

THE ODONATA OF THE REGION OF MOUNT AUYANTEPUI AND THE SIERRA DE LEMA, IN VENEZUELAN GUYANA. 3. ADDITIONS TO THE FAMILIES GOMPHIDAE, AESHNIDAE AND CORDULIIDAE, WITH DESCRIPTION OF *PROGOMPHUS RACENISI* SPEC.NOV.

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New records are presented of 2 gomphids and 3 aeshnids. *P. racenisi* sp.n. (holotype ♂: Venezuela, Bolivar, km 107, El Dorado-Sta Elena de Uairén, 19-VIII-1957; deposited in Inst. Zool. Agric., Maracay) is described and figured. *Staurophlebia auca* Kenn. is for the first time recorded from Venezuela, and the hitherto unknown female is described. The taxonomic status of 2 known females of "*Paracordulia sericea* Rácenis" is discussed, and a female of another, probably allied, but here not named sp., is described.

INTRODUCTION

This third contribution to the knowledge of the dragonflies of the region under study deals with what should be probably considered as seven species. Two of them belong to the Gomphidae, one being new to science (*Progomphus racenisi* sp.n.). The Aeshnidae are represented by three species, one of which has been previously reported from Auyantepuí (*Aeshna draco* Racenis), the second one (*Gynacantha mexicana* Sel.) was known from other parts of Venezuela only, while *Staurophlebia auca* Kenn. is for the first time recorded from the country; it was known from the male sex only, hence a description of the female is here provided.

In part 2 of the current series, RACENIS (1970) has reported a corduline, describing it as the female of *Paracordulia sericea* (Sel.). This same specimen is dealt with in the present paper. It is shown that it represents a hitherto unknown species, the generic affiliation of which is uncertain. Since the male is unknown,

we refrain from naming it.

Most of the localities mentioned were characterized by RÁCENIS (1968) in part 1 of this series. The collection sites listed here are all situated along the road from El Dorado to Santa Elena de Uairén, at the Brazilian border, or West of this road (Bolívar State).

All specimens are deposited at the Instituto de Zoología Agrícola (IZA), Facultad de Agronomía, Universidad Central de Venezuela, Maracay.

DISCUSSION OF THE SPECIES

Gomphidae

PROGOMPHUS RACENISI SP.N.

Figures 1-10

Material. — 1 ♂ (holotype) Venezuela, Bolívar State, km 107, Road El Dorado — Santa Elena de Uairén, 19-VIII-1957, F. Fernández Y. & C.J. Rosales leg. (Coll. Inst. Zool. Agríc., Maracay; No. 14039).

The single male is adult, with the colours well preserved. The front wings are broken on the nodus; the second right and third left tarsus are lost. This rather small species keys out with *phyllochromus* Ris in BELLE (1973), but structurally resembles *recurvatus* Ris, both in anal appendages and secondary genitalia.

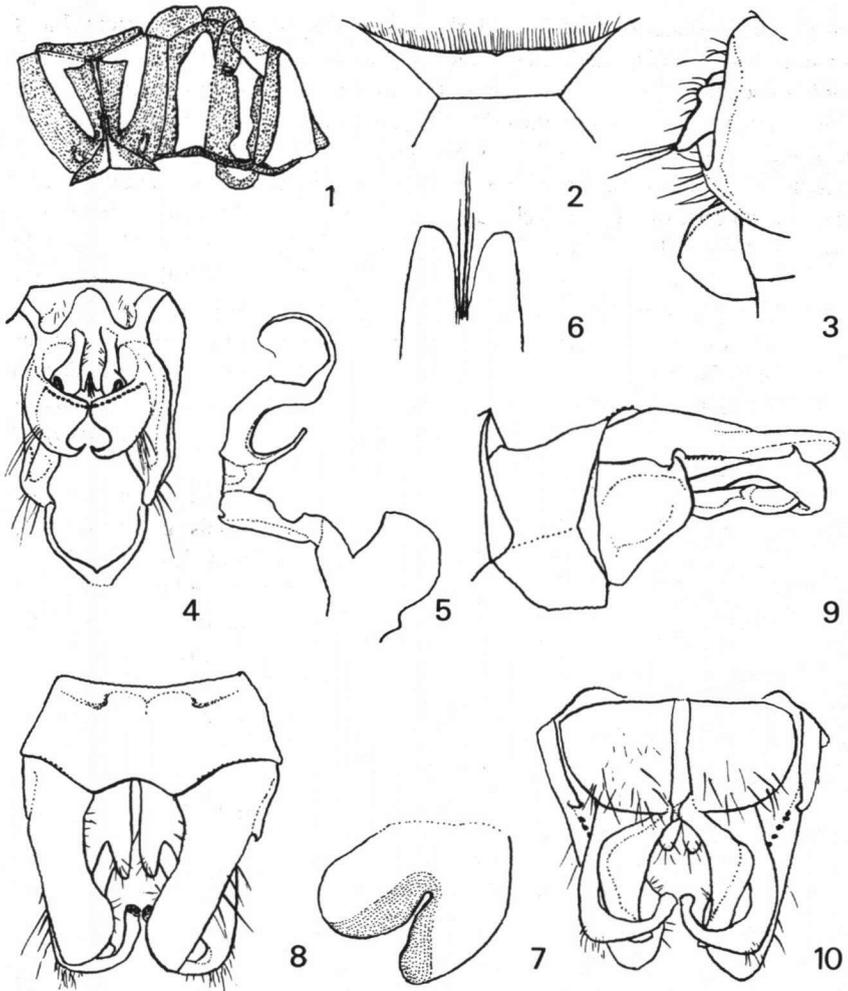
Male (holotype). — Total length 33.6 mm; abdomen (without appendages) 25 mm; hind wing 20 mm; costal edge of pterostigma in fore wing 2.6 mm.

Labrum entirely dark brown, anteclypeus lighter greyish, postclypeus brown. Anterior surface of frons brown basally; superior surface with a broad grey anterior band, posteriorly with an undulate dark brown basal band, beset with single long black hairs. Vertex as well as occipital plate and antennae, dark brown. Posterior margin of occipital plate slightly concave with a minute central notch, and fringed with brown hairs. Rear of head brown, becoming yellow basally near the compound eyes. Mandibles yellow basally; labium pale yellow.

Thorax: anterior lobe of prothorax black; pronotum brown with the middle lobe bright yellow; posterior lobe dark brown with black margin. Pterothorax brown with yellow stripes. First pale antehumeral stripe not reaching antealar sinus, somewhat fusiform to rearward. Second pale antehumeral stripe represented only by a tiny yellow antealar spot. Antealar sinus yellow in center, ridge brown. Dark middorsal carina with a thin yellow line on top, not confluent with the yellow of the collar. Underparts of thorax light brown.

Legs brown, apical part of tibiae and tarsi black; claws rusty, black-tipped. Third tarsus four fifths the length of third tibia. Lamina tibialis of first tibia about one fifth the tibial length.

Abdomen: dorsum black with yellow markings. Segment 1 yellow laterally, dark dorsally on its basal half. No tubercle on venter of segment 1. Segments 2 to 7 with a narrow yellow middorsal line. Segment 2 laterally yellow, dorsally with a dark basal line followed by a yellow transverse bar extending upwards from the



Figs 1-10. *Progomphus racenisi* sp.n. holotype male: (1) diagram of pterothorax; — (2) occipital plate; — (3) accessory genitalia, left lateral view; — (4) the same (except penis), ventral view; — (5) penis, right lateral view; — (6) penis guard, frontal view; — (7) apex of right anterior hamule; — (8) caudal appendages, dorsal view; — (9) the same, left lateral view; — (10) the same, ventral view.

yellow auricles and occupying the basal third; the remaining two thirds dark. Segments 3 to 6 each with a triangular yellow laterobasal spot, connected with its counterpart by an uninterrupted, narrow yellow dorsobasal band. On segment 7 this yellow band fills the space between hind margin of segment 6 and the supplementary transverse carina of segment 7, being, however, interrupted in the

middle on its posterior half by a dark triangular spot. Rest of segment 7 and dorsum of segments 8 and 9, black. Side and venter of segments 8 and 9 and the whole of segment 10, rusty. Segment 10 with a black posterior margin.

Superior anal appendages dark basally, becoming lighter apically. The basal externolateral dilatation well developed, ending in a small black mediad curved denticle. The inferior carina with 8 denticles in a single row. Appendix inferior rusty; apical part of each branch curved inwards, backwards and upwards and ending with small denticles. The supero-external anteapical tooth strongly developed, its terminal hook curved proximad. Each branch of the deeply cleft inferior appendage provided basally with a strong internal tooth.

Processes of anal tubercles very conspicuous, crescent-like, nearly as long as appendages. Their apices are curved upwards and inwards but lack the slender terminal prolongation typical for *recurvatus*, as shown in RIS' (1912) figure of that species. — Genital hamules and penis are shown in figures. Posterior hamules with 10 denticles each.

Wings between base and nodus with a faint tinge of yellow, somewhat stronger near the roots. Pterostigma pale brown, surmounting 4-5 cells. Basal subcostal cross-vein present. Antenodal and postnodal cross-veins of first series 12:14-15:12/12:10-10-11 in fore and hind wings, respectively. First and fifth antenodal cross-vein reinforced. Supra triangles open, subtriangles and triangles two-celled. Trigonal interspaces starting with two (front wings) and three (hind wings) cells against triangle, followed by two rows of cells. Anal field in front wings with two double cells each. Hind wings with 5 paranal cells and 4 postanal cells. Second anal interspace with two rows of cells.

Female unknown.

I name this species after the late Prof. Dr. Janis Rácenis, who was the first odonatologist of Venezuela, and my friend.

ZONOPHORA SOLITARIA RACENIS, 1970

Material. — 1 ♀: Venezuela, Bolívar State, km 125, road El Dorado-Santa Elena de Uairén, 1100 m, 23-IX-1967, C.J. Rosales, M. Gélvez & L. Rodríguez leg.

According to a personal communication from Dr J. Belle, Velp (July 15, 1981), *Z. obscura* BELLE (1976), described from the same region, must be considered a synonym of *solitaria* Rácenis. No female was hitherto known.

Aeshnidae

AESHNA DRACO RACENIS, 1958

Material. — 4 ♂: Auyantepuí, 1600 m, — -III-1973, Laime leg.

This species was described from Auyantepuí and was again reported from there by RÁCENIS (1970). The female is still unknown and the species has not been found at any other place yet.

GYNACANTHA MEXICANA SELYS, 1869

Material. — 1 ♀: km 88, 19-VII-1966, Campos leg.

RÁCENIS (1970) does not mention this species for the region. The present female was detected under some material identified as *Gynacantha nervosa* Ramb.

STAUROPHLEBIA AUCA KENNEDY, 1937

Figure 11

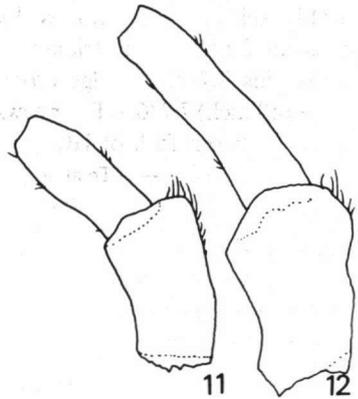
Material. — 1 ♀: Misión de Uonkén, 850 m, 5-III-1966, A.T. Pérez leg.

The present specimen fits KENNEDY's (1937) original description of *S. auca* and the redescription by GEIJSKES (1959) better than that of any other species of the genus. The female was still unknown and the species has not been reported from Venezuela previously.

Female. — Rear of head and occipital triangle black, except for a small pruinose blue "butterfly mark" behind and below the occipital rim, beset with white hairs. Labium yellow; face green. A well-developed black stripe along the fronto-nasal suture and the base of labrum; free margin of labrum edged with brown laterally, in the middle of the labrum a transverse impression, reaching from base to the center, the end of it dark brown. T-spot well-marked, broadly connected with the black posterior band. Horns of vertex somewhat more acute than in the male figured by GEIJSKES (1959), much like in the drawing of the male holotype (KENNEDY, 1937). Second joint of antenna not "extra long".

Synthorax green, a black stripe along the middorsal carina and the antealar sinus, but without reaching the upper end of humeral suture. Brown spots as follows:

one near the upper end of the humeral suture, one above the stigma, and another in the depression at the upper end of the third lateral suture, this last one poorly developed. Side of prothorax, ventrum of synthorax and coxae, pruinose. Legs yellowish, but inner side of tibiae and the whole of tarsi, black. Abdomen reddish brown, except for segment 1 and the base of segment 2, which are green.



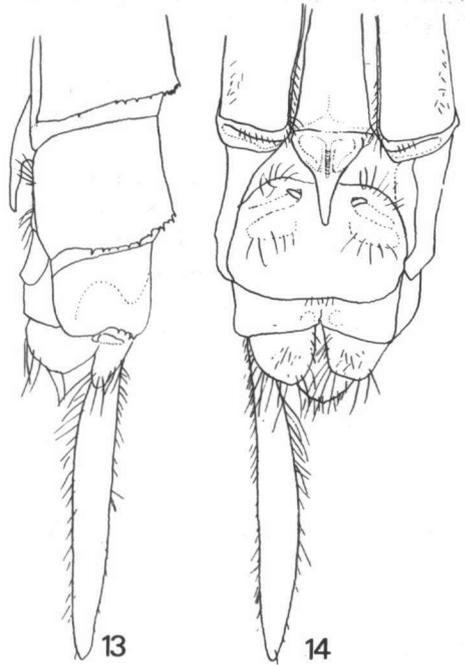
Figs 11-12. First two segments of antenna in two species of *Staurophlebia*: (11) *S. auca*, allotype female, antenna with second segment of "normal" length; — (12) *S. wayana*, male (No. 4251, from Venezuela, Barinas), antenna with "extra long" second segment of antenna.

Anal appendages pale brown, as long as segments 9+10 together, with a low central longitudinal carina, and with the apex slightly curved outwards. Genital valvae reaching almost to the end of segment 10. Ventral process on segment 10 two-pronged.

Wings suffused with brown near apex; pterostigma yellow. Antenodal and postnodal cross-veins 22:29-28:23/24:20-19:24 in fore- and hind wings, respectively. Second reinforced antenodal the eleventh in the left, the ninth in the right front wing, the tenth in both hind wings. Cells within triangle 7:7/6:7 in anterior and posterior wings, respectively. Cubital cross-veins 9:9/6:6; cells in anal loop 16/14; cells passing nodus by subcosta 2:1/1:1; supratrangular cross-veins 8:7/6:6; bridge cross-veins (all incl.) 7:7/6:7. Four rows of cells between fork of IR_3 .

Measurements. — Total length (without appendages) 79 mm; abdomen (excl. app.) 59 mm; length of anal appendages 6 mm; greatest width (in the apical half) 1.2 mm; hind wing 64 mm; costal edge of pterostigma in front wing 3.5 mm.

Four species of this genus are known from Venezuela, viz. *Staurophlebia auca* Kennedy, *gigantula* Martin, *reticulata* (Burm.) and *wayana* Geijskes, all of which are represented in the collection of the IZA.



Figs 13-14. *Paracordulia* sp. 2, female (Venezuela, Amazonas, Yacuray-Ventuari): (13) apex of abdomen with vulvar lamina, left lateral view; — (14) the same, ventral view.

Corduliidae

PARACORDULIA SP. 1 (pro *sericea* Rácenis, 1970)

Figure 15

Material. — 1 ♀: La Laja, 4-VIII-1961, J. Rácenis leg. (cf. RÁCENIS, 1970)

This specimen, thought by RÁCENIS (1970) to be the female of *Paracordulia sericea* (Selys), apparently does not belong to this species. GEIJSKES (1970), although also only by supposition, attributes a female from Surinam to *sericea* (Selys). The wing venation of Geijskes' female corresponds, in fact, far better with

Table I
Venational and other features of three females of *Paracordulia* Martin

Structure	Sp. 1 (La Laja)	<i>sericea</i> (after GEIJSKES, 1970)	Sp. 2 (Yacuray)
rear of head	brilliant black	"paler brown"	orange brown
hind femur/tibia (mm)	7/6	♀? (♂ 8/?)	9/8
subtriangle (fore wing)	2-celled	3-celled	3-celled
number of cells at beginning of discoidal space in front wings	2/2	3/3	3/4
cell-rows in discoidal field of front wing	2 throughout	first 2, than 3	first 2, than 3
accessory bridge cross-veins	$\frac{0}{0} \mid \frac{0}{0}$	$\frac{2}{2} \mid \frac{2}{2}$	$\frac{1}{1} \mid \frac{1}{1}$
Cu cross-veins	$\frac{1}{1} \mid \frac{1}{2}$	$\frac{1}{1} \mid \frac{1}{1}$	$\frac{1}{1} \mid \frac{1}{1}$
Antenodals	$\frac{09}{07} \mid \frac{10}{06}$	$\frac{12}{07} \mid \frac{13}{07}$	$\frac{11}{07} \mid \frac{11}{07}$
Postnodals	$\frac{7}{8} \mid \frac{7}{9}$	$\frac{6}{8} \mid \frac{6}{8}$	$\frac{6}{8} \mid \frac{6}{8}$
cells in anal loop	19	17/19	22
abdomen/hind wing (mm)	34/33	33/36	34/35
anal appendages (mm)	1	"nearly 4"	nearly 4
position of t in hind wing relative to arculus	very slightly proximad	"just proximad"	proximad
sectors of arculus connected at their origin (hw)	no	yes	yes

that of male *sericea* (=Selys' type specimens), than does the venation of *Racenisi*' female. The description given by RÁCENIS (1970), along with a figure of the apical abdominal segments, is fairly detailed. After reexamining this female, I would point to some of the most important characteristics (cf. also Tab. I): Several venational peculiarities of *Racenisi*' female separate it at a glance from male *sericea* (Sel.), as well as from Geijskes' female. These are: the two-celled

subtriangle of front wing, the presence of only two rows of cells in the discoidal field of front wing, and the absence of accessory bridge cross-veins in all wings. Finally, the unusual configuration of the terminal segments, with the conspicuous ovipositor, which remembers that of some *Somatochlora*, and the short anal appendages, are very unlike the same structures in Geijskes' female, supposed to be *sericea* (Sel.). I consider it possible, if not probable, that Racenis' female does not even belong to *Paracordulia*. Were it not for the presence of a cross-vein in front wing triangles, one would think of a relationship with *Dorocordulia errans* Calv.. Due to the uncertainty even about its generic position, I refrain from giving a name to this specimen until more material, especially males, will become available.

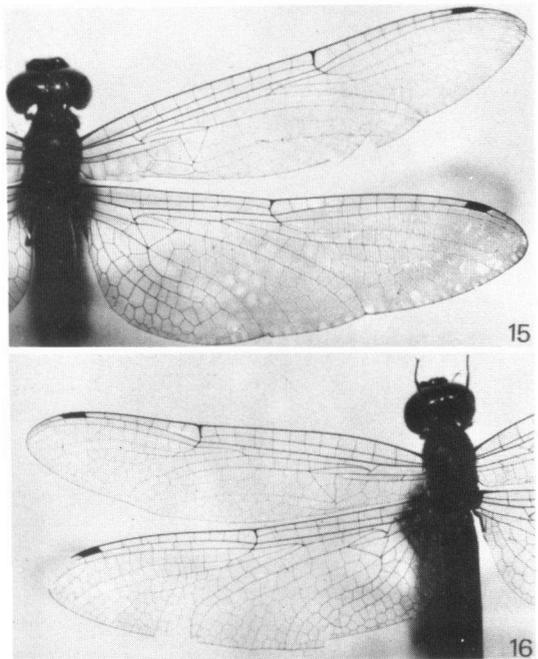
It is curious that there is still another female in the IZA collection (No. 3362), which does not fit either GEIJSKES' (1970) description of his supposed female of *P. sericea* (Sel.), or RÁCENIS' (1970) account of the above female, but which belongs, without any doubt, to the genus *Paracordulia*. Although this specimen was not caught in the region of Auyantepui, but on the Río Ventuari, in the Venezuelan Amazon Territory, it seems useful to give a short description and figures, in order to facilitate comparisons. This female is clearly not conspecific with Geijskes' supposed *sericea* female from Surinam. As a result, it is again uncertain which one may then be the true female of *Paracordulia sericea* (Sel.). At the same time it turns out to be impossible for the moment, to name the Ventuari female.

PARACORDULIA SP. 2

Figures 13-14, 16

Material. — 1♀: Venezuela, Amazonas Federal Territory, Yacuray-Ventuari, 4-VIII-1957, J. Rácenis leg.

Labium yellow; labrum orange with a dark triangular spot centrobasally (possibly due to post-mortem changes); postclypeus yellow brown; right half of



Figs 15-16. Wing venation in two species of *Paracordulia*: (15) right wing pair of *Paracordulia* sp. 1, female (La Laja); — (16) left wing pair of *Paracordulia* sp. 2, female (Yacuray-Ventuari).

frons orange, left half brown (probably due to post-mortem changes), above with a metallic green and violet lustre; vertex brown with two orange points on top; occipital triangle rusty; rear of head orange brown, becoming yellow basally, towards eye margin. Synthorax pale metallic green. Femora of first two pairs pale brown, darker in third pair; tibiae dark brown, tarsi black. Claws with a distinct tooth at less than three fourths their length.

Wings hyaline with a yellow tinge in the costal space, between nodus and pterostigma in front wings, and at the base of all four wings, especially near the brown membranula of hind wings. Pterostigma brown. For venational characters cf. Table I and Figure 16.

Abdomen rusty, shining coppery green and violet dorsally. Right appendage black (left missing), slightly shorter than segments 8+9 together. Vulvar lamina with a broad base and a thin elongated tip; ventrum of segment 9 slightly concave at its posterior margin, not covering segment 10 (but cf. GEIJSKES' 1970 description and figure of his supposed *sericea* female!).

ACKNOWLEDGEMENT

I am very much indebted to Dr J. BELLE, Velp (The Netherlands) for checking the specimen of *Progomphus racenisi* sp.n. and my description thereof, as well as for his valuable comments concerning this species and *Zonophora solitaria*.

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