

TRANSACTIONS
OF THE
ROYAL SOCIETY OF NEW ZEALAND

ZOOLOGY

VOL. 1

No. 28

FEBRUARY 8, 1962

[Continued from *Transactions of the Royal Society of N.Z.*, Volume 88, Part 4.]

Notes and Synonymy of New Zealand Ichneumonidae
Subfamily Pimplinae

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[Received by the Editor, July 27, 1961.]

Abstract

THIS paper re-describes and deals with the nomenclature of the only known indigenous species of the subfamily Pimplinae (Ichneumonidae; Hymenoptera) in New Zealand. A key for the identification of two widespread Australasian species that occur in New Zealand, three introduced species and the indigenous species is given. Notes and principle references for each species is included and also a special note on the species of the genus *Ephialtes* that have been introduced into New Zealand for the purpose of biological control of the codling moth.

THE subfamily Pimplinae is represented in New Zealand by only one described indigenous species, *Certonotus fractinervis*, which belongs to a well-known Australian genus. Two other species, *Lissopimpla excelsa* and *Echthromorpha intricatoria*, that have been recorded as occurring naturally in New Zealand are common and widespread species also found in Australia, and have probably found their way into New Zealand from Australia within the last 150 years. The remaining three species that occur in this country, *Rhyssa persuasoria*, *Rhyssa lineolata*, and *Ephialtes caudatus*, have been introduced into New Zealand for biological control purposes.

The following key will serve to distinguish the six species of Pimplinae at present recorded from New Zealand.

KEY TO NEW ZEALAND SPECIES OF PIMPLINAE

- | | |
|---|---|
| 1. Mesonotum transversely striate or rugulose | 2 |
| Mesonotum smooth or punctate | 4 |
| 2. Propodeum with at least the median basal area defined and usually with other areas more or less defined | |
| Propodeum without defined areas, and without carinae | 3 |
| 3. The flagellum of the antennae with a white annulus | |
| The flagellum of the antennae without a white annulus | |
| 4. Tarsal claws of moderate size without a long spatulate bristle; abdomen strongly and densely punctate | |
| Tarsal claws large, each with a long, spatulate bristle; abdomen either smooth and shining or mat, never strongly and densely punctate | 5 |
| 5. Mainly red-brown species; posterior femora with a small tooth-like projection beneath; abdomen polished; nervulus interstitial or antifurcal | |
| Mainly black species with conspicuous yellow markings; posterior femora without a tooth-like projection beneath; abdomen not polished, somewhat mat; nervulus strongly postfurcal | |

Certonotus fractinervis

Rhyssa lineolata

Rhyssa persuasoria

Ephialtes caudatus

Lissopimpla excelsa

Echthromorpha intricatoria

Certonotus fractinervis (Vollenhaven)

Rhyssa fractinervis Vollenhaven, 1873. Tydschr. vol. 5, entom. 16, p. 69 Gourlay, 1930, N.Z. Dept. Sci. & Indust. Res. Bull. no. 22, p. 5.

Rhyssa antipodum Smith, 1876, Trans. Ent. Soc. Lond. p. 479. Hutton, 1881, Colonial Mus. & Geol. Survey of N.Z. no. 10, p. 128.

Rhyssa clavula Colenso, 1885, Trans. N.Z. Inst. vol. 17, p. 158.

Female. Body length 27 mm; forewing, length 20 mm; antennae, length 19 mm and ovipositor 35 mm.

A large dark-brown species marked with lemon-yellow. Head brown, external orbits widely marked with yellow, especially wide on vertex; internal orbits yellow beneath antennal base; face yellow with two parallel brown streaks running from base of antennae to clypeus; clypeus brownish yellow; mandibles blackish brown, the teeth black; malar space brown; antennae black, with apical third of the flagellum white, except the apical segment, which is brown, usually the white annulus extends from the 25th to the 48th segments; thorax dark brown, with the upper parts of the prothorax, sub-alar ridge, tegula, scutellum and post-scutellum yellow; propodeum with the posterior half or in some specimens the posterior two-thirds yellow; abdomen with the 1st and 2nd tergites brown with sub-apical transverse bands of yellow, laterally and medially widened, and a yellow spot laterally at the base of the 2nd tergite; remaining tergites brown, with a median broad yellow mark, and extensively marked laterally with yellow; anterior and middle coxae and trochanters yellow, posterior coxae brown, the trochanters more or less yellowish; all femora and tibiae brown with tarsi yellowish brown; stigma and veins black.

Face sparsely but distinctly punctate, clypeus with a number of deep and large punctures on each side of the smooth median area; teeth of mandibles short and sub-equal in length, the upper broader than the lower; the first segment of flagellum twice as long as the 2nd, the latter sub-equal in length to the 3rd segment, the central segment slightly longer than their diameter; vertex and back of head shining and impunctate; posterior ocelli separated by less than their diameter; pronotum impunctate and shining; mesonotum transversely striate; notauli strongly impressed anteriorly, the median lobe prominent; scutellum, post-scutellum impunctate, or in some specimens there are a few obsolete punctures on the scutellum; mesopleurum finely but not closely punctate, a large oval depression adjacent to the mesopleural suture impunctate and shining; metapleurum, impunctate and convex in upper half; propodeum impunctate and shining, with the median basal area deeply excavated; lateral basal areas very weakly defined, the carinae almost obsolete; lateral longitudinal carinae well defined; first tergite with spiracles situated about $\frac{1}{3}$ of the length of the segment from base, and slightly further from each other than from base; 2nd tergite as long as its apical width, widening towards apex; 3rd tergite wider at base than at apex and slightly longer than basal width; 4th and 5th tergites parallel sided, about as wide as long; 6th tergite slightly longer than 4th or 5th tergites, the remaining tergites short, with the 6th, angularly bent downwards; the abdomen is compressed from the 3rd tergite, more strongly so at apex; all coxae impunctate and shining, tarsal claws without teeth and well-curved; posterior femora cylindrical and about $\frac{3}{4}$ the length of the posterior tibia; posterior tibial spines short.

Male. Similar to female but with the face and malar space usually entirely yellow and apical half of propodeum yellow; only the 1st tergite

with a sub-apical transverse band of yellow, the remaining tergites brown except for a trace of yellow in the middle of each tergite on apical quarter; abdomen much narrower, the tergites relatively much longer than broad, the 1st tergite three times as long as apical width, remaining tergites correspondingly narrow and elongated. As in the female the nervulus is antifurcal and vertical and the nervellus broken at its upper quarter and strongly reclivous.

Re-described from a series of six females and two males from the following localities: Creswell Sounds, South Westland; Mt Lomond and Waipango, Southland; Lake Brunner, Canterbury; and several localities in the North Island. The species has previously been recorded from Mt Arthur at 3,600ft, Lake Wakatipu, Humbolt Range at 3,000ft in Beech forest; Mt Peel, at 5,000ft, in February, and Mt Earnshaw, in January.

This large and handsome species was first described and named by Vollenhaven in 1873 from a female collected in New Zealand. Three years later Smith described and named another female collected at Oxford, Canterbury, *Rhyssa antipodum*, and in 1885 it was again described and named by Colenso from North Island specimens.

The species is not uncommon in native forests throughout both the North and South Islands and is a parasite of the Elephant Beetle (*Thynocodes urus*).

As the older descriptions are somewhat vague, mainly based on coloration, and do not mention characters that are now used in separating the species or this genus, the New Zealand species is re-described above.

Rhyssa lineolata (Kirby)

Cryptocentrum lineolatum Kirby, 1837. In Richardson, Fauna Bor. Amer. vol. 5, p. 260.

Rhyssa albomaculata Cresson, 1864, Ent. Soc. Phil., Proc. vol. 3, p. 318.

Epirhyssa Crevieri Provancher, 1880, Nat. Canad. vol. 12, p. 17.

Rhyssa lineolata (Kirby) Pratt, 1939, Ent. Soc. Amer. Ann. vol. 32, p. 733.

Mr R. Zondog, of the Forest Research Institute, Rotorua, has recently recorded this species from New Zealand. I am indebted to him for a series of specimens bred from pine logs infested with *Sirex*, at Rotorua. This widespread European and American species has apparently recently become established in New Zealand, and was probably introduced with consignments of *Rhyssa persuasoria*, which has been introduced and established in this country to control the Horntail Borer (*Sirex noctilio*). Pratt (1939) gives a detailed account of the morphology of this species.

Rhyssa persuasoria (Linnaeus)

Pimpla persuasorius Linnaeus, 1758, Syst. Nat. ed. 10, vol. 5, p. 562.

Rhyssa persuasoria (Linnaeus). Chrystal & Myers, 1928, Bull. Ent. Res. vol. 19, pp. 67-77. Clark, 1930, N.Z. Journ. Sci. & Tech. vol. 12, pp. 145-146. Miller & Clark, 1935, Bull. Ent. Res. vol. 26, pp. 149-154. Miller & Clark, 1935, N.Z. Journ. Sci. & Tech. vol. 19, pp. 63-64. Gourlay, 1951, Bull. Ent. Res. vol. 42, p. 21.

The above are the more important references to *Rhyssa persuasoria*, a notable parasite of the Horntail Borer (*Sirex noctilio*) in New Zealand.

This species, like other pimplids, varies considerably in size, usually correlated with the size of the host larva. The majority of the females range in length from 18 to 34 mm (excluding the ovipositor) while the males are normally much smaller. The extent of the yellow markings vary somewhat, although the colour of the legs is usually fairly constant, except that in some specimens the posterior legs, especially the coxae, are more or less darkened.

Rhyssa persuasoria was first introduced into New Zealand in 1928, and further introductions were made in 1929 and 1931. The actual liberations were made in Marlborough, Wairau, Hanmer Springs and Palmerston North in 1929, in Tasman and Moutere, in the Nelson district and Wairiki in 1931, and in Ashburton and Braeburn, in Canterbury, in 1932.

Lissopimpla excelsa (Costa)

Pimpla excelsa Costa, 1864, Ann. Mus. Zool., Napoli, 2 (1862).

Rhyssa semipunctata Kirby, Trans. Ent. Soc., London, 1883, p. 212.

Xenopimpla semipunctata Cameron, 1898, Mem. Manch. Soc. vol. 42, p. 27.

Lissopimpla semipunctata (Kirby), Gourlay, 1930, Dept. Sci. & Industr. Res. Bull. 22, p. 5.

Lissopimpla excelsa (Costa), Parrott, 1952, Trans. Roy. Soc. N.Z., vol. 80, part 2, p. 163.

A full synonymy, description, notes on variability, seasonal occurrence and hosts in New Zealand was given by Parrott in 1952.

Echthromorpha intricatoria (Fabr.)

Cryptus intricatorius Fabr., 1805, Syst. Piez. p. 77.

Allotheronia 12-guttata Ashmead, 1900, Proc. U.S. Nat. Mus. vol. 23, p. 55.

Echthromorpha intricatoria (Fabr.) Gourlay, 1926, Ent. Mon. Mag. vol. 62, p. 170.

Parrott, 1952, Trans. Roy. Soc. N.Z., vol. 80, part 2, p. 156.

A full synonymy, description, notes on variability, habits, hosts and seasonal occurrence of this species in New Zealand has been given by Parrott in 1952.

This species, originally described by Fabricius from Australia, is one of the most conspicuous and commonest ichneumon wasps in New Zealand. It probably found its way into New Zealand and became established within recent times, as it was first recorded in this country by Ashmead in 1900. *Echthromorpha intricatoria* has a wide range of hosts, and in New Zealand parasitises a number of species of butterflies and moths. The females lay their eggs in the host larva and the adult parasite emerges from the host pupa.

A NOTE ON *Ephialtes caudatus* Ratz

About 1903 a codling moth parasite was introduced into California from Spain under the name *Ephialtes messor* Grav., and according to the New Zealand Agriculture Department Report for 1907, pp. 209-212, the same parasite was introduced into New Zealand from California by the Department. Rosenberg (Bull. Ent. Res. vol. 25, p. 2, 1934) considered that *Ephialtes messor* Grav. may be the insect known in Europe as *Ephialtes extensor* Taschb. Although this species was evidently bred and distributed throughout New Zealand, there is no evidence that it had become established.

Up to 1939 the nomenclature of the species of *Epheltes* that are parasites of the codling moth (*Cydia pomonella*) was rather confused. Perkins, in 1939 (Bull. Ent. Res. vol. 30, pp. 307-308) considered that *Ephialtes* species bred from codling moths have usually been determined as *E. (Calliephialtes) extensor* Taschb, 1863. Two species have been confused under this name and neither of them, according to Perkins, is *E. extensor*, which is a synonym of *E. punctulata* (Ratz.) (*Pimpla punctulata* Ratz. 1844). Two species, *E. caudatus* Ratz. 1848, and *E. crassiseta* Thomson, 1877, are known to have been bred from codling moths in Europe.

The females of these two species may be distinguished by the form of the ovipositor. In *E. caudatus* the ovipositor is obliquely truncated apically, while in *E. crassiseta* the ovipositor is sharply pointed.

There is a specimen of *Ephialtes caudatus* in the D.S.I.R. collections, collected according to the label, "Nelson, May, 1943; parasite of the codling moth". In 1943 *E. caudatus* was reared and liberated in the Nelson district by the Cawthron Institute, but in the Annual Report of the Institute for 1944-45 (published 1945) it is stated that *Ephialtes caudatus* was not found in the two orchards in the Nelson

District in which it had been liberated in 1943. The author has collected extensively in the Nelson District over the past ten years, including orchards in which *E. caudatus* had been liberated, but no sign of this species has been seen in the field, and it is highly improbable that it has become established in the Nelson District.

It has therefore been reasonably established that the species of *Ephialtes* introduced into New Zealand to control the codling moth, was *Ephialtes caudatus* Ratz., but so far this species has not been identified in field collections, and it is therefore doubtful whether it has become established in this country. The specimen in the collections of the D.S.I.R., Nelson, may have been a specimen placed in the collection from the consignment of this parasite received from Europe.

ACKNOWLEDGMENTS

This paper has been prepared in connection with my work on Australian Ichneumonidae, and the author wishes to gratefully acknowledge financial assistance from the Australian Commonwealth Scientific and Industrial Research Organisation Endowment Fund, Melbourne, the N.S.W. Dept. Agriculture, Sydney, the Waite Institute, Adelaide, and the National Museum, Melbourne. I also wish to thank Mr R. Zondog and Mr T. C. R. White, of the Forest Research Institute, Rotorua, New Zealand, for specimens of New Zealand parasitic wasps. To Dr Henry Townes, Museum of Zoology, the University of Michigan, Ann Arbor, Michigan, U.S.A., for assistance in nomenclature problems connected with the Ichneumonidae.

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