the practical implementation is limited. In this paper we address the review of some research papers on this topic of phytoremediation.

**Keywords:** Wastewater, Phytoremediation, Treatment, Heavy Metals.

## 1. Phytoremediation of Domestic Wastewater using Eichhornia Crassipes.

ALIREZA VALIPOUR, V. KALYAN RAMAN and V.S. GHOLE.

In this review paper of phytoremediation a study was carried out using shallow pond water hyacinth (Eichhornia crassipes) system and analytical data was collected before and after treatment. They also stated the comparison between conventional water hyacinth and the shallow pond water hyacinth in which the shallow pond water hyacinth system shows better treatment efficiency. Normal water hyacinth was collected from the local lake and experiment was done. The domestic wastewater sample was being collected from the sewage treatment plant in Pune. Tests like temperature, pH, COD, BOD5, dissolved oxygen(DO), Chlorides, TDS, TSS, NH3-N, PO4-P, MPN and TVC as per the standard methods were carried out. Many Hydraulic Retention like 48h, 36h, 24h, 21h, 18h, 15h, 12h & 8h was used until the COD percentage reached a constant level. From the results we get to know as we keep on increasing Hydraulic Loading Rate more difference we get to see before and after test.

## 2. Wastewater Treatment by Phytoremediation Methods.

Hossein Farraji

In this paper information about wastewater treatment by phytoremediation is given. Mainly the paper is focused on the use of aquatic plants as they have main role in water

resources and food chain. An introduction to this method of treating the wastewater is given. A table format easily explains the types of phytoremediation and their types, media, contaminants and plants which can be used. Importance of aquatic phytoremediation is also given. Types of phytoremediation process are very well explained. Also is brief information about heavy metals is provided. At last a table summary of recent studies on aquatic phytoremediation is provided so that it gets very helpful for us to implement if we ever want to.

## 2. PHYTOREMEDIATION- AN OVERVIEW REVIEW.

A.VASAVI, R. USHA AND P.M. SWAMY

In this review a general idea about phytoremediation is delivered. Main focus is on the development of transgenic plants with improved phytoremediation capabilities and their potential use in environmental cleanup. A proper description of the materials and method to be used is explained. Working process of phytoremediation is also given. A brief information about proper plant section is provided and a list of some plants

Used in phytoremediation is provided too. Using a diagram processes are explained in short. A table of some heavy metals and plant species which can purify them is also provided which is very helpful. Some achievements, advantages of this method is also given.

## 3. Phytoremediation of Heavy Metals from Urban Waste Leachate by Southern Cattail (Typha domingensis).

Amin Mojiri, Hamidi Abdul Aziz, Mohammad Ali Zahed, Shuokr Qarani Aziz, M. Razip B.Selamat.

In this review, phytoremediation treatment was used to treat the heavy metals inside the wastewater. Typha domingensis i.e. Southern cattail plant is being used for the treatment. These plants were transplanted into pots containing 10 litres of mixed urban waste leachate and water (mixed 75 percentages of waste located with 25 percentage of water). Hydraulic Retention Time was taken as 24, 48 and 72 hours. The majorly focused heavy metals were Nickel (Ni), Lead (Pb), Cadmium (Cd). From results it is found that the Typha domingensis is effective accumulator plant for phytoremediation of were Nickel (Ni), Lead (Pb), Cadmium (Cd). The phytoremediation increased and got better results when the number of plants transplanting and time taking samples were increased.

#### **4. Phytoremediation of Heavy Metal Industrial contaminated soil by *Spiracia oleracea* L and *Zeamays* L.**

**Abhilash M.R, Srikantaswamy S, Shiva Kumar D, Jagadish K and Shruthi L.**

In this review heavy metals in industrial contaminated soil in Mysuru city is being treated by means of phytoremediation method. In addition Translocation Factor (TF) and Biological Concentration Factor (BCF) is being also carried out to find the ability of plants used. Plants used in this research are *Spiracia oleracea* L and *Zeamays* L. The sample was collected from the Industrial wastewater irrigated zone. The mainly focused metals were Copper (Cu), Iron (Fe), Nickel (Ni), Lead (Pb), Zinc (Zn). The most of uptake was from the readings of the roots as compared with the stem and leaf. In this study, it has been found that these two plants were more effective in accumulating certain metals compared with other species grown in that soil. *Zeamays* L. is being considered a hyperaccumulator of Iron, and is being able to accumulate heavy metals more efficiently and is more suitable for phytoremediation process.

#### **Conclusion**

In this method to treat the wastewater is more economical as compared with the wastewater treatment plants. The treatment of treating the heavy metals is very costly as the use the many different types of filters. Here we can simply grow some plants like discussed above and treat the wastewater effectively. This method is very easy to adopt, less costly and easy for maintenance. Different plants can be selected as per the requirement of treatment of water depending upon various factors like major impurities in water, type of land, climate, etc.

#### **References**

1. Phytoremediation of Domestic Wastewater Using *Eichhornia crassipes*. ALIREZA VALIPOUR, V. KALYAN RAMAN and V.S. GHOLE.
2. Wastewater Treatment by Phytoremediation Methods. Hossein Farraji.
3. PHYTOREMEDIATION- AN OVERVIEW REVIEW. A.VASAVI, R. USHA AND P.M. SWAMY.
4. Phytoremediation of Heavy Metals from Urban Waste Leachate by Southern Cattail (*Typha domingensis*). Amin Mojiri, Hamidi Abdul Aziz, Mohammad Ali Zahed, Shuokr Qarani Aziz, M. Razip B. Selamat.
5. Phytoremediation of Heavy Metal Industrial contaminated soil by *Spiracia oleracea* L and *Zeamays* L. Abhilash M.R, Srikantaswamy S, Shiva Kumar D, Jagadish K and Shruthi L.