World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:13, No:11, 2019

Impact of Bacillus subtilis Exotoxins on Fecundity, Sex Hormones and Release of Schistosoma mansoni cercariae in Biomphalaria alexandrina Snails

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Abstract : Schistosomiasis, also known as bilharzia, is a disease caused by a parasitic trematode worm called Schistosoma. Biological control of the snail intermediate hosts of Schistosoma is one of the promising methods for eliminating this disease in Egypt. The molluscicidal activity of exotoxins secreted from Bacillus subtilis bacteria was studied. The effect of these exotoxins was studied on the fecundity of Biomphalaria alexandrina snails the intermediate host of Schistosoma mansoni; the fecundity includes the reproductive rate (R0) of B. alexandrina snails and levels of sex hormones (progesterone, testosterone, and estradiol). Moreover, the cercarial production of S. mansoni was determined. The results showed a significant reduction in the egg-laying capacity of the treated snails after exposure to sublethal concentrations (LC10 and LC25) of B. Subtilis exotoxins; this reduction reached 70% at LC25. Moreover, B. Subtilis exotoxins' significantly suppressed the cercarial production of B. alexandrina snails. It is concluded that the exotoxins of Bacillus subtilis bacteria play an important role in the interference of the Schistosomiasis transmission, hence should be applied in the strategy of schistosomiasis control.

Keywords : schistosomiasis, Biomphalaria alexandrina snails, Bacillus subtilis bacteria, fecundity, sex hormones
Conference Title : ICEBESE 2019 : International Conference on Environmental, Biological, Ecological Sciences and Engineering
Conference Location : Dubai, United Arab Emirates
Conference Dates : November 07-08, 2019