Compatibility of Steinernema asiaticum and Heterorhabditis bacteriophora with registered Insecticides and Bt for Control of Plutella xylostella under laboratory Conditions

RAJESH KUMAR, RAM SINGH, RIM KIM WALIA & KUM KUM WALIA

Received: 2013-05-16/2013-06-10 Accepted: 2013-06-22

Kumar R, Sing R, Walia R K & Walia K K [Agricult Univ, Hisar / India]: Compatibility of Steinernema asiaticum and Heterorhabditis bacteriophora with registered Insecticides and Bt for Control of Plutella xylostella under laboratory Conditions. – Entomol Gener 34 (4): 297–301; Stuttgart 2013-11. – – – [Note]

Two species of EPNs i.e, Steinernema asiaticum (Anis, Sgahina, Reid et al 2002) and Heterorhabditis bacteriophora (Poinar 1976) and three insecticides (Endosulfan 35EC, Malathion 50EC and Bt) registered to control Plutella xylostella (Linnaeus 1758) in cabbage were tested for compatibility in laboratory assays. Double strength concentrations of endosulfan (0.035%, 0.07%), malathion (0.025%, 0.05%) and Bt formulation (0.1%, 0.2%) were prepared in distilled water. Infective Juveniles (IJs) of S asiaticum and H bacteriophora @ 100 per ml sterile distilled water were added in Petri plates (4 cm dia) to equal amount of insecticide preparation to get the required concentration. Observations were recorded on mortality of nematodes after 24 and 48h. Minimum IJ mortality 0.87 and 1.59 per cent was recorded in Bt (0.1%) in S asiaticum and H bacteriophora, respectively. Maximum mean IJ mortality 6 and 12.4 per cent was recorded in endosulfan (0.07%) in S asiaticum and H bacteriophora, respectively. The effect of time factor alone and interaction between time and concentration of insecticides was non-significant. Overall, negligible IJ mortality was recorded. It is inferred that the two species of EPNs can be incorporated in IPM programme for the management of P. xylostella.

Key words: Heterorhabditis bacteriophora (Poinar 1976) – Plutella xylostella (Linnaeus 1758) – Steinernema asiaticum (Anis, Sgahina, Reid et al 2002) – Bt, endosulfan – malathion

1 Introduction

Diamondback moth (DBM), Plutella xylostella (Linnaeus 1758), is a noxious pest of cabbage and cauliflower. Heavy yield loss may occur if incidence of P xylostella occurs at an early stage of crop. Management of DBM with the use of insecticide alone has become difficult since the pest has developed resistance to many organophosphate, carbamate and pyrethroid insecticides. SHELTON, WYMAN, CUSHING et al [1993] and TABASHNIK [1994] reported that the overuse of insecticides has caused development of resistance, particularly in tropical and sub-tropical countries where farmers tend to grow cabbage continuously and apply mixtures of chemical insecticides, sometimes more than twice a week. As an alternative, biological control agents like, Bacillus thuringiensis (Bt) (Berliner 1915) are being used widely [CHERRY, MERCADIER, MEIKL et al 2004]. However, FERRE & VAN RIE [2002] reported that prolonged use of Bt can lead to emergence of resistant DBM populations. These were recorded first in 1990 from Malaysia and now these are widespread in Asia and the Americas.