

ENTOMOLOGY

Cone and Seed Insects of Grand Fir, *Abies grandis* (Dougl.) Lindl.—A study was conducted on Vancouver Island to determine the seed-destroying insects of grand fir, their feeding habits and relative importance. There occurred in varying numbers three species of Cecidomyiidae (midges) as yet unidentified; two Chalcididae, *Megastigmus pinus* Parfitt and *M. rafni* Hoff.; and one species of Lonchacidae, *Earomyia abietum* McAlpine.

Larvae of the three midges are easily separated on the basis of their feeding habits; one feeds in the seed, one forms a gall and the other feeds on the scale. The larvae of the seed midge feeds singly within a seed. The gall midge larva causes a gall in the cone scale often near the seed where it fuses the seed to the scale. Larvae of the scale midge feed singly or in clusters on the inner surface of the cone scale.

The seed chalcids (*M. pinus* and *M. rafni*) are similar in habit in that larvae of both species feed within the seed, each larva completing its development in a single seed. Eggs of *M. Pinus* hatch and larvae start feeding in early June. Larvae of *M. rafni* start feeding about 1 month later. Larvae remain in the seeds throughout the summer and winter, to emerge as adults the following spring.

Table 1.
Insects in eight grand fir cones and resulting seed loss,
Cowichan Bay, B.C. 1963

Insect	No. insects per cone	No. seeds destroyed
Seed midge.....	6.6	6.6
Gall midge.....	13.0	None directly
Scale midge.....	28.0	None directly
<i>Megastigmus pinus</i>	25.0	25.0
<i>Megastigmus rafni</i>	3.4	3.4
<i>Earomyia abietum</i>	1.3	Variable

The larvae of the fir seed maggot, (*E. abietum*), wander throughout the cone. They enter and feed on seeds, particularly in early instars. In later instars they continue to enter seeds, but at this time are highly predacious, devouring larvae of seed chalcids and seed and gall midges.

Data in Table 1 show the relative importance of insects encountered in a detailed examination of eight cones. The seed chalcid (*M. pinus*), is the most serious seed destroyer. The gall mite, by fusing seeds to cone scales may cause loss of seed during seed extraction. The seed maggot, mainly predacious in its earlier instars, often damages good seeds in its search for seed-inhabiting insects.—A. F. Hedlin, Forest Research Laboratory, Victoria, B.C.

An Important Predator of the Aspen Leaf Beetle, *Chrysomela crotchi* Brown, in Manitoba and Saskatchewan.

—A recent outbreak of the aspen leaf beetle (Elliott and Hildahl. Ann. Rep. Forest Insect and Dis. Sur., Can. Dept. Forestry, Ottawa, 1961, 1962, 1963, and 1964) caused moderate to severe defoliation and skeletonizing of trembling aspen over an area of some 73,700 square miles of the aspen parkland and adjacent areas of continuous forest in Manitoba and east-central Saskatchewan. It commenced in 1961, reached a peak in 1963, and collapsed during 1964. The main cause of this rapid decline appeared to be a syrphid predator that attacks the eggs and larvae of the beetle. Attempts to rear the predator to the adult stage have been unsuccessful to date but J. R. Vockeroth, Entomology Research Institute, Canada Department of Agriculture, Ottawa, examined larvae and

stated that they are “almost certain to be *Phalacrodira niortarsis* (Zett.)”. The predator’s habit of laying eggs among those of the host (Fig. 1A), and the appearance of the full grown larvae (Fig. 1B) are similar to the description by Schneider (Tijdschr. over Plantenziekten. 59. 1953) for *Syrphus niortarsis* Zett., a predator of the eggs and larvae of *Melasoma* (= *Chrysomela*) spp. in Europe. Other similarities in the life history and habits are apparent: the eggs hatch in advance of those of the host and the predaceous larvae attack the host’s eggs; the larvae suck out the contents of the host’s eggs leaving the collapsed chorions stuck to the leaf surface; the larvae also feed on the first and second instar host larvae (observed by the authors in laboratory rearings only); and it overwinters in the larval stage.

The syrphid was first observed in 1962 at three separate locations in Manitoba and Saskatchewan and by 1963 was

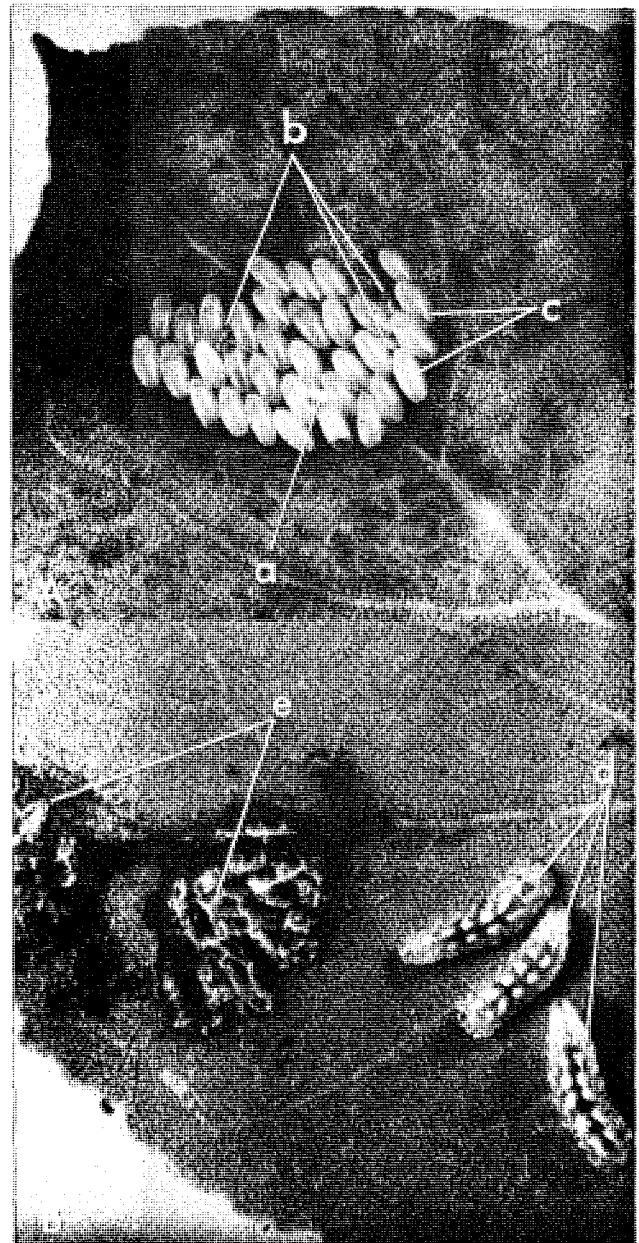


FIG. 1. a, syrphid egg; b, newly-hatched syrphid larvae; c, *C. crotchi* eggs; d, fully grown syrphid larvae; e, remains of *C. crotchi* eggs.