

Radium Accumulation By Plants

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Researches on the uranium deposits conducted in cooperation with M.S.Makarov have established that plants practically do not accumulate uranium, and radioactive equilibrium in plants growing over uranium ore bodies removed to the radium side in tens, hundreds and thousands times. Owing to this highlyproductive radium determinations according to alpha-activity of plants ash and use of radiochemical analysis only to determine uranium or thorium nature of the revealed anomalies of alpha-activity turned out to be possible. Practically all anomalies of plants alpha-activity exceeding the local background in 10-2000 times turned out to be connected with appropriate radium anomalies, and the most intensive ones – with uranium ore bodies. It was established that radium is accumulated by all studied plants bioobjects linearly proportionally to its concentrations in the rootinhabited zone according to the non-barrier type. Radium plant-soil coefficient (PSC) (ratio of its contents in ash and in soil nutrition horizon 1-5 m deep) changed from 0,3 to 30 and was equal to 2-3. Later it was established that the greatest values of radium PSC were revealed when uranium is present in the rootinhabited zone as sorbed forms, and the least values – when entering uranium minerals into quartz, that made radium heavily available for plants.

The reason of uranium low contents in overground parts of plants growing over uranium ore bodies is presence of absorption limits in them on the level $10^{-6}\%$ in ash. The majority of overground bioobjects accumulated uranium according to the background barrier non-informative type. Determination of quantitative barrier characteristics (QBC) has allowed to conduct grouping of studied plants-bioobjects according to their prospecting radioactivity for uranium and radium. According to his data the roots of 12 plants species, green moss (Common hair moss) – *Polytrichum hyperboreum* R. Br. and lichen (Cup moss – reindeer moss) – *Lichenenes* were non-barrier, quantitatively-informative bioobjects in relation with high uranium concentrations. Only 4 from 80 studied bioobjects: crust of the lower part of pine (*Pinus silvestris*) and larch (*Larix dahurica Turcz.*) trunks, suberificated pine cones and stalk of rhododendron dahurica (*Rhododendron dahuricum* L.) were practically non-barrier. Leaves (needles), sprouts and twigs of majority of studied trees and shrubs of Siberia were non-informative, background-barrier in relation with uranium. All 139 studied plants bioobjects turned out to be non-barrier in relation with radium. The researches of 1960-s showed that in “young” green parts of plants radium contents increased from spring to autumn in 2-5 times, and in old bioobjects – trees trunks crust, in suberificated cones and in 3-10 year lengths of trees and shrubs twigs were stable in time. weeks after samples ashing, when radonin them is in equilibrium with radium.