

***Aeshna (Hesperaeschna) condor* sp. nov.
from the Venezuelan Andes, with a redescription of
A. (H.) joannisi, comments on other species,
and descriptions of larvae (Odonata: Aeshnidae)**

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Abstract

Aeshna (Hesperaeschna) condor sp. nov. is described and illustrated from four males and six exuviae. The adult color pattern does not resemble that of any other Venezuelan species, but structurally the new species comes closest to *A. (H.) punctata* and *A. (H.) joannisi*. This latter is here recorded for the first time from Venezuela, and its exuviae are described. The larva of *A. (Marmaraeschna) vigintipunctata* is also described and figured. A key to the ultimate instar larvae of all aeshnids found in the region of the upper Río Quinimarí, Táchira State, Venezuela, is presented.

Introduction

During the last few years, numerous collecting trips were carried out to the Tamá-massif in Táchira State, near the extreme western border of Venezuela. Some of the odonates found at these Andean localities proved to be either new species, new Venezuelan records, or otherwise of interest (De Marmels 2000).

The present paper deals with three species of Aeshnidae, none of which has been found below 2,000 m a.s.l. The first species considered here proved to be new to science, the second is for the first time reported from this country, and the third species is widely distributed in the Venezuelan Andes, but its biology is not well known. The larvae (exuviae) of all three were found and are described here for the first time. All specimens are deposited in the insect collection of the Museo del Instituto de Zoología Agrícola "Francisco Fernández Yépez" (MIZA), at Maracay, except when indicated otherwise.

Methods

Terminology for wing veins follows Riek & Kukalová-Peck (1984). In cases of bilaterally asymmetrical counts, those referring to the right side are given in brackets after the figures for the left side. Total length and length of abdomen include the cerci of the imagoes, and in larvae the paraprocts. Length of pterostigma refers to costal side of Fw pterostigma, length of femur includes trochanter. The nomenclature of the abdominal markings for adult Aeshnidae is that proposed by Walker (1912). All dimensions are given in millimeters. The illustrations were made with the help of a Wild M-8 stereo microscope equipped with a camera lucida. Notes on adult coloration are based on color slides of live specimens.

Aeshna (Hesperaeschna) condor sp. nov.

(Figs 1-19)

Material examined

Holotype ♂: Venezuela, Táchira State, San Vicente de La Revancha, road to Las Copas, 2,000 m a.s.l., Tamá National Park, 6 November 1999, J. De Marmels leg., MIZA, no. 16679. Paratypes: 16 May 1999, 2 ♂ – one in MIZA, one in R.W. Garrison coll.; 7 July 2000, 1 ♂. Exuviae, ultimate instar: 30 November 1997, 1 ♀; 16/17 May 1999, 1 ♀; 7/8 July 2000, 1 ♂, 3 ♀; all J. De Marmels leg. (MIZA).

Etymology

This large and contrastingly colored species of the high Andes is named after the largest Andean vulture, the Andean Condor (*Vultur gryphus*).

Description of the holotype

Head: Labium dark brown; face sky blue; top of frons largely black, hence the usual T-spot not discernible; on each side of the inferred broad stem of the T-spot a small blue area connected with lateral blue of frons. Compound eyes almost black, the pseudopupillae indistinguishable; posterior eye margin yellow green, rear of head black.

Thorax: Pterothorax brown black with broad yellow green stripes over mesepisternum, mesepimeron and metepimeron; metepisternum covered in its dorsal half by a pointed branch of the mesepimeral stripe descending from antealar sinus (Fig. 7). Mesepisternal antealar plate, wing roots and notum yellow green; ventral parts of pterothorax dark brown. Legs black, except basal two thirds of femora, which are red brown. Wings moderately infumated, with extreme base proximal to CuP amber. Pterostigma small, dark red brown dorsally, covering three cells or less, venation black. Fw with 22 (20) Ax, Hw with 14; the primary Ax the seventh in three wings, the eighth in left Fw; Px 14 (15) in Fw, 18 (20) in Hw. Median space free; supratriangle with five cells in Fw, four in Hw; triangle with five cells in Fw, four in Hw (always including divided basal cell); fork of IR2 originating proximally well before pterostigma, symmetrical, and

enclosing three rows of cells (four rows distally in Hw); Rspl enclosing three cell rows. Membranula bicolored, white basally, sooty distally; anal triangle three-celled; anal loop with three cell rows totalling 13 (11) cells; two rows of cells in basal half of space between MP and CuA, distally one row; five to six cell rows between CuA and wing margin after the supplementary anal loop. Anal angle of Hw pronounced.

Abdomen: A strong constriction at segment (S) 3; S1 with ventral tubercle. Coloration black with pale markings as follows: lateral and dorsal spots of S1 yellow green; anteromedial lateral spot of S2 yellow green becoming dark blue distally; posterolateral spot yellow green in proximal half, deep blue in distal half, and here confluent with dark blue posterodorsal spot. Genital lobe projecting ventrally, slightly angled distally, and with small dark blue spot in the distal lateral groove; most of ventral surface of genital lobe beset with numerous black spinules, especially towards mesal margin. Auricles pale blue dorsally, black ventrally, each with two recurved teeth. S3 with dark blue anterolateral spot fading to pale green at transverse carina; mediolateral spot pale green, mediodorsal spot ferruginous, posterolateral spot absent, posterodorsal spot large, dark blue. S4+5 with pale green antero- and mediolateral spots, and with large, dark blue posterodorsal spots; S6 with small, pale green antero- and mediolateral spots and with olivaceous posterodorsal spots. S7-9 with olivaceous posterodorsal spots, those of S9 very small; a small green posterolateral spot on S8+9; S10 black. Abdomen dark rufous brown ventrally. S4-8 with supplementary longitudinal carinae; S10 bearing an elevated dorsal keel on basal half, ending as a blunt tip.

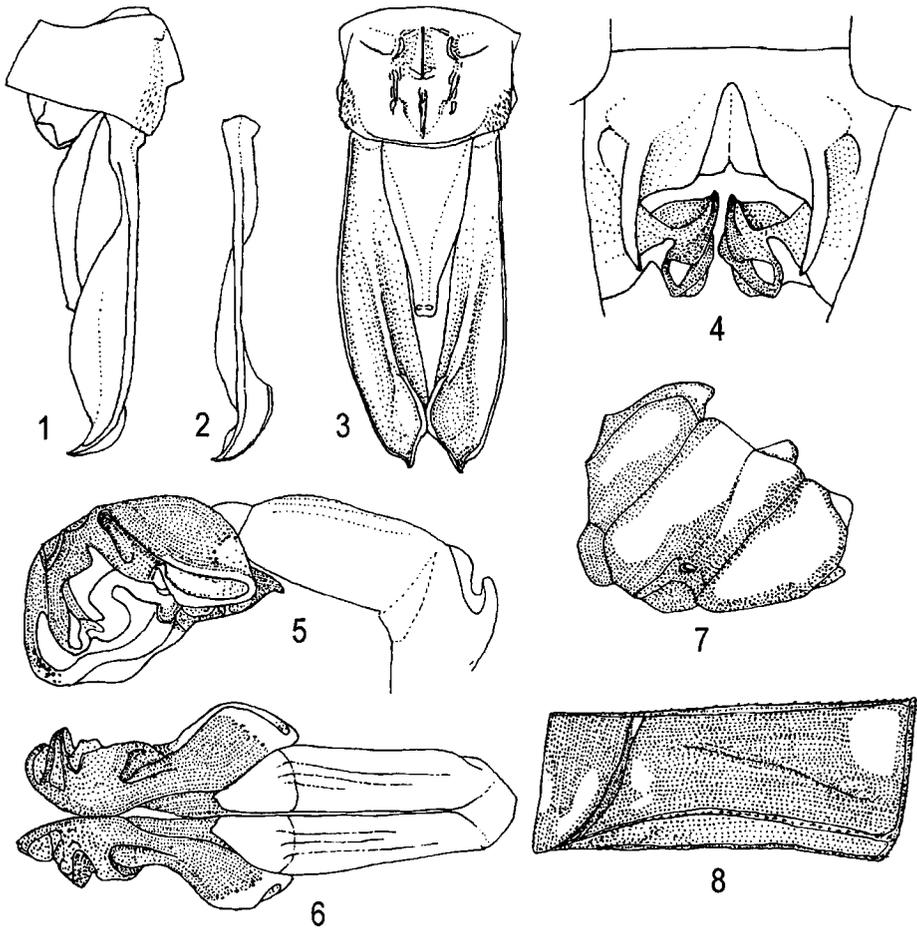
Caudal appendages black; cerci longer than S9+10, as long as S8 + half of S9, with no basal spine or tubercle, narrow at basal fifth, then widening into a broadly lanceolate portion and ending in a strong, conical, ventrally curved claw-like hook (Fig. 1). Cerci dorsally with a median keel, which is low and blunt in the central portion of the appendage, but strongly arched dorsad and sharply marginated on distal fifth, then again sloping ventrally to merge with distal hook. Cerci internally and epiproct covered with black hairs. Epiproct longer than half the length of the cerci (Fig. 1), and bearing two blunt, subapical dorsal teeth. Anterior lamina of secondary genitalia with long spines, each slightly curved mesad and almost reaching to caudal end of well developed hamular fold; blade of hamular process almost transversely truncated proximally, but with mesal anterior angle slightly projecting cephalad, as a small point (Fig. 4).

Dimensions: Total length – 72.1; abdomen – 52.5; cerci – 6.0; Fw – 53.0; Hw – 49.6; pterostigma – 2.0.

Description of the paratypes

Identical to holotype in color pattern and structural features. Wing venation: 20-22 Ax and 14-16 Px in Fw; Hw with 14-15 Ax and 17 Px; the second primary Ax the seventh or eighth in Fw and Hw; supratriangle with 5-6 cells in Fw, 3-4 (once 5) in Hw; Hw triangle enclosing 4-5 cells; cells in anal loop 12-14. Penis as illustrated in Figs 5-6.

Dimensions: Total length – 69.0-71.3; abdomen – 50.0-53.5; cerci – 5.3-6.0; Fw – 53.5; Hw – 51.3; pterostigma – 2.2-2.4.



Figures 1-8. Characters of adult male *Aeshna condor* sp. nov. – (1) S10 with caudal appendages, hairs omitted, left lateral view (holotype); (2) left cercus, left laterodorsal view (holotype); (3) same as Fig. 1, dorsal view; (4) secondary genitalia, ventral view (holotype); (5) penis, left lateral view (paratype); (6) same, ventral view; (7) thoracic pattern of male, left lateral view, schematized; (8) S5, left lateral view (holotype).

Female

Ovipositing females have been observed twice. None could be secured. Females share the contrasting thoracic color pattern with the male, but details of coloration of head and abdomen, and length of cerci are not yet known due to absence of material.

Description of the larva

Ultimate instar exuviae, identified by supposition: the only large aeshnid in range with undescribed larva. There is no strongly defined pattern (Fig. 16).

Head: Broader than thorax; occipital lobes narrow, not bulging posteriorly (Fig. 9). Antenna (Fig. 11) long, reaching to beyond anterior margin of labrum; labium robust; articulation between pre- and postmentum in resting position laying behind mesocoxae (Fig. 10); median cleft closed, median lobe broad, weakly convex forming a gentle curve; labial palp narrow, parallel-sided, with apical hook forming a small point (Figs 12-13). On each side of median cleft, and at some distance from it, a small tooth, or these teeth indistinguishable.

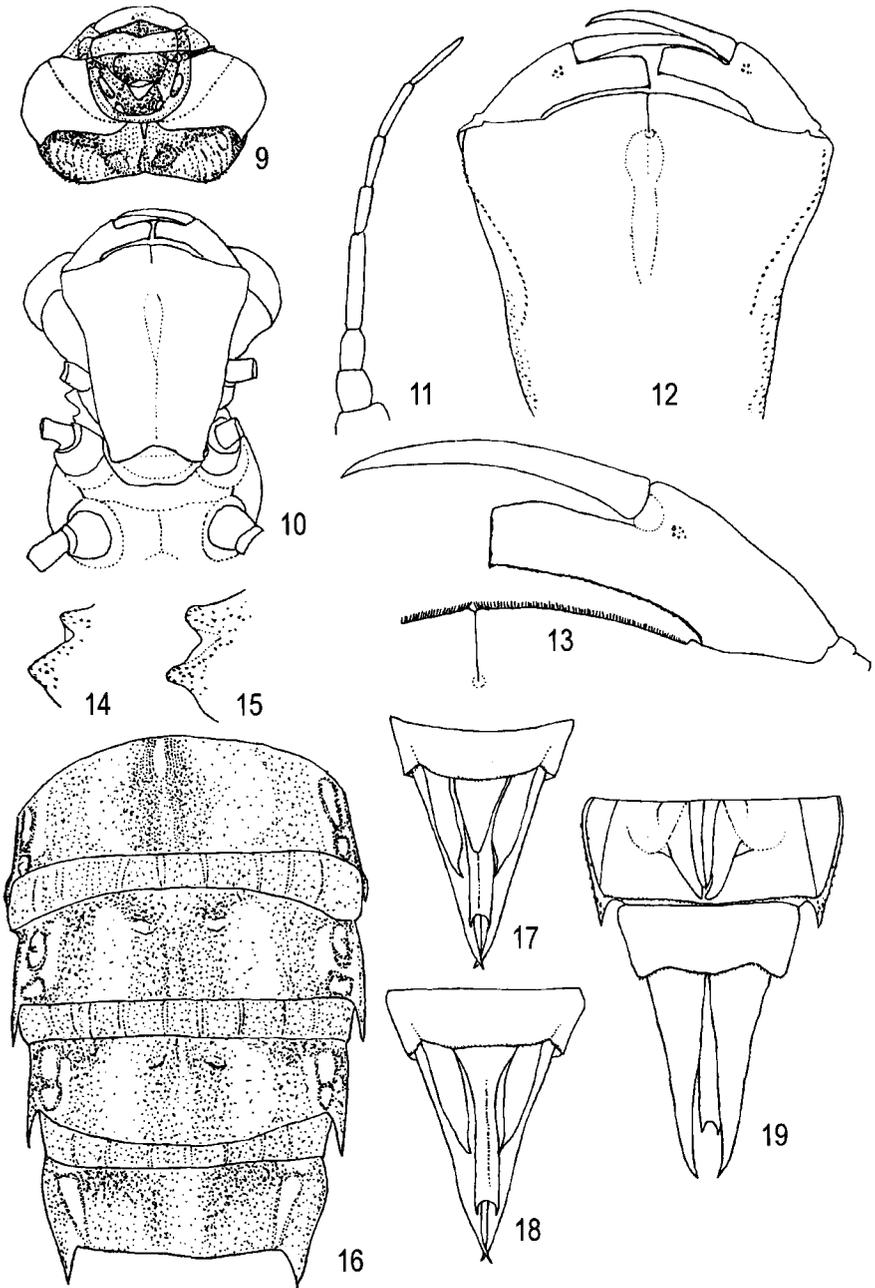
Thorax: Pronotum not projecting laterally, here broadly rounded, dark, with a pale spot at each lateral angle. Prothoracic supracoxal processes short, similar in male and female (Figs 14-15). Femora dark with two pale rings in distal half, tip dark; tibiae pale with darker subbasal ring; tarsi pale. Wing cases reaching to end of S5.

Abdomen: In two specimens with weakly developed, darker mesodorsal longitudinal stripe accompanied on each side by an ill-defined paler longitudinal stripe. Most noticeably a pale dorsomedian streak in basal fourth of S6, in most specimens. Sides of abdomen with a more pronounced pattern (Fig. 16). Rather weak lateral spines on S6-9, those on S6 small to very small and appressed to body wall; the larger spines on S7-9 of approximately same size, straight, and directed posteriorly (Fig. 16). Male projection slightly longer than half of epiproct, the latter broadly excised at tip; paraprocts as long as S8+9 together; cerci half as long as paraprocts (Fig. 17). Female cerci slightly longer than half of paraprocts (Fig. 18). Valves of ovipositor reaching close, but not quite to, hind margin of S9 (Fig. 19).

Dimensions: Total length – 41.7-43.8; maximum width of head – 9.5-9.9; labium, with closed palpi in resting position – 10.0-11.0; hind femur – 10.0-11.0; hind tibia – 8.6-9.1.

Diagnosis of the adult

When I first saw a male of *A. condor* flying at some distance, I identified it as probable *Remartinia luteipennis* (Burmeister), due to the broad, pale thoracic stripes. Upon capture, this specimen seemed to be similar to *A. williamsoniana* Calvert from Mexico and Central America. The thoracic pattern of this species (Calvert 1956: plate 39, Fig. 523) was similar to that of those Andean specimens. I sent a male to Rosser W. Garrison (Azusa, California, USA), who kindly compared it with the holotype of *A. williamsoniana* lodged in the University of Michigan. He detected numerous differences, which I am quoting hereafter (characters of *A. williamsoniana* in square brackets): Cerci longer than S9+10 together [shorter]; with decumbent, spine-like tip [with small, pointed tip]; S4-8 with supplementary longitudinal carinae [without such carinae]; Hw wide, with five cell-rows between CuA and hind margin of wing [narrow, with three cell-rows]; pterostigma short, extending three cells or less [long, extending almost four cells]; genital lobe pointed [rounded]; S1 with midventral tubercle [bare]; spines of anterior lamina converging posteriorly [parallel]; blade of hamular processes with median margin pronounced [nearly transverse].



Figures 9-19. Characters of exuviae of *Aeshna condor* sp. nov. – (9) head of male, dorsal view; (10) head and thorax of female, ventral view; (11) right antenna of female; (12) anterior portion of labium of female, dorsal view; (13) right palpus of same specimen, amplified; (14) left prothoracic supracoxal processes of male, dorsal view; (15) same of female; (16) pattern of S6-9 of female, dorsal view; (17) S10 with caudal appendages of male, dorsal view; (18) same of female; (19) S9-10 of female showing ovipositor, ventral view.

The shape of the cerci in *A. condor* is similar to *A. punctata* Martin from Brazil (Machado 1985: 330, Fig. 8), but color pattern is widely different in these two species, and the larva of the latter has a pointed epiproct (Santos 1966), whereas in *A. condor* it is bifid.

Biology

The species is known from only one place in the Mount Tamá range, at 2,000 m a.s.l. The habitat was a small, natural pond of perhaps 30x12 m, with cristalline, about three meter-deep water. The pond was fed by a minute stream, but probably also received subterranean water filtering into it from the steep slope on the northeastern edge, which was overgrown with cloud forest. A felt of tall grasses with interspersed shrubs of *Eupatorium*, *Rubus*, Melastomataceae and ferns covered about two thirds of the circumference of the pond. Towards the open water this vegetation formed a two meter wide belt of floating mats with lots of grass stems projecting over the exposed water surface. There were no fish, but huge, black tadpoles of a grass green hyloid frog were common. The surrounding area was partly swampy pasture land. The pond was rich in odonates. Hundreds of *Cyanallagma laterale* (Selys) and numerous *Lestes apollinaris* Navás, *Erythrodiplax abjecta* (Rambur) and *Sympetrum gilvum* (Selys) were observed. No fewer than four species of Aeshnidae bred here, viz. *Aeshna c. cornigera* Brauer, *A. joannisi* Martin (see below), *A. marchali* Rambur, and *A. condor*. In the swampy belt around the pond, *Cyanallagma tamaense* De Marmels was common.

Records of adults and/or exuviae of *A. condor* were as follows: 30. November 1997, 1 ♂, 1 exuvia; 17 January 1999, none; 15-18 May 1999, single males, 2 ♀, 1 exuvia; 5-11 November 1999, 3 ♂; 7 July 2000, 1 ♂, 5 exuviae. Females were observed twice: One tried to oviposit into a branch of a partly submerged bush, the other appeared to insert eggs into floating grass stems. All exuviae were collected from branches of bushes emerging from the water, ca 10-40 cm above the surface.

Field diagnosis

The adult male *A. condor* is impressive when patrolling the edge of the pond below the overhanging branches of the trees or over the floating mats. Its large size, black eyes, and overall dark coloration interrupted only by the bold yellow green thoracic stripes, make this species appear yet more robust than it actually is; it is easily recognizable from a distance. The exuviae are larger than those of any other species present at this pond, and can be separated from exuviae of other large Andean species by the broad, robust labium and by the characters given in the key (see below).

Aeshna (Hesperaeschna) joannisi Martin, 1897 (Figs 20-38)

Material examined

Venezuela, Táchira State, San Vicente de La Revancha, road to Las Copas, 2,000 m a.s.l., Tamá National Park, 16 May 1999, 4 ♂, 1 ♀; 7-11 November 1999, 3 ♂; 7/8 July 2000,

4 ♂. Exuviae: 13/17 January 1999 (1), 16 May 1999 (9), 5 November 1999 (12); Zumbador, 2,600 m a.s.l., 12 July 2000 (1), all J. De Marmels leg. (MIZA; 1 ♂ in RW Garrison collection).

This species was previously known from “Bolivia”, Abitagua in Ecuador, and Popayán in southern Colombia (Calvert 1956). It is here for the first time recorded from Venezuela. The female was described by Martin (1897, 1908). Calvert (1956) gave a description of the male and some additional features of the female based on observations by Erich Schmidt. Some details not mentioned by these authors are given here, especially concerning color pattern of live male and female specimens. The penis is also illustrated (Figs 24-25). The larva is described for the first time.

Redescription of the adult male

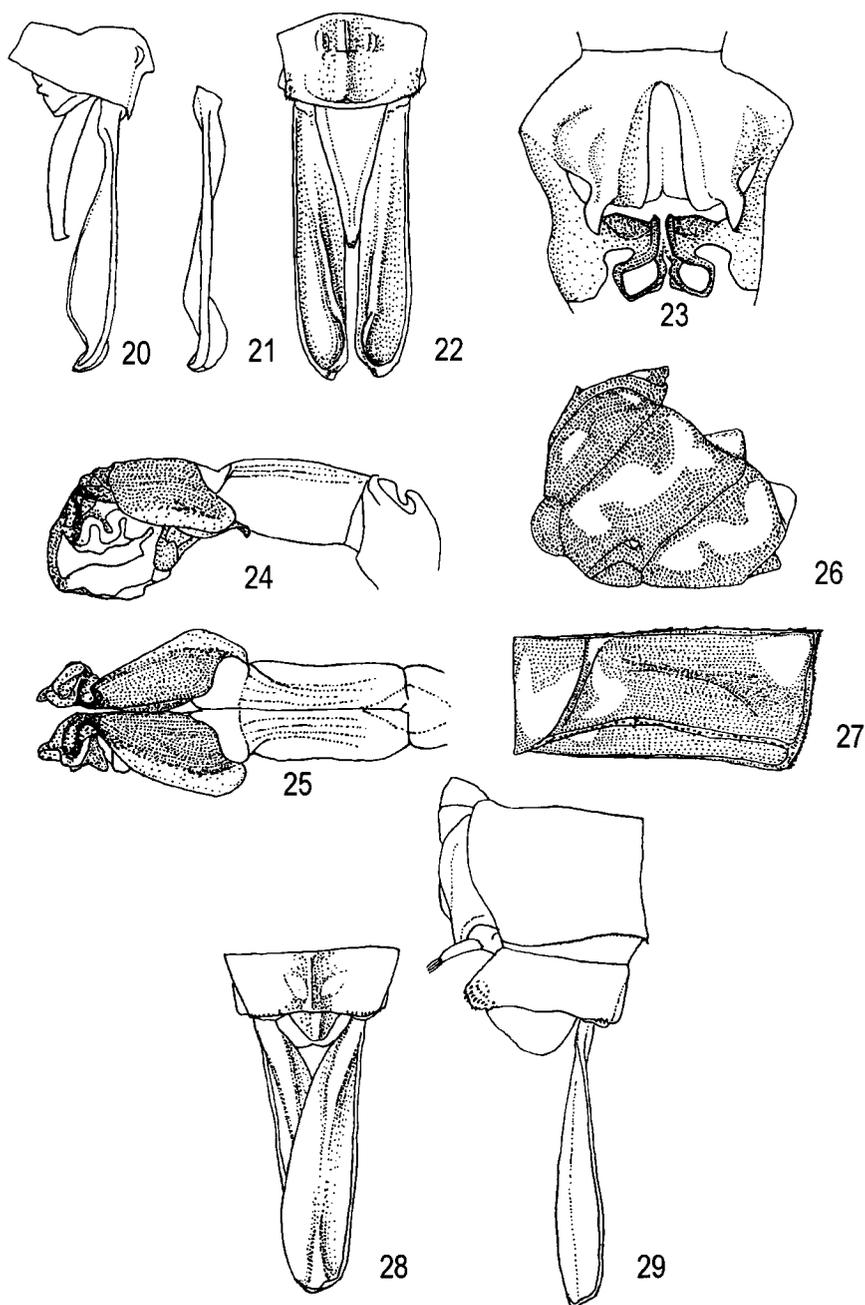
Vertical part of frons yellow, laterally sky blue; postclypeus sky blue, anteclypeus yellow, labrum basally blue, distally ochreous. Compound eyes dark brown, light grey brown medially with visible pseudopupillae; posterior eye margin yellow, with some blue at midheight (lateral view). Labium dark brown. Thoracic spots and stripes (Fig. 26) yellow green, metepimeral stripe blue at antealar sinus. Lateral spot of S1 yellow green; anteromedial lateral spot on S2 yellow green proximal to auricle, sky blue distally from it; posterolateral spot yellow green proximally and ventrally, sky blue distally and dorsally, and fusing with sky blue posterodorsal spot; anterolateral spot of S3 sky blue, as are posterodorsal spots of S3+4; posterodorsal spots of remaining segments moss green to brown olivaceous; a small blue spot in distal groove of genital lobe. Antero- and mediolateral spots of S4-8 green; supplementary longitudinal carinae on S4 or S5-8 or S9. Genital lobe projecting and densely covered with spinules; spines of anterior lamina short and blunt, inflated basally. Blades of anterior hamuli (Fig. 23) similar to those of *A. condor*. Penis as illustrated (Figs 24-25). Caudal appendages also similar to those of *A. condor*, but with tip of cerci blunt (Figs 20-21). Wings hyaline to fairly infumated with an amber basal spot in all wings often reaching to first Ax. Some specimens with only nine cells in anal loop and/or four cell rows between IR2 and Rspl; two cell rows in basal portion of space between MP and CuA.

Dimensions: Total length – 59.5-62.9; abdomen – 42.5-45.9; cerci – 5.0-5.2; Fw – 43-44.5; Hw – 40.0-43.0; pterostigma – 2.1-2.6.

Redescription of the adult female

Vertical portion of frons and labrum olivaceous brown; small bluish areas laterally on greyish ochreous postclypeus, and on frons. Thoracic and abdominal pattern as in male, but lacking any blue, all pale markings being pale green to turquoise (on S2+3), or olivaceous (posterodorsal spots). Cerci longer than S9+10 together, lanceolate, with a blunt, externally slightly truncated tip (Figs 28-29). Wings as in male, but with pale saffronous tint in the nodal region; pterostigma covering two to three cells.

Dimensions: Total length – 58.3; abdomen – 42.2; cerci – 5.0; Fw – 44.0; Hw – 43.5; pterostigma – 2.2.



Figures 20-29. Characters of adult *Aeshna joannisi*, from Las Copas – (20) S10 with caudal appendages of male, left lateral view; (21) left cercus, left laterodorsal view; (22) same as Fig. 20, dorsal view; (23) secondary genitalia, ventral view; (24) penis, left lateral view; (25) same, ventral view; (26) thoracic pattern of male, left lateral view, schematized; (27) S5 of male, left lateral view; (28) S10 with caudal appendages of female, dorsal view; (29) S9-10 with ovipositor and cerci, left lateral view.

Description of the larva

Ultimate instar exuviae, identified by supposition: the only undescribed, medium-sized larva in range with exceedingly long labium. Most exuviae are well patterned, but may be darker overall, or with pale areas more extended than the specimen illustrated (Fig. 35). Head broader than thorax, much as in the preceding species; antenna (Fig. 31) long, reaching to beyond anterior border of labrum, on each side with a large pale spot; a pale mark also on middle of occiput, and one at each occipital angle. Labium very long and slender; articulation between pre- and postmentum in resting position between third pair of coxae (Fig. 30), otherwise similar to *A. condor* (Figs 32-33). Pronotum not projecting laterally, rounded, and pale; a pale central mark also on anterior lobe and near distal margin; remainder of pronotum remarkably dark; prothoracic supracoxal processes as illustrated (Fig. 34). Legs strongly patterned; femur with broad, dark crossband in basal half, enclosing a pale dorsal spot near base; a narrower crossband on distal third and tip of femur also dark; tibiae pale with two narrow, poorly defined dark crossbands near their base. Abdomen with lateral spines on S6-9, those on S6 small and appressed to body wall (Fig. 35). Length of male projection barely half of epiproct, the latter broadly excised apically; paraprocts about as long as S8+9 together, or slightly longer; cerci more than half as long as paraprocts (Figs 36-37). Valves of ovipositor reaching to hind margin of S9 (Fig. 38).

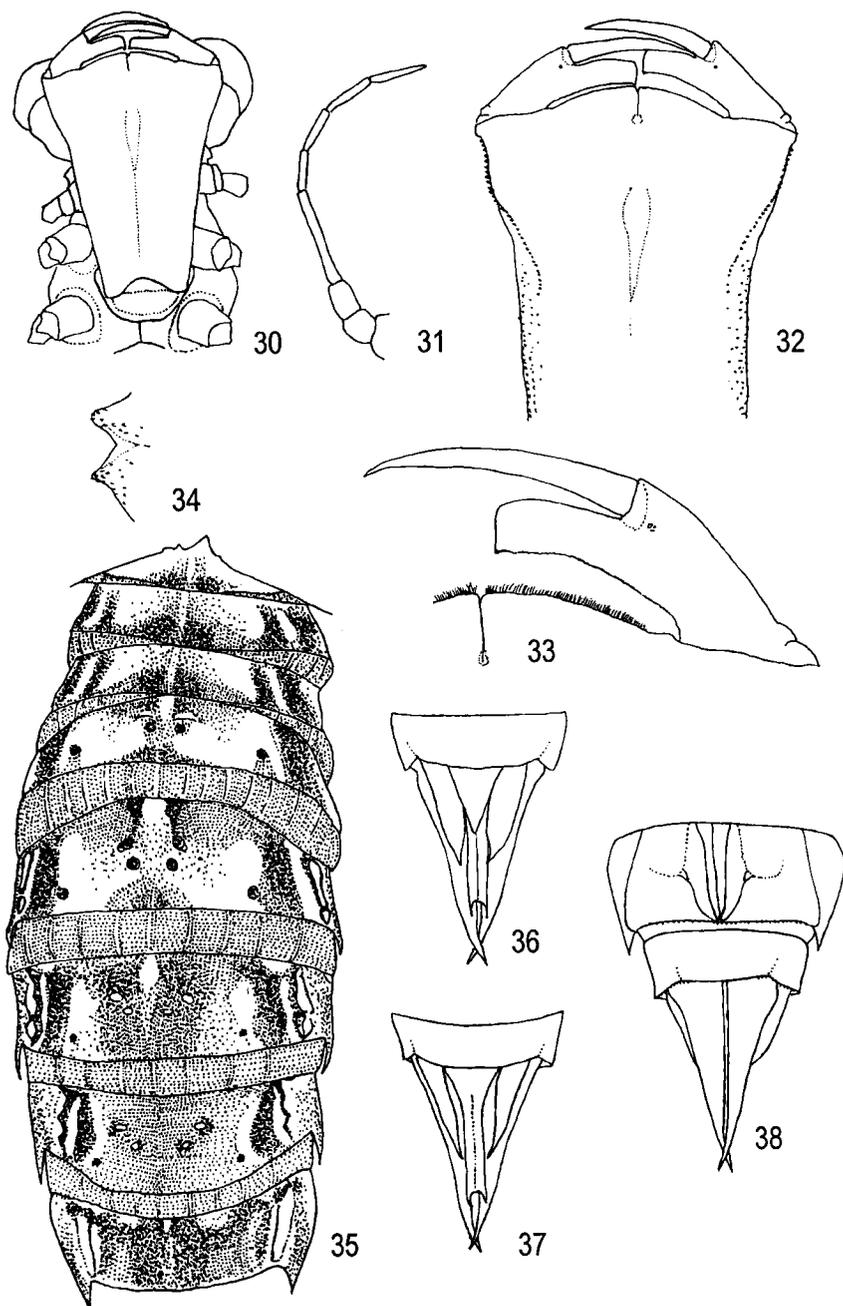
Dimensions: Total length – 35.0-41.5; maximum width of head – 8.0-8.6; labium, with closed palpi in resting position – 9.6-10.6; hind femur – 8.7-9.6; hind tibia – 8.0-8.5.

Field diagnosis

Patrolling males may be confused with syntopic males of *A. marchali*, but are larger and darker. The dark distal half of the abdomen characterizes *A. joannisi* in flight, whereas *A. marchali* has large, pale blue posterodorsal spots. The face of *A. marchali* is yellow, but blue in *A. joannisi*. Captured adults of *A. joannisi* are easily identified on the basis of the pale mesepisternal stripes, each being reduced to a small basal and a dorsal spot. In *A. marchali* there is only a basal spot. Larvae are immediately recognized by their unusually long labium.

Biology

A. joannisi was abundant at the same pond described under *A. condor*. Judging from the number of exuviae I collected, *A. joannisi* was ten to twenty times more common than *A. condor*. Usually two or three males were patrolling over the pond and occasionally approached the shore. Whenever a male was captured, another took its place. Females were seen twice. They approached the floating mats after 16:00 h local time to oviposit into floating grass stems. Exuviae were found clinging to branches of half submerged bushes in front of the floating mats. Larvae transformed a few centimeters above water, but occasionally as high as 30 cm. Adults and/or exuviae were observed in January (rare), May, July and November. Only a small number of the exuviae seen were collected.



Figures 30-38. Characters of exuviae of *Aeshna joannisi*, from Las Copas – (30) head and thorax of male, ventral view; (31) right antenna of female; (32) anterior portion of labium of male, dorsal view; (33) right palpus of same specimen, amplified; (34) left prothoracic supracoxal processes of male, dorsal view; (35) pattern of S2-9 of female; (36) S10 with caudal appendages of male, dorsal view; (37) same of female; (38) S9-10 of female, ventral view.

Aeshna (Marmaraeschna) vigintipunctata Ris, 1918
(Figs 39-50)

All Venezuelan populations were provisionally assigned to this species by De Marmels (1988). However, Muzón & von Ellenrieder (2001) recently reviewed the subgenus *Marmaraeschna* Calvert, ascribing the Venezuelan specimens to a new species. These authors did not illustrate the penis, which is figured here (Figs 49-50). The larva of this species is described hereafter for the first time, on the basis of reared specimens and some additional material. Prior to the present description, only a penultimate instar larva of an unknown species of *Marmaraeschna* from Antioquia Department, Colombia, had been figured (Roldán Pérez 1988: 65, Fig. 50).

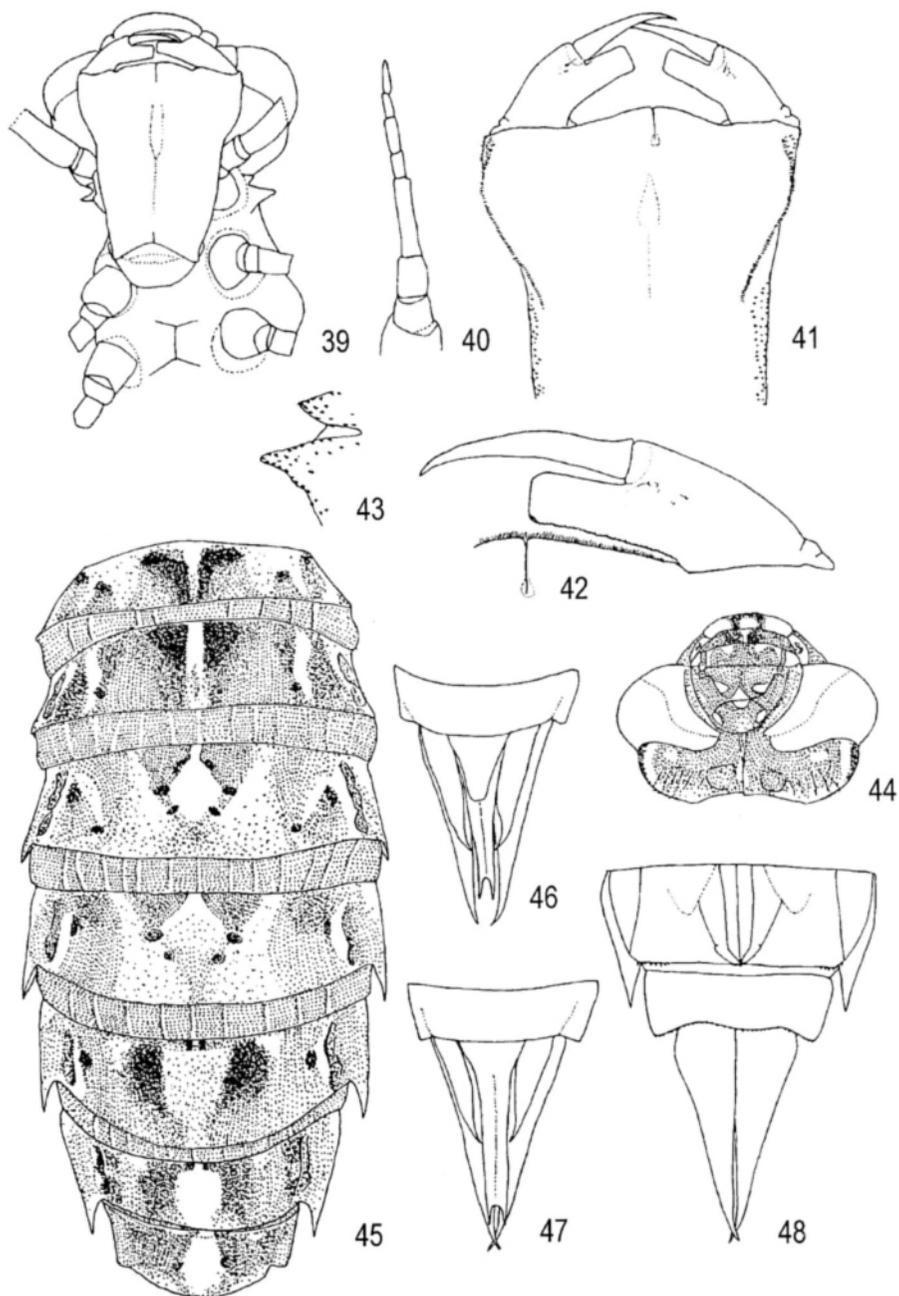
Material

Venezuela, Mérida State, Mérida, El Valle, Monterrey, 2,400 m a.s.l., 11-16 February 1983, 1 ♂ ultimate instar larva, 1 ♀ penultimate instar larva, both preserved in alcohol; Táchira State, San Vicente de La Revancha, road to Las Copas, 2,000 m a.s.l., Tamá National Park, 17 January 1999, 2 ♂ and 1 ♀ exuviae, all reared; same, but road to La Pesa, 2,350 m a.s.l., 13 January 1999, 1 ♀ exuvia; all J. De Marmels leg. (MIZA).

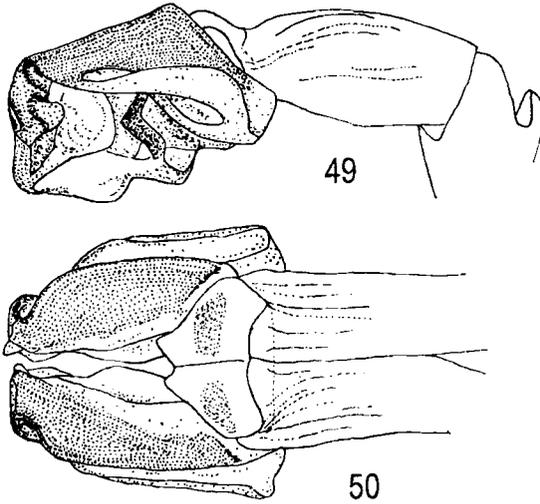
Description

Asterisked characters are of possible subgeneric value. The exuviae, but not those larvae preserved in alcohol, show a well defined pattern, but specimens vary in overall darkness. Head broader than thorax, and patterned as in Fig. 44. Antennae short, not reaching to anterior border of labrum (Fig. 40); occipital lobes more bulging than in the two previous species*. Labium reaching to near hind border of second coxae; median cleft closed, with a minute tooth at each side of cleft, or without such teeth; labial palp narrowly rectangular with no apical hook (Figs 41-42), instead with infraapical angle truncate*. Pronotum pale laterally, dark on central two fourths, here with pale circular spot at each side of ecdysal suture; lateral angles of pronotum slightly flattened and extended laterally into a blunt point*. Prothoracic supracoxal processes with a long and sharply pointed posterior branch (Fig. 43), similar in male and female. Femora and tibiae dark at basal and distal articulations, and with two additional dark crossbands in between. Abdomen patterned as in Fig. 45. In two specimens, S6+7 are overall paler than in the illustrated example. Characteristic for all is the pair of dark spots on S8, and the pale central spot on each, S9 and S10. Strong lateral spines on S6-9, those on S6 projecting freely caudad and projecting slightly laterad, not appressed to body wall as in the two preceding species. Male projection clearly less than half the length of epiproct, and with a blunt tip (Fig. 46); apical excision of epiproct narrow*. Paraprocts slightly longer than S8+9 together; male cerci much longer than half the paraprocts, female cerci slightly shorter (Figs 46-47). Valves of ovipositor reaching exactly to hind margin of S9 (Fig. 48).

Dimensions: Total length – 39.5-42.5 (44.0 in the alcoholic ultimate instar larva); maximum width of head – 9.5-9.7; labium – 9.0-9.5; hind femur – 8.5-9.7; hind tibia – 8.0-8.7.



Figures 39-48. Characters of exuviae of *Aeshna (Marmaraeschna) vigintipunctata*, from Las Copas – (39) head and thorax of female, ventral view; (40) antenna of female; (41) anterior portion of labium of male, dorsal view; (42) right palpus of same specimen, amplified; (43) left prothoracic supracoxal processes of male, dorsal view; (44) head of male, dorsal view; (45) pattern of S4-10 of male, dorsal view; (46) S10 with caudal appendages of male, dorsal view; (47) same of female; (48) S9-10 of female, ventral view.



Figures 49-50. Penis of *Aeshna (Marmaraeschna) vigintipunctata* – (49) Left lateral view; (50) same, ventral view.

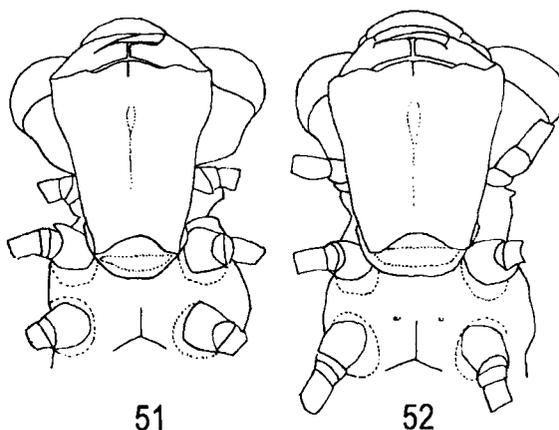
Biology

Larvae of *A. vigintipunctata* are rheophilous and are found in small to medium-sized streams with dense riparian vegetation and submerged roots, bordered by bushes and scattered trees, but always outside of closed forest. Adults were seen patrolling over open pasture lands along or away from small streams. When clouds blocked the sun, they settled on vertical rock surfaces where they were almost invisible due to their lichen-like color pattern.

Key to the aeshnid larvae of the upper Quinimarí River Valley around San Vicente de La Revancha, Tamá National Park

- 1. Epiproct spiniform; lateral spines on S4 or 5 to 9; ovipositor reaching to near end of S10; only in streams in upper cloud forest *Allopetalia pustulosa*
- 1'. Epiproct bifid; lateral spines on S6 or 7 to 9; ovipositor not, or only with its extreme tip reaching to beyond end of S9; habitat variable **2**
- 2. Occipital lobes bulging (Fig. 44); antenna short (Fig. 40), not reaching to anterior border of labrum; labial palp with no apical hook, infra-apical angle obtuse; spines of S6 robust, directed away from body; a pair of dark spots near middle of S8, and a pale median spot on each, S9+10; ovipositor reaching to distal margin of S9 (Fig. 48); excision of epiproct narrow, U-shaped, with bottom line of "U" narrowly

- concave; occurring only in streams in partly cleared cloud forest or in shrubby pasture land *Aeshna (M.) vigintipunctata*
- 2'. Occipital lobes not bulging, narrow (Fig. 9); antenna longer (Fig. 11), reaching to beyond anterior border of labrum; labial palp usually with small apical hook or, at least with pronounced infra-apical angle; spines of S6 absent or weak, appressed to body wall; color pattern not as above; ovipositor variable; excision of epiproct broad, with bottom line of excision almost straight or interrupted by protruding median carina (Fig. 17); occurring in standing or slightly flowing water
 subgenus *Hesperaeschna* 3
3. Labium long and slender, reaching to between third pair of coxae; spines on S6-9 *Aeshna (H.) joannisi*
- 3'. Labium shorter and broader, not reaching to third pair of coxae, number of abdominal spines variable 4
4. Larvae (ultimate instar) larger than 41 mm, robust; maximum width of head 9.5 mm or more; spines on S6-9; ovipositor reaching close to hind margin of S9
 *Aeshna (H.) condor*
- 4'. Larva (ultimate instar) smaller than 39 mm, slender; maximum width of head 8 mm or less; number of abdominal spines and length of ovipositor variable 5
5. Labium stocky (Fig. 52); spines on S7-9; ovipositor not reaching to end of S9 ...
 *Aeshna (H.) marchali*
- 5'. Labium slender (Fig. 51); spines on S6-9; ovipositor reaching to beyond end of S9
 *Aeshna (H.) c. cornigera*



Figures 51-52. Larval labia of two Andean Aeshnidae – (51) Head and thorax of female *Aeshna (Hesperaeschna) c. cornigera* from Las Copas, ventral view; (52) same of *Aeshna (H.) marchali* from Las Copas, ventral view.

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