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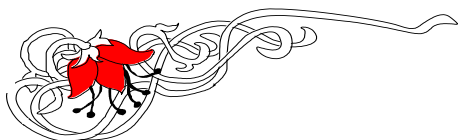
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Abstract

Insects are the furthestmost abundant biotas in most ecosystems, they are more strictly and quickly affected by pollutants in their ecosystem, their response as a bioindicator to determine the effect of chemical and physical properties of water is an ideal technique to assess water quality. The impact of water quality on the aquatic insect's population density, evenness and richness, was studied through seasonal collection of aquatic insects from opened drain stream and comparing them to specimens collected from the normal Nile River stream at Abu Zabal (Al Akhankah, Al Qalyubia governorate, Egypt). Water samples were analyzed, the results ensured the positive effect of the aquatic insects as a monitor to evaluate the water quality. The maggots of the drone fly *Eristalis tenax* (L., 1758) (Diptera: Syrphidae), the dominant species of the first stream have survived in habitats with extreme microbial contamination at this Alakrasha opened drain. So, the cuticle surface that play as the first physical barrier, have investigated using scanning electron microscopy, which revealed lattice-like array of high-density microstructures (Nanopillars) that are narrow, sharp, and pointed, appear to make it difficult for bacteria to colonize on its surface and acts as a defense against bacterial infection. Antimicrobial susceptibility testing for the Rat-tailed maggot extract of the whole body shows a high level of antibacterial activity.

Keywords: Aquatic insects, Bioindicator, Water quality, *Eristalis tenax* (L.), cuticle surface, Nanopillars, maggot extraction, antibacterial activity.

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