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**Biochemical and Histological Effects of Gibberellic Acid on *Locusta migratoria migratoria*
Fifth Instar Larvae**

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ABSTRACT

Experiments were conducted to assess the effect of gibberellic acid (GA₃), a plant growth regulator, on *Locusta migratoria migratoria* fifth instar larvae. Newly emerged larvae were exposed to various concentrations of GA₃ administered by topical application or by forced ingestion. Results showed that treated insects exhibited toxic symptoms with a dose-dependent mortality. GA₃ toxicity was also demonstrated by perturbation of the moult processes. In fact, we noted that treated insects present exuviations difficulties due to the impossibility to reject the old integuments causing mortality in the 5th instar larvae. Histological study of proventriculus revealed alterations in the epithelial cells and absence of apolysis phenomenon. Data also showed that GA₃ induced significant quantitative variation of haemolymph metabolites. These changes result in a significant decrease in the total concentration of proteins and carbohydrates and an increase in the total concentration of haemolymph lipids.

Keywords: *L. migratoria*, gibberellic acid, toxicity, histology, haemolymph metabolites.

1. Introduction

Locusts and grasshoppers (Orthoptera, Acrididae) represent perhaps the most conspicuous of all insect pests and are abundant insects of dry grassland and desert. When populations of these insects build up, certain species exhibit gregarious and migratory behavior, leading to the formation of spectacular swarms. From their mention in the Bible to current media reports, these locust plagues attract public attention in a way that no other insects do; the image of a flying

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