PHYTOINDICATION IN ASSESSING OF ENVIRONMENTAL POLLUTION

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The deterioration of the ecological situation on Earth as a whole and in many industrial countries in the second half of the XX century led to a revision of environmental concepts of nature protection, the search for new effective methods for assessing environmental pollution and the state of biota at all levels of its organization, the development of new environmental standards for permissible anthropogenic loads on natural systems.

Vegetation is the most important component of biogeocenosis, ensuring the vital activity of other biotic components. Vegetation changes under the influence of various environmental factors affect the state of biogeocenosis as a whole and, as a result, can be used as diagnostic signs.

Phytoindication as one of the directions of bioindication was formed in the XIX century. due to the need to solve practical problems for determining the depth of groundwater, salinization, geochemical anomalies, etc.

Phytoindication can be carried out by the response of plants in species that are most sensitive to individual ingredients, or by the accumulation of harmful substances in the body of plants. Therefore, among plants there are (1) bioindicators with high sensitivity to pollutants and (2) storage bioindicators.

Due to the peculiarities of metabolism (the presence of a highly sensitive photosynthetic apparatus that absorbs toxic substances from the environment), plants are more used to diagnose atmospheric air pollution, but they can also be used to diagnose soil pollution.

To diagnose the levels of total air pollution, it is better to use the first group of bioindicators, since changes and disturbances in them directly reflect the degree of air pollution. Bioindicators-storage devices can be used to diagnose air pollution with a specific pollutant. In this case, it is necessary to additionally experimentally determine at what levels of accumulation of pollutants in organisms there are permissible levels of air pollution.

The classification of the principles and levels of phyto-indication of air quality and the environment in general can be built taking into account the levels of organization of living matter: (1) molecular, (2) subcellular and cellular, (3) organ and organismic, (4) population, (5) ecosystem or biogeocenotic, (6) biospheric.

The effect of gaseous toxicants on plastid pigments is widely discussed in the literature. There is evidence that under the influence of low doses of SO2 and HF, pigment formation is stimulated, and high concentrations of these gases lead to a decrease in the content of chlorophyll, which may be a consequence of the destruction of chlorophylls and their transformation into the corresponding pheophytins, as well as a decrease in the

synthesis of chlorophyll. It is noted that chlorophyll type A and carotenoids are more sensitive to industrial emissions than chlorophyll b. A number of researchers have used the pigment composition of photosynthetic plants to diagnose their resistance to gases and the degree of their damage.

Biophysical methods of studying the vital activity of plants have significant advantages over traditional physiological and biochemical methods, since they allow to study many processes in the dynamics of the action of any environmental and anthropogenic factors in vivo (without killing and rubbing). These include electrophysical methods for registering pH and pH, electrical conductivity and electrical capacitance, bioluminescence, spectral analysis and some others. Many researchers have found that acidic gases cause a decrease in pH, Eh and gH, and alkaline gases (NH3) cause their increase. Under the influence of industrial emissions in woody plants, the electrical resistance of tissues increases from 80-100 to 200-500 mOhm in weakened trees and to more than 500 mOhm in dying trees. Consequently, this method makes it possible to assess both long-term levels of air pollution and the state of forest ecosystems.

In recent years, among the methods of assessing the state of the environment, lichenoindication (indication of the state of lichens) has acquired a certain and worthy place. Compared with aerochemical methods, it has a number of positive aspects: (1) it is a fast and cheap method for mapping chemical loads over large areas; (2) the method allows you to record the state of the air environment for a long time. However, this method can be used only in those cities and forest ecosystems where there are lichens. Currently, the sensitivity of a large number of lichen species to a number of pollutants has been studied, their field tolerance has been determined.

Experience of ecological zoning of territories, revision and approbation. It is necessary to develop criteria that are subject to complex pollution, with the use of a phyto-indication based on the composition of pollutants and levels of em, shows that a system of criteria is quite successful with chronic pollution, allowing for this purpose such morphophysiological indicators of the state of plants and ecosystems as indicators of the state of plants, such as the activity of peroxidation to assess air pollution levels, and vice versa. dazs, radial annual growth, as well as ICH, calculations- This will increase the efficiency of bioindicationtann according to the parameters of lichenoflora. to carry out scientific work and lay the scientific foundations for the ecological methods of phyto-indication, forecasting and expertise given here. environmental pollution requires additional

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