EFFECT OF CERTAIN TYPES OF BACTERIA IN WATER ENVIRONMENT ON DISTRIBUTION OF SOME VECTOR SNAILS

By

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APPROVAL SHEET

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بسم الله الرحمن الرحيم

سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا

إِنَّكَ إِنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

سورة البقرة - آية رقم ٣٢

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ABSTRACT

The present study revealed the effect of certain bacterial species in water bodies on distribution and natural infection of vector snails of *Schistosoma mansoni, S. haematobium* and *Fasciola* spp.. Field study carried out in seven Egyptian governorates (Giza, Cairo, Qaluobia, Sharkia, Ismailia, Beheira and Damietta) during successive four seasons starting from spring ٢٠٠٩ to winter ٢٠١٠.

The total coliform bacterial counts (TC), *Enterococcus faecalis*, *Clostridium perfringens* and presence of certain Gram-negative bacilli bacteria were tested in ٣٢٨ water samples.

Only Cairo and Ismailia governorates showed the accepted mean values of TC counts by ٣٦٣ and ٣٧٨ MPN/١٠٠ ml respectively, but Beheira, Sharkia, Damietta, Qaluobia and Giza recorded the unaccepted ones.

Most of collected water samples (٦٧,٤٪) were found positive for *E. faecalis* bacteria and Beheira was the most polluted governorate for TC count (٧٦٦/١٠٠ ml) and sewage pollution (٨٨,٥٪). All collected water samples recorded negative results for the presence of *C. perfringens* bacteria.

The number of isolations of Gram-negative bacilli bacteria isolated through study period was ٥٥٤. Isolations were identified for seven bacterial genera including *Escherichia coli* (٥٩,٢٪), *Proteus* spp. (١٥,٩٪), *Enterobacter aerogenes* (١٢,٨٪), *Klebsiella pneumoniae* (٤,٣٪), *Pseudomonas aeruginosa* (٢,٩٪), *Citrobacter* spp. (٢,٧٪) and *Vibrio* spp. (٢,٢٪). These bacterial species causes many diseases and the crops

irrigated by water contaminated with these bacteria considered a source of serious diseases.

In the field study, the vector snails *Lymnaea natalensis* were found highly distributed than *Biomphalaria alexandrina* and *Bulinus truncates*. These snails and infected ones recorded the highest distribution percentages by ٥١,٦٪ and ٥٩,٣٪ respectively in polluted water with total coliform range ١٠٠ - ٣٠٠ MPN/١٠٠ ml. On the other hand, water contaminated with *P. aeruginosa* and *Vibrio* spp. bacteria was found to be more repellent to snails.

Laboratory study declared that *P. aeruginosa*, *Vibrio* spp., *E. aerogenes, Bacillus thuringiensis, E. faecalis* and *K. pneumoniae* have effect on mortality rate, egg-laying capacity and protein content of lab *B. alexandrina*, *B. truncates* and *L. natalensis* snails. The percentage of infection and the rate of cercarial production of *B. alexandrina* snails infected by *S. mansoni* miracidia in the presence of these bacterial species were affected.

The effect of bacterial species that were isolated from water on the efficiency of Bayluscide and copper sulfate showed that these bacteria have very low effect on $CuSO_4$, but it was found to be capable of degraded Bayluscide especially *E. faecalis* and *P. aeruginosa* bacteria.

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