

JOINT EVENT

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Toxicological aspects of physiological and biochemical changes with potassium silicate and silica nanoparticles on albino rat**Helmi Mohamed El-bendary**
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Naturally occurring micron sized silica has gained enormous popularity as a physically active insecticide. Nano-sized silica has insecticidal properties and would be needed in lesser quantity in comparison with conventional insecticides because of the huge surface to volume ratio of nanoparticles. Nano molecules have been widely used in consumer and industrial applications, such as medicine, cosmetics and foods, because they exhibit unique physicochemical properties and innovative functions. However, nanomaterials (NMs) can also be problematic in terms of eliciting a toxicological effect by their small size. The present study was designed to examine the toxic effects of orally administered pesticide Sil-MATRIX 29% (potassium silicate) and silica nano-particles (SiO₂-NPs) using male albino rats, at sublethal doses [2/5, 1/4 and 1/8 LD50], relative to control on [body, organs weight such as liver, kidney, heart, spleen, and cytotoxic effect (such as total protein content levels as biochemical aspects)] for 28 and 45 days' time exposure period. Orally ingested Sil-MATRIX 29% and silica nanoparticles (SiO₂-NPs) [2/5, 1/4 and 1/8 LD50] were not associated with significant changes in the average gain of body and organ weight. On the other hand, total protein content value after ingestion with Sil-MATRIX and SiO₂-NPs for all doses and treatments time period were increased significantly in a pattern similar to control rats. Our results suggested that the well-dispersed nano-silica cytotoxic effect caused systemic exposure in mouse and induced mutagenic activity. Our information indicated that further studies of relation between physicochemical properties and biological responses are needed for the development and safer form of (NMs).

Biography

Helmi Mohamed El-bendary is Assistant Professor of Agriculture at Fayoum University. He finished his BSc in Plant Protection Department at Cairo University and D.S.P.U at Mediterranean Agronomic Institute, Greece, M.S.c. at Cairo University, LLB at Cairo University, and Ph.D. at Mansoura University.

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