Abstract

Rotifers are an important group of zooplanktons in freshwater ecosystems and also presented as models in ecotoxicology studies. Pesticides are One of the most important factors we can feel its hazards Due to growing trend in technology that can provide damage to aquatic communities. Therefore the lethal concentration (LC_{50} 24h) of Deltamethrin and Imidaclopride -that are widely usage in the Sistan region- determined and their impact on reproduction and growth of the freshwater rotifer (*Brachionus calyciflorus*)were studied. Single cell algae Chlorella (*Chlorella vulgaris*) was used as food. Rotifers in order to adapt to the environment and get the required amount of dormant eggs were cultured for at least three months in the laboratory at 25 ° C and 3000 lux of light under the darkness and light period of 16: 8 and then the lethal concentration (LC_{50}) of imidaclopride and deltamethrin determined for freshwater rotifer (*Brachionus calyciflorus*) based on OECD standards. Lethal concentration (LC_{50}) of deltamethrin and imidaclopride for freshwater rotifer determined as 1.06 mgl^{-1} and 124.54 mg l^{-1} respectively. Based on these concentrations, the different treatments desinated and the rotifer population responses to the four different concentrations of deltamethrin (0.05, 0.10, 0.21 and 0.53 mgl^{-1}) and imidaclopride (6.22, 12.45, 24.91 and 62.27 mgl^{-1}) plus a control treatment were studied. The results showed that the difference in density of rotifers in all treatments with the control group at tenth day of testing was significant ($p<0.05$). Deltamethrin at a concentration of 0.05 and imidaclopride at concentration of 6.22 had no significant differences with control group in specific growth rate(per day)($p<0.05$). Ratio of ovigerous females to nonovigerous females and the ratio of mictic females to amictic females at all concentrations of both insecticides significantly affected compaired with control group ($p<0.05$). Increase of mictic females to amictic females' ratio in final days of test; indicate the dominance of sexual reproduction in rotifer life cycle. For deltamethrin in 0.53 mgl^{-1} and imidaclopride in 62.27 mgl^{-1} due to stop of growth and reproduction, the ratio of mictic females to amictic females was not defined.

Keywords: Deltamethrin, Imidaclopride, Rotifer, *Brachionus calyciflorus*, LC_{50}.

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LC_{50} 24h determination of Deltamethrin and Imidacloprid insecticide and their effect on reproduction and population growth of freshwater rotifer (*Brachionus calyciflorus*)

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