**The Turkish Journal of Occupational / Environmental Medicine and Safety**



**Vol:1, No:1(2), 2017 Web:** [http://www.turjoem.com](http://www.turjoem.com/) **ISSN : 2149-4711**



**SS-018 . Molecular mechanism and toxic effects of anti-coagulant rodenticides**

Çinel Köksal Karayıldırım

Ege Üniversitesi, İlaç Geliştirme ve Farmakokinetik Araştırma Uygulama Merkezi

Objective: Rodenticides are pesticides that consumed by target mammals and can lead to

secondary exposure of predators. Anticoaugulant rodenticides (LAARs) are widely used for harmful

rodent control purposes. LAARs are divided into two main groups which are the first generation and

second generation. Second generation rodenticides show higher toxicity and they are lethal for

rodents in a single feeding with lower concentrations due to the affinity to binding sites in the liver

and greater accumulation and persistence. However first generation rodenticides generally require

higher concentration and consecutive intake over days in order to accumulate the lethal dose. The

aim of this presentation to reviewed molecular mecanisms and toxic effects which were reported in

literatures for anticoagulant rodenticides.

Methods: Anticoagulant rodenticides inhibit vitamin K epoxide reductase (VKOR) which is an

electron carrier vitally involved in the oxidation reduction cycle leading to γ-carboxylation. Vitamin

K is a cofactor of primary importance in the blood coagulation process as it contributes to the

activation of blood subsequently clotting factors (II, VII, IX, and X). The greater potency and

duration of action of long-acting anticoagulant rodenticides is attributed to their affinity for vitamin

K, their ability to disrupt the vitamin K epoxide cycle at more than one point, hepatic accumulation

and unusually long biological half-lives due to high lipid solubility and enterohepatic circulation.

After exposure to LAAR can therefore lead to a progressive decrease in blood clotting factor

between 12 and 24 h after intoxication resulting in massive bleeding episodes that are potentially

fatal.

Results: This presentation provide a comprehensive understanding of LAAR molecular mecanism

which causes by vitamin K.

Conclusion: In summary, the presented information about Molecular mechanism and toxic effects

of anti-coagulant rodenticides, is useful for the researchers especially those who are involved in

manufacture processes.

Keywords: Rodenticides, Anticoagulant, Toxicity

TURJOEM , 2017 , 1 ,1 (2)