

NINE NEW ANISOPTERA LARVAE FROM VENEZUELA (GOMPHIDAE, AESHNIDAE, CORDULIIDAE, LIBELLULIDAE)

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Received July 25, 1989 / Accepted October 6, 1989

The ultimate instar larvae or exuviae of the following spp. are described and illustrated: *Progomphus racenisi* De Marmels, 1983; *Aeshna draco* Racenis, 1958; *Castoraeschna tepuica* De Marmels, 1989; *Racenaeschna angustistrigis* Calvert, 1958; *Neocordulia biancoi* Racenis, 1970; *Elga leptostyla* Ris, 1911; *Nephelitia phryne* (Perty, 1834); *Orthemis levis* Calvert, 1906, and *Rhodopygia hollandi* Calvert, 1907. Differential characters which separate these larvae from similar larvae of other spp. are mentioned, and observations concerning their breeding sites are added.

INTRODUCTION

In the absence of adults on overcast days, or outside the flight season, larvae or exuviae of advanced instars can be of inestimable value for recording odonate species in their biotopes. This has already been demonstrated elsewhere, especially in some European countries, where all larvae of the comparatively few species have been described and can, therefore, be identified. In Venezuela, however, the larvae of many genera and most of the approximately 500 species are still unknown. Hence the finding of a larva or exuviae does not normally help much in establishing a species record. The present paper is a small contribution to improve this deplorable lack of knowledge.

GOMPHIDAE

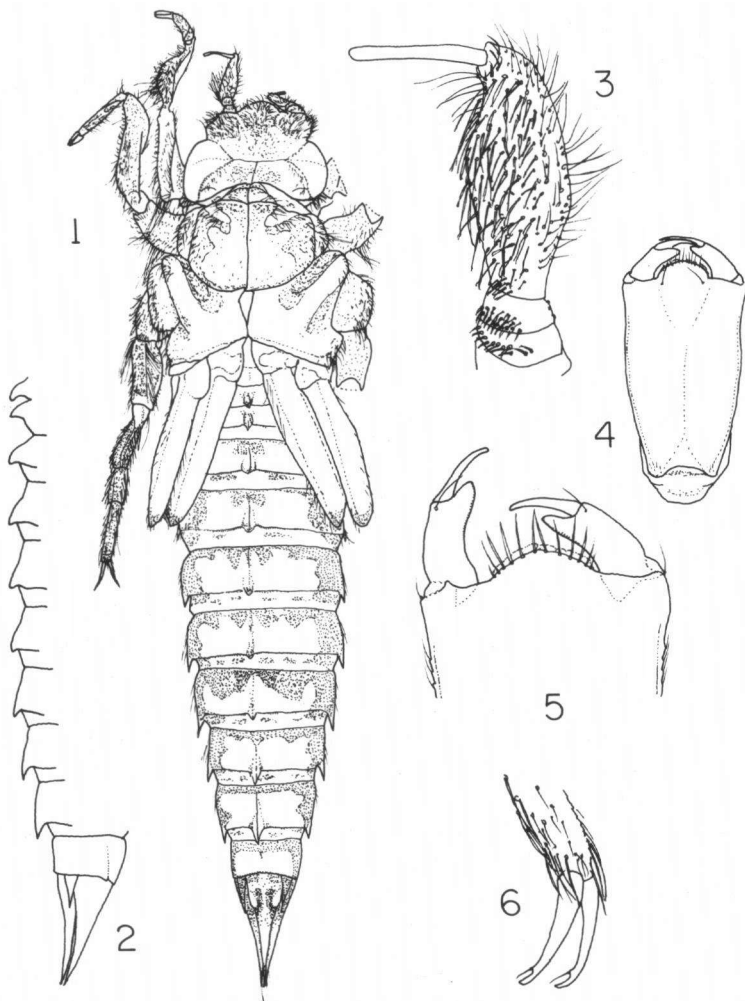
PROGOMPHUS RACENISI DE MARMELS, 1983

Figures 1-6

Material examined (collected with emerging adults). — 2 ♂, ultimate instar exuviae: 1 ♂, La

Escalera, road El Dorado-Santa Elena de Uairén, Bolívar, 1280 m, 20/22-V-1985; — 1 ♂, El Pílon, road Santa Elena de Uairén-Icabarú, Bolívar, 920 m, 28-I-1985, both J. De Marmels leg.

Brown with dark patterned abdomen (Fig. 1). Fourth antennal segment half as long as third (Fig. 3). Hinge of labium between second and third pairs of coxae; median lobe with about a dozen long, robust and transparent marginal setae, ventrally with one seta basally on each side of the median lobe (Figs 4, 5). Middle



Figs 1-6. *Progomphus racenisi*: (1) male exuvia, La Escalera; — (2) skyline of the abdomen, right lateral view; — (3) right antenna, El Pílon; — (4) labium, ventral view, La Escalera; — (5) anterior part of labium, dorsal view, El Pílon; (6) tip of left hind tarsus with claws.

coxae much more ventrally located than fore and hind coxae; fore and middle tibiae strongly arched and laterally compressed. Burrowing hooks absent; claws of fore and middle tarsi broadly flattened, cheliform, claws of hind tarsi unciform, long, with a short seta close to tip (Fig. 6). Hind legs dark with pale femoro-tibial articulation. Abdomen with lateral spines on segments 4-9, dorsal spines on segments 1-9, the latter rather short and blunt on segments 1-6, more pointed on remaining segments.

Measurements (in mm). — Total length 17.5-18; hind femur 2; hind tibia 1.9; hind tarsus (without claws) 2-2.2.

Remarks. — Similar to larvae of *P. brachycnemis* Needham, but the dorsal spines in the latter considerably longer and sharply pointed. — Both exuviae were found together with the emerging adults, on the sandy margins of small creeks in primary forest.

AESHNIDAE

AESHNA DRACO RACENIS, 1958

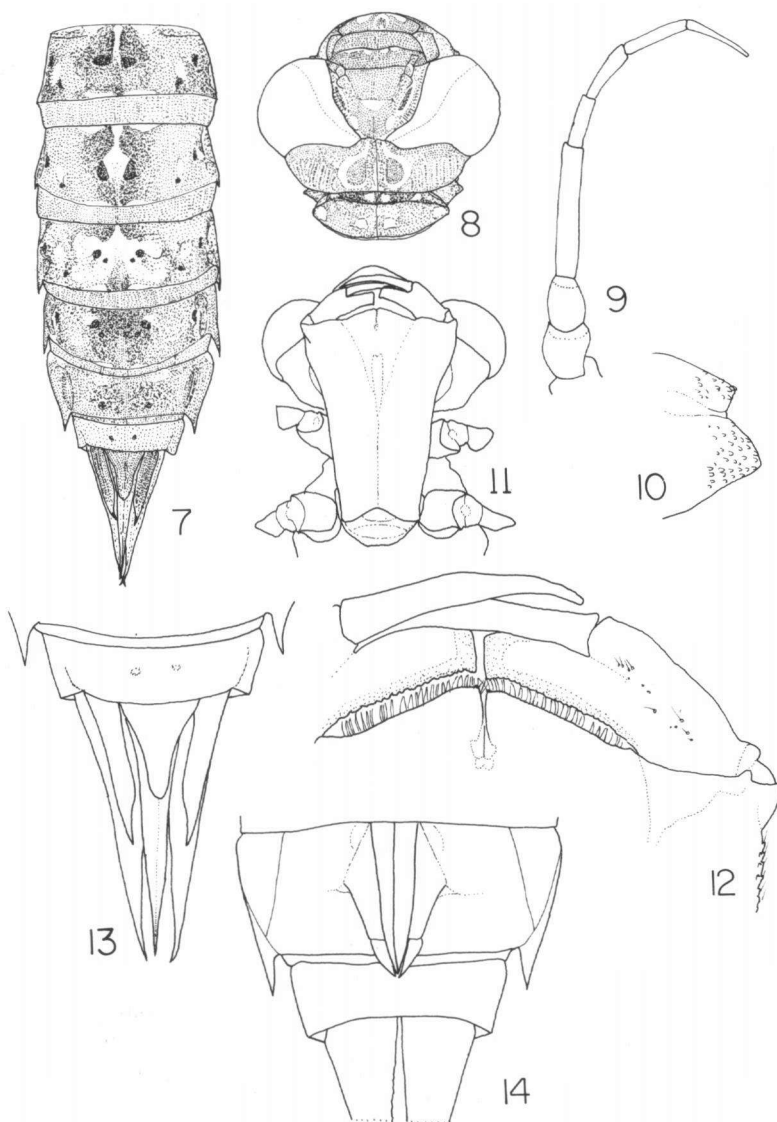
Figures 7-14

Material examined (supposition). — 1 ♂, 3 ♀, ultimate instar exuviae, Cerro Neblina, 2100 m, Amazonas Federal Territory, 15/18-III-1984, J. De Marmels leg.; — 2 ♂, ultimate instar larvae, Roraima, 2650 m, Bolívar, 19/21-II-1979, L.J. Joly leg.; 1 ♀, penultimate instar larva, Auyantepui, 2100 m, 30-I/03-II-1988, A. Chacón & L.J. Joly leg.; 1 ♀, ultimate instar larva, Apacará-Tepuy (Chimantá-Tepuy), 2350 m, Bolívar, 3/5-II-1984, S. Gorzula leg.; — 1 ♂, 1 ♀, inferior instar larvae, Marawaka, 2600 m, Amazonas Federal Territory, 5/24-III-1985, Expedition "Fundación Terramar" (R. Candia & A. Chacón leg.); — 1 ♂, inferior instar larva, Ptari-Tepuy, 2350 m, 23-II-1978, collector unknown.

Male and one female exuviae dark with vividly patterned abdomen (Fig. 7); two female exuviae and the larvae kept in alcohol paler. Hinge of labium surpassing second pair of coxae; movable hook of labial palp with no setae; first projection of prothoracic supracoaxal process small and blunt, the second broad, triangular (Fig. 10). Femora with two broad partly confluent dark bands across central portion and additional narrower bands at base and tip. Tibiae with faintly indicated dark basal band. Each abdominal segment with different pattern (Fig. 7), but general appearance constant within species. Lateral spines on segments 6-9. Epiproct little shorter than paraprocts and ending in a single point (Fig. 13). Female gonapophyses just surpassing hind margin of segment 9 (Fig. 14).

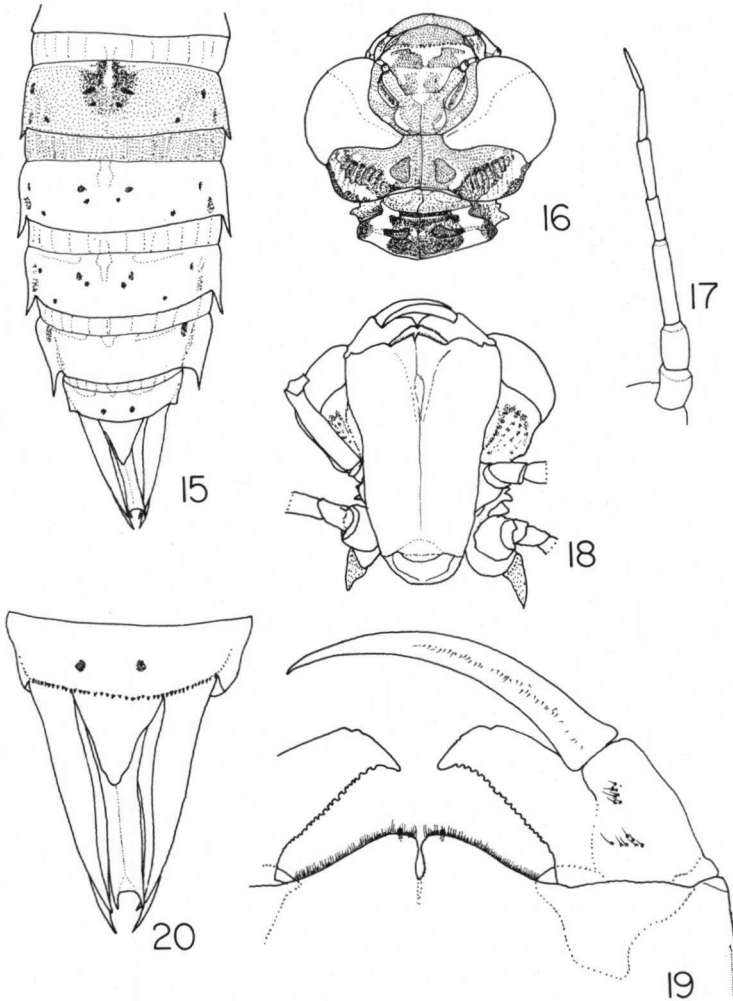
Measurements (in mm). — Exuviae: Total length 41-45; maximum diameter of head across compound eyes 10-10.5; hind femur 10; hind tibia 10.

Remarks. — The spiniform epiproct is characteristic. The same feature also occurs in *Aeshna punctata* Martin (SANTOS, 1966) and in *Racenaeschna angustistrigis* Calvert. The first species does not occur in Venezuela while the (supposed) larva of the latter is described below. The exuviae from Cerro Neblina clung to sticks and trunks in the water. Other exuviae as well as larvae

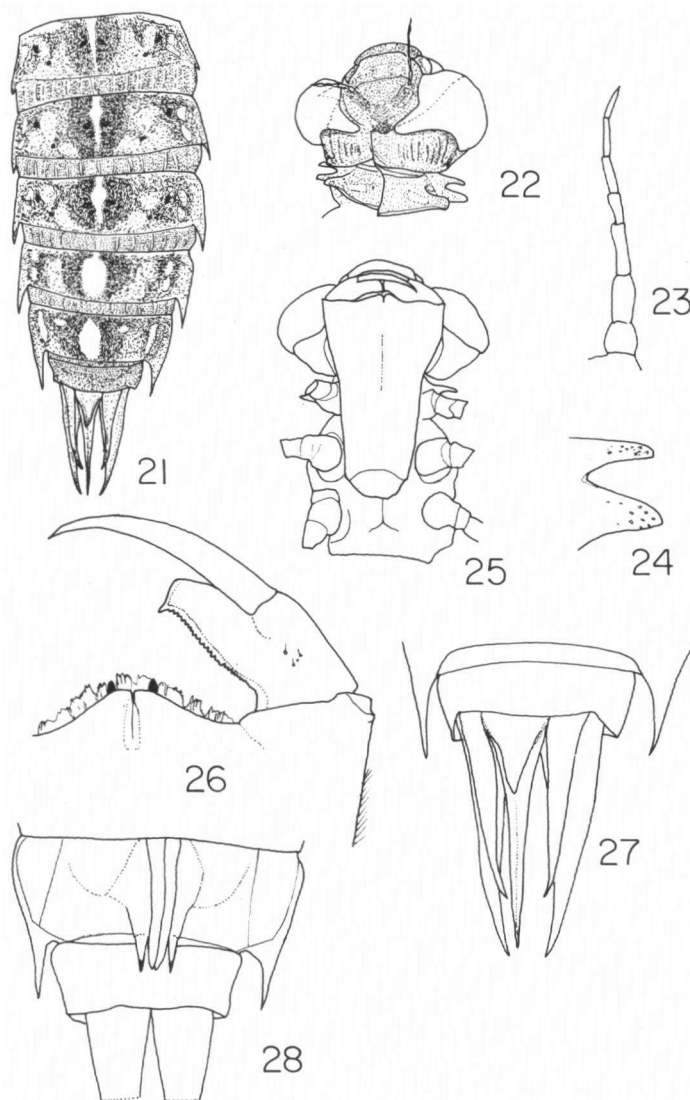


Figs 7-14. *Aeshna draco*, (7-13) male exuviae; (14) female exuviae (Cerro Neblina): (7) abdominal pattern; — (8) head, dorsal view; — (9) right antenna; — (10) right prothoracic supracoxal process; — (11) labium, ventral view; — (12) anterior part of labium, dorsal view; — (13) anal pyramid; — (14) last abdominal segments with gonapophyses, ventral view.

and adults of *Aeshna draco* were common. Some living larvae which I brought back to the laboratory died weeks later. The wing venation visible on the wing sheaths of the exuviae, and the geographic origin of the larvae are rather clear indications of their identity with *A. draco*. A description of the habitat at the Neblina site was given in DE MARMELS (1989). RACENIS (1958) offers a color picture of the habitat on the Auyan-Tepuy.



Figs 15-20. *Castoraeschna tepuica*, male exuviae, Marawaka: (15) Abdominal pattern (indicated for segment 6 only); — (16) head, dorsal view; — (17) left antenna; — (18) labium, ventral view; — (19) anterior part of labium, dorsal view; — (20) anal pyramid, dorsal view.



Figs 21-28. *Racenaeschna angustistrigis*, (21-27) male exuviae; (28) female exuviae (La Escalera): (21) abdominal pattern; — (22) head, dorsal view; — (23) antenna; — (24) right prothoracic supracoxal process; — (25) labium, ventral view; — (26) anterior part of labium, dorsal view; — (27) anal pyramid, dorsal view; — (28) last abdominal segments with gonapophyses, ventral view.

CASTORAESCHNA TEPUICA DE MARMELS, 1989

Figures 15-20

Material examined (reared). — 1 ♂, ultimate instar exuviae, Marawaka, 1140 m, Amazonas Federal Territory, 10/17-III-1985, Expedition Fundación Terramar" (J. De Marmels) leg.

Brown with well-defined pattern on head, pronotum and abdomen (Figs 15, 16). Hinge of labium between second and third pair of coxae; first projection of prothoracic supracoxal process less than half the size of the second, the latter narrow and slightly back-curved. Legs pale, first and second femur with four dark cross-bands, hind femur with diffuse cross-band near base and two more near tip. Wing sheaths pale, vividly marked with brown. Abdominal segments uniformly patterned, as indicated for segment 6 (Fig. 15). Cerci as long as bifid epiproct, paraprocts longer.

Measurements (in mm). — Total length 49; maximum width of head across compound eyes 10.5; hind femur 9; hind tibia 9.

Remarks. — In comparison with other Venezuelan aeshnid larvae the long cerci seem to be diagnostic. The unique larva was found, in its penultimate instar, in a small ditch with little running water, in primary forest.

RACENAESCHNA ANGUSTISTRIGIS CALVERT, 1958

Figures 21-28

Material examined (supposition). — 1 ♂, 1 ♀, ultimate instar exuviae, La Escalera, road El Dorado-Santa Elena de Uairén, Bolívar, 1280 m, 20/22-V-1985, J. De Marmels leg.

Dark brown; only abdomen with recognizable pattern (Fig. 21). Occipital lobes bluntly angled; hinge of labium reaching to anterior margin of third coxae (Fig. 25); median lobe of prementum with a large blunt tooth on each side of the median cleft (Fig. 26). Prothoracic supracoxal processes long and finger-like (Fig. 24). Femora with four dark cross-bands, including those at base and tip. Wing sheaths reaching to end of fourth abdominal segment. Abdomen with lateral spines on segments 5-9, in the male those of segment 9 surpassing hind margin of segment 10, in female shorter. Epiproct spiniform, in the male as long as paraprocts, in female shorter; cerci slightly shorter than epiproct in female, much shorter in male (Fig. 27). Female gonapophyses directed straight backwards, spiniform (Fig. 28).

Measurements (in mm). — Total length 37-38; maximum width of head across compound eyes 8-9; hind femur 7; hind tibia 7.

Remarks. — The two exuviae are associated with *R. angustistrigis* on the basis of agreement of adult wing venation with that imprinted on their wing sheaths. An adult female has also been collected along the same creek in the forest.

CORDULIIDAE

NEOCORDULIA BIANCOI RACENIS, 1970

Figures 29-34

Material examined (all exuviae from reared specimens). — 2 ♂, 2 ♀, ultimate instar exuviae, El Pilón, road Santa Elena de Uairen-Icabarú, 920 m, Bolívar, 17/31-I-1985, J. De Marmels leg.; 1 ♂, 1 ♀, ultimate instar larvae (same dates as above); — 1 ♂, ultimate instar larva and one early instar larva of unknown sex, Marawaka, 1140 m, Amazonas Federal Territory, 10/17-III-1985, Expedition "Fundación Terramar" (J. De Marmels) leg.

Red brown; labium and distal portion of abdomen (in the exuviae) with a strong orange tint. Head large, as broad as thorax; compound eyes small; frons produced in a sharp transverse ridge (Fig. 29). Hind angles of occipital lobes slightly produced and covered with scales. Prementum strongly constricted prior to articulation with submentum; outer margin with a row of about 15 scale-shaped setae preceding articulation (Fig. 31). Hind margin of pronotum ending on each side with a conical tubercle directed slightly back and upwards. Legs long and slender, femora with two dark cross-bands and two spur-like on the dorsal carina (first femur sometimes with three such setae); third tibiae with several similar setae. Mesosternum and metasternum strongly hollowed out to give space to labial mask, this impression fringed with scale-like setae (Fig. 31). Abdomen characteristically patterned (Fig. 29); dorsal hooks absent. In females vulvar scale rudiment clearly visible (Fig. 34).

Measurements (in mm). — Exuviae: Total length 20.5-22; maximum width of head across compound eyes 6-7; hind femur 8-8.5; hind tibia 8.5-9.

Remarks. The larval stage of *Neocordulia* Selys was hitherto unknown. The larva of *N. biancoi* is strikingly different from those of two species of *Aeshnosoma* Selys described by GEIJSKES (1970), showing superficial similarities with the larva of *Rialla villosa* (Navás) from Chile which was described and parsimoniously illustrated by NEEDHAM & BULLOCK (1943). The larvae of *N. biancoi* from El Pilón were found in a small creek in the forest where they thrived between stones and plant debris; those on the Marawaka lived in the same ditch described under *Castoraeschna tepuica*.

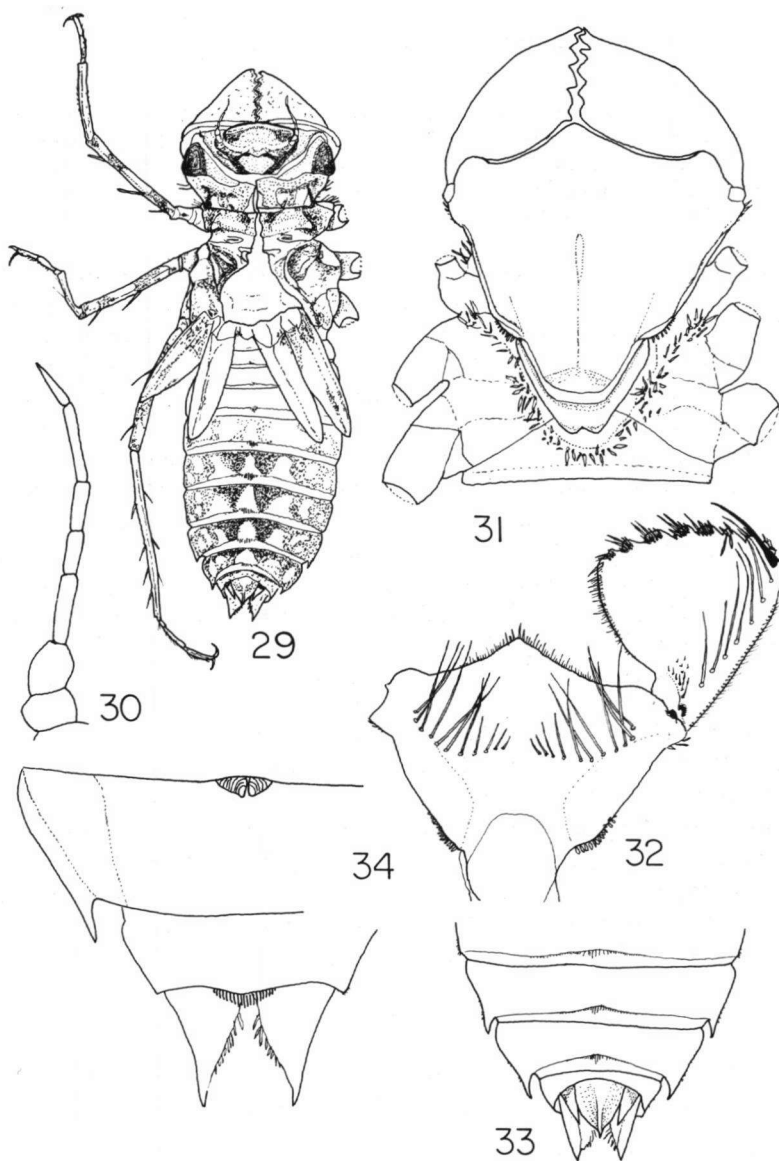
LIBELLULIDAE

ELGA LEPTOSTYLA RIS, 1911

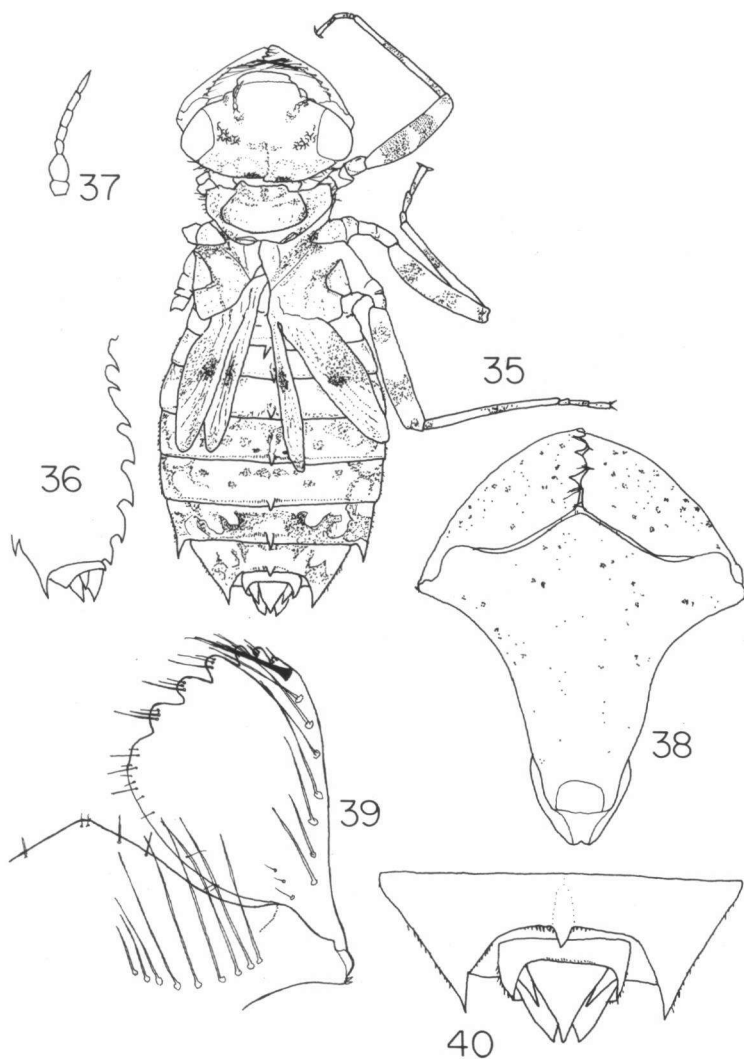
Figures 35-40

Material examined (reared). — 1 ♀, ultimate instar exuviae, upper Río Baria, 140 m, Amazonas Federal Territory, III-1984, Expedition "FUDECI" (J. De Marmels) leg.

Pale with darker markings as in Figure 35. Head bulbous; antennae very small, apparently seven-jointed with segments 3-5 extremely short (Fig. 37). Labium



Figs 29-34. *Neocordulia biancoi* (El Pilón): (29) female exuviae; — (30) antenna, male ultimate instar larva; — (31) labium, ventral view, same specimen; — (32) labium with right labial palp, dorsal view, same specimen; — (33) end of abdomen, dorsal view, female exuviae; — (34) same, ventral view.



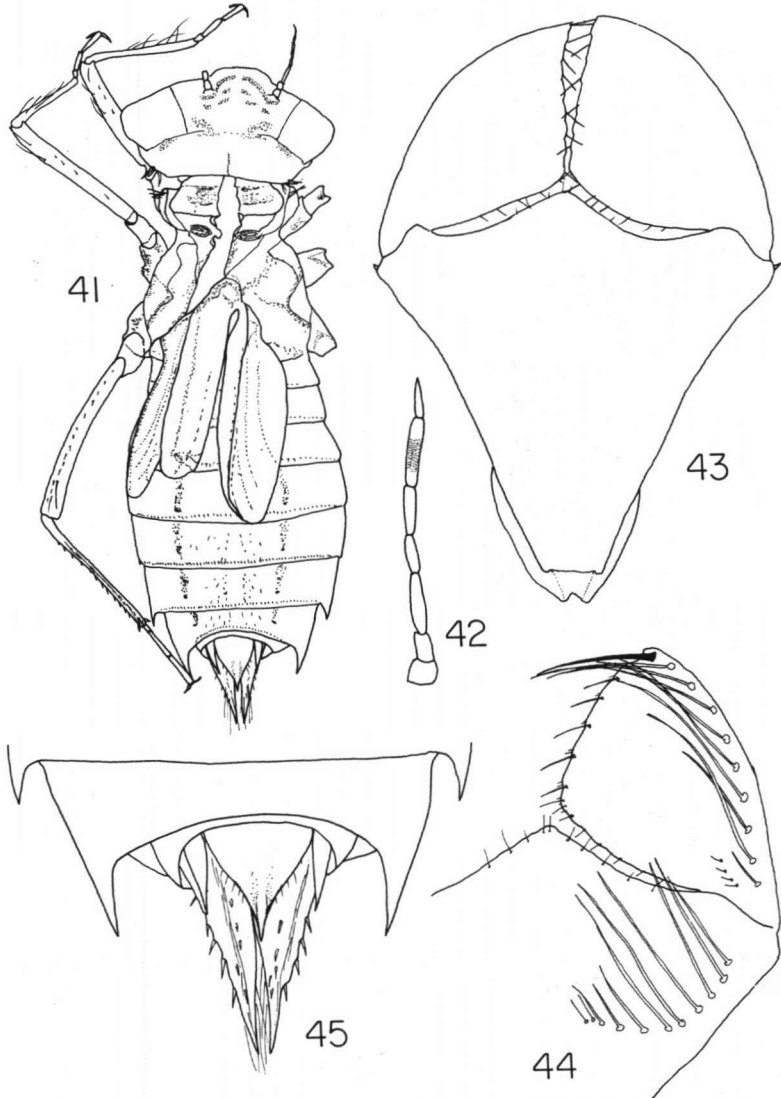
Figs 35-40. *Elga leptostyla*, upper Rio Baria: (35) exuviae; — (36) skyline of abdomen, left lateral view; — (37) left antenna; — (38) labium, ventral view; — (39) anterior part of labium, dorsal view; — (40) anal pyramid, dorsal view.

reaching to between third coxae, very narrow at articulation with submentum, broad at base of labial palps. Legs short; femora with two dark cross-bands; tibiae with dark cross-band at base and in distal half. Wing sheaths reaching to end of segment 6. Dorsal hooks on abdominal segments 3-9, lateral spines on

segments 8 and 9.

Measurements (in mm). — Total length 11.5; maximum width of head across compound eyes 3.6; hind femur 2.6; hind tibia 2.6.

Remark. — The larva was found in a small stony black water creek in the



Figs 41-45. *Nephepeltia phryne*, El Limón: (41) female exuviae; — (42) antenna; — (43) labium, ventral view; — (44) anterior part of labium, dorsal view; — (45) anal pyramid, dorsal view.

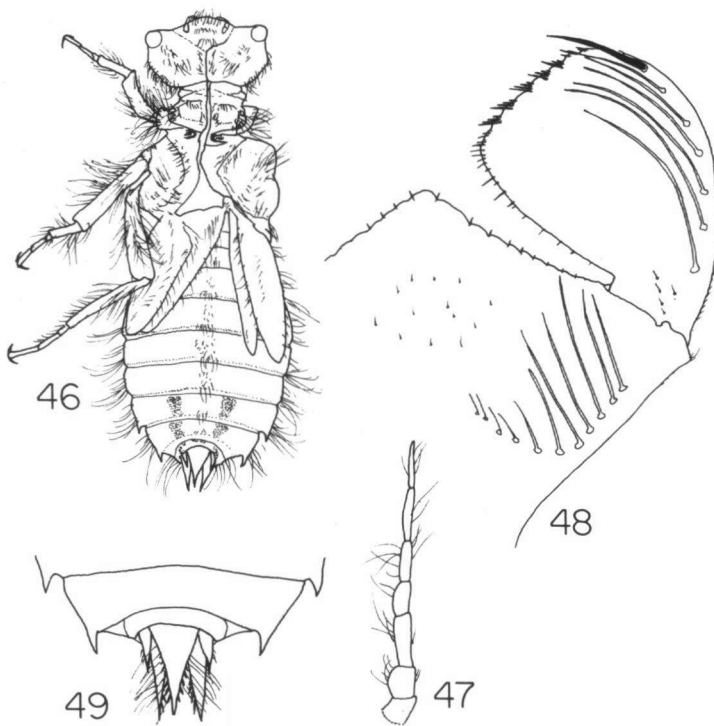
NEPHEPELTIA PHRYNE (PERTY, 1834)

Figures 41-45

Material examined (reared). — 1 ♀, ultimate instar exuviae, Pozo Diablo, El Limón (Maracay), 430 m, Aragua, 11-V-1981, collector not stated.

Slender, pale larva with long legs and paraprocts. Occipital margin almost straight; hinge of labium situated between second coxae; hind border of pronotum rounded, lateral angles spinous. Legs pale, femora with two to four conspicuous setae dorsally near tip; tibiae with about 10 such setae, especially in the distal half. Wing sheaths reaching end of abdominal segment 6. Lateral spines on segments 8 and 9; dorsal hooks absent; segment 10 extremely short. Paraprocts about three times the length of cerci, straight; epiproct half as long as paraprocts.

Measurements (in mm). — Total length 10.6; maximum width of head across compound eyes 3.6; hind femur 3; hind tibia 3.5.



Figs 46-49. *Orthemis levis*, Canoabo: (46) female exuviae; — (47) right antenna; — (48) anterior part of labium, dorsal view; — (49) anal pyramid, dorsal view.

ORTHEMIS LEVIS CALVERT, 1906

Figures 46-49

Material examined (supposition). — 1 ♀, ultimate instar exuviae, Canoabo, 600 m, Carabobo, 11-X-1988, J. De Marmels leg.

A hairy larva with reduced color pattern. Eyes small and protruding; the seven-segmented antenna thin and hairy; occipital margin almost straight; hinge of labium reaching anterior margin of second coxae. Legs short, hairy; wing sheaths surpassing end of abdominal segment 5. Abdomen ovoid with well-developed lateral spines on segments 8 and 9, but devoid of dorsal hooks; tips of cerci at half-length of epiproct.

Measurements (in mm). — Total length 19.5; hind femur 5.5; hind tibia 5.5.

Remarks. A freshly emerged female adult flew up from a spot where I detected the exuviae clinging to a stem of a tall grass standing in the water. The only other *Orthemis* Hagen found at the place was *discolor* Burmeister, which I had reared at previous opportunities. The larva of *levis* can be separated from that of *discolor* by its smaller size, the shorter anal pyramid with relatively longer cerci, and the much shallower crenations of the median lobe and labial palp. In addition, larvae of *discolor* have eight or more palpal setae, but only four long premental setae, on each side. — The larval habitat could be described as a roadside pond filled with rain water, mostly covered with tall grasses and sedges.

RHODOPYGIA HOLLANDI CALVERT, 1907

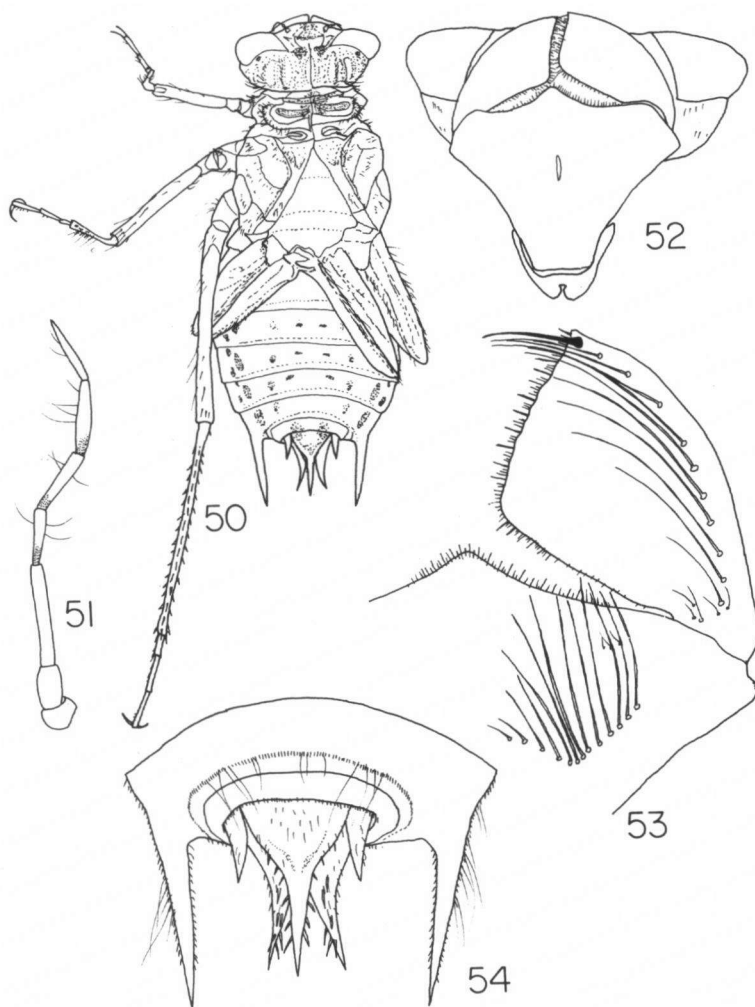
Figures 50-54

Material examined (reared). — 1 ♂, ultimate instar exuviae, Calabozo, 100 m, Guárico, 27-X-1982, J. Limongi & J. De Marmels leg.

Brown with ill-defined dark spots on the abdomen (Fig. 50). Hinge of labium situated behind first pair of coxae; palpi not clearly crenate. Legs very long; tibiae, especially hind tibiae, spiny; wing sheaths reaching backwards to segment 8. Abdomen without dorsal hooks, but with two straight lateral spines on segment 9 which, in ventral view, are longer than segments 8 and 9 together (internal free edge of spines in ventral view). Cerci and paraprocts divergent with their tips slightly curved downwards. Cerci less than half as long as epiproct.

Measurements (in mm). — Total length (excluding lateral abdominal spines) 19.2; hind femur 8; hind tibia 9.6; lateral spine of ninth abdominal segment 2.9.

Remarks. — LIMONGI (1983) described the exuviae of (reared) *Rhodopygia geijskesi* Belle. The single specimen of *hollandi* is larger with longer abdominal spines. In *R. geijskesi* these spines are 2.4 mm long or shorter (inner edge, ventral view) and shorter than segments 8 and 9 together (ventral view). — Larvae of both species were collected in a large road-side ditch (130x25 m), devoid of vegetation.



Figs 50-54. *Rhodopygia hollandi*, Calabozo: (50) male exuviae; — (51) left antenna; — (52) labium, ventral view; — (53) anterior part of labium, dorsal view; — (54) anal pyramid, dorsal view.

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