

NOTES ON INSECTS ASSOCIATED WITH *PINUS RADIATA*  
IN NEW ZEALAND.

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In 1932, Clark investigated the exotic and indigenous insect relationships with *Pinus radiata* in New Zealand, recording six species in the former group and 19 in the latter. Three previously unrecorded insect associations are now added to this list.

*Sirex noctilio* F. is the principal insect concerned with destruction of trees in *P. radiata* forests in this country, against which the Ichneumonid parasite, *Rhyssa persuasoria* (L.) has been employed for some years by the Cawthron Institute. During the last seven years the writer has been concerned with obtaining field material of *Rhyssa* from *P. radiata* and rearing it in insectaries for distribution in New Zealand. In August and September dead trees are felled and are examined for the presence of *Sirex* and *Rhyssa* larvae. Those which contain *Rhyssa* larvae are then sawn into six foot logs and are stored in the insectaries, awaiting the emergence of *Rhyssa*. While making routine examinations of these dead *P. radiata* trees in the Belgrove plantation area in 1948, for the purpose of obtaining *Rhyssa* infested logs, on two occasions primary parasitism of *S. noctilio* by the native Oryssid wasp, *Guiglia schauinslandi* (Ashm.) was noticed. Pupae of *G. schauinslandi* were recovered from the inside of larval remains of *S. noctilio*; in one instance this occurrence was detected only by an outline of the *G. schauinslandi* pupa inside the *Sirex* larva and was revealed on opening up the latter.

The probable native hosts of *G. schauinslandi* are the weevils, *Psepholax sulcatus* White, *P. coronatus* White and *P. barbifrons* White, as was noted by the writer in 1927. By a coincidence, *P. coronatus* has been demonstrated by Clark (1932) to have transferred its attentions additionally to *Pinus radiata*, although the writer has not yet found this relationship to be present in the Nelson province. *G. schauinslandi* must parasitise late larval stages of *S. noctilio*, when they travel to the final horizontal pupation position, close to the outside of the trunk of the tree, for they would then be within reach of the parasite's short ovipositor; emergence of the parasite is in the October-December period, with only a few adults remaining alive by early in January, while emergence of *Sirex* does not commence in Nelson until mid January and continues until April. No young *Sirex* larvae would therefore be available for parasitism by *Guiglia*. In some instances *Rhyssa* may be hyperparasitised by *Guiglia*, for *Rhyssa* parasitises one-half to two-thirds grown larvae of *Sirex* when they are well within the tree and these larvae come close to the outside of the tree before they are finally killed and consumed by the *Rhyssa* larvae. *Rhyssa* larvae are therefore in the same vulnerable position for hyperparasitism as are *Sirex* larvae for primary parasitism. The significance of *Guiglia* cannot yet be assessed, but the percentage of parasitism must be low, for only a few dozen individuals appear in the insectaries every year, compared with some thousands of *Rhyssa* and even greater numbers of *Sirex*.

The other two occurrences on *P. radiata* are both of indigenous beetles, *Stenopotes pallidus* Pasc. (Cerambycid) and *Anthribus sharpi* Broun (Anthribid), which spend their larval instars in and under the bark of dead trees at the same state of desiccation as the *Sirex-Rhyssa* relationship.

The records of an Oryssid parasitising *S. noctilio* and of the two additional native beetles in association with *P. radiata* are additional interesting examples of the manner in which certain members of the New Zealand insect fauna are adapting themselves

to the changing biological relationships in areas in which the native forest cover has been greatly reduced by milling or fire. This restricts indigenous insects to the remaining native forest, thus limiting their distribution, which is increased only when a new association is formed with exotic trees or insects.

*References.*

- CLARK, A. F. (1932). Insects infesting *Pinus radiata* in New Zealand.—N.Z. J. Sci. Tech., **13**, pp. 235–243.
- GOURLAY, E. S. (1927).—Notes on the New Zealand wood wasp *Ophrynopus schauinslandi* Ashmead.—Trans. Proc. N.Z. Inst., **57**, pp. 691–693.
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