

Research of the Activity of Chlorophyllase in Plants Growing in the High Radiation Background Zone

A. Jafarly and E. Dzhafarov

*Institute of Radiation Problems of ANAS, F. Agayev 9, AZ1143 Baki, Azerbaijan
e_dzhafarov@rambler.ru*

The research objects have been *Alhagi pseudalhagi*, *Zygophyllum* L. and *Argusia sibirica* L. Choice of the plants is connected to the fact that they are the most widespread ones in the chosen site, ground of which is dirtied by ^{238}U , ^{232}Th , ^{226}Ra and ^{40}K . The work has been aimed on researching impact of the low-dosed ionizing radiation to photosynthesis of plants. The findings show that between concentrations of photosynthetic pigments in experimental and control plants growing in identical soil-climatic conditions there are certain distinctions being sometimes very considerable ones. Besides, in the concrete natural conditions photosynthetic reaction of different species to irradiation proves to be different and for a plant taken separately the reaction has seasonal character. Analysis of the dynamics of green pigments' synthesis for *Argusia sibirica* L. at the first two phases of development has shown that the photosynthesis intensity was practically similar in experimental and control plants. At the same time final phase of the plant's development was notable for decrease of the photosynthesis intensity, resulting in the inhibition of speed of the pigments' synthesis. For *Alhagi pseudalhagi* both at the initial, and the final phase of vegetation period there was observed decrease of the chlorophylls' synthesis. At the middle phase the ionizing radiation favored increase of pigments' concentration in this plant at nearly 30%. The fact of increase of chlorophylls' concentration in leaves of the researched plants under impact of radiation can be accepted as stimulation of pigment biosynthesis. Taking into account that biosynthesis of pigments is also specified by activity of chlorophyllase enzyme, we deemed expedient to research change of the enzyme's activity. Activity of the enzyme was judged by us from increase of chlorophyllid's number in the sample within a certain period of the pigment's incubation with the enzyme preparation. It was revealed that for all the researched plants, where is found out biostimulation of the chlorophyll's synthesis, activity of the chlorophyllase decreases. We can suppose that decrease of chlorophyllase's activity under impact of the ionizing radiation is reason for intensification of chlorophylls' synthesis. In other words, it can supposed that the chlorophyllase isn't catalyst of the biosynthesis of the chlorophyll a, but on the contrary, performs at this time some hydrolytic function realizing decay of the chlorophyll's molecules.