

Parasites and Predators

Parasites reared from *Pulvinaria* sp. and *Lecanium* spp. in the Okanagan Valley include *Coccophagus scutellaris* (Dalm.), *Aphycus kincaidi* (Timb.), and *Aphycus* sp. near *californicus* How. *Lecanium* spp. were also parasitized by *Coccophagus lycimnia* (Wlkr.) and *Microterys* sp.³ Larvae of a predacious fly, *Leucopis* sp.⁴, were found devouring large numbers of *Lecanium* eggs. Unfortunately, this predator was sometimes parasitized by *Pachyneuron eros* Gir. Various coccinellids (species not determined) attack soft scales in the Okanagan Valley, and anthocorids were seen feeding on *Lecanium* spp. in the laboratory. In the spring, birds of the finch family were observed feeding on overwintered nymphs of *Lecanium* spp.

Summary

In experiments from 1949 to 1955 in British Columbia peach and apricot

orchards, a post-harvest spray of malathion, Diazinon, or Trithion gave excellent control of summer nymphs of *Lecanium* sp. A on apricot trees. Diazinon or malathion, at the pink-bud stage of peach, also gave good control of small, overwintered nymphs of *Lecanium* sp. D, but was not quite so effective against slightly larger nymphs of *Lecanium* sp. A at ten per cent full bloom. A summer spray of malathion, parathion, nicotine sulphate plus soap, nicotine sulphate plus polyethylene glycol mono laurate, lindane, lindane plus stove oil, or demeton did not give satisfactory control of mature and almost mature scales of *Lecanium* sp. A. Summer nymphs of *Pulvinaria* sp. were controlled in June by one application of parathion; both Lindane and toxaphene were ineffective. At least five species of Hymenoptera and one species of Diptera attack soft scales on peach and apricot trees in the Okanagan Valley.

Acknowledgments

Thanks are due to Mr. G. D. Halvorson of the Summerland Laboratory, and to Mr. H. A. Magel, now at the Canada Experimental Farm, Agassiz, B.C., for their assistance in the application of the sprays.

A NOTE ON SEXING LIVE SPECIMENS OF *SCOLYTUS UNISPINOSUS* LEC. (SCOLYTIDAE, COLEOPTERA)¹

M. D. ATKINS and L. H. MCMULLEN²

A method for rapid, accurate determination of insect sex is often a valuable asset in field studies. Several sex differences, including one common to many species of *Scolytus*, and the results of testing their validity for field use, are presented here for *Scolytus unispinosus* Lec., the Douglas-fir engraver beetle.

In recent work it was necessary to determine the sex of a number of Douglas-fir engraver beetle adults in the field without injuring them. This led to an examination of adults under the microscope which revealed three differences in the external morphology of the sexes.

The first difference noticed in the attacking adults, was that the frons of the male bore a denser crown of setae than that of the female. This characteristic was used to sex 60 adults with a 10x hand-lens and then under 40x with a stereoscopic microscope. Subsequent dissections revealed that 14 errors were made with the hand lens, while only one was made using the microscope. The value of this characteristic is reduced after the beetles have been engaged in gallery construction, as the head setae become considerably worn.

A stable and reliable difference was found in the shape of the head as described for most members of this genus (Blackman, 1934). When viewed laterally, the front of the female's

1. Contribution No. 378, Forest Biology Division, Science Service, Department of Agriculture, Ottawa, Canada.

2. Forest Biology Laboratory, Victoria, B.C.

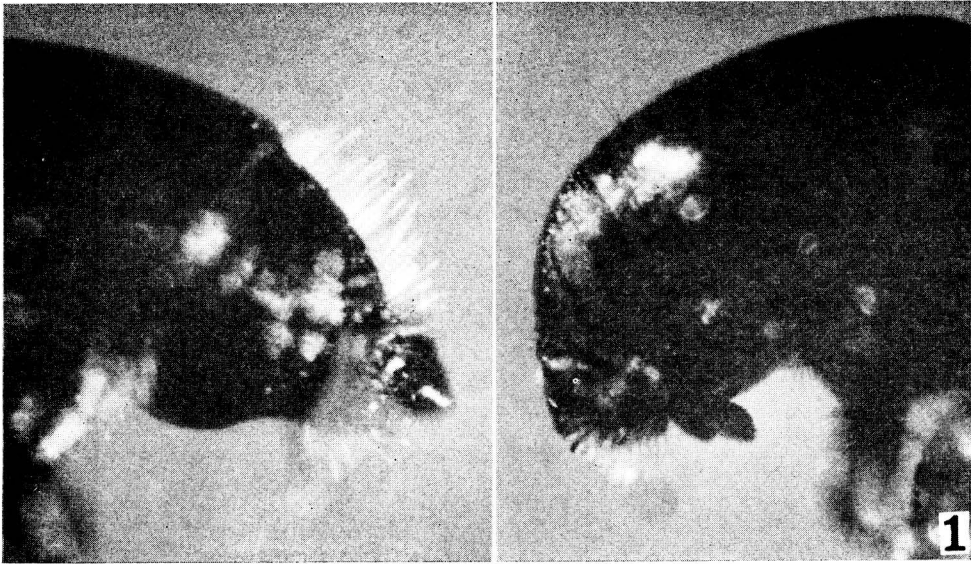


Fig. 1.—Heads of male (left) and female (right) *Scolytus unispinosus* Lec., showing difference in shape and setation.

head is convex while that of the male is sloping and flattened to a point well behind the eyes. Both head shape and setation differences are shown in Fig. 1.

A sample of 40 beetles was sexed by the authors under 40x, using head shape as the differentiating character. Later dissections showed that no errors were made. As microscopic examination is inconvenient for field identification, two more samples were sexed with a 10x hand lens. Dissection showed that out of 65 beetles, only 3 were sexed incorrectly.

The third interesting sex difference results from behaviour. Once gallery

construction has begun, and the male has assumed its duty of kicking the boring dust from the entrance hole, small particles of white frass adhere to the posterior sternites which form the posterior, ventral concavity (Fig. 2). As some males leave their galleries while new attacks are still being made, one cannot only tell the sex of the individuals, but also some of the past history of males by this observation.

Two interesting sidelights of the examination were the discovery of nematodes densely packed in the abdominal cavity of about 15 per cent of the adults, and the presence of a large hymenopterous larva in the abdominal cavity of 2 specimens.

Reference

- Blackman, M. W. 1934. A revisional study of the genus *Scolytus* Geoffroy (*Eccoptogaster* Herbst) in North America. U.S.D.A. Technical Bulletin 431, 1-30.



Fig. 2.—Ventral view of male *Scolytus unispinosus* Lec., showing boring dust adhered to sternites of posterior ventral concavity.