

MORE ON THE PEA'S NECTARIES AND INSECT VISITORS

Clement, S. L., L. A. Lathrop, and F. J. Muehlbauer

USDA, ARS, Washington State University, Pullman, WA USA

The culinary pea, Pisum sativum L., is an almost entirely self-pollinated species but the structure of the plant's flowers indicate that its ancestors were insect-pollinated (7). Loenning (A) provided further evidence of the pea's adaptation to cross-pollination by insects in his report on the pea's floral nectaries and insect visitors (bees and thrips).

Another insect visitor of pea flowers is the pea weevil, Bruchus pisorum (L.) (Coleoptera:Bruchidae), a worldwide pest of peas. This weevil visits pea flowers to feed on the pollen, which is required for female weevils (but not exclusively pea pollen) to develop their eggs (1,6). To our knowledge there are no reports of the pea weevil collecting nectar from peas.

During laboratory studies to determine the nature of pea weevil resistance reported (5) in several pea accessions in the collection maintained at the USDA Plant Introduction Station, Geneva, New York, we repeatedly observed pea weevils bite into the base of fresh 1-2 day old 'Alaska' pea flowers. These flowers were offered to weevils in plastic petri dishes. Weevil holes were always a small slit (ca. 1.5 mm long) on the concave outer surface of a flower near the base of the corolla tube (Fig. 1). These holes provided access to the nectar at the base of the staminal tube and carpel. Other parts of a flower were never punctured. Thus, this behavior fits Inouye's (3) definition of nectar robbing--- "behavior exhibited by some species of birds, bees, and ants in which nectar is obtained through holes bitten near the bases of the corolla tubes, in a manner generally circumventing contact with the sexual parts of the flowers". It also fits his definition of a primary nectar robber which is "an individual that makes the holes and then extracts the nectar". Beetles have rarely been implicated as nectar robbers; indeed, Inouye (3) mentioned only one example of nectar robbing by a beetle species in his review article.

Presence of nectar in Alaska peas was confirmed by treating the small amount of liquid at the base of the flower's staminal tube and carpel with a drop of 5% phenol solution followed by a drop of concentrated H₂SO₄. This phenol + H₂SO₄ solution becomes orange if sugar is present (2). This simple carbohydrate test was used to detect the presence of nectar in fresh 1-2 day-old flowers of 19 pea lines from the Pisum germplasm collections at Geneva, New York, and Landskrona, Sweden. These 19 lines were a sub-sample of a larger number grown in 1.8 x 1.8 m field cages at Pullman, Washington, in 1987. Flowers were collected in the morning (8-10 AM) and were treated with phenol and H₂SO₄ as previously described.

We are in the process of examining in more detail the nectar robbing behavior of the pea weevil.

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Fig. 1. An open 'Alaska' pea flower. Arrow indicates hole made by Bruchus pisorum.