

DISTURBED HAEMATOLOGICAL AND IMMUNOLOGICAL PARAMETERS OF INSECTS BY BOTANICALS AS AN EFFECTIVE APPROACH OF PEST CONTROL: A REVIEW OF RECENT PROGRESS

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ABSTRACT

The indiscriminate and excessive uses of conventional insecticides lead to several drastic problems in the environment, human health and economics. Therefore, it is necessary to seek for safe alternatives among which botanicals represent useful materials for the pest control. The primary objective of the present review was searching for a new control strategy of insect pests via the disruptive effects of botanicals on the haemogram parameters and the immune reactions. In this article, we discussed the effects of plant extracts and plant products on the haemogram parameters including total hemocyte population, differential hemocytes counts, histopathological deformities of hemocytes, haemolymph (blood) volume, mitotic index and heart activity. It focused, secondarily, on the innate immunity (humoral and cellular) in insects and the adverse impacts of botanicals on its mechanisms (phagocytosis, encapsulation, nodulation and melanization). As concluded in the current review, botanicals suppress the immune capability, leading to the insects become susceptible to the effects of microbes and ultimately results in the death. This can be appreciated as a new strategy for an effective control of insect pests. However, some points of future research had been provided. Also, some fieldwork should be conducted to realize the botanical impacts on haematological and immunological criteria for the pest control.