

# The oviposition behaviour of parasitic Hymenoptera with very long ovipositors (Ichneumonoidea: Braconidae)

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ABSTRACT. — The oviposition behaviour of a parasitic Hymenopteron with very long ovipositor, *Gronaulax* sp. (Braconidae: Braconinae) is described for the first time.

## Introduction

Very to extremely long ovipositors occur in the Ichneumonoidea (Hymenoptera), both in the Ichneumonidae and in the Braconidae. In the Ichneumonidae the longest ovipositor reaches up to 8 times fore wing length (*Dolichomitus hypermeces* Townes, 1975: 125, 127 from Peru), in the Braconidae the maximum is not 14 times body length (Berland, 1951: 918; Townes, 1975: 125), but about 9 times fore wing (*Euurobracon yokohamae* (Dalla Torre, 1898 from Japan).

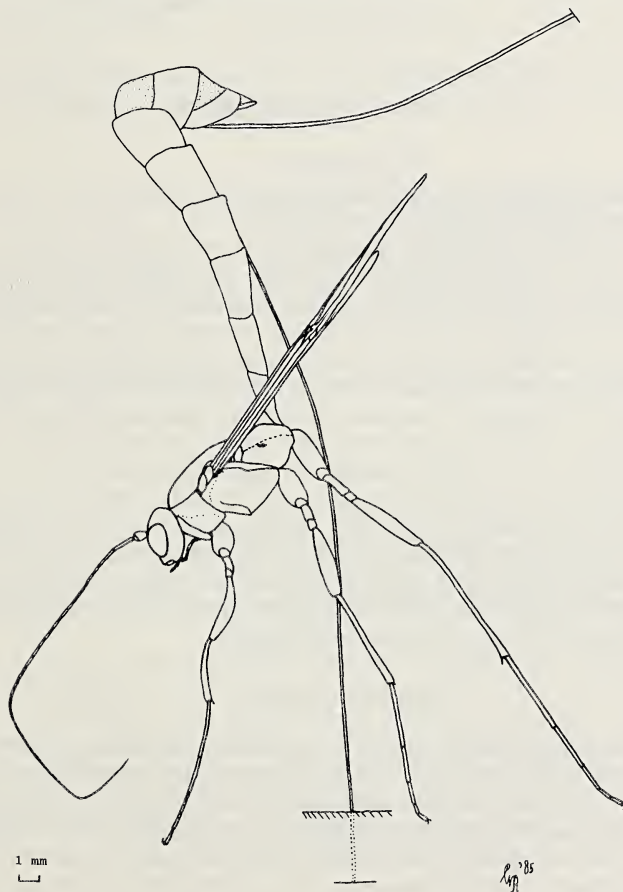


Fig. 1. Oviposition by *Rhyssa persuasoria* L.

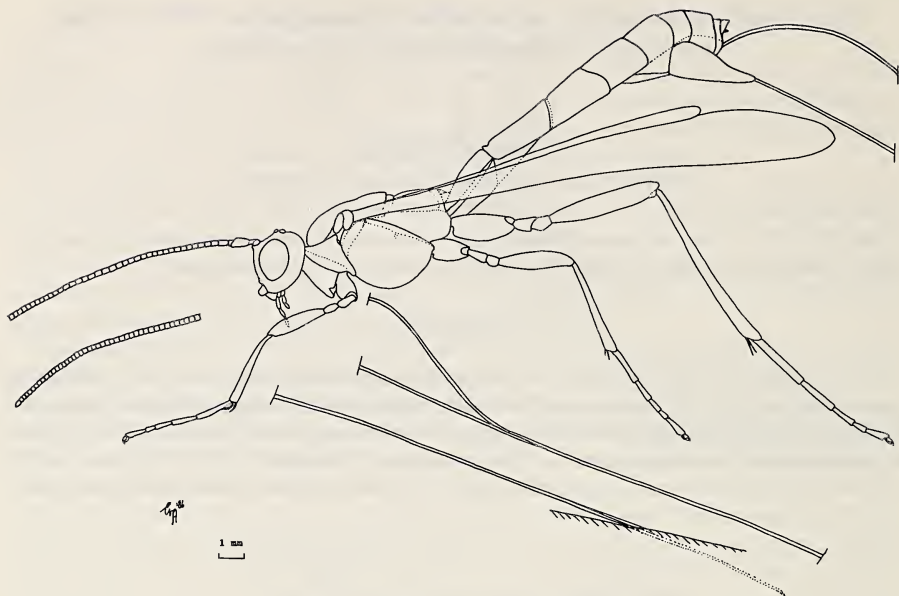


Fig. 2. Oviposition by *Gronaulax* sp.

The South American Braconid whereupon Berland based his statement has actually a short ovipositor; the genus will be described in the near future.

The oviposition behaviour of parasitic Ichneumonidae with very long ovipositors remained unknown. It was obvious that an ovipositor longer than twice length of fore wing cannot be handled like it is done by e.g., the well-known *Rhyssa persuasoria* L. (Ichneumonidae: Pimplinae). In species with ovipositor about twice length of fore wing or shorter the metasoma is gradually vertically positioned, the ovipositor is more or less guided by the hind coxae and driven nearly vertically in the wood by pressure of the apical quarter of the metasoma (fig. 1). This type R (of *Rhyssa*) of oviposition is common among both Ichneumonidae and Braconidae, which have to penetrate a hard substrate to lay their egg on or in the host larva. It was suggested that the species with very long ovipositors use their long ovipositor to reach (also) the deep-boring beetle-larvae in decomposing organic matter. Tunnels made by the host larva may guide the ovipositor (Van Achterberg, 1981: 89). During my short visit to the Tangkoko-Dua Saudara Nature Reserve (North Sulawesi, near Bitung, ca. 9000 ha) on November 28, 1985 I observed a Braconid with long ovipositor (about 2.5 times fore wing) ovipositing in a comparatively thin branch of a tall fallen tree, dead for at most one year and about 50 meters long. The site was about 100 m above sea level on the Gunung Tangkoko.

#### Oviposition behaviour

Several species were flying along the main stem and between the branches of the tree, mostly with the same colour pattern, body black with dark reddish head and dark brown wings. One species with long (2.5 times fore wing) to very long (4.5 times) ovipositor was flying above the medium-sized branches and the main stem, respectively. A second species with medium-sized ovipositor (about equal to fore wing) was searching among the thinner branches. Only the latter species feigned death for several minutes in the net when captured ("thanatosis"). Most common was the first mentioned species, belonging to the genus *Gronaulax* Cameron (Braconidae: Braconinae) and oviposition was observed by a female with fore wing 18.5 mm and

length of ovipositor 45 mm. The branch penetrated had a diameter of about 10 cm.

The female was hovering briefly in front of the branch before landing. The antennae were not seen to touch the substrate. The wings were kept obliquely sideways and were shivering somewhat. The female walked forwards and tipped the substrate with the tip of the ovipositor (or sheath). Then it stepped somewhat backwards and elevated the metasoma between the wings. This position remained nearly unchanged for the whole oviposition period of half an hour. The ovipositor was manipulated by downwards and sideways movements of the apex of the metasoma. The angle between ovipositor and metasoma remained about  $120^\circ$  for the whole oviposition period (fig. 2). After half an hour it quickly retracted the ovipositor and flew off. As shown in fig. 2 the position of the metasoma in respect to the ovipositor during insertion of the ovipositor is fundamentally different from type R oviposition (fig. 1). The ovipositor is not brought under the body and not guided by part of the metasoma and by the hind coxae. This would be very difficult, if not impossible considering the length of the ovipositor in the observed *Gronaulax* sp. It is obvious that for this new type of oviposition (type G) less force is delivered to the ovipositor and that most of the time is used to follow existing cracks and tunnels in the dead wood. Likely most of the time it was "sweeping" its ovipositor to follow the tunnels made by the host larva. The host of this *Gronaulax* sp. is unknown, but related genera are parasites of larvae of Cerambycidae and Buprestidae.

#### Acknowledgements

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#### LITERATURE

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ATLAS PROVISOIRE DES INSECTES DE BELGIQUE, CARTES 1801-2030 (G. Caspar, J. Leclercq & C. Verstraeten eds). Faculté des Sciences Agronomiques de l'Etat, Zoologie Générale et Faunistique. Gembloux (Belgique). ISSN 9771-5471. Gebrocheerd, prijs onbekend.

Deze aflevering bevat de verspreidingskaarten van kleinere of grotere groepen insekten behorende tot de Saldoidea (Heteroptera), Aphodidae (Coleoptera) en Nymphalidae (Lepidoptera, nieuwe bewerking). Dan volgt een serie kaarten met gegevens over Hymenoptera, waarbij dankzij de medewerking van br. V. Lefebvre ook de verspreiding in het aangrenzende Nederlandse gebied opgenomen kon worden. Behandeld worden: de families Orussidae (vier soorten), Megalodontidae, Ibalidae, Bethylidae, Eumenidae, Vespidae, van de Sphecidae de pas in België ontdekte *Alysson ratzeburgi* (Dahlbom) en ten slotte *Xylocopa violacea* (Linnaeus) als enige vertegenwoordiger van de Xylocopidae. De serie besluit met de Sciomyzidae (Diptera).

Wie zich interesseert voor de Belgische faunistiek in relatie tot die van Nederland zal in deze publikatie weer veel interessante gegevens aantreffen. — B. J. Lempke.