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DISEASE AS A LARVAL MORTALITY FACTOR IN ALFALFA WEEVIL, *HYPERA POSTICA* (COLEOPTERA: CURCULIONIDAE) POPULATIONS IN ILLINOIS[1]

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ABSTRACT

During the 1974 growing season, larvae of the alfalfa weevil, *Hypera postica* (Gyllenhal), were examined for pathogens. Three larvae out of 715 examined were infected with a microsporidium. This infection was present in both Washington and Mason counties in Illinois.

A number of naturally occurring pathogens have been reported from the alfalfa weevil, *Hypera postica* (Gyllenhal). Microsporidia (Maddox and Luckmann, 1966; Drea et al., 1969; Youssef, 1974) and fungi (Harcourt et al., 1974; Hedlund and Pass, 1968) have been recovered from field collected alfalfa weevils. In order to evaluate the role of naturally occurring diseases as biological control agents of alfalfa weevil larvae, we sampled two locations in Illinois throughout 1974 and determined the type and incidence of diseases in these samples.

METHODS AND MATERIALS

Two locations, Washington and Mason counties, were each sampled four times with a total of 25 samples taken for the growing season. Alfalfa weevil larvae were mass-collected with a 15-inch diameter sweepnet. The larvae were separated from plant material and other debris by means of a small Berlese unit. As larvae were extracted from the plant material they were collected in 1/2 pt paper cartons and layered alternately with 3.6 in filter paper disks. Larvae were then held at 40°F until they were examined for pathogens.

Individual larvae were examined for the presence of disease agents. Third and fourth instars were cut open, and individual tissues removed and examined under phase contrast microscopy for the presence of disease agents. First and second instars were squashed as whole larvae between a microscope slide and cover slip, then examined by phase contrast microscopy. Microsporidian infections were verified by Giemsa staining.

RESULTS AND DISCUSSION

During the sampling period the mean larval densities were 44.65 and 144.23 larvae/ft^2 for the locations in Washington and Mason counties, respectively. A total of 712 larvae were examined.

Six of these larvae had bacterial septicemia, a condition in which bacteria occur in the haemocoel, often as a result of stress, injury, or other diseases (Bucher, 1960). Subsequent

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observations revealed that bacterial septicemia was the result of larval injury during the collection process or a stressed condition between the time of collection and microscopic examination. Larvae which were refrigerated immediately after collection and kept refrigerated until examination did not have bacterial septicemia.

Three of the 712 larvae (one first and two second instars) examined were infected with microsporidia. Infected larvae were collected from two fields in Washington County where there were 37.0 and 36.6 larvae/ft^2, and from one field in Mason County where the population was 215.2 larvae/ft^2. Although infected larvae came from two separate locations, they were collected on approximately the same date, 13 May and 20 May. This same microsporidium was reported earlier from Illinois (Maddox and Luckmann, 1966) and the infected larva was collected on a similar date, 16 May 1966. We feel that this microsporidium probably has some other insect as its primary host and infects alfalfa weevils only when the primary host and the alfalfa weevil come into contact, probably in early May.

Two additional microsporidia have been reported from the alfalfa weevil, *Perezia hyperae* (Youssef, 1972) and *Nosema* sp. (Drea et al., 1969). We have never recovered either of these species from alfalfa weevils collected in Illinois. No entomophthora was recovered from any of the alfalfa weevils examined.

From these observations we conclude that diseases did not significantly affect the alfalfa weevil populations in the areas we sampled.

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