

Neuroptera of the Amazon Basin

Part 7 - Corydalidae (1)

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Abstract

The two genera and eight species of Corydalidae (Neuroptera: Megaloptera) known from the Amazon Basin are described and keys are provided to their identification.

INTRODUCTION

Corydalidae are among the largest and strangest looking Neuroptera. Males of most species of *Corydalus* develop very elongate mandibles, which in some cases can be 30 mm long. *Corydalus armatus* (Hagen) is a very large species, with antennae reaching a length of 55 mm, and wings measuring 160 mm from wingtip to wingtip. Other species are not much smaller. Corydalidae are distributed throughout the New World, Australia, New Zealand, Asia, and South Africa. In the Neotropical Region, Penny (1977) listed 7 genera and 45 species, although Glorioso (1981) has since synonymized the genus *Doeringia*, and Flint (1973) has described two more species from Chile, and reduced one form to subspecies rank.

BIOLOGY

Studies of the North American species *Corydalus cornutus* (Linnaeus) and *Corydalus cognatus* (Hagen) indicate that females oviposit only two or three masses of eggs at the beginning of "Summer", in shaded areas or dark substrates over the water, like fallen tree trunks or under bridges. Each mass of eggs contains between 1000 and 3000 eggs, and are covered with a brilliant white protective material secreted by a gland at the end

of the female's abdomen (Brown & Fitzpatrick, 1978). The eggs hatch after about 13 days, and larvae emerge from the eggs aided by a toothed egg burster (Evans, 1972). Larvae fall or crawl into the water and pass through 11 larval stages that last three years in colder regions (Evans, 1972) or two years in warm temperate areas (Brown & Fitzpatrick, 1978). Larvae feed on a wide variety of small, aquatic animals, including other corydalids. The mature larvae crawl out of the water and pupate under stone and plant debris. Females require some days to mature and produce eggs after emergence, and feed on fruit juices and sugar water in the laboratory. Males appear not to feed, or feed on fruit juices (Brown & Fitzpatrick, 1978). Mature males secrete a strong odor from a pair of eversible glands located anterior to the ninth abdominal segment. Mating occurs on a vertical surface and lasts less than a minute. The female dies soon after depositing her two or three egg masses.

Systematics: Corydalidae are divided into two subfamilies, Corydalinae and Chauliodinae. Male Chauliodinae are quite distinctly different from Corydalinae, lacking the ninth gonostyles and usually bearing pectinate antennae. Adult Chauliodinae are also usually smaller than Corydalinae. Larval Chauliodinae lack ventral abdominal gill tufts found in Corydalinae. In South America, Chauliodinae are confined to Chile, and thus will not be considered further.

Corydalinae contains three Neotropical genera: *Corydalus*, *Chloronia*, and *Platyneuromus* (Glorioso, 1981). *Platyneuromus* is confined to Central America, while *Corydalus* and *Chloronia* are distributed throughout most of Central and South America, although they are absent from Chile. *Chloronia* consists of 10

(1) — The first part of this series covered the following groups: part 1 — Sisyridae, part 2 — Dilaridae, part 3 — Ascalaphidae, part 4 — Sialidae, part 5 — Coniopterygidae, part 6 — Mantispidae.

(2) — Instituto Nacional de Pesquisas da Amazônia, Manaus.

species, of which only *Chloronia hieroglyphica* (Rambur) is found within the Amazon Basin. *Corydalus* is a larger genus, with Penny (1977) reporting 27 named species from the Neotropical Region, although as Glorioso (1981) states "only about a dozen appear valid". The two included genera can be separated by use of the following key:

KEY TO AMAZONIAN GENERA OF
CORYDALIDAE

- 1a. Last branch of radial sector branched; usually yellow with dark markings; male ninth gonostyles usually bearing small apical tooth *Chloronia*
- 1b. Last branch of radial sector unbranched; usually brown to black with paler markings; male ninth gonostyles not bearing apical tooth *Corydalus*

Chloronia Banks, 1908

Chloronia Banks, 1908, *Proc. ent. Soc. Wash.*, 10:30.

Type Species: *Hermes corripens* Walker, designated by Weele, 1909.

This genus is a relatively small one with 10 species, ranging from northern Mexico south to Rio Grande do Sul state in southern Brazil. Only one species, *Chloronia hieroglyphica* Rambur, is found within the Amazon Basin, and because a full description was recently given (Penny & Flint, 1982) only a diagnostic description will be given below.

Chloronia hieroglyphica (Rambur)

(Figs. 2-4, Map 1)

Neuromus hieroglyphica Rambur, 1842, *Histoire naturelle des insectes*, Nevr.: 442.

Hermes hieroglyphica (Rambur) Walker, 1853, *List of the insects* — — —:206.

Corydalis hieroglyphica (Rambur) Hagen, 1861, *Smithson. misc. Coll.*, 4 (1):194.

Chloronia hieroglyphica (Rambur) Banks, 1908, *Proc. ent. Soc. Wash.*, 10:30.

Male holotype in the Selys Collection, Brussels Belgium.

Body and wings lemon yellow in life with black markings on the occiput, four black spots on

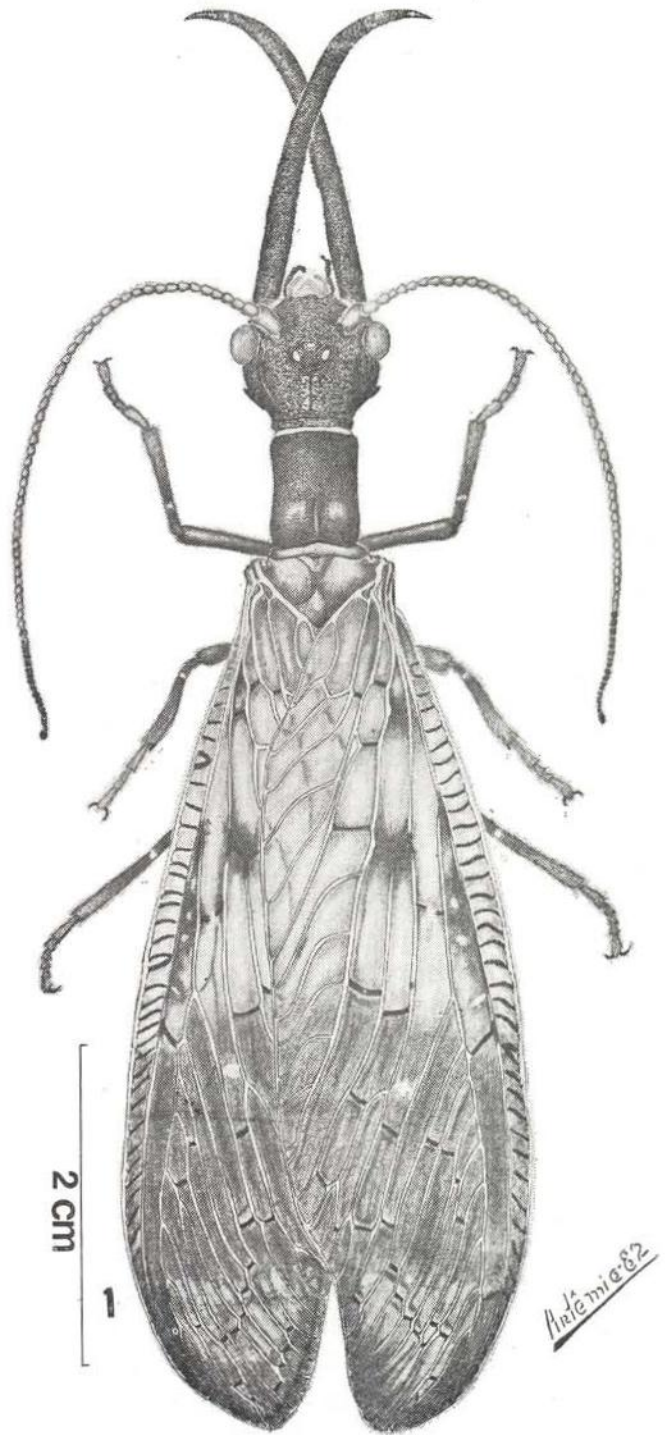


Fig. 1 — *Corydalus batesi*, general aspect (Drawn by Artêmio Coelho da Silva).

the pronotum, and many of the forewing crossveins margined with black. Male tenth tergites elongate, slightly curved mesally, approximately 4 times as long as broad. Ninth gonostyles stout, incurved, broadest before

Penny

apex, which gently tapers to a strong apical tooth. Tenth gonostyles 2 thin, elongate, caudally directed projections, broadened at midlength, and connected anteromesally by fused tenth gonocoxites.

Forewing Length: male, 23-25 mm; female, 24-30 mm.

Geographical Distribution: Penny & Flint (1982) report this species from **Brazil, French Guiana, Guiana** and **Peru**. Within the Amazon Basin this species has been found from Iquitos to just south of Belém, and from Manaus to Puerto Maldonado in Peru.

This species is easily separated from all other members of this genus by the elongate form of the male tenth gonostyles.

Corydalis Latreille, 1802

Corydalis Latreille, 1802, *Histoire naturelle Générale et Particulière*, 3:290.

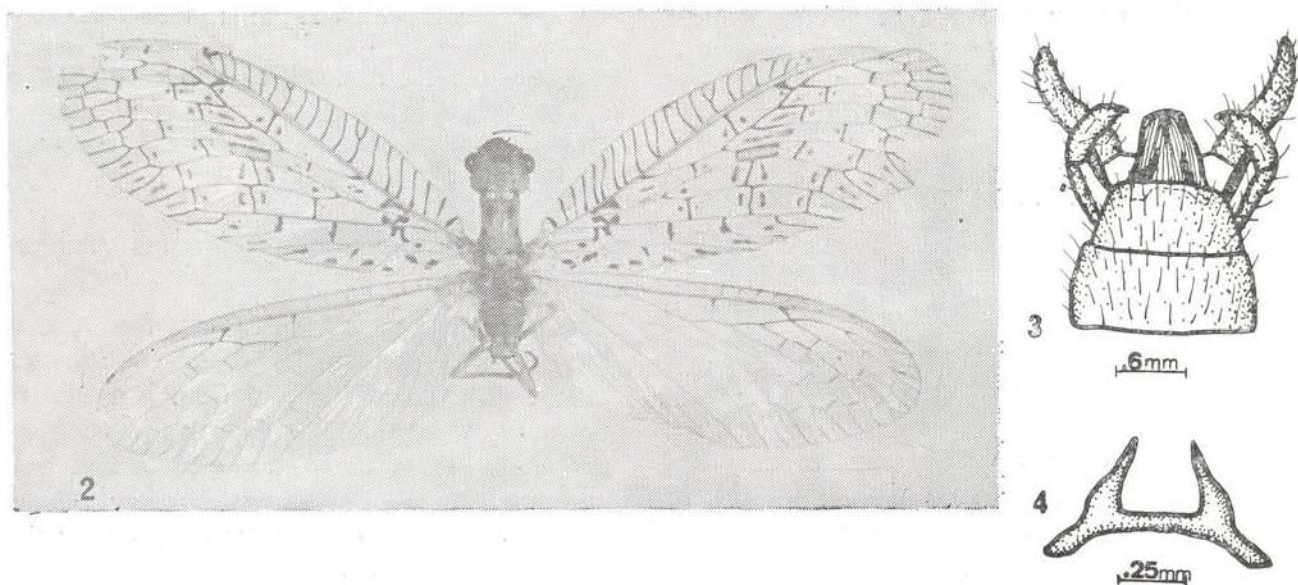
Corydalis Latreille, 1804, *Histoire naturelle Générale et Particulière*, 9:44.

Type Species: *Hemerobius cornutus* Linnaeus, by monotypy.

This genus is known from 35 described names, but much synonymy is present (Glorioso, 1981). *Corydalis* ranges from Canada to northern Argentina. Five species have been collected within the Amazon Basin and two others at its southwestern boundary. These seven species can be separated, using the following key:



Map 1 — Geographical distribution of *Chloronia hieroglyphica*, *Corydalis arpi*, and *Corydalis cephalotes*.



Figs. 2-4 — *Chloronia hieroglyphica*, 2) general aspect, 3) male genitalia, 4) male tenth gonostyles.

KEY TO AMAZONIAN SPECIES OF CORYDALUS

- 1a. Prestigmal costal crossveins yellow, forming a pale patch before the stigma *C. arpi*
- 1b. Prestigmal costal crossveins black, giving the prestigmal area less contrast with stigma 2
- 2a. Male antennal segments wider than long; basal part of tibia black, contrasting sharply with paler apical part; female antennae black *C. armatus*
- 2b. Male antennal segments longer than wide; basal part of tibia usually pale, if darkened, then not contrasting with rest of tibia; female antennae dark or pale 3
- 3a. Male tenth tergites apically smoothly rounded 4
- 3b. Male tenth tergites apically pointed or recurved 6
- 4a. Small white spots in wing cells 5
- 4b. Small white spots absent from wing cells; lateral margin of head and pronotum bearing longitudinal dark stripe .. *C. nevermanni*
- 5a. Forewings bearing distinct incision near pterostigmal region; white spots of forewing membrane indistinct; antennae pale yellow to brown; male mandibles always short ... *C. cephalotes*
- 5b. Forewing lacking incisions at pterostigmal area; white spots of forewing membrane quite distinct, often bordered with black; antennae brown; male mandibles short to twice as long as head *C. primitivus*
- 6a. Forewings uniformly pale brown; male ninth gonostyles straight, almost as long as tenth tergites *C. nubilus*
- 6b. Forewings basically very dark with pale infuscations; male ninth gonostyles incurved and apically swollen, half as long as tenth tergites *C. batesi*

Corydalus armatus (Hagen, 1861)

(Figs. 5, 11, 16, Map 2)

Corydalus armatus Hagen, 1861, *Syn. N. Amer. Neur.*, p. 321.

Corydalus armatus (Hagen) Weele, 1910, *Coll. zool. Edm. Selys Longchamps*, 5:16.

Syntypes in the Rambur Collection, Paris, cannot be located.

Present description based on 8 males, 4 females, pinned.

Head: Dark brown, with rugose occiput, postocular ridge and small lateral tooth behind compound eye. Mandible of male dark brown to black; 29 mm long, or about 3 times head length. Antennae of male pale yellow basally, shading to dark brown on apical nine segments; basal segments wider than long;

with 55 flagellomeres. Antennae of female dark brown to black throughout; flagellomeres longer than wide throughout; with 51-52 flagellomeres.

Thorax: Completely dark brown.

Legs: Femur, apical 3/4 of tibia and tarsi pale brown. Basal 1/4 of tibia dark brown to black with abrupt boundary apically.

Wings: Forewing membrane entirely pale brown with numerous small white spots in wing cells. Longitudinal veins yellowish brown; crossveins dark brown to black with little margining of membrane. Rs with 10 branches. Hindwings pale brown, without markings.

Abdomen: Dark brown. Male ninth gonostyles short, apically swollen, without apical tooth. Tenth tergite elongate (50% longer than ninth gonostyles) and apically recurved. Tenth



Map 2 — Geographical distribution of *Corydalus armatus*, *Corydalus nubilus*, and *Corydalus primitivus*.

goonstyles evenly rounded, comparatively broad, parallel- not inwardly directed, twice as long as wide; outer basal margin elongate and broad below rest of base.

Forewing Length: male, 58-75 mm; female, 65-71 mm.

Geographical Distribution: The original type series of *C. armatus* is from COLOMBIA. Glorioso (1981) reported this species from **Argentina, Bolivia, Peru, Colombia, Ecuador, Venezuela, Panama, Costa Rica, Guatemala, Belize, and Mexico**. Within the Amazon Basin, this species appears to be confined to the mountainous regions of the eastern slopes of the Andes. Known records are: **Bolivia**, La Paz, Chulumani; Coroico Exp. Sta., N. Yungus Prov.; **Peru**, Ayacucho, 5 km n. of Huanta; Huánuco, Tingo Maria; Huánuco, Yurac, 67 mi. e. of Tingo Maria; Junin, Chontilla, 22 km s.e. of Iscozazin; Pan de Azucar; Chanchamayo; Chauchorango; Lima, Chosica; Paltaybamba; San Miguel; Sinchono; **Ecuador**, Napo, Tena; Pastaza, Puyo; Zamora-Chinchipe, Banos.

Species Relationships: This is our largest species of *Corydalus*, and males are immediately recognizable by their enlarged antennae. There are also conspicuous darkened areas at the base of the tibia of both male and female. Males have recurved tenth tergites, thus linking it to the North American *C. cornutus* and *C. affinis* from southern Brazil. However, the characteristics given above will separate *C. armatus* from these latter two species.

***Corydalus arpi* Navás, 1936**

(Fig. 6, Map 1)

Corydalus arpi Navás, 1936, *Revta Mus. paul.*, 20:723.

Holotype (sex unknown) in Hamburg Museum, destroyed during Second World War.

Present description based on 1 female, pinned, and original description.

Head: Dark brown with rugose occiput, postocular ridge, and acute lateral tooth behind compound eyes. Female mandibles dark reddish brown. Antennae pale reddish brown basally, changing abruptly to black on apical 7 segments; basal flagellomeres longer than wide; with 38 flagellomeres.

Thorax: Dark brown, becoming black at pronotal lateral margins.

Legs: Completely reddish brown.

Wings: Forewing base color greyish brown with small white spots in many cells. A very distinct prestigmal pale yellow area along costal margin. All wing veins dark brown to black, except pale yellow in area of prestigmal spot. Hindwing pale brown with yellow veins; lacking small white spots.

Abdomen: Dark brown.

Forewing Length: 42.5 - 47 mm.

Temporal Distribution: The type was listed by Navás as "9 Arg. ded." This may be a typographical error for Aug. The only other specimen that I have seen was taken in August.

Geographical Distribution: The type was taken at Brazil: Amazonas, São Paulo de Olivença, 9 Arg. ded. A second female was taken at Rondonia, Porto Velho, 14-VIII-1979, J. Campbell (INPA).

Species Relationships: Without males it is difficult to relate this species to others of the genus, but the distinctive pale prestigmal area easily distinguishes this species. From the original description, it appears that *C. bolivari* Banks also has this distinctive prestigmal pale area, and could quite possibly be a synonym of *C. arpi*.

***Corydalus batesi* (MacLachlan, 1868)**

(Figs. 1, 7, 12, 17, Map 3)

Corydalus batesii MacLachlan, 1868, *J. Linn. Soc. Zool.*, 9:232.

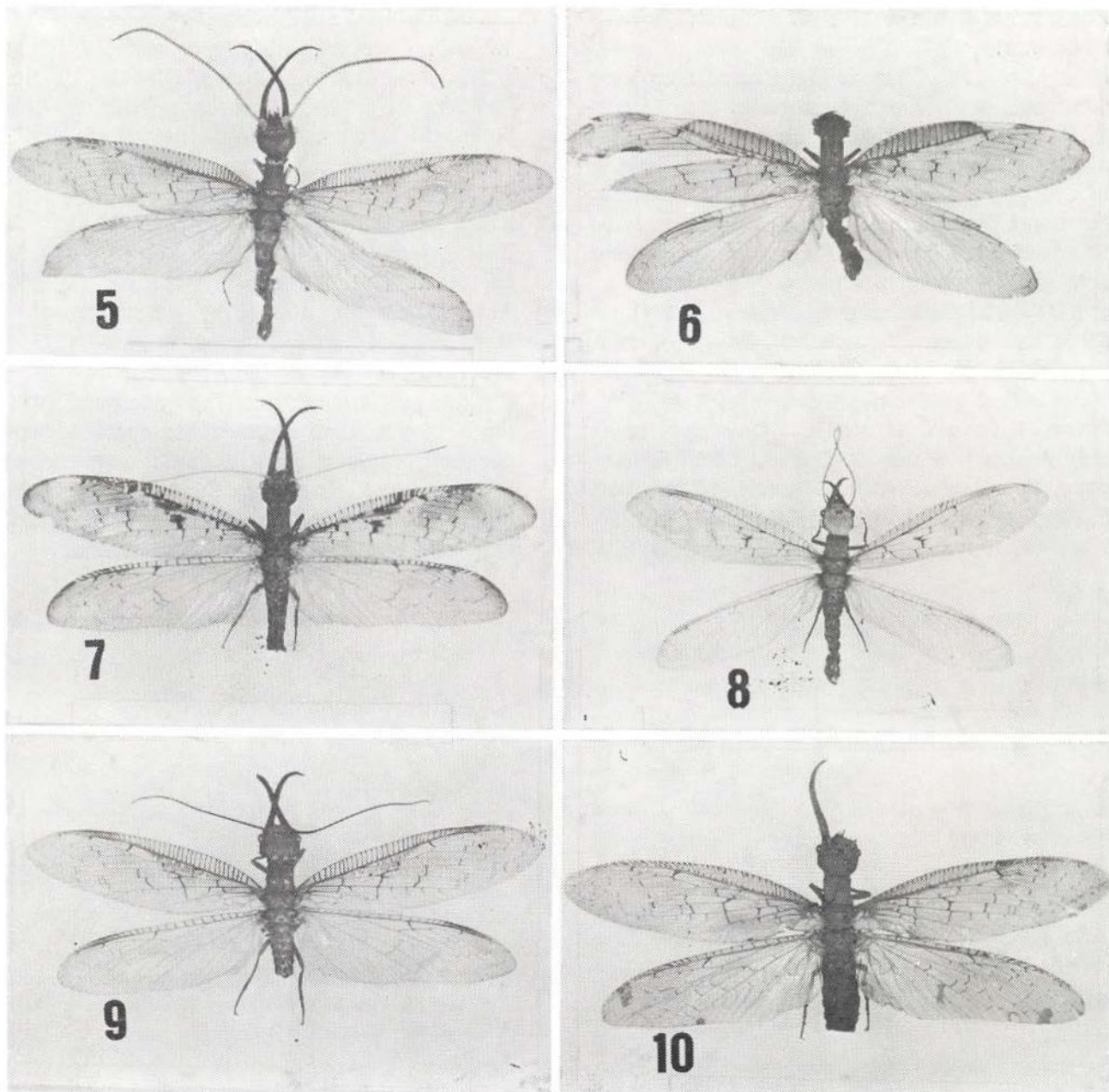
Corydalus batesi (MacLachlan) Weele, 1910, *Coll. zool. Edm. Selys Longchamps.*, 5:18.

Holotype female in the British Museum (Natural History), London, England.

Present description based on 10 males, 13 females, pinned.

Head: Dark brown with rugose occiput, postocular ridge, and small lateral tooth behind compound eyes. Mandibles of male dark brown; from 50% longer to 3 times longer than head length. Antennae pale yellow, shading to black on apical 16 segments; basal flagellomeres longer than wide; with 64 flagellomeres.

Thorax: Completely dark brown.



Figs. 5-10 — Wings of 5) *Corydalus armatus* male .53X, 6) *Corydalus arpi* female .75X, 7) *Corydalus batesi* male .75X, 8) *Corydalus nevermanni* male .75X, 9) *Corydalus nubilus* male .75X, 10) *Corydalus Primitivus* male .75X.

Legs: Femur and basal part of tibia brown, changing to pale yellow on apical part of tibia and tarsi.

Forewings: Mottled black and pale with dark coloration prevailing along base of R-M, between R and Rs before mid-length, at second r-m crossvein, and in the pterostigmal region. A few of the cells have small white spots, but never very numerous. All veins pale yellow, except dark brown at crossveins and

areas of darker membrane. Hindwing pale yellow basally, becoming increasingly darker apically, without white spots.

Abdomen: Dark brown. Male ninth gonostylus short, apically swollen, without apical tooth. Tenth tergite elongate (twice as long as ninth gonostyles) and apically recurved. Tenth gonostyles evenly rounded slightly inwardly directed, elongate lobes; outer basal margin not strongly elongate below rest of base.

Forewing Length: male, 47-62 mm; female, 52-68 mm.

Intraspecific Variation: Male mandibles vary considerably in length, from about 8 to 35 mm in length, and seems to be correlated with overall size- larger males have longer mandibles.

Temporal Distribution: Most specimens have been collected between August and November within the Amazon Basin.

Geographical Distribution: Glorioso (1981) records this species from **Brazil, Bolivia, Guiana** and **Ecuador**. Within **Brazil**, the holotype was collected at Amazonas, Ega (Tefé), H. W. Bates, 1 female (BMNH). Other specimens are: Amazonas, Carauari, 2-VIII-1980, F. Barbosa, 2 males (INPA); Carauari, 28-VIII-1980, F. Barbosa, 1 male (INPA); Carauari, IX-1980, F. Barbosa, 3 males, 8 females, F. Barbosa (INPA); Ca-

rauari, X-1980, F. Barbosa, 1 male, 1 female (INPA); Carauari, XII-1981, 1 male, 1 female (INPA); Amazonas, Manaus, 5-II-1979, J. Rankin, 1 male (INPA); Amazonas, Reserva Campinas, BR-174, km 45, 2-VIII-1978, N.D. Penny, 1 female (INPA); Amazonas, AM-010, km 244, 19-I-1977, N.D. Penny, 1 male (INPA); Amazonas, Rio Japura, Lago Amaná, XI-1981, R. Best, 1 female (INPA); Amazonas, AM-010, km 30, 5-X-1977, I.S. Gorayeb, 1 male (MPEG); AM-010, km 30, 13-X-1977, I.S. Gorayeb, 1 male (MPEG); Pará, Ananindeua, 10-II-1979, L. Teixeira, 1 male (MPEG).

Species Relationships: The recurved male tenth tergites and small white spots in wing cells align this species with *C. cornutus*, *C. armatus*, etc. However, this species is immediately separable by its very dark wings, and form and coloration of the antennae.



Map 3 — Geographical distribution of *Corydalus batesi* and *Corydalus nevermanni*.

Corydalus cephalotes (Rambur, 1842)

(Map 1)

Corydalus cephalotes Rambur, 1842, *Hist. nat. Névropt.*, p. 441.

Neuromus cephalotes (Rambur) Davis, 1903, *Bull. N.Y. St. Mus.*, 68:467.

Corydalus cephalotes (Rambur) Weele, 1910, *Coll. zool. Edm. Selys Longchamps*, 5:11.

Corydalus hecate MacLachlan, 1866, *J. Ent.*, 2:499.

Holotype female of *C. cephalotes* in the Selys Collection of the Brussels Museum.

Two syntypes of *C. hecate* presumably in British Museum, Natural History, London.

Present description based on Weele (1910).

Head: Dark brown. Mandibles of both male and female short, not extending farther than the length of head. Antennae slender, yellow to brown.

Thorax: dark brown.

Legs: Pale brown.

Wings: Forewing membrane dark brown in male, cinereous in female. Distinct incision near pterostigma, giving apex of wing a much more narrowed shape. Longitudinal veins yellowish brown; crossveins black. Forewings with small and indistinct white spots; hindwings lacking spots.

Abdomen: Dark brown. Male ninth gonostyles short, apically swollen, without apical tooth. Tenth tergite elongate (about 50% longer than ninth gonostyles); basally swollen and apically rounded, not recurved. Tenth gonostyles narrowly elongate, slightly inwardly directed lobes.

Forewing length: male, 52-62 mm; female 59-66 mm.

Geographical Distribution: Rambur's type is from "Bresil". Glorioso (1981) indicates specimens from southern Brazil, as far north as "Chapada" (Chapada dos Guimarães) located at 15° 25'S, 55° 45'W, which is just outside of the southwestern margin of the Amazon Basin drainage.

Species Relationships: This species appears to be very similar to *C. primitivus*, although Weele (1910) mentions a distinctive incision and narrowing of the wings apically in *C. ce-*

phalotes, and males always having short mandibles. In many species this latter characteristic is quite variable, although I have seen enough males of *C. nevermanni* to feel confident that this species always has short male mandibles. It is quite possible that the same holds true for *C. cephalotes*.

Corydalus nevermanni Navás, 1934

(Figs. 8, 13, 18, Map 3)

Corydalus nevermanni Navás, 1934, *Mems. R. Acad. Cienc. Artes Barcelona*, 23:507.

Holotype in Hamburg Museum, destroyed during Second World War.

Present description based on 6 males, 7 females, pinned.

Head: Pale brown with rugose occiput. Postocular ridge and small lateral tooth behind compound eyes dark brown to black. Mandibles of male approximately as long as head. Antennae entirely dark brown to black; basal flagellomeres longer than wide; with 53-60 flagellomeres.

Thorax: Pronotum pale brown with longitudinal stripe along lateral margin dark brown to black. *Legs*: Entirely yellowish brown.

Wings: Coloration of membrane pale brown, with longitudinal veins yellowish and crossveins black. Lacking white spots in cells. Hindwing pale yellow without dark markings or white spots.

Abdomen: Dark brown. Male ninth gonostyles short, apically swollen, without apical tooth. Tenth tergites elongate (almost twice as long as ninth gonostyles) and apically rounded. Tenth gonostyles apically pointed lobes; outer basal margin recurved upwards.

Forewing Length: male, 42 mm; female, 37-55 mm.

Intraspecific Variation: One female specimen has darker infuscations margining the forewing crossveins, and other specimens show this darkening to a much lesser extent.

Temporal Distribution: Specimens from the center of the Amazon Basin have been collected in January, while farther north, in the

upper reaches of the Rio Negro they have been collected in April, while a specimen in northern Amazonas state, near the border between Brazil and Venezuela, was collected in August. *Geographical Distribution*: The type specimen was from Costa Rica. Banks (1943) mentioned this species from Caracas, **Venezuela**. Within the Amazon Basin, specimens have been collected at **Brazil**: Amazonas, Rio Toototobi (1°41'N, 63°39'W), 27-VII-1977, J. Hayes, 1 female (INPA); Amazonas, Rio Urubu (2°0'S, 60°10'W), 22-24-I-1982, P. Burnheim and N. Silva, 5 males, 4 females (INPA); Amazonas, São Gabriel da Cachoeira (0°10'S, 67°00'W), 17-19-IV-1982, R.A. de Freitas, 1 male, 1 female (INPA).

The exact identity of this species is in doubt because the original holotype no longer exists. However, from the original description and later notes by Banks (1943) we get some indication as to its identity. The dark lateral stripe on the posterior part of the head and pronotum are quite distinctive. The wings are pale, without whitish spots. The apically rounded male tenth tergites and short mandibles link this species with *C. primitivus* and *C. cephalotes*, respectively, but forewing and antennal coloration quickly separate these species.

Corydalus nubilus (Erichson, 1848)

(Figs. 9, 14, 19, Map 2)

Corydalus nubilus Erichson, 1848, *Schomburgk's Reise in Guyana*, 3:586.

Corydalus nubilus (Erichson) Weele, 1910, *Coll. zool. Edm. Selys Longchamps*, 5 (1):19.

Original types in the Entomological Collection of Humboldt University, Berlin, D.D.R.

Present description based on 7 males, 13 females, pinned.

Head: Pale brown to dark brown with rugose occiput and small lateral tooth behind compound eyes. Postocular ridge very weak to absent. Mandibles of male dark brown; from 50% to 3 times longer than head length. Antennal scape and pedicel yellowish-brown; bearing 71-75 dark brown to black flagellomeres, basally slightly longer than wide.

Thorax: Completely pale brown to dark brown. *Legs*: Yellowish-brown throughout.

Forewings: Pale brown with slight indication of darker infuscation near base of Rs. Most wing cells bearing one or more small white spots. Longitudinal veins yellow; crossveins dark brown to black. Hindwing membrane pale yellow with crossveins basally yellow, and apically and along costal margin dark brown; without white spots.

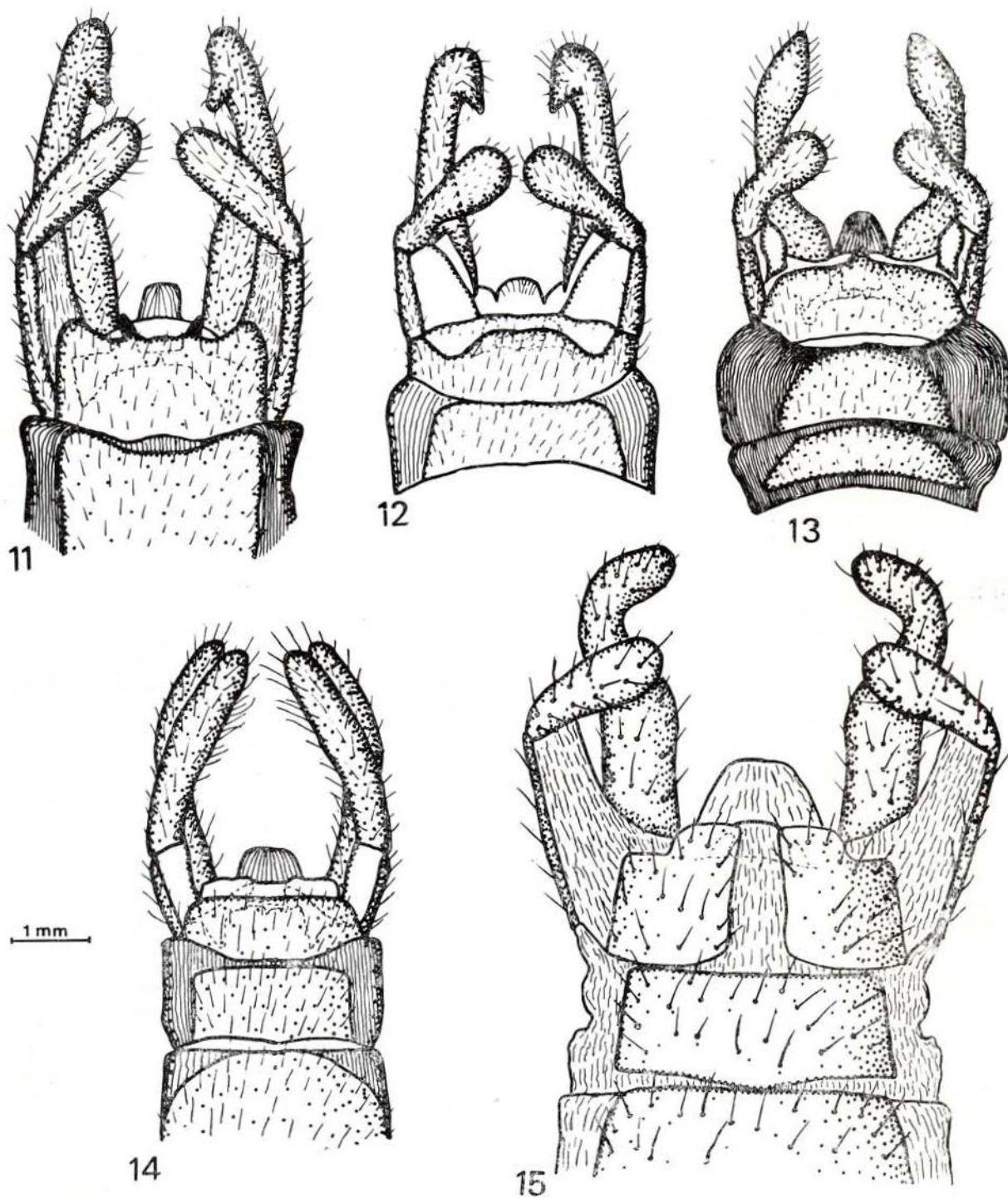
Abdomen: Pale to dark brown. Male ninth gonostyles very long, almost as long as tenth tergites, not apically swollen nor incurved; without apical tooth. Tenth tergites elongate and apically rounded. Tenth gonostyles broad, apically rounded lobes; outer basal margin elongate and broad.

Forewing Length: male, 41-55 mm; female, 39-65 mm.

Intraspecific Variation: Male mandibles vary in length from 8 to 28 mm in length, and seems to be correlated with overall size. General coloration varies from pale to dark brown and darker infuscations may be present or absent. Size also varies considerably, with some specimens nearly twice the size of others.

Temporal Distribution: This species seems to emerge as adults throughout the year in Amazonia.

Geographical Distribution: Glorioso (1981) mentions this species from GUIANA and FRENCH GUIANA. Weele (1910) further mentions **Venezuela**, **Brazil** and **Peru**. Within the Amazon Basin, this species is known from **Peru**: Chambireyacu, near Yurimaguas, VI-VIII-1885, M. de Mathan, 1 female (MNHN); **Brazil**: Amazonas, Ilha Careiro, V-1977, W. Junk, 1 male (INPA); Amazonas, Reserva Campinas, BR-174, km 45, 9-IX-1976, B. Mascarenhas, 1 female (INPA); Pará, Tucuruí, 15-VI-1980, M. Otsuka, 1 male, 1 female (INPA); Pará, Tucuruí, 4-VIII-1980, 3 females, eq. J. A. Nunes de Melio (INPA); Amazonas, Manaus, INPA, 18-II-1974, E. Castellon, 1 male (INPA); Amapá, Porto Platon, II-1957, A. Machado, 2 males (INPA); Mato Grosso, Cuiabá, J. Noack, 1 male, 1 female (INPA); Mato Grosso, Reserva Humboldt, Aripuanã, 18-III-1977, N.D. Penny, 1 female (INPA); Reserva Humboldt, Aripuanã, 12-I-1979, L. A. Lacey, 1 female (INPA); Mato



Figs. 11-15 — Male genitalia of 11) *Corydalus armatus*, 12) *Corydalus batesi*, 13) *Corydalus nevermanni*, 14) *Corydalus nubilus*, 15) *Corydalus primitivus*.

Grosso, Ig. São Francisco, 22-XI-1977, R. Best, 3 females (INPA); Acre, Rio Branco, 17-I-1980, W. E. Kerr, 1 female (INPA); Pará, Rio Tapajós, E. Snethlage, 1908, 1 male (MPEG); Pará, Capitão Poço, 26-II-1978, P. Tadeu, 1 female (MPEG).

The very elongate male ninth gonostyles immediately separate this from all other species of *Corydalus*. However, lacking this character, females can still be separated by the dark antennae and numerous white wing spots.

Corydalus primitivus Weele, 1909

(Figs. 10, 15, 20, Map 2)

Corydalus primitivus Weele, 1909, *Notes Leyden Mus.*, 30:251.

Four syntype males and two syntype females in Leyden Museum; 1 syntype female in the Selys Collection, Brussels, Belgium.

Present description based on 1 male, pinned.
Head: Dark brown with rugose occiput, indistinct postocular ridge and small lateral tooth behind compound eye. Mandibles of male dark brown; approximately twice as long as head length. Antennae entirely dark brown; basal flagellomeres longer than wide; flagellar apex broken, with only 44 flagellomeres remaining.
Thorax: Completely dark brown.

Legs: Completely dark brown.

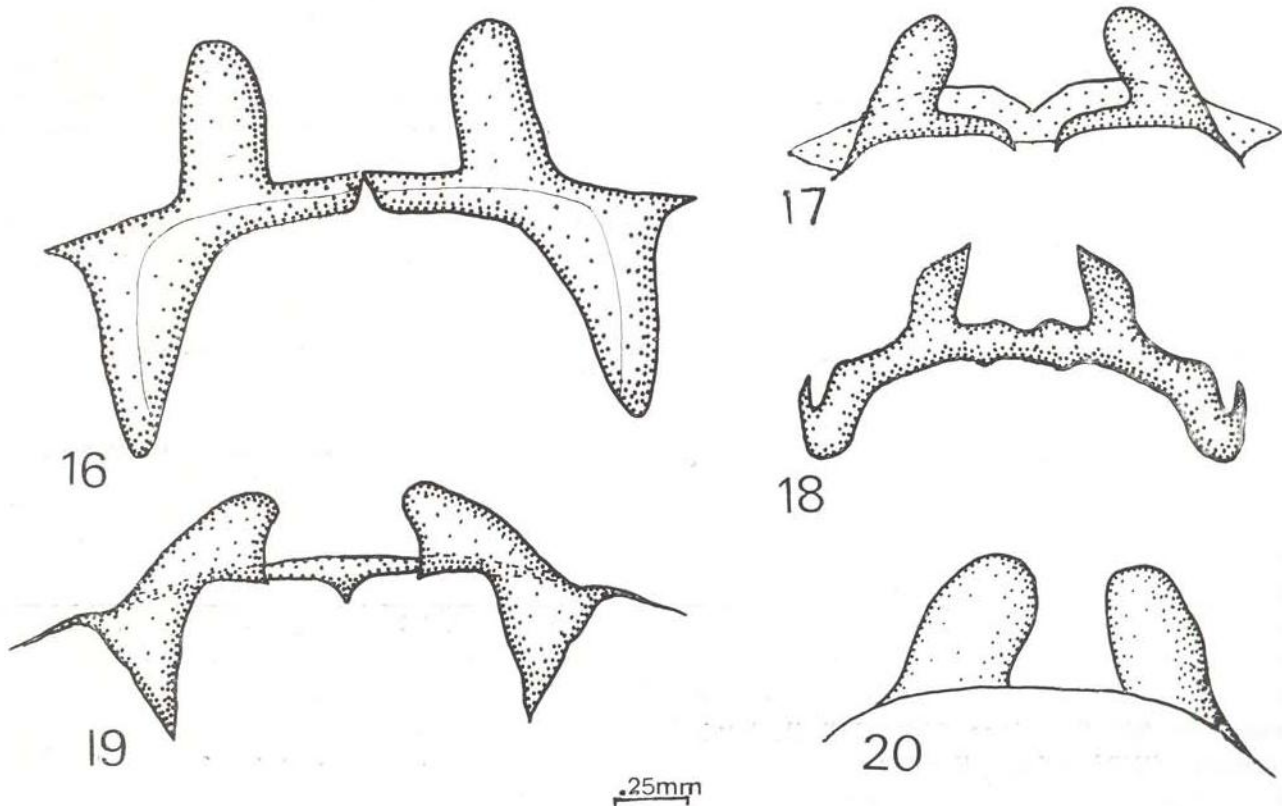
Forewings: Membrane uniformly pale brown, with numerous small white spots in almost all cells of forewing. Hindwing pale brown with a few small white spots restricted to radial area.

Abdomen: Dark brown. Male ninth gonostyles short, apically swollen, without apical tooth. Tenth tergite elongate (about 50% longer than ninth gonostyles), and apically rounded-not recurved. Tenth gonostyles evenly rounded, slightly inwardly directed, elongate lobes; outer basal margin not strongly elongate below rest of base.

Forewing Length: male, 58 mm.

Intraspecific Variation: In Weele's original description (1909) and later monographic revision (1910) he mentions small white spots surrounded by dark circles. The male specimen that I have seen has rather uniformly pale brown wings, although the white spots are present. As the genitalia are similar to those described by Weele for this species, and as wing coloration can often intensify around spots or crossveins, I believe this to be the same species.

Geographical Distribution: This species was originally described from a series of six specimens from Tucuman, **Argentina**. Glorioso (1981) reports this species from **Argentina**.



Figs. 16-20 — Male tenth gonostyles of 16) **Corydalus armatus**, 17) **Corydalus batesi**, 18) **Corydalus nevermanni**, 19) **Corydalus nubilus**, 20) **Corydalus primitivus**.

Bolivia, Brazil, Paraguay, and Peru. The Brazilian record is from "Chapada", or Chapada dos Guimarães, a locality just north of Cuiabá, in Mato Grosso state, at the southwestern border of the Amazon Basin.

Species Relationships: The genitalia appear to be similar to *C. cephalotes*, but the wings lack the pterostigmal incision and apical narrowing of this latter species.

RESUMO

Os dois gêneros e oito espécies de Corydalidae (Neuroptera: Megaloptera) conhecidos da Bacia Amazônica são descritos e chaves apresentadas para sua identificação.

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