INTERNATIONAL JOURNAL OF RESEARCHES IN BIOSCIENCES, AGRICULTURE AND TECHNOLOGY
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www.vmsindia.org

AN ESTIMATION OF ALGAE IN DIFFERENT POLLUTED AQUATIC ECOSYSTEM

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ABSTRACT:
Algal populations possess many attributes as biological indicators of spatial and temporal environmental changes. Algal characteristics such as the structural and functional variables that have been used in biological estimation are presented in this document. Algae in aquatic ecosystems are an important component of biological evaluation programs for checking water quality. Aquatic populations are affected by anthropogenic activities, resulting in an alteration in the bio-aquatic systems. Microscopic analysis of water samples indicates that algal species provides potentially useful early warning signs of harmful conditions. Toxin-producing blooms are responsible for disturbing Lake Ecosystem. Laboratory microscopic evaluation, which reveals the composition and density of the algal flora present in a water body, is an important component of monitoring programs and is valuable in determining diverse trophic conditions. In addition to blue green algae, other species of chlorophyceae, diatoms, etc. are useful indicators for estimating water quality.

Keywords: Algae, Bio-indicator, aquatic, ecosystem, blooms.

INTRODUCTION:

Governmental organization and the general public have become much concerned about monitoring the quality of aquatic sources. Physical and chemical estimations provide quantitative information on the presence and levels of aquatic pollution, but these data do not reflect the extent of environmental stress reaching the living organisms. Organic pollution could negatively impact on the water quality in different ways. During the degradation and decomposition process of organic water, dissolved oxygen in the water body may used up to greater rate than it can be restore thus, giving rise to oxygen depletion which causes severe effects on the aquatic ecosystem. Nutrient enrichment is one of the most common problems in lakes, and scientists have demonstrated the strong association between nutrient loading and phytoplankton biomass. Algae can grow in abundance to the extent that they change properties aquatic ecosystem, which can significantly impair the recreational uses of water systems. Algae are involved in water contaminaton in a several ways. Enrichment of inorganic chemicals are responsible for the growth of algae in water bodies.

Bio-indicator algae can be used to estimate the effects of pollutants on the environment. Although indicator algae's can defines a trait or characteristics of the environment. Algae are known to be good indicators of pollution of many types for the following reasons: Many algal species are available all the year. Response fast to the fluctuations in the environment due to pollution. The presences of some algae are well correlated with particular type of pollution particularly organic pollution. Algae have wide temporal and spatial distribution.

MATERIAL & METHODS :

An analysis of various aquatic algae reported in literature and acting as indicator of water pollution was carried out and an account of most pollution tolerant genera and species was included in the results. The samples are collected from three different sites which includes industrial effluents, home sewage and organic sewage.

RESULTS

Algae growing in different types of polluted waters are:

1. Algae Association Indicating Industrial effluent:

a) Algae indicating high acidity: *Euglena mutablis, Euglena stellata, Euglena viridis, , Ulothrix zonata,*

b) Distillery effluent: *Chlamydobotrys sp., Chlorogonium gracilliama.*

c) Industrial effluent: *Chlamydomonas ehrenbergii, Cyclotella meneghiniana, , Navicula pygmea, N. subtilissima, Nitzschia,* Oil effluent: *Amphora ovalis, Diatoma vulgare, Gomphonema Herculaneum, Melosira varian, Navicula radiosa, Surirella molleriana, Synedra acus, S. ulna.*

d) Phenolic effluent:*, Cyelotella kuetzinigii, Diatoma vulgare, Fragilaria virescens, Nitzschia palea, Synedra ulna.*

e) Chromium effluent: *Euglena acus, E. oxyuris, E. sociabilis, E. viridis, Navicula atomus, N. cuspidate, Nitzschia linearis, N. palea.*

DISCUSSION

Regarding algae in polluted water it can be concluded that: the type of pollution cannot be correctly indicated solely by the presence of the single species; different species of the same genus may behave differently, some may occur in polluted waters, while other require unpolluted waters for their growth; similarly different strains of the same species may either require clear water for their growth or may grow in polluted waters e.g. There are reports that *Oscillatoria spp.* from a utter were not able to grow in clear water. Ecological studies on algae carried out at 3 sites of an effluent. Based on the relative abundance, *Oscillatoria acuminate, O. amphibian, O. subtillissima, O. subbrevis, O. laetevirens var. minimus, Scenedesmus opoliensis var. mononensis, Chlamydomonas conferta and nitzchia amphioxiodes* have been considered to be the pollution-tolerant taxa. *Cyanophyceae* was found to be the most pollution tolerant group. Other 3 groups, viz. Chlorophyceae, Euglenophyceae and Bacillariophyceae were found to be very sensitive to pollution and they were represented only by a few genera. It has been suggested that the presence of certain algal species can be considered as reliable source as the pollution indicators.

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Wikipedia https://en.wikipedia.org/wiki/Algae

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The home sewage carried in the open usually show abundant growth of algae as under which were given in following table;

Class	*Genera*
1. Euglenophyceae	*a) Euglena acus* *b) E. charkowiensis* *c) E. spirogyra*
2. Cyanophyceae	*a) Oscillatoria amphibian* *b) O. bozyana* *c) O. mougeotia* *d) Spirulina major*

Algae of Organically Polluted effluent :

Algae of the organically polluted wastes belonging to different genera are given in table;

Class	Genera
1) Euglenophyceae	*a) Euglena aeus*
	b) E. gracilus
	c) E. spirogyra
	d) E. viridis
2) Chlorophyceae	*a) Carteria multifilis*
	b) Chlamydomonas reinhardtii
	c) Chlorella pyrenoidosa
	d) Chlorella vulgaris
	a) Chlorococcum humicolum
	b) Pandorina morum
3) Cyanophyceae	*a) Oscillatoria chalybea*
	b) O. Chlorina
	c) O. lutebornii
	d) O. limoa
	e) O. putrida
	f) O. envis
4) Bacillariophyceae	*a) Navicula cryptocephala*
	b) N. muralis