

TALKS

A brief overview of the *Vkorc1* gene mutations related to anticoagulant rodenticide resistance in Turkish populations of *Rattus rattus* and *Rattus norvegicus*

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Rats include the most known rodent species and have importance for public health due to the spread of zoonotic diseases. First- and second-generation anticoagulant rodenticides are used to control these rodents, especially in urban areas; however, studies show that anticoagulant rodenticide resistance associated with *Vkorc1* (vitamin K epoxide reductase complex subunit 1) gene exists in rats. Mutations in the *Vkorc1* gene causing changes in the enzyme structure prevent the binding of anticoagulant rodenticide to the enzyme and reduce the anticoagulant efficacy significantly. Black rat (*Rattus rattus*) and Brown rat (*Rattus norvegicus*) native to southeastern Asia have been spreading to Turkey via shipping or highway transportation for years. In the present study, in addition to the previously identified Ala21Thr (*R. rattus*) in Exon 1 region, Ile90Leu (*R. rattus*, *R. norvegicus*) in Exon 2 region and Leu120Gln (*R. norvegicus*) in Exon 3 region, newly identified Ser74Asn, Gln77Pro (*R. rattus*) and Ser79Pro (*R. norvegicus*) mutations were found as “missense mutations” causing amino acid changes. While Leu120Gln is the only detected mutation related to resistance based on previous studies, the relevance of other mutations to resistance is unclear. In order to obtain precise results, future studies are needed for applied rodenticide resistance studies to be carried out especially in specimens with missense mutations. In any case, the results obtained will contribute to rodent control studies in Turkey. This study has been accepted as an article in “PeerJ Life & Environment” under the title “*Vkorc1* gene polymorphisms confer resistance to anticoagulant rodenticide in Turkish rats”.