INVESTIGATIONS ON INSECTS ATTACKING EUROPEAN RHAMNACEAE

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Rhamnus cathartica L., a widely distributed Eurasian shrub, is the alternate host of the rust *Puccinia coronata* Cda. which causes serious damage to oats. Since *R. cathartica* was introduced into North America without its enemies, the Research Institute at Belleville, Ontario, Canada, and the European Station of the Commonwealth Institute of Biological Control, Delémont, Switzerland, are investigating the possibilities of establishing natural control agents of *R. cathartica* in Canada.

In 1964 we began a systematic survey in Europe of insects associated with *R. cathartica* and related species (*R. alpina* L., *R. saxatilis* Jacq., *R. orbiculata* Bornm., *R. alaternus* L.) and other genera (*Frangula alnus* Mill., *F. rupestris* Scop., *Paliurus spina-christi* Mill.). Lists of field records and additional records compiled from the literature are given by Malicky *et al* (1970). The insect fauna of the Rhamnaceae spp. studied contains a large number of polyphagous Lepidoptera, Coleoptera and Rhynchota. Stenophagous species are found mainly amongst the Lepidoptera (Pieridae: *Gonepteryx rhamni* L., *G. cleopatra* L., Lycaenidae: *Strymonidia spini* Schiff., Geometridae: *Scotosia rhamnata* Schiff., *S. vetulata* Schiff., *Triphosa dubitata* L., *T. sabaudiata* Dup., Phycitidae: *Eurhodope legatella* Hb., Cochylidae: *Hysterosia sodaliana* Haw., Walshiidae: *Sorhagenia lophyrella* Dgl., *S. rhamniella* Z., *S. janiszewskae* Riedl., Gracillariidae: *Euspilapteryx quadrisignella* Z., Bucculatrigidae: *Bucculatrix "frangulella"* Gz., Stigmellidae: *Stigmella catharticella* Stt., *S. rhamnella* H.S., *S. paliurella* Geras.). Stenophagous Homoptera are the Psyllidae *Psylla* cf. *rhamnicola* Scott., *Trichochermes walkeri* Foerst. and *Trioza rhamni* Schrank. and a number of Aphid species. So far only one stenophagous species has been found amongst the many Coleoptera collected from Rhamnaceae hosts (Cerambycidae: *Oberea pedemontana* CF.). Stenophagous dipterous species of the Trypetid genus *Carpomyia* and some possibly stenophagous Cecidomyiidae attack the fruits.

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From 1965 to 1967 feeding tests were made with larvae of *G. rhamni*, *S. spini*, *S. rhamnata*, *S. vetulata*, *T. dubitata*, *E. legatella*, *H. sodaliana*, *S. rhamniella*, *S. lophyrella* and *B. "frangulella"*. Leaves of 7 Rhamnaceae species (representing 3 genera) and of 22 additional shrub and tree species (representing 20 genera and 13 families) were offered in "starvation tests" (larvae starved to death) and "short-term-tests" (test plants offered for 5 days). In these tests *G. rhamni*, *S. rhamnata*, *S. vetulata*, *T. dubitata*, *E. legatella*, *S. rhamniella*, and *S. lophyrella* restricted their feeding to members of the Rhamnaceae genera *Rhamnus* and *Frangula*, whilst *S. spini* and *H. sodaliana* also accepted some genera of other families. Under the conditions of these tests there was no distinct discrimination between the species belonging to the genera *Rhamnus* or *Frangula*, but the field survey showed that some species (*S. rhamnata*, *S. vetulata*, *T. dubitata*, *S. lophyrella*, *S. rhamniella*) prefer *R. cathartica*, whilst others (*G. rhamni*, *S. janiszewskae*) prefer *F. alnus*. Most of the stenophagous Lepidoptera accepted the relatively hard and evergreen leaves of *R. alaternus* as well as the soft and deciduous leaves of other *Rhamnus* or *Frangula* species, but refused to feed on the leaves of the Rhamnaceae genus *Paliurus*.

Many of the stenophagous insects attacking *Rhamnus* appear to cause only little damage to their host. The Geometrids *S. vetulata* and *T. dubitata* may be potential defoliators of *R. cathartica* if they can operate without controlling agents such as parasites, etc. Hence both Geometrid species have been sent to Canada (Research Institute, Belleville, Ontario) where further pre-release studies are under way. Screening tests with the flower-feeding *S. rhamniella* are not as yet complete, but the available information suggests that this moth could complement the action of the leaf-feeding Geometrids. The Psyllid *T. walkeri* forms leaf-galls. In high densities it might affect *R. cathartica*, but further investigations have to be made to determine whether the species is "safe" for transfer to North America. At present we consider *O. pedemontana** as the most promising insect for the biological control of *R. cathartica*. The larvae of this Longicorn beetle mine within the wood of both stem and branches, causing a deformation of the bark and die-back of parts of the plant.

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Reference

Malicky, H., Sobhian, R. and Zwölfer, H., 1970. Investigations on the possibilities of biological control of *Rhamnus cathartica* L. in Canada: Host ranges, feeding sites, and phenology of insects associated with European Rhamnaceae. Z. ang. Ent. 65: 77-97.