عنوان مقاله:

Targeting Plutella xylostella digestive enzymes by applying resistant Brassicaceae host cultivars

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خلاصه مقاله:

The diamondback moth, Plutella xylostella (L.) (Lepidoptera: Plutellidae) is one of the most destructive insect pests, feeding exclusively on wild and cultivated cruciferous species. The attacked plants produce considerable amount of glucosinolates in response to insects' feeding. Herein, we studied digestive activities of P. xylostella on four different genotypes of family Brassicaceae including two canola cultivars (SLM۰۴۶ and RGS۰۰۳) and two cabbage cultivars (Green-Cornet and Glob-Master). The highest proteolytic and amylolytic activities of P. xylostella were observed on Green-Cornet and the lowest occurred on RGS۰۰۳ and Glob-Master, respectively. The highest activity of α-glucosidase and β-glucosidases were observed on Green-Cornet and SLM۰۴۶ and the lowest was observed on Glob-Master and RGS۰۰۳. The zymogram analysis revealed different isozymes of protease, trypsin-like and α-amylase in the midgut extract of P. xylostella. Activity of the above mentioned isozymes was inhibited in larvae feeding on RGS۰۰۳ and Glob Master as resistant host cultivars. Also, larvae feeding on the resistant genotypes showed more glucosidase activities, indicating possibility of high glycosinolate existence in the resistant genotypes. By these results we can state that host plant property can affect insect digestive physiology through inhibiting digestive enzyme activities. These findings provide insights into the direct effects of host plants on insect physiology which are conducive to change in insect fitness.

کلمات کلیدی:

Brassicaceae, digestive enzymes, plant resistance, Plutella xylostella