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Effects of copper oxychloride on the histology of earthworm coelomocytes

V. Kilic¹, G. Aydogan Kilic¹, N.N. Şimsek¹, D. Koca¹

¹Anadolu University, Faculty of Science, Eskişehir, Turkey

vkilic1@anadolu.edu.tr

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Environmental contamination of soils by copper containing agrochemicals is a current problem. Copper oxychloride-based fungicides are the most widely used agents as foliar sprays against fungal diseases in a number of crops. Earthworms are keystone species within ecosystems since they play a major role in physical, chemical and biological processes in the soil [1]. The coelomic fluid of earthworms has functions in pollutant disposition and tissue distribution while coelomocytes are responsible for the immune defense of the animal. Any impairment of coelomocyte functioning can compromise the health of the entire organism. However there are very limited studies on the use of histological features of earthworm coelomocytes as biomarker of exposure to the environmental contaminants [2].

Therefore we investigated histopathological changes as a result of copper oxychloride exposure in earthworm (*Aporrectodea caliginosa*) coelomocytes. Samples consisted of control and experimental group animals which were exposed to 35 and 100 mg/kg (artificial soil) doses of copper oxychloride during 7 days. Healthy worms weighing between 300-400 mg each were left on filter paper in petri dishes for 24 h in order to reduce the soil content in their gut. Non-invasive extirpation technique of Eyambe et al., (1991) was used for collecting earthworm coelomocytes with slight modifications [3]. Freshly isolated *cell suspension* was then *dropped onto specimen slides*. Samples were stained with toluidin blue after ethanol (95 %) fixation.

Granulocytes and amoebocytes did not show any significant alterations while the most significant changes were observed in leucocytes such as swelling and deformation of cells at the dose of 100 mg/kg. This response of leucocytes was thought to be a result of their natural function making them the primary target for copper oxychloride toxicity, since they are the cells capable of synthesizing extracellular respiratory pigments responsible of storing exogenous pigments such as heavy metals [4]. These results manifested that observation of isolated earthworm coelomocytes with simple histological staining can be a primary and effective way for the evaluation of structural changes as a result of environmental exposure.

1. Helling, B., Reinecke, S.A., Reinecke, A.J. *Ecotoxicology and Environmental Safety* 46 (2000), p.108-116.
2. Calisi, A., Lionetto, M.G., Schettino, T., *Ecotoxicology and Environmental Safety* 72 (2009), p.1369-1377.
3. Eyambe, G.S., Goven, A.J., Fitzpatrick, L.C., Venables, B. J., Cooper, E.L. *Laboratory Animals* 25 (1991), p.61-67.
4. Adamowicz, A. *Tissue and Cell*, 37 (2005), p.125-133.