

## *Neocordulia caudacuta* sp. nov. from the Coastal Cordillera, Venezuela (Odonata: Corduliidae)

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### ABSTRACT

Male, female and larva of *Neocordulia caudacuta* sp. nov. (holotype: Río Castaño, Aragua State, Venezuela; 21 vi 2007; deposited in MIZA) are described and illustrated. The new species belongs in the subgenus *Mesocordulia*. Male *N. caudacuta* differs from *N. batesi* in details of hamule and penis, and in possessing a sharp, erect dorsomedian spine on abdominal segment 10. Female *N. caudacuta* has strongly dorsocurved cerci and is comparatively larger than its congeners. The larva of *N. caudacuta* differs from that of *N. batesi longipollex* in having larger occipital tubercles, higher number of premental and palpal setae, and in the presence of lateral spines on abdominal segment 9.

### INTRODUCTION

In Venezuela, corduliids are extremely rare north of the Orinoco River and the only species so far recorded is the one described below. No more than one male, one female and one ultimate stadium larva have been collected thus far, and all were secured at spots that received frequent visits in the last 50 years, by Janis Rácenis and Francisco Fernández Yépez (both deceased), undergraduate and graduate students, occasional visitors, and by myself. *Neocordulia* Selys, 1882 has recently (May 1992) been split into the exclusively South American subgenus *Neocordulia* s. str. and *Mesocordulia* May, 1992, which is predominantly Central American but is also known from northwestern South America.

The new species described hereafter falls within *Mesocordulia*, constituting the first record of the subgenus from Venezuela.

### METHODS

Wing vein terminology follows Riek & Kukalová-Peck (1984). All dimensions are given in millimeters. Total length includes cerci, length of abdomen excludes them; length of femur excludes trochanter; length of pterostigma refers to costal edge of forewing pterostigma. Features of wing venation within parentheses refer to right wing. All drawings were made with a camera lucida coupled with a Wild M-8 stereo microscope.

*Neocordulia caudacuta* sp. nov.  
(Figs 1-3)

*Neocordulia* sp. — May (1992: 41).

Etymology

The adjectivised specific epithet derives from “cauda” (Latin): tail, and “acuta” (Latin): pointed, referring to the sharp tergal spine on S10 of male.

Specimens studied

Holotype ♂: Venezuela, Aragua State, “Henri Pittier” National Park, Río Castaño, Regresiva del Diablo (10°21'30”N, 67°36'W; 1,350 m a.s.l.), 21 vi 2007, J. De Marmels leg. (MIZA no. 17468). Paratype ♀: “Henri Pittier” National Park, 11.9 km S of Cumbres de Choroní, 20 ix 1980, R. W. Garrison leg. (RWG private collection, Sacramento CA, USA). Larva (♂, ultimate stadium): “Henri Pittier” National Park, Rancho Grande, camino a la toma (10°21'25”N, 67°41'W; 1,100 m), 26 iv 1990, R. Visbal leg. (MIZA).

Description of male holotype

A mature male, which was photographed in color when still alive.

**Head:** Mouthparts and face rufous, top of frontal tubercles and vertex darker, brown black with weak bluish black luster (which almost disappeared after death); antenna black. Compound eyes in life bright blue to blue green; occipital triangle brown, rear of head black; black hairs on face, vertex and behind occipital triangle.

**Thorax:** Prothorax brown; pterothorax coated with blond hairs, metallic green, but rufous along sutures and along antealar carina; meso- and metakatepisternum, and venter rufous. — Legs black, but coxae, trochanters and base of femora rufous; protibial keel slightly over one third the length of tibia, mesotibial keel less than 0.1 the length of tibia; tarsal claws dark red brown. — Wings slightly smoky, more so in costal and subcostal spaces; wing venation and pterostigma very dark brown, almost black; membranula dark brown. Fw with 12 (14) Ax and 8 Px; Hw with 8 Ax

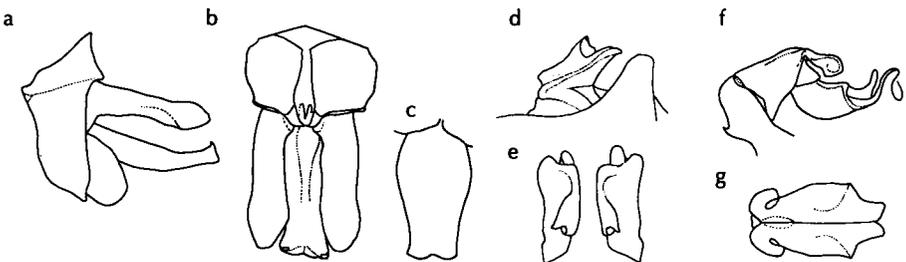


Figure 1: *Neocordulia caudacuta* sp. nov., male holotype — (a) S10 with caudal appendages in left lateral view; (b) same in dorsal view; (c) epiproct in ventral view; (d) right hamule in right lateral view – (a-d) hairs omitted; (e) hamules in ventral view; (f) penis in right lateral view; (g) same in ventral view.

and 11 (10) Px. Triangles, subtriangles and supratrangles free; subtriangle in Fw pentagonal; 2 crossveins in cubital space of Fw; two cell-rows in discal field of Fw, except at extreme wing margin where there are 3-5 cell-rows. Hw with 3 (2) crossveins in cubital space; anal loop enclosing 12 (14) cells, with no accessory cells; discal field of Hw with two cell-rows at base, after five cell-length broadening to finally enclose 8 cells at anal margin of wing; two cell-rows between anal loop and anal margin of wing at level of triangle (once 3 cells, in right Hw). IR1 of Fw beginning 3.5 (3) cells proximally of pterostigma, of Hw 6 (5) cells; anal triangle 2-celled.

**Abdomen:** Black, except S1 and S2, which are brown, and ventral surface of tergites 7 and 8, which are pale brown apically. S7 and S8 laterally expanded; dorsomedian carina of S10 strongly rising distally, ending in a sharp, triangular spine (Fig. 1a). Caudal appendages dark brown, shaped as in Figures 1a-c. Secondary genitalia as illustrated (Figs 1d-g); genital lobe with stiff, black hairs.

**Measurements:** Total length 53.0; abdomen 38.0; cercus 2.0; Hw 35.7; hind femur 6.7; pterostigma 2.5.

#### Description of female paratype

A subteneral specimen.

**Head:** Labium and labrum yellow brown, mandible ochreous; frons brown, shiny; vertex and occipital triangle dark brown, coated with dark hairs, as is frons; rear of head brown, but black along compound eyes.

**Thorax:** Metallic green, densely covered with blond hairs. — Legs brown; base of femora paler; tarsi darker; claws whitish. — Wings basally yellow to triangles and somewhat paler yellow in costal and subcostal spaces to tip; venation brown, pterostigma pale brown. Fw with 14 Ax and 10 Px; Hw with 9 (8) Ax and 14 Px. Fw triangle, subtriangle and supratriangle free; discal field of Fw as in male; Fw with 1 crossvein in cubital space, Hw with 2 crossveins; both Hw triangles crossed near

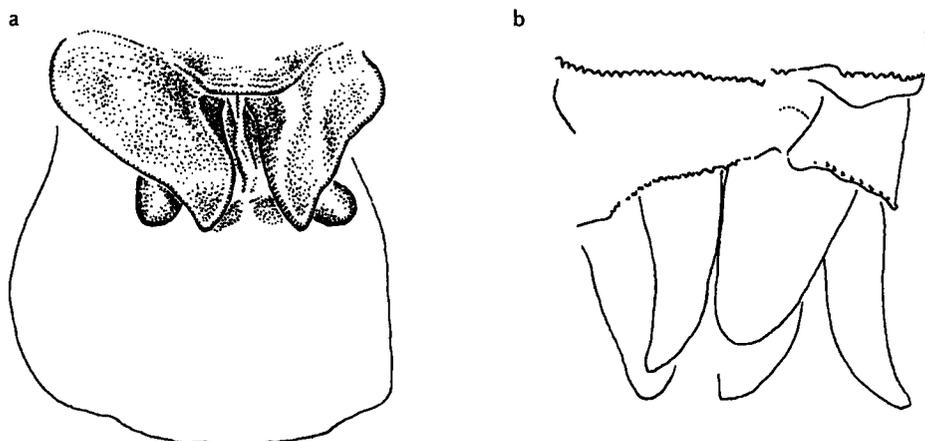


Figure 2: *Neocordulia caudacuta* sp. nov., female paratype — (a) S9 with vulvar lamina and styli in ventral view; (b) S10 with epiproct and outcurved cerci in left laterodorsal view; both Figures by R.W. Garrison.

distal angle; supratriangle with 1 crossvein (free); anal loop enclosing 17 cells, accessory cells absent; three cell-rows between anal loop and hind margin of wing, but once four cells at level of triangle, in both wings.

**Abdomen:** Brown (including cercus), whitish along lateral carinae and ventrally. Vulvar lamina dark brown and coated with long, dark hairs, about two fifths the length of S9, and reaching distally to beyond level of styli (Fig. 2a); epiproct almost as long as cercus; cerci curved outwards (Fig. 2b).

**Measurements:** Total length 55.0; abdomen 41.0; Hw 38.0; pterostigma 2.5.

#### Description of larva

Male, ultimate stadium. Grey brown, unpatterned, densely covered with distally expanded scales, partly pedunculated, some similar to leaves of the Ginkgo tree but without apical excision. Legs paler, with an orange tint.

**Head:** Wider than long; frontal shelf large, its free border excised at middle (Figs 3a, b); occipital tubercles very prominent, laterally protruding beyond head, basally constricted and bearing hair- to leaf-like scales; antenna short, seven-jointed, with first and second segment much wider than flagellum (Fig. 3c); occipital margin slightly sinuate. Labrum entire; mandibles as illustrated (Fig. 3d). Labium reaching backwards to hind coxa; pattern of raptorial setae as illustrated (Figs 3e, f); noteworthy is a fairly long accessory seta on each palpus close to articulation with prementum.

**Thorax:** Pronotum with rounded lateral margin (Fig. 3g). Wing sheaths reaching to distal border of S5. Legs entirely (incl. tarsi) covered with scale-like setae and short hairs; hind tibia with only three spur-like, short, flattened and blunt setae dorsally; ventrally and apically there are some more spine-like setae or spurs (Fig. 3i); femora, especially of hind legs, with soft, long hairs; first and second segment of tarsi each with pair of ventrobasal spines.

**Abdomen:** S9 with short, blunt lateral spines; caudal appendages as illustrated (Fig. 3h).  
**Measurements:** Total length 21.0; abdomen 11.4; head width 6.0; head length 4.0; hind femur 5.0; hind tibia 7.0.

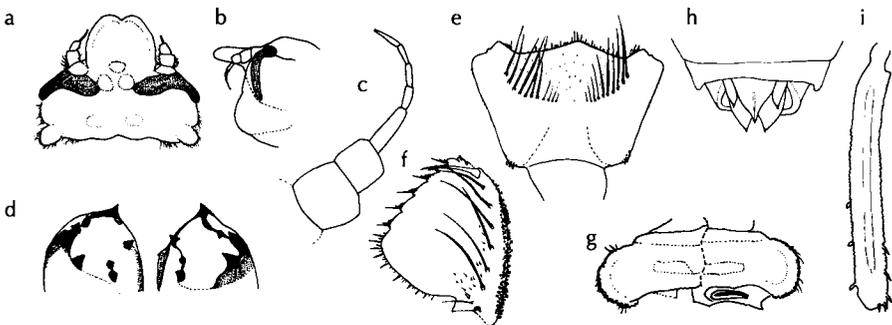


Figure 3: *Neocordulia caudacuta* sp. nov., ultimate stadium larva, male — (a) head in dorsal view, scales and hairs largely omitted; (b) same in left lateral view, labium removed; (c) left antenna, scales and hairs omitted; (d) mandibles in natural position in ventral view; (e) prementum in dorsal view; (f) right lateral palp in dorsal view; (g) pronotum in dorsal view; (h) tip of abdomen in dorsal view, scales and hairs omitted; (i) right hind tibia in external view, hairs omitted.

## Habitat

The adult male was taken at 12:30 h flying downstream in good, sunny weather. The bed of the crystalline Río Castaño was 2-4 m wide at the collecting spot – the stream itself much narrower –, and shaded by dense cloud forest. It had a stony bed with, variably, gravel, sandy or muddy bottom, and with packages of fallen leaves between stones and trunks, but with few spots with fine detritus accumulated on the ground. Among the more regular accompanying odonates were *Hetaerina capitalis* Selys, 1873, *H. cruentata* (Rambur, 1842), *Cora cyane* Selys, 1853, *C. xanthostoma* (Ris, 1918), *Euthore f. fasciata* (Hagen, 1853), *Philogenia cassandra* Hagen, 1862, *P. ferox* Rácenis, 1959, *Teinopodagrion venale* (Hagen, 1862), *Argia medullaris* Hagen, *Palaemnema melanostigma* Hagen in Selys, 1860, *Progomphus abbreviatus* Belle, 1973 and *Brechmorhoga rapax* Calvert, 1898. The larva was collected between leaf detritus in a tiny streamlet, the bed of which was at most 0.5 m wide, within cloud forest.

## DISCUSSION

The new species is close to *Neocordulia batesi* (Selys, 1871). However, specimens of *N. batesi* were not available for direct comparison. Therefore, *N. caudacuta* was compared with descriptions and figures of *N. batesi* in May (1992) for adults, and of *N. batesi longipollex* Calvert, 1909 in Novelo-Gutiérrez & Ramírez (1995) for the larval stage; the larva of the nominotypic subspecies is still unknown. Judging from the illustrations provided by May, the hamule of *N. batesi* is broadly rounded distally in ventral view, and directed slightly mesad, while in *N. caudacuta* the hamule is bluntly pointed and directed outwards. The basal-ventral portion of the apical segment of the penis appears, in lateral view, more slender and sharply triangular in *N. caudacuta*, but broader and differently shaped in *N. batesi*. Tip of penis hood is broad and rounded apically (lateral view) in *N. caudacuta*, but narrow in *N. batesi*. Dorsal crest of S10 is of similar height throughout and truncated apically in *N. batesi*, but rises sharply and is extended into a triangular apical spine in *N. caudacuta*. There are also a few differences in wing venation: the male *N. caudacuta* has only two cell-rows separating anal loop from hind border of wing, while in males *N. batesi* there are three such rows. The paratype female *N. caudacuta* was briefly treated by May (1992, sub *N. batesi*), who suggested it possibly represented a new species. The larva of *N. caudacuta* differs from that of *N. batesi longipollex* in having more developed occipital tubercles, a higher number of raptorial setae on prementum and labial palp, and the presence of lateral spines on S9.

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