

## DIVERSE RESPONSE OF WILD AND MUTANT STRAINS OF DROSOPHILA MELANOGASTER TO SOLANACEAE ALKALOIDS

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In our previous reports we showed that Solanaceae alkaloids have ovicidal effect, together with repellent activity against *Spodoptera exigua* moths, cause negative chemotaxy of *Dugesia gonocephala* flatworms and have cardioinhibitory effect on *Zophobas atratus* beetles. *Drosophila melanogaster* is one of the most useful laboratory models to test acute and subacute reproductive toxicity for insects. We examined the effect of Solanaceae extracts on three strains of *D. melanogaster*: wild type, white strain (sex-linked mutation) and sephia strain (autosomal mutation). The experiment was carried out under laboratory conditions at a temperature of 20±2 °C and 60±5% relative humidity. Insects laid eggs on the agar substratum containing various concentrations of extracts. Then, larval development (number of individuals, ratio of development) was evaluated. Subsequent generation of imagoes was transmitted to the next control vials and the insects were allowed to copulate and lay eggs. The three exposed strains revealed various responses to the stressor. Larval development revealed bimodal action of extracts for wild type population. Higher concentrations speeded up the development, while the lower ones – slowed it down. We think that such an effect could be caused by two factors: either extract affected hormonal balance or larvae were able to detect higher concentrations of Solanaceae extracts, while the lower ones were under the threshold level. Therefore, in case of the higher concentrations, larvae try to escape from toxic substratum and to moult quicker. Wild type showed concentration-dependant final toxicity, with high correlation coefficient (-0.8507) between extract concentration and survival ratio of imagoes, whereas both mutants showed lower correlation coefficients (-0.1619 and -0.6704 for white and sephia strain, respectively). However, they showed higher, not concentration-dependant mortality, than wild type. White mutant flies were more susceptible to the alkaloids as compared to sephia mutant flies. The next generation, exposed to control substratum, showed bimodal reproductive effects of extracts. Imagoes cultured with higher concentrations of extracts laid more eggs than those which were exposed to lower concentrations. Perhaps, the extract causes epistatic regulation of reproduction. To sum up, tested extract has promising insecticidal activity, especially that it can be used in relatively low concentrations.

Keywords: Solanaceae alkaloids, *Drosophila melanogaster*, reproductive toxicity