International Journal of Advance and Innovative Research
Volume 9, Issue 3 July - September 2022
ISSN 2394 - 7780

STUDY OF BIO INDICTORS PLANTS OF MAUSAM RIVER MALEGAON

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ABSTRACT
Environment means our surrounding i.e. everything around us that includes biotic and abiotic components with which we are always in contact. Land, surface waters, and ground water worldwide, are increasingly affected by contaminations from industrial, research experiments, military, and agricultural activities either due to ignorance, lack of vision, carelessness, or high cost of waste disposal and treatment. The rapid build-up of toxic pollutants (metals, radionuclide, and organic contaminants in soil, surface water, and ground water) not only affects natural resources, but also causes major strains on ecosystems. Malegaon is located at the confluence of Girna and Mausam rivers, at elevation of 438 metres (1437 feet) at 18.42°N 77.53°E.It is located at around 280 km northeast of state capital Mumbai. It has good connectivity with nearby cities like Nashik, Manmad,Mumbai and Dhule. Power looms, the cloth industry in Malegaon flourished due to increased productivity. Malegaon is well-known city for Handloom and power loom. Malegaon is second largest city in respect of population in Nasik district of Maharashtra. Mostly Mausam River is most polluted river due to discharge of waste water for mills industries. This river downstream of river channel has naturally vegetation cover of some plants .this plants are pollution indicator.

Keywords: Malegaon, Pollution, Plants.

INTRODUCTION
The city is situated on the 20°32' North latitude & 74°35' East longitude .The average height of city area is 429.4 Mts. above the mean sea level. Malegaon city has an area of 12.95 sq. km. Malegaon city lies on the National Highway No.3. Railway junction Manmad lies at the distance on 36 km to the south of Malegaon the city of Malegaon. The city of Malegaon is on the bank of the river Mausam, which joins the Girna River further to the south .It is a part of Western Ghat which is known as Sahyadri Mountain in this area .Naturally the city lies on the lee-ward side & therefore this area suffers from low rainfall.

The textile industry uses high volumes of water throughout its operations, from the washing of fibers to bleaching, dyeing and washing of finished products. On average, approximately 200 liters of water are required to produce l kg of textiles (Table 1). The large volumes of wastewater generated also contain a wide variety of chemicals, used throughout processing. These can cause damage if not properly treated before being discharged into the environment. Of all the steps involved in textiles processing, wet processing creates the highest volume of wastewater. Following table shows textile industries different process, sources and releases of in river Mausam and Girna

Process	Source	Pollutants
Energy production	Emissions from boiler	Particulates, nitrous oxides (Nox) sulphur dioxide (So_2)
Coating, drying and curing	Emission from high temperature ovens	Volatile organic components (VOCs)
Cotton handling activities	Emission from preparation, Carding, combing and fabrics manufacturing	Particulates
Sizing	Emission from using sizing compound (gum, PVA)	Nitrogen oxides, sulphur oxide, carbon monoxide
Bleaching	Emission from using chlorine compound	Chlorine, chlorine dioxide
Dyeing	Disperse dyeing using carriers Sulphur dyeing , Aniline dyeing	Carriers H_2S
Printing	Emission	Hydrocarbon, ammonia
finishing	Resin finishing, heat setting of synthetic fabric	Formaldehyde carrier- low molecular weight polymer- lubricating oils
Chemical storage	Emissions from storage tanks for commodity and chemical	Volatile organic components(VOCs)
Wastewater treatment	Emission from treatment tanks and vessels	Volatile organic components toxic emissions

ISSN 2394 - 7780

MATERIALS AND METHODS

At present studies we observe that Mausam River downstream of river channel have naturally vegetation cover of some plants, like Eichhornia species, Azolla species, Salvia species Typha latifolia, duck weed this plants are pollution indicator also they control the pollution through the process of phytoremediation.

According to yang etal (1) phytoremediation is also consider a type of bioremediation which offers the possibility of bio recovery of heavy metals using plants. These plants have constructive and adaptive mechanism for accumulating or tolerating high contaminants in their rhizosphere, plants acts as a solar driven pump, which can extract and concentrate certain heavy metals from the environment .This remediation methods maintains the biological properties and physical properties of the soil, water and air.

Table 2 . Phytoremediation methods and its description and plant used for techniques

Sr.No	Phytoremediation methods	Description	Plants used
1	Phytoextraction	Plants absorb contaminants and store in above-ground shoots and the harvestable parts of roots.	Brassica juncea, Typha latifolia, Azolla filiculoides, (Brassicaceae,Euphorbiaceae, Asteraceae, Laminceae plant families)
2	Phytostabilization	Roots and their exudates immobilize contaminants through adsorption, accumulation, precipitation within the root zone, and thus prevent the spreading of contaminants.	Brassica juncea, Glycine max L.
3	Phytodegradation	Plant enzymatic breakdown of organic contaminants, both internally and through secreted enzymes.	Myriophyyllum aquaticum, Salix nigra, Taxodium distichum, betula nigra
4	Phytovolatilization	Plant roots stimulate soil microbial communities in plant root zones to break down contaminants	Arabidopsis thaliana, Brassica juncea, Brassica napue
5	Rhizofiltration	Contaminants taken up by the roots through the plants to the leaves and are volatized through stomata where gas exchange occurs.	Helianthus annuus.L, Hydrocotyle umbellate, Lemna minor, Azolla pinnata

Phytoremediation of various inorganic pollutants such as Cd, Cr, Pb, Cu, Zn, Co, Ni, Se, Cs and as has been extensively studied. This is mainly based on the use of natural hyperaccumulator plants with exceptional metal-accumulating capacity, which can take up metals to concentrations at least an order of magnitude greater than the normal plants growing in the same environment. These plants have several beneficial characteristics such as the ability to accumulate metals in their shoots and an exceptionally high tolerance to heavy metals (2), (3). At present, there are totally more than 400 species of hyperaccumulator plants for As, Cd, Mn, Ni, Zn etc. have been found.

RESULTS AND DISCUSSION

Mausam River downstream of river channel shows luxuriant growth of Eichhornia species as compare to Azolla species, Salvia species Typha latifolia, duck weed etc. These plant work as phytoremediation mechanisms through phytoextraction, phytostabilization, phytodegradation, phytovolatilization, rhizofiltration and rhizodegradation which helps to control or minimize the all kinds of pollution.

FUNDING SOURCES

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors

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