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Entomopathogenic Bacteria as Biological Control Agents: Review Paper

Authors : Tadesse Kebede Dabsu

Abstract : Insect pest is one the major limiting factor for sustainable food production. To overtake insect pest problem, since Second World War, producers have used excessive insecticide for insect pest management. However, in the era of 21st Century, the excessive use of insecticide caused insect resistant, insecticide bioaccumulation, insecticide hazard to environment, human health problem, and the like. Due to these problems, research efforts have been focused on the development of environmental free sustainable insect pest management method. To minimize all above mentioned risk utilizing of biological control such as entomopathogenicmicroorganism include bacteria, virus, fungus, and their productsare the best option for suppress insect population below certain density level. The objective of this review was to review the updated available studies and recent developments on the entomopathogenic bacteria (EPB) as biological control of insect pest and challenge of using them for control of insect pest. EPB's mechanisms of insecticidal activities, type, taxonomy, and history are included in this paper body. EPB has been successfully used for the suppression of populations of insect pests. Controlling of harmful insect by entomopathogenic bacteria is an effective, low bioaccumulation in environment and food, very specific, reduce resistance risk in insect pest, economically and sustainable method of major insect pest management method. Identified and reported as potential major common type of entomopathogenic bacteria include Bacillus thuringiensis, Photorhabdus sp., Xenorhabdus spp.Walbachiaspp, Actinomycetesspp.etc. These bacteria being enter into insect body through natural opening or by vector release toxin protein inside of insect and disrupt the cell's content cause natural mortality under natural condition. As per reported by different scientists, insect orders like Lepidoptera, Hemiptera, Hymenoptera, Coleoptera, and Dipterahave been successful controlled by entomopathogenic bacteria. As per coming across in different scientific research journals, much of the work was emphasised on Bacillus thuringiensisbsp. Therefore, for commercial production like Bacillus thuringiensi, detail research should be done on other bacteria species. The efficacy and practical application of EPB are restricted to some crops and greenhouse area, but their field application at farmers' level very less. So still much work needs to be done to the practical application of the EPB at widely application. Their efficacy, pathogenicity, and host range test should be tested under environmental condition.

Keywords : insect pest, entomopathogenic bacteria, biological control, agent
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