

RESULTS OF ALLELOPATY RESEARCH IN SLOVAK FOREST ECOSYSTEMS

Čaboun V.

Forest Research Institute Zvolen, T. G. Masaryka 22, 960 01 Zvolen, Slovakia
e-mail: Vladimir.Caboun@fris.sk

Majority of scientific workers dealing with allelopathy suppose that this branch dealing with biophysical and biochemical interrelations of organisms has been still in the beginning of deeper cognition. Therefore there are still new possibilities of using allelopathy in practice and there are explained phenomena not explained up to now.

Considering the fact interrelations of organisms and thus also allelopathy has been formed for long millennia in natural environment it is very difficult to observe them in natural ecosystems. But if some external intervention occurs in ecosystems allelopathic interrelations are clearly evident – proportional to the intensity of intervention to natural development. Man causes greatest interventions in the nature.

There is outline at least some of this amount of possibilities and resultates of allelopathy in forest ecosystems in the article.

Allelopathy in seed production: Mutual influencing of tree species was apparent already in seed germination. It follows from results that germination and germination energy can be influenced considerably by aboveground as well as soil macerate of tree species, plants but also other organisms living in forest ecosystem.

Allelopathy in nursery management and forest regeneration: The effect was apparently even stronger in case of seedlings and plants. After the assessment of two years long experiments with the seedlings of tree species we found the greatest negative effect of locust seedlings on Scots pine. Inhibitory effect of volatile substances of aboveground part of locust tree on the seedlings of pine was so strong that in the distance of 15 cm from locust tree any seedling of pine was not growing. We studied also the effect of macerate on the growth of plants.

Allelopathy in forest protection: A big group of substances being used in attraction or repelling insects and higher animals belong here. Explanation of allelopathy in the framework of forest protection will enable to explain interactions between stand and pests, what will contribute to increase of total resistance potential of stands.

Allelopathy in influencing forest structure: Interrelations of tree species were studied also in other regions of Slovakia. With study of mutual effects of 20 years old various tree species growing close to each other we found also considerable differences in diameter, height, branching, formation of wood and total biomass of tree species. We observed the strongest effect with birch on pine. Also the effect of alder on spruce is very negative.

Importance of allelopathy for production of biomass: The allelopathy can influence, under some conditions, the creation of biomass positively and the bioproduction can increase more by than 100%, or negatively and than bioproduction can decrease till zero.