**Food and Oviposition Preference of Diamondback Moth**

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*Plutella xylostella* (Diamondback moth ((DBM)) is a Lepidoptera that feeds and oviposits almost exclusively on Brassicaceae plants. Host plants include many crops, landscape ornamentals, and weeds. Our objective was to determine food and oviposition preferences of individuals coming from different regions of Canada (Saskatchewan, Alberta, and three Ontario environments) and how larval age may also influence this choice. To do so, we simultaneously exposed a larva of instar III or IV (n=18 for each instar and population) to leaf discs of garden cress, wintercress, black mustard, aubretia, broccoli and ornamental kale, and observed its selection over a period of one hour. The rate of herbivory and weight gain were measured. Adult females were exposed to the same species and their oviposition preferences examined. Results show that garden cress (*Lepidium sativum*) is the most preferred species for both food and oviposition sources. No studies have yet reported DBM preference for garden cress. Oddly, previous studies have reported that garden cress contains saponins, chemicals proposed to be toxic to DBM larvae. The ultimate goal of our study was to understand host plant preferences and their potential to act as reservoirs to sustain, limit and promote population growth and whether these preferences differ among populations of diverse geographic origins. Our results suggest that DBM might be able to survive and grow on species previously thought to be toxic, questioning the ability of using such plants as trap crops and the capacity of DBM to adapt to novel hosts.