



BIOINDICATORS in ENVIRONMENT

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Bioindicators are organisms, chemical markers or biological processes whose change point can be observed to altered environmental conditions and can be used to identify and quantify the effects of pollutants on the environment.

Bioindicators are organisms, such as lichens, birds and bacteria that are used to monitor the health of the environment. The organisms and organism associations are monitored for changes that may indicate a problem within their ecosystem. The changes can be chemical, physiological or behavioral. Bioindicators are relevant for Ecological health.

Bioindicators may be of two types:

a- Accumulation bioindicator: store pollutants without any evident changes in their metabolisms.

b- Response bioindicator: react with cell changes or visible symptoms of damage when taking up even small quantity of harmful substances. There may be Ecological changes; Behavioural changes; and Physiological changes.

Bioindicators are used to: detect changes in the natural environment, monitor for the presence of pollution and its effect on the ecosystem in which the organism lives, monitor the progress of environmental cleanup and test substances, like drinking water, for the presence of contaminants. Specific physiological and behavioral changes in bioindicators are used to detect changes in environmental health. The specific changes differ from organism to Organism. The use of organisms as bioindicators encompasses many areas of science.

Uses, Types of Organisms as Bioindicators

1- Microbial Indicators

Microorganisms can be used as indicators of aquatic or terrestrial ecosystem health. Found in large quantities, microorganisms are easier to sample than other organisms.

2- Plant Indicators

The presence or absence of plants or vegetative life can provide important clues about environmental health, or they can be accumulators of metal or their metabolism product. Plants are increasingly being used as highly effective and sensitive tools for recognizing and predicting environmental stresses.

3- Animals as bioindicators

An increase or decrease in an animal population may indicate damage to the ecosystem. For example, if depletion of important food sources occurs, animal species dependent upon these food sources will also be reduced in number *i.e.* population decline. Overpopulation can result due to growth of opportunistic species.

4- Insects as bioindicators

- For example when dissolved oxygen is reduced, haemoglobin-possessing bloodworms (Chironomidae) increase in number. And Stonefly nymphs decline as temperature increases ; also Pesticide runoff leads to substantial reduction in species diversity.