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Notes on Megaloptera from the Guyanas, S. Am.

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Summary

1. Megaloptera seem to be scarce in the Guyanas. Only four species have been recognized, three of these belong to the genus *Corydalus*, one to the genus *Chloronia*.

2. Due to inadequate descriptions and misidentifications the systematic position of the species of *Corydalus* proved to be doubtful. The holotypes, still in existence of the species under consideration, could be inspected.

3. In the course of this revision an unnamed species was detected, previously dealt with under the name of a common species. Of another species, described and known from the female sex only, the corresponding male sex could be detected.

4. Imagines are seldom encountered in the day time, most specimens are found at lights at night time. Females are more frequently collected than males. The flight period of the species shows a concentration towards the end of the year, probably influenced by the start of the rainy season after a long dry period.

5. Larvae and one pupa of Megaloptera have been found by chance in the creeks and rivers of the mountainous interior of Surinam and in creeks of the savanna area.

6. Under the tropical circumstances of the Guyanas, cold stenotherm aquatic insects as are Megaloptera, do not find favourable ecological conditions for their development. A few specialized species are able to take their place in this environment, represented in relatively small quantities.

Introduction

In South America the Megaloptera are represented by a number of species belonging to the Corydalidae and a few species to the Sialidae. According to PENNY (1977) 27 species of the genus *Corydalus* and 12 species of the genus *Chloronia* have been described from the neotropical region. Four species of three other genera are recorded from Central and North America. Representatives of the Chauliodinae are known from North America and Chili.

In the Guyanas, the part of the northern coast of the South-American continent situated between the River Orinoco in Venezuela and the River Amazon in Brazil, Megaloptera are scarce. Up to now, only four species have been recognized, three of them belonging to the genus *Corydalus*, one to *Chloronia*.

In the following account, the systematic position of these species and some ecological details are discussed.

Remarks on the species

Corydalus nubilus ERICHSON, 1848 seems to be the more common species in the Guyanas. There has been much confusion about this species. The original description of a male specimen from British Guyana by ERICHSON is inadequate. The description of a female specimen from Venezuela by DAVIS (1903) remains doubtful. NAVAS (1928) has described a second male specimen of this species from Br. Guyana as a new species under the name *C. titschacki*.

Thanks to the courtesy of Dr. K. K. Günther and Mrs. H. Wendt (Mus. Berlin), I was able to examine the holotype specimen of *nubila* described by ERICHSON. It proved to be

the same as the male of *titschacki* NAVAS, of which the type specimen, deposited in the Museum Hamburg, has been lost during the second world war. However, it could be recognized by the abdominal appendices, figured by NAVAS. One more male and two females from Surinam and one female from French Guyana, comprise our present knowledge of this hitherto problematic species. It will be redescribed and figured in full elsewhere.

Corydalus spec. nov.

A second, as yet unnamed species of *Corydalus* was detected, previously concealed under the species name of *nubilus*. It was misidentified by VAN DER WEELE (1910) and described from one male and one female specimen from the River Oyapock in French Guyana. The male appendices and genitalia of this species were illustrated at the same time. VAN DER WEELE says: "I have not seen the type (of *nubilus*) neither a photograph of it, but after the original description there is no doubt about the identity of the species." But still it proved to be doubtful. This unnamed species differs from *nubilus* by the more spotted fore wings, the numerous costal crossveins and in the male sex by its long slender appendages. The photograph given by VAN DER WEELE on Planche 1, Fig. 8, is taken from a female specimen labelled "Goeldi, Para, Brasilia", that is still present in the Leiden Museum. The drawings of the male appendices and genitalia as given by VAN DER WEELE, must have been taken from a male specimen form "Environs de Seint-Georges, Oyapock, South Coachitane, Guyane française, F. Geay 1900 (Mus. Paris), the only male seen by him. During my visit to the Paris Museum in March 1972, this male specimen could not be found again. Fortunately, in 1969 two other males and two females of this species have been collected on the Oyapock River by the Guyane Mission Balachowsky–Gruner. From these new descriptions with drawings are made, which will be published elsewhere.

Corydalus batesii MAC LACHLAN, 1868

This large species was originally described by MAC LACHLAN from a female specimen collected by Bates in the middle of the last century on the Upper Amazon near Ega. The type-specimen could be examined by courtesy of Dr. D. E. Kimmins of the Br. Museum in London. It is distinguished by its large size, dark spots in fore wings and yellow antennae. VAN DER WEELE (1910) recorded the species from Suriname on the basis of a female specimen in the collection of the Leiden Museum. It was collected in 1903 on the Upper Saramacca River by P. J. de Kock during a geographical Expedition. More recently (1944–1962) additional specimens of this species have been collected in Suriname, represented by one male (also from the Upper Saramacca River) and five females from various creeks in the interior. This additional material has made it possible to rediagnose the species. Especially the male genital appendices are distinctive. These notes and drawings will be published in full elsewhere.

Once having netted a female specimen of *batesii* that was in hiding under a large leaf along a bush creek, I was bloodily bitten in one of my fingers by the strong sharp pointed mandibulae of that specimen, when taken from the net.

Chloronia hieroglyphica (RAMBUR, 1842)

It is a well known small species with rounded pale yellow wings, marked with black crossveins and some dark criss-cross spots and lines on base of the fore wings. RAMBUR's type specimens, a male from Cayenne (coll. Serville) and a female from Venezuela, both in Selys collection in the Brussels Museum, could be examined, thanks to the courtesy of Dr. G. Demoulin.

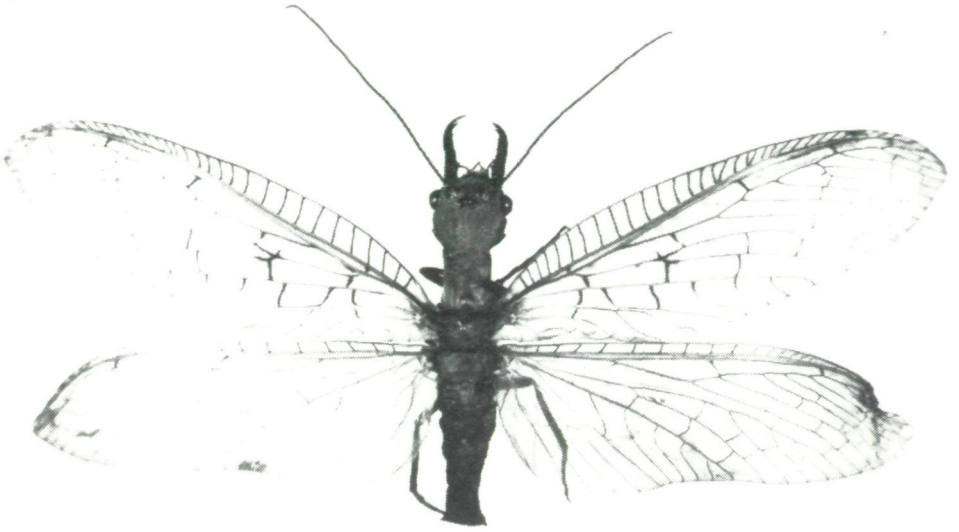

Fig. 1: *Corydalus nubilus* ERICHSON, male paratype, from Suriname.

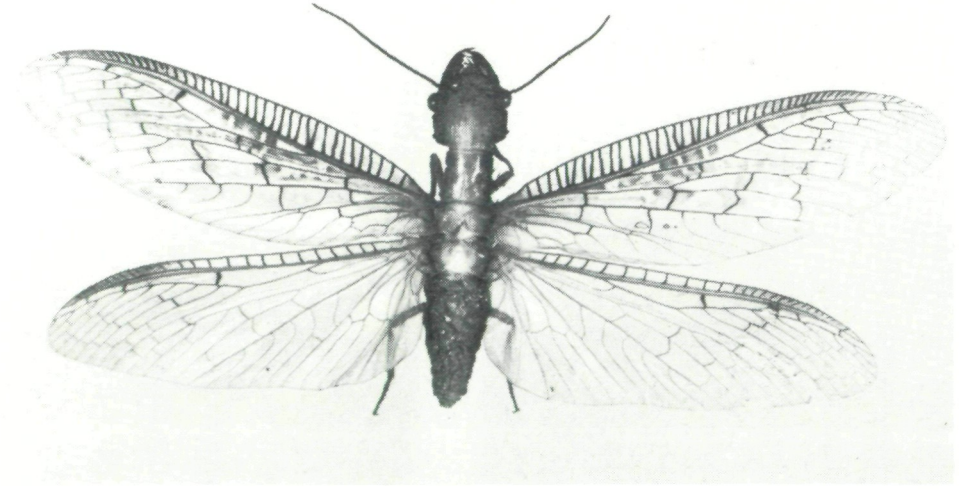

Fig. 2: *Corydalus* sp. nov. female from French Guyana.

The species is easily recognizable by its remarkable wing markings. It is wide-spread in Northern Brazil, the Guayanas and Peru. Several specimens, males and females, are known from French Guyana, but only one female specimen from Suriname, and from Guyana (former Br. B.).

General remarks

Of the four species of Megaloptera inhabiting the Guyanas, the type specimens could be examined. Since the male genitalia show the best characteristics for the identification of the species, the identity of species based on female type specimens remains problematic as long as the corresponding male is unknown.

Ecological data

Imagines are seldom encountered in the day time, when taking shelter under larger leaves along the water's edge of rivers and creeks. As the imagines of Corydalidae are nocturnal, specimens have been found mostly on lights at night time. In general females are more frequently collected than males. According to DAVIS (1903), adults of *Corydalus cornuta,* a north-american species, are very short-lived. Of specimens kept in cages, males never lived longer than three days after emerging, females lived as long as eight or ten days. Probably adults take no food. No such observations have been made on the tropical species.

With regard to the flight period of the adults, the scanty data of 20 specimens (6 males, 14 females) collected in the Guyanas, show the following picture: two males in March, one female in July, two females in August, one female in September, two males one female at the end of October, two males eight females in November, one female in December. The concentration at the end of the year (November) may be influenced by the start of the rainy season after the main dry season in September/October. The main air temperature is 27 C, its maximum 36 C, its minimum 15 C.

From an ecological point of view, it has been found in Suriname that some species give the impression to be confined to large open rivers (*Corydalus nubilus, C.* sp.nov.), others to shadowed small bush creeks (*C. batesii, Chloronia hieroglyphica*).

Fig. 3: *Corydalus batesii* MC L., female from Suriname.

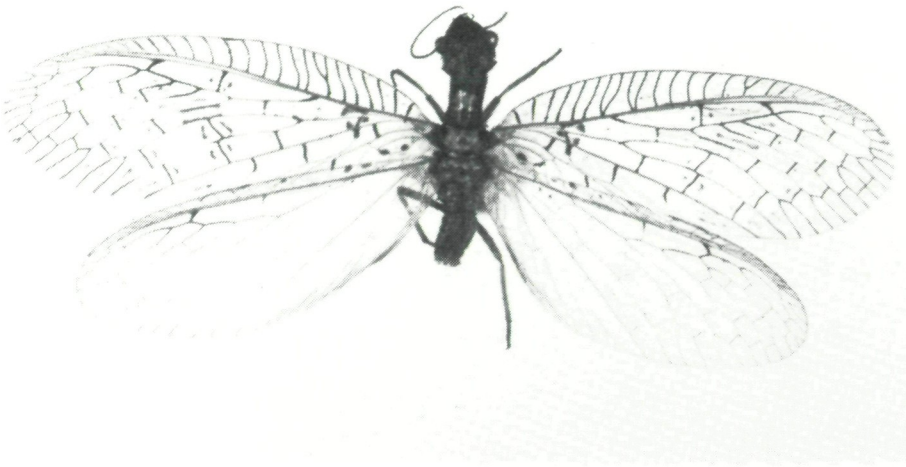

Fig. 4: *Chloronia hieroglyphica* (RAMBUR), female from Suriname.

None of the larvae of the neotropical species of Megaloptera seem to have been described. There is only a small note given by DAVIS (1903) on a larva from Rio Negro, Amazon, Thayer Exp. (about 1869). This specimen showed six jointed antennae, the marks of the larva of *C. cornuta* (from N. Am.) on head and thorax, but differing from that species by spongy tufts projecting ventrally from abdomen at each segment. Recently PENNY and FLINT (1982) have described and figured the larva of *Chloronia hieroglyphica* from the Amazon Region in "A revision of the genus *Chloronia* (Neuroptera: Corydalidae)" Smithsonian contributions to zoology, number 348: 1–27.

In Suriname larvae have not rarely been found in juvenile and in full grown stages. They are living under stones or pieces of wood in bush creeks, or among leaves of Podostemonaceae growing in the rapids and falls of rivers. Among these larvae two types could be distinguished: abdominal gill filaments hairy, or nearly hairless. The identity of these larvae is still unknown. Once a large pupa could be picked up from the bank of the River Marowijne.

In the interior of the Guyanas the water of the creeks and rivers is quite clear but sterile, poor in nutritious substances, acid (pH in rivers 6,5, in brown savanna creeks 3,5–4,5) with a very low calcareous content. The temperature of the water is relatively high. Up in the mountains to about 1000 m elevation, the temperature of the water in the springs is 21 C. During its course in the creeks running through the tropical rainforest, the temperature rises slowly from 22 to 25 C. When the river opens a path in the forest, the insolation by direct sunlight asserts its influence. The temperature of the water rises especially in the rapids and the falls to 31 C. The temperature in the lower river course shows but little fluctuations (30–28 C) (GEIJSKES, 1942).

It becomes evident that under such circumstances the Guyanas do not form ideal ecological conditions for the development of cold stenotherm insects as are most of the Megaloptera. Only a few specialised species can take their place in such an environment, represented in relatively small quantities.

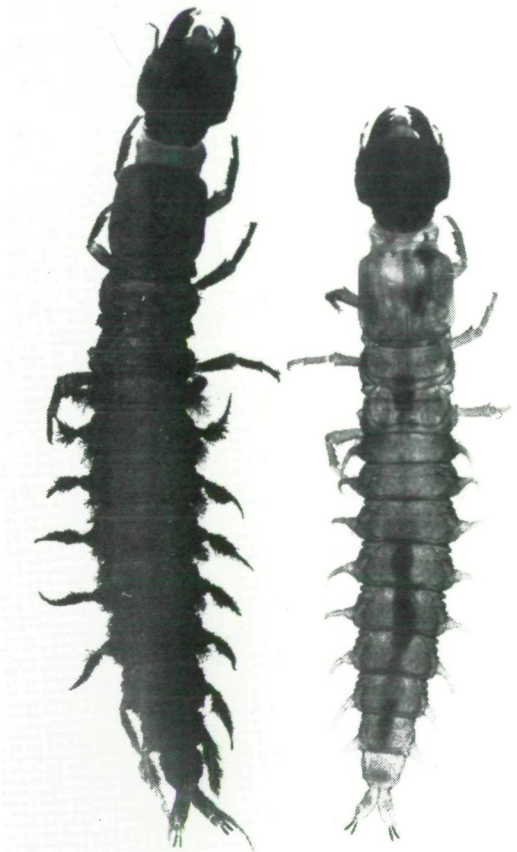

Fig. 5: Two types of *Corydalus* larvae from Suriname.

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