

A strain of diamondback moth (DBM), *Plutella xylostella* (L.) (Lepidoptera: Plutellidae), adapted to peas was detected in 1999 in the export vegetable growing area south of Lake Naivasha in the Rift Valley Province of Kenya. The pea strain (DBM-P) was compared in laboratory studies to the normal crucifer strain (DBM-C). Whereas DBM-P performed comparably well on kales and peas, the cabbage strain (DBM-C) suffered heavy mortality on peas. Out of the 250 DBM-C first instars, only six reached adult stage on pea. In addition, larval development was prolonged by five days on peas as compared to kale, and larval growth was greatly reduced. Pupal weights of DBM-C survivors on pea were significantly lower (3.8 mg) than of DBM-P (4.6 mg) and those of both strains on kale (5.7 and 5.3 mg, respectively). Neonate larvae of the pea strain mined on both kale and pea but both the proportion of larvae mining and the number of mining days were lower than for DBM-C on kale. The latter failed completely to mine on pea. A laboratory culture was started with the DBM-C survivors on pea and the performance of the progeny compared on kale and pea in three additional generations of selection. Larval survival increased from 2.4% in the first generation to 28.6%, 41.3% and 49.7% in the second, third and fourth generation, respectively. Pupal weight of larvae reared on pea increased with each generation of selection, but it remained significantly lower than of larvae reared on kale. In spite of the large differences in larval mining on the two host plants, performance on peas was not related to the ability of DBM-C to mine on pea but rather to the ability to initiate feeding without the normal stimuli present in crucifers. Pupal mortality for larvae from both hosts was similar when larvae of equal weight were compared, suggesting acceptable suitability of pea for larval development once the new host is accepted. The implications of these findings on adaptability of DBM to plants beyond its normal host range are discussed.