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**INTEGRATED ASSESSMENT OF THE POTENTIAL
HAZARD OF INSECTICIDES EXPOSURE TO THE
HUMAN BODY WHEN CONSUMING CONTAMINATED
AGRICULTURAL PRODUCTS (ONBIFENTHRINEXAMPLE)**

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The pesticides application is conditioned by the needs to preserve the crops, therefore they are introduced into agrocenoses and continuously circulating in the environment. In case of multiplying pesticides applications, the soil can become a source of pollution of agricultural products.

Bifenthrin is a synthetic pyrethroid insecticide of third generation which characterized by ecological stability, persistence in plants and high insecticidal activity. It is both ecological hazardous and hazardous for human organism after contaminated agricultural products consumption. Assessment of the health risks of pesticides is an integral part of their monitoring.

The purpose of the work was integrated assessment of the potential hazard of insecticides exposure to the human body when consuming contaminated agricultural products (on bifenthrin example) for preventive measures substantiation.

Materials and methods of research. The bifenthrin stability parameters in agricultural crops were studied in the field experiments in soil and climatic conditions of Ukraine. Pesticides Rotam Bifenthrin 100, EC, Acetamiprid+Bifenthrin, EC, Blockbuster, EC, Galil, SC, Macrogard, CS, Elmire 100, EC were applied on agricultural crops. For the integrated assessment of the potential hazard of pesticide exposure to the human body when consuming contaminated agricultural products, a methodology developed by specialists of Hygiene and Ecology Institute was used. Allowable daily dose (ADD), half-life period (DT_{50}) and average daily consumption of the product were estimated on a four-graded scale.

Results and discussion. The results of the study of the bifenthrin content dynamics in different crops showed that the substance detecting in an amounts from 1.8 mg/kg to 0.1 mg/kg after one hour and 3 days after application of insecticide formulations. The actual data on the dynamics of bifenthrin content in agricultural crops obtained during field studies allowed determining the parameters of degradation using the method of mathematical modeling. Differences in the DT_{50} values of bifenthrin in different crops are unreliable ($p > 0.05$). This allowed us to calculate the average values of this index – 14.44 ± 1.51 days.

Assessment of the risk of adverse effects of bifenthrin on human health when consuming agricultural products grown in insecticides on its basis application showed next results: ADD – 0.02 mg/kg (2 points), half-life period (DT_{50}) – 14.44 ± 1.51 day (3 points), total crops consumption – 1174 g/day (4 points). An integrated index of the contaminated products consumption value was 9 (2 class of hazard).

Conclusion. Integral assessment of the potential risk of bifenthrin exposure to humans when consuming contaminated agricultural products showed that the substance pertains to the 2nd class of hazard (dangerous compounds). This is primarily due to the fact that it is relatively stable in agricultural products and is used on a large number of crops (high average consumption rates).

Perspectives. Given the high toxicity of insecticides and the peculiarities of their mechanisms of action (direct effects on the nervous system), as well as high dangers to human health when contaminated agricultural products are consumed, careful monitoring of residual amounts of bifenthrin in cultivated plants should be carefully monitored. The obtained parameter (integral index of hazard when consuming contaminated agricultural products) should be taken into account when deciding on bifenthrin-based formulations expansion of the scope.