

Management of Insect Pests Using Baculovirus Based Biopesticides in India

Authors : Mudasir Gani, Rakesh Kumar Gupta, Kamlesh Bali, Abdul Rouf Wani

Abstract : The gypsy moth (*Lymantria obfuscata*) and tent caterpillar (*Malacosoma indicum*) are serious pests that attack a wide range of fruit and forest trees in Jammu & Kashmir range of North-Western Himalayas in India. Investigations were carried out to isolate and bioprospect naturally occurring nucleopolyhedroviruses (NPVs) as potent biopesticides against these pests. The biological and molecular characterization of NPV isolates from different ecosystems was conducted, and the *polh*, *lef-8* and *lef-9* genes were sequenced and subjected to phylogenetic analysis. The *L. obfuscata* NPV was more closely related to the *L. dispar* NPV, whereas *M. indicum* NPV was more closely related to the *M. californicum* NPV in the NCBI taxonomy database. Among different isolates, Bhaderwah isolates exhibited highest virus activity ($LD_{50} = 250$ POBs/larvae) and speed of kill ($ST_{50} = 6.80$ days) against *L. obfuscata* whereas Mahor isolates proved most virulent against *M. indicum*, with lowest LD_{50} (257 POBs/larva) and ST_{50} (6.80 days). The *in vivo* mass production for highest productivity and quality revealed that the optimum yield was obtained when 3rd instar larvae were inoculated with a viral dose of 1.44×10^5 POBs/larva and allowed to incubate for nine days for *L. obfuscata*. However, for *M. indicum* larvae, a viral dose of 2.88×10^6 POBs/larva and incubation period of 10 days were found optimum. It was found that harvesting of moribund larvae yields good quality NPV. The field application of *L. obfuscata* NPV and *M. indicum* NPV against the respective host populations on apple and willow with the pre-standardized dosage of 1×10^{12} POBs/acre reduced the larval population density up to 25-63%.

Keywords : baculoviruses, biopesticides, *Lymantria obfuscata*, *Malacosoma indicum*

Conference Title : ICAAE 2020 : International Conference on Advances in Agricultural Entomology

Conference Location : Dubai, United Arab Emirates

Conference Dates : March 19-20, 2020