

## PS-018. Degradation process of pesticides

Hüseyin İltter, Muhsin Akbaba, Volkan Recai Ötegen

1Ministry of Health of Turkey, Public Health Institution, Environmental health department 2Çukurova  
University Faculty of Medicine Department of Public Health

Pesticides degradation is transformation to environmentally compatible, harmless substances after practice. Approximately 2.5 million tons of pesticides used each year, predominantly in agriculture. Greater than 95% is not reaching target. They spread into environment in ways such as evaporation, infiltration and surface flow and involve in ecosystem without specific targets. Active process may take days to years depending on pesticide and environmental settings. Every year remaining pesticides in soil and water accumulate through bioaccumulation and biomagnification. It may reach surface waters by the accumulation of groundwater or may be found in higher regions through the atmosphere. Degradation is using two types of transformation, being biotic and abiotic. Biotic transformation takes place through microorganisms, abiotic transformation is through chemical and photochemical reactions. Different metabolites may occur in variety of conditions and their potential effects are not fully known. **Biotic transformation:** Makes biggest contribution to degradation. While human organism detoxify pesticides, bacteria metabolize. Degradation takes place faster in a suitable environment and living conditions for the growth of microorganisms. There is a wide network of enzymes and other bacteria also can have this feature with gene transfer. High concentrations of pesticides or repeated administration makes degradation faster. **Abiotic transformation:** Surface water pesticides may transform with the impact of sunlight. Factors affecting the photochemical decomposition of pesticides are sunlight intensity, application method and characteristics of area and the pesticide. Chemical transformations happen without any microorganism. Physical factors such as pH, temperature, humidity and properties of pesticide determine reaction type and affect their speed. Reduction of temperature leads deceleration of chemical degradation. One of the most common degradation is hydrolysis through reaction with water. Depending on pesticide type it may occur in either acidic or basic conditions.

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