

PREDACEUS SHIELD-BUGS (HETEROPTERA: PENTATOMIDAE) IN NEW ZEALAND

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During the summer of 1962 a number of examples of predation by New Zealand pentatomid bugs came to the writer's notice. These, and other records contained in various publications and insect collections have been gathered together in the following note.

Asopid bugs of the family Pentatomidae are well known insect predators. In New Zealand the two species present, *Cermatulus nasalis* (Westwood) and *Oechalia schellenbergii* (Guérin-Ménéville), have been recorded attacking other insects, although there is only one published record (Muggeridge, 1933) of predation by *O. schellenbergii*. *Cermatulus nasalis* has been recorded preying on the larvae of the armyworms *Agrotis ypsilon* (Rott.), *Pseudaletia separata* (Walk.), *Persectania aversa* (Walk.), *Heliothis armigera* Hubn., the geometrid moths *Asaphodes megaspilata* (Walk.), and *Venusia verriculata* (Feld.), the red admiral *Vanessa gonerilla* (Fabr.), the eucalyptus beetle *Gonipterus scutellatus* Gyll., and the pear-slug *Caliroa limacina* (de Geer), by Broun (1896), Myers (1922, 1926), Tillyard (1926), and Gourlay (1930). Exposed pupae of noctuid moths may also be attacked (Myers, 1922, 1926), and Myers (1921) described a specimen of *Cermatulus nasalis* attacking an adult male cicada, *Melampsalta cruentata* (Fabr.). Powell (1954) mentioned its habit of preying on pear-slug and monarch butterfly (*Danaus plexippus* (L.)) larvae.

Additional records of the predatory habits of *Cermatulus nasalis* gathered by the Entomology Division, D.S.I.R., include a specimen from Awakeri, Bay of Plenty, 14 March 1949, feeding on monarch butterfly larvae; three specimens taken at Nelson, 23 January 1949, by Dr W. Cottier, also feeding on monarch butterfly larvae; and one specimen collected at Nelson, 4 December 1962, by Mr W. P. Thomas which readily fed on larvae of the leaf-rollers *Tortrix excessana* (Walk.), and *Epiphyas postvittana* (Walk.), in captivity. (Fig. 1.)

An antepenultimate *Cermatulus* nymph was found feeding on a small noctuid caterpillar at Nelson, 11 January 1963, by Dr W. C. Clark. During 70 days captivity the nymph moulted twice to become adult, and consumed seven leaf-roller larvae in their final three instars, one *Tortrix excessana* moth, two *Epiphyas postvittana* moths, and one pear-slug larvae. (Figs. 2 & 3.) Later, during

March, April and May, this specimen showed no further interest in caterpillars. Records in the Plant Diseases Division, D.S.I.R., collection comprise a specimen attacking monarch butterfly larvae at Titirangi, 26 March 1943, Mrs Dahl, and a nymph and adults attacking *Paropsis* larvae at Puketutu Is., 15 November 1960, Mrs B. M. May. Dr R. A. Cumber (pers. comm.) reports, that almost immediate predation resulted when a specimen of *Cermatulus* and a geometrid larva collected by sweeping in the East Cape area were placed together.

Predatory habits of the South Island high country sub-species, *Cermatulus nasalis hudsoni* Woodward, have been noted in Canterbury by Mr Graeme White. At Mt Magog two fifth instar nymphs were observed on 17 January 1963 tussling over a small lepidopterous larva into which they had inserted their stylets, one at each end. A second observation was made at Mt Bailey, 18 January 1962, when another fifth instar nymph was seen with its stylet inserted through the dorsum of the thorax of a *Crambus vittellus* (Dbl.) moth.

The other New Zealand aspid bug, *Oechalia schellenbergii* (Guérin-Ménéville), which occurs in the central and northern parts of the country, is less common, and often described as a predatory or partly carnivorous insect (Kirkaldy 1909, and b, Myers 1922, 1926, Tillyard 1926, Smith 1944, Eyles 1960). Such statements are usually based on the habits of the species in Australia where Froggatt (1907) records it preying on the larvae of the noctuid vine moth, *Phalaenoides glycine* Lew., several species of cutworm (species not specified), and larvae of the fig-leaf beetle *Galeruca semipullata* Clark. Muggeridge (1933) was the first to observe the predatory habits of *Oechalia schellenbergii* in New Zealand, and recorded it preying on larvae and pupae of the white butterfly (*Pieris rapae* L.). The Entomology Division, D.S.I.R., collections contain three specimens from Hawke's Bay, February 1933, J. Muggeridge, recorded attacking white butterfly (*Pieris rapae* L.) larvae; one specimen from Wairenga-a-hiha, Gisborne, 7 March 1955, R. Robbins, also preying on white butterfly larvae; three specimens from Motupiko, Nelson, February 1960, observed by Mr E. W. Valentine feeding on second and third instar larvae of the army-worm, *Pseudaletia separata* (Walk.), which were particularly abundant in an oat crop; and one specimen from an apple orchard at Redwoods Valley, Nelson, October 1962, which consumed approximately twenty-four immature apple leaf-roller caterpillars during nine days in captivity. Mr D. J. Lamont of Motueka photographed a specimen attacking a large caterpillar of *Heliothis*

armigera Hubn. in March 1962. The Plant Diseases Division, D.S.I.R., collection contains two specimens of *O. schellenbergii* from Hawke's Bay, 21 March 1932, Dr W. Cottier, recorded attacking *Pieris rapae*.

The New Zealand representatives of the sub-family Acanthosomatinae—*Rhopalimorpha obscura* White, *R. lineolaris* Pendergrast, *R. alpina* Woodward, and *Oncacontias vittatus* (Fabr.) are reported to be exclusively phytophagous by Myers (1926), but Pendergrast (1952) observed a starved male *R. obscura* sucking the contents from partially incubated eggs of *R. lineolaris* and also found eggs with the contents sucked from them in a jar containing starved individuals of both species. There are no records of predatory habits among the species of the sub-family Pentatominae present in New Zealand, viz., *Nezara viridula* (L.), *Dictyotus caenosus* (Westwood), *Hypsithocus hudsonae* Bergroth, *Cuspicona simplex* Walker and *Antestia orbona* Kirkaldy, excepting *Glaucias amyoti* (White) which Broun (1896) and Gourlay (1930) have reported feeding on the larvae of the pear-slug, *Caliroa limacina*. Myers (1926) described a nymph of *G. amyoti* preying on another nymph which was undergoing ecdysis.

It is interesting to recall that in North America the widely distributed aspid bug *Podisus maculiventris* (Say), which appears generally similar to *O. schellenbergii*, is well-known as a predator of the fall army-worm *Spodoptera* (=Laphygma) *frugiperda* (Smith and Abbot) along with three other heteropterous bugs—the anthocorid *Orius insidiosus* (Say), the nabid *Nabis ferus* (L.) and the reduviid *Sinea sanguisuga* Stal (Luginbill, 1928). *P. maculiventris* is regarded as the most useful of American predaceous Hemiptera and ranks next to the carabid *Calosoma* (species not mentioned) as an enemy of the fall army-worm (Clausen, 1940).

The New Zealand aspid bugs are undoubtedly beneficial from the point of view of agriculturists and gardeners, indeed Myers (1926) claims them to be "highly beneficial", but as their numbers are low their overall effect on caterpillar populations is probably not great, and further, they are not known to be exclusively predatory in habit. Muggeridge (1933) regarded *Oechalia schellenbergii* as being too uncommon to be considered important from the point of view of control of the white butterfly. Experience with *Cermatulus nasalis* in the laboratory indicates that the appetite for caterpillars may be rather limited in adults of this species.

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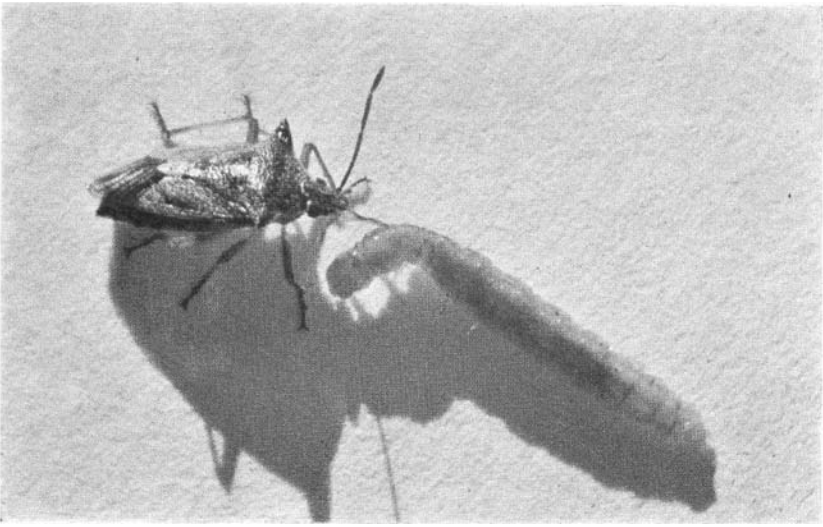


Fig. 1-Adult *Oechalia schellenbergii* preying upon a leaf-roller caterpillar in the laboratory of the Entomology Division, D.S.J.R., Nelson. Photo: G. W. Ramsay.

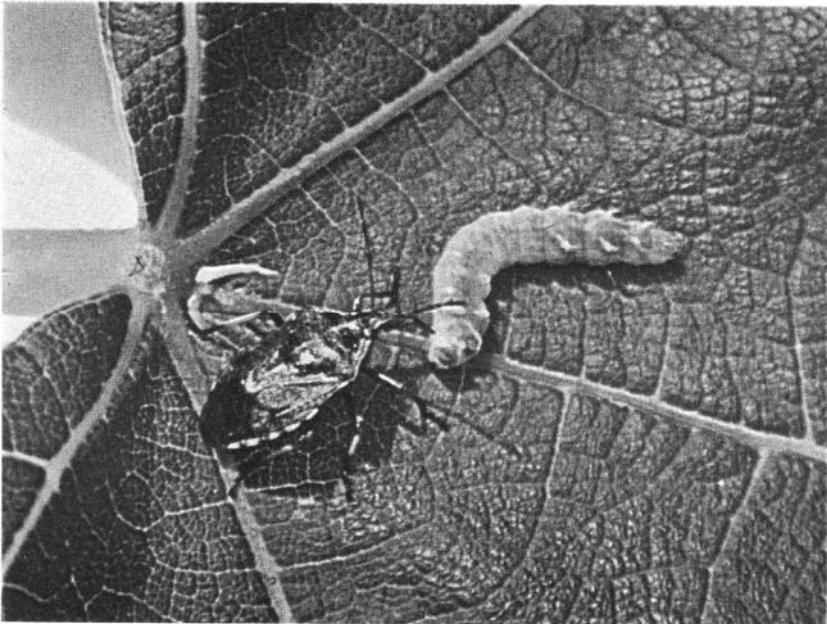


Fig. 2-Adult *Cermatulus nasalis* with a captured leaf-roller caterpillar. Photo: D. B. Read.

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