



**BIOCHEMICAL AND MOLECULAR CHANGES INDUCED
BY INSECT GROWTH REGULATORS (IGRS) ON SOLITARY
AND GREGARIOUS PHASES OF THE DESERT LOCUST,
SCHISTOCERCA GREGARIA (ORTHOPTERA: ACRIDIDAE)**

A Thesis submitted to the Department of Entomology, Faculty of Science, Ain
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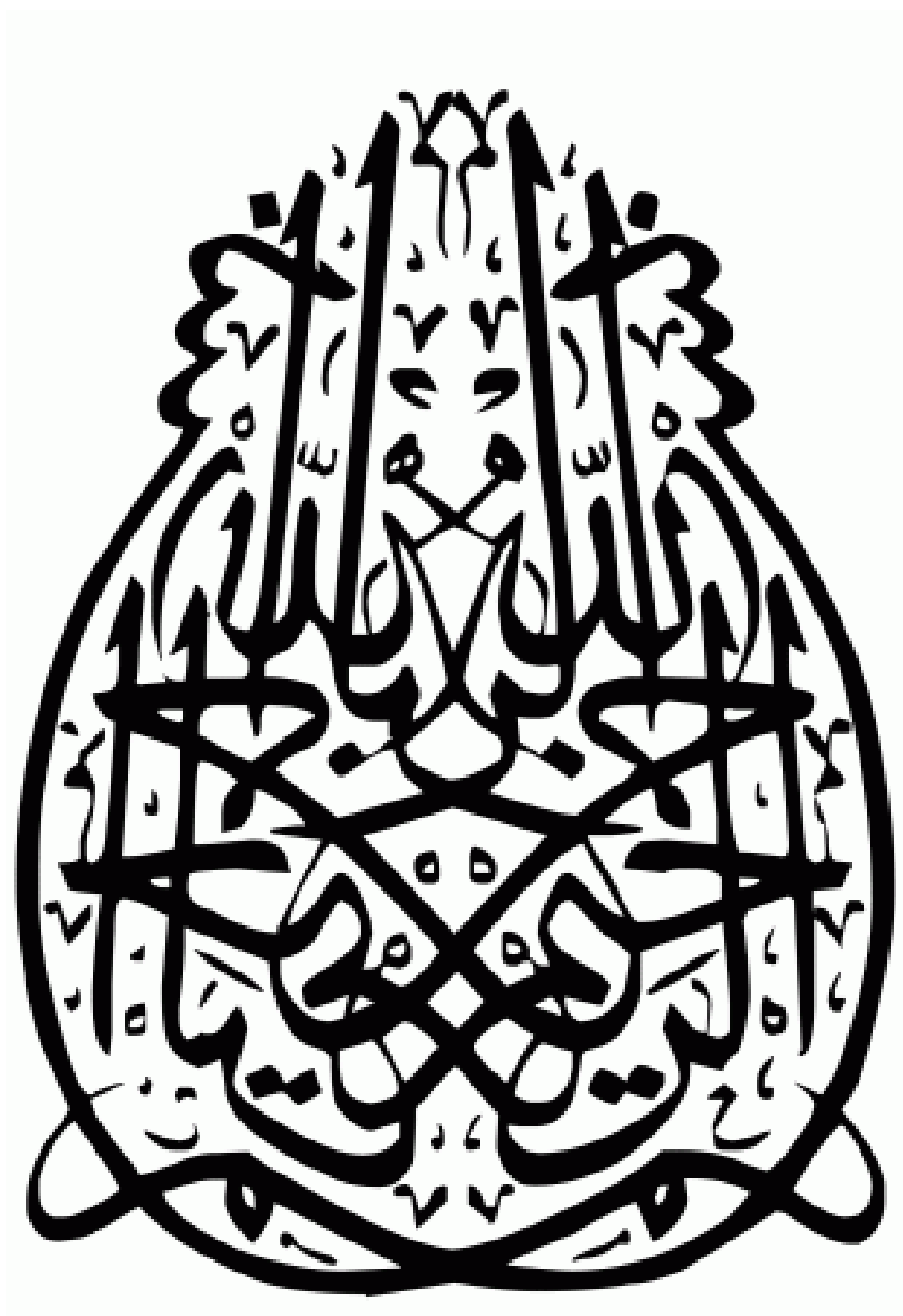
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ABSTRACT

Application of both diflubenzuron and pyriproxyfen induced highly significant influences in some biological aspects of solitary and gregarious *Schistocerca gregaria*, pretreated as 3rd nymphs. Total inhibition of adult emergence of diflubenzuron was 89.5%, and 100%, respectively, with gregarious and solitary. Likewise, pyriproxyfen induced total inhibition 82.2%, and 93.5%, respectively, with gregarious and solitary. Also, effects of these IGRs on the phase polymorphism of *S. gregaria* were displayed. Data revealed that both the previous IGRs were able to enhance the solitarization of *S. gregaria*, especially in some biological aspects. This effect was highly significant in pyriproxyfen with gregarious *S. gregaria*. However, they were unable to enhance the green pigmentation, while they induced the darkening pattern.

Some biological aspects and pigmentation of two extreme phases of *S. gregaria* were studied under variation of rearing density. Data revealed that the isolation condition induced a highly significant prolongation effect of their biological aspects and vice versa. Black patches' appearance/disappearance were the marker to the lifestyle of phase.

Furthermore, this study displayed Solitary- Gregarious-Phase-Interchange (SGPI) as the modern controlling agent of *S. gregaria*, where this phenomenon was related to gene control. Consequently, quantitative and qualitative biochemical and molecular analysis were carried out on two extreme phases and the transient generations in between. Hence, the obtained data showed that low rearing population density induced a significant reduction of total protein and DNA levels. Quantitative differences were also detected in protein and DNA profile.

Key Words: *Schistocerca gregaria*, IGRs, diflubenzuron, pyriproxyfen, phase change, protein, DNA.

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