

**A NEW SPECIES OF GYNOTHEMIS AND ITS LARVA
(ODONATA, LIBELLULIDAE)**

NOTES ON ODONATA OF SURINAM XII

by

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With 17 text-figures

The genus *Gynothemis* was introduced by Calvert (1909), when describing an aberrant member of the Macrothemini from Brazil. The following characteristics were used for this genus: anal area in hind wing with irregularly arranged cells; one row of cells in Rspl, M₂ not undulate; triangle in fore wing free, two rows of cells in discoidal field from triangle to wing margin. Femora in both sexes armed with the usual two rows of spines, those of the male not differentiated. Type species: *Gynothemis venipunctata* Calvert, from Chapada in Brazil.

Ris (1913) added two more species to the genus, viz., *heteronycha* Calvert, described by the author in *Brechmorhoga*, and *calliste* Ris, known from one female only. According to Ris, the three species resemble the smaller species of *Macrothemis* in general appearance, and also in having a similar wing venation. However, they differ from *Macrothemis* in the structure of the claws, described as very long and thin, with the tooth at about mid-length of the claw, but shorter than the tip. The modification of the spines on the hind femur of males is variable within the genus. In *heteronycha* this armature consists of a row of 16-18 short triangular spines, directed proximad. In *G. venipunctata* there are 5 such spines, in *G. calliste* 10. In *uniseta*, here described as a new species from Surinam, there is no row of spines at all, but one long seta.

It is surprising that three species of *Gynothemis* have brown basal spots in the wings. The species from Surinam has hyaline wings, except for one female, which shows an orange brown spot in the tip of the wings.

There is also some variation in the wing venation: two cubital crossveins in *heteronycha*, one in the other species; two additional cells in heel of anal loop, one in the others; two rows of cells in discoidal field of hind wing in *heteronycha*, one row in the three remaining species; two rows of cells in anal area of hind wing in *heteronycha* and in *calliste*, three or four rows in *uniseta*.

The species of this genus described by Calvert and Ris, had their origin in southern Brazil (Mato Grosso, Minas Gerais, Parana) and in Paraguay. Surinam is the first record north of the equator on the neotropical continent.

To elucidate the heterogeneity within this genus, a careful examination of the type specimens is necessary. A better knowledge of the larvae should be very helpful too.

***Gynothemis uniseta* spec. nov.** (figs. 1-17)

Male, holotype. A freshly emerged specimen without colours, of which the structures only can be given.

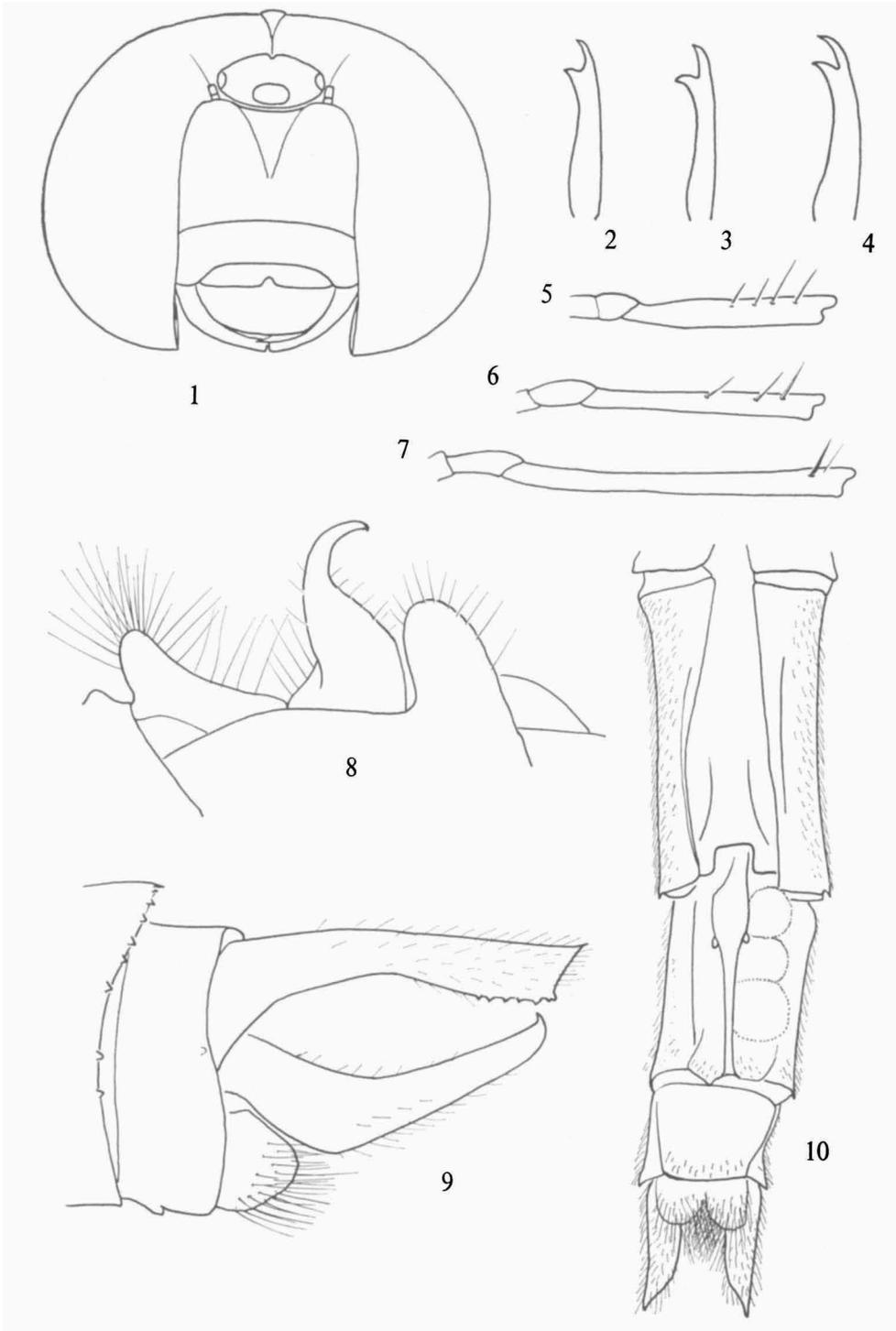
Face long and very narrow, completely surrounded by the eyes, which reach to below the mouthparts. Top of frons divided by a median groove, the two rounded parts not sharply edged. Vertex rounded, slightly indented in the median, the lateral ocelli at the sides. Antennae slender, scapus and pedicellus short and thick, flagellum thread-like. Occipital triangle long, the sharply pointed top reaching to about halfway the median suture of the touching eyes. Compound eyes divided in a more roughly celled upper part (of white colour in this specimen) and a more finely celled part below (with a grey-black colour).

Prothorax with a large, simply rounded front lobe and a small, depressed, rounded hind lobe, hardly divided in the median.

Synthorax small, without special structures. A fringe of long soft hairs in front of mesepisternum, becoming shorter to the distal end near the bases of the fore wings.

Wings hyaline, no trace of basal spots. Nodus in fore wing in the distal half of wing, in ratio 13 : 9; in hind wing in the basal half of wing, in ratio 9 : 11.5. Venation: 11½ antenodal crossveins in fore wing, 8 in hind wing; 6 postnodal crossveins in fore wing, 9 in hind wing. Arculus just passing second subcostal crossvein, sectors stalked to the level of the third subcostal crossvein. One bridge crossvein, one cubital crossvein. M₂ smoothly curved, not undulate. Rspl with one row of cells. Discoidal field in fore wing with two rows of cells to the wing margin, the field narrowed at the wing margin. Triangle free, subtriangle in fore wing two-celled. In hind wing Cu₁ arising at anal angle of triangle. Between M₄ and Cu₁ three simple cells. Anal loop with two rows of cells, one additional cell in the "heel", 14 cells in total. In anal field 3-4 rows of cells, membrane narrow and long, covering the first

Figs. 1-10. *Gynothemis uniseta* spec. nov., male (holotype) and female (allotype) imagines. 1, head of female in front; 2-4, claw of right fore, middle and hind leg of male; 5-7, setae on right fore, middle and hind femur of male; 8, right side view of male genitalia on second segment; 9, left side view of male appendices; 10, ventral view of last abdominal segments of female, with three extruded eggs on left side.



three cells in the last row of the anal area. Pterostigma 1.5 mm long, covering two underlying cells or some more, of same size in both wing pairs.

Legs long, beset with black setae and spines. On the outer margin of the fore, middle, and hind femora, there are three, four, and one longer dark brown setae in the distal half, respectively. Claws long, an additional tooth near the tip, this larger but not longer than tip.

Abdomen long and slender, segments 2 and 3 thicker than the remaining segments. Genitalia segment 2: anterior lobe semicircular, as high as genital lobe, a fringe of long bristles on top and along the sides; hamulus with a broad triangular base and a long end-hook, curved backwards; genital lobe $1\frac{1}{2}$ as high as wide, the top rounded and armed with spines.

Appendices: superiores about as long as segments 9 and 10 together, straight, base dilated laterally, distal end enlarged on the underside with a row of 6-7 teeth, obliquely cut off to the black tip. Appendix inferior triangular, long pointed, nearly as long as superiores, tip curved upwards, ending in a tooth with two denticles.

Total length, 23 mm; abdomen, 16 mm; hind wing, 21.5 mm; pterostigma, 1.5 mm.

One male (holotype) from Surinam, Lawa River, Stoelmans Island, found at a small creek in the forest, when it had just emerged from its exuviae at noon on August 14, 1953, D. C. Geijskes leg. The specimen is preserved in alcohol. Microscope slides are made of the right legs and the right wing pair.

Female, allotype. Head with face (labium, labrum, clypeus, genae and lower part of frons) cream yellow; upper part of frons and vertex black with a bluish shine. In front of frons, the black colour descending into the deep median groove. Antennae black, upper end of pedicellus brown. Vertex rounded, a short slit over the median to the middle ocellus. Occipital triangle brown at top, yellow more rearward, the long top in front reaching to half way the suture between the touching eyes. Rear of head yellow along the eye-margins, the inner part black.

Prothorax dark brown to black, apical margin of fore lobe yellow; apical margin of hind lobe small, rounded and flat with a small incision in the median.

Synthorax dark brown, interrupted by large yellow stripes as follows: antehumerals about $\frac{2}{5}$ as wide as dark middorsal part of mesepisternum, dilated at upper end. Sides with three broad yellow stripes, the first one on the mesepimeron, not as wide as the black stripe bordering the humeral suture; second and third side-stripe wider than the black stripes in between.

Sternum yellow, along the ventral margin of metepimeron a black stripe as a continuation of the third black side-stripe. In the median of the ventrum, two oblique black spots situated more distad, connected with the black stripe on ventral margin of epimeron.

Wings hyaline, no basal spot, venation black, stigma dark brown, membrane long and narrow, light brown coloured. Wing venation: $11\frac{1}{2}$ antenodal crossveins in fore wing and 8 in hind wing. Arculus in fore wing just before second subcostal crossvein, in hind wing just behind that crossvein. Postnodal crossveins 8 in fore wing and 9 in hind wing. One row of cells in Rspl in both wing pairs. Triangle in fore and in hind wing free, subtriangle in fore wing two-celled. Discoidal field in fore wing with two rows of cells to the end, the field narrowed at the hind margin. In hind wing between M_4 and Cu_1 three simple cells. Cu_1 arising at anal angle of triangle. Anal loop with two rows of cells, one forked cell in the "heel", 13 cells altogether. Anal field with three or four rows of cells.

Legs black, basal part of femora yellowish, especially on fore and middle legs. Femora armed with black setae at the outer margin in the distal half, four and three on fore and middle femur, respectively, one seta on hind femur. Claws long, with a strong additional tooth near tip, but not surpassing tip of claw.

Abdomen for the larger part black, a yellow side-line over segments one to seven, on six and seven reduced to isolated yellow spots. A second yellow side-line present along the ventral margin on segments one to three, prolonged on the ventrum of segments four to nine. Segment 10 and appendices black, the latter slightly longer than segment 10, tip sharply pointed.

Valvula vulvae black, apical margin slightly excavated, the margins not swollen, not surpassing end of segment 8. Median processus on ventrum of segment 9 minute.

Total length, 23 mm; abdomen, 15.5 mm; hind wing, 21 mm; pterostigma, 1.5 mm.

Surinam: Wilhelmina Mts., Camp 3 (about 19 km N. of Lucie River), flying over mountain creek, 3 p.m., 12.viii.1963, one female (allotype), P. H. Pijpers leg. Three other females from the same area, collected respectively at 31.vii.1963, one female, S. Ligorie leg.; 16.viii.1963, one female, S. Ligorie leg.; second camp at 10 km N. of Lucie River, at a creek, 13.vii.1963, one female, S. Ligorie leg. These females are all adult and much resemble the allotype, except that in the wing venation the arculus rises at or shortly after the second subcostal crossvein.

One female from Mapane (District Commewijne) Camp 8, "settling on a twig above a small creek in the forest" on 9.xii.1953, D. C. Geijskes leg.,

has the wing tips orange-brown up to two cells proximad of stigma. Another female specimen was collected when just emerged and still uncoloured at a small creek in the forest of Stoelmans Island, Lawa River, on 20.viii.1953, D. C. Geijskes leg., at the same place where the holotype male was found. In spite of an intensive search, the exuviae could not be detected. This female specimen is preserved in alcohol.

The measurements of these six females are: total length, 22-24 mm; abdomen, 15-16 mm; hind wing, 21-12 mm; pterostigma, 1.5 mm.

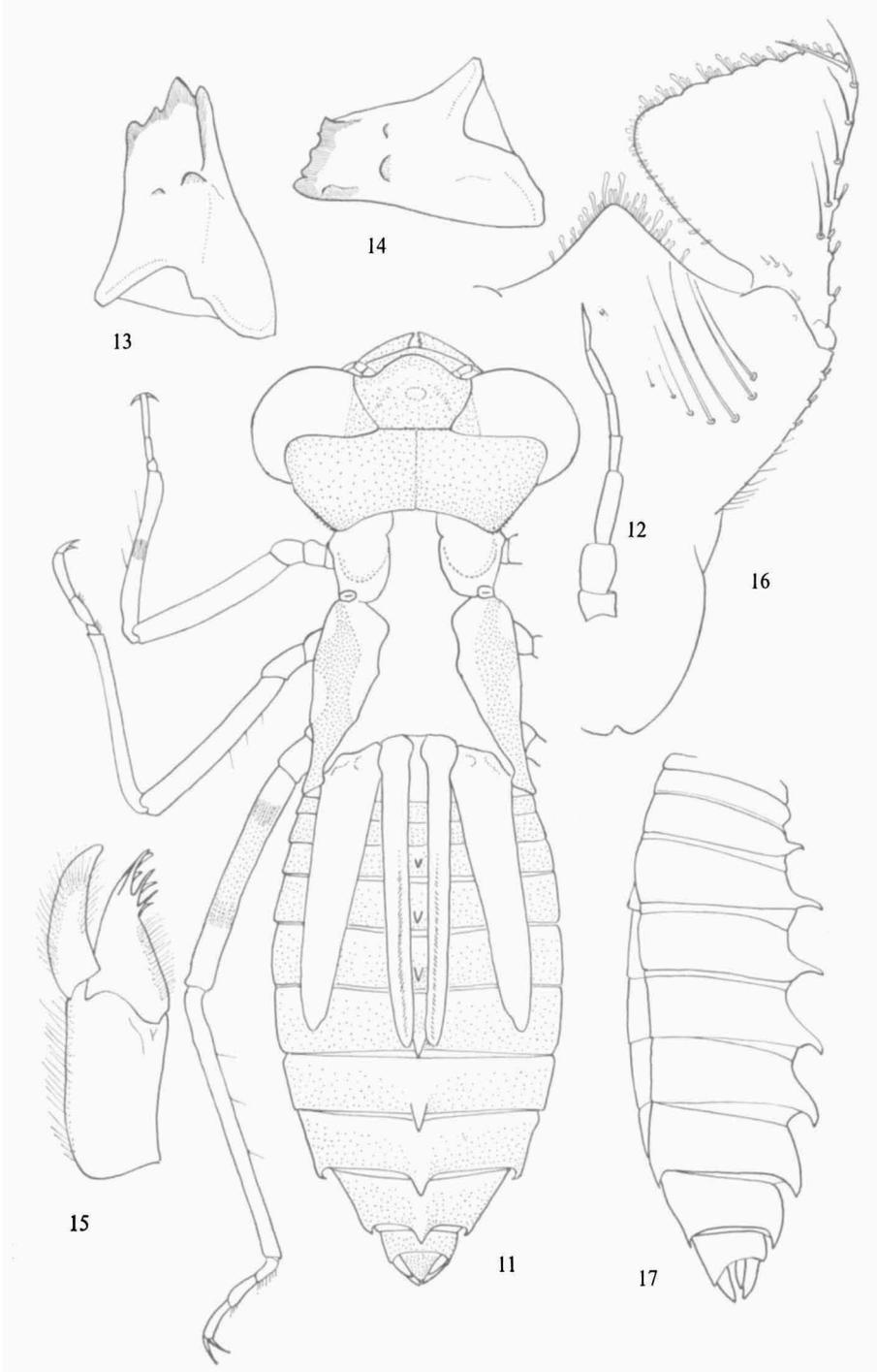
This species of *Gynothemis* seems to be rare in Surinam. It was found at small creeks in the forest of the interior at three different places, viz., one in the north near the savanna region (Mapane); one half way up the Maroni River on the eastern border (Stoelmans Island); one on the southern slopes of the Wilhelmina Mts. in the centre of Surinam. It was by chance that the larva could be picked up, when an emerging male specimen was found on its exuviae. Its description is given below.

Larva. A small, stout-bodied, clean larva with prominent eyes, long feet and long oval abdomen.

Head large, widest across the rounded eyes, swollen behind the eyes, dentate at the sides and armed with a few short flat setae, hind margin concave. Vertex small, nearly rectangular. Antennae small, 7-jointed, the first two joints short and thick, pedicellus longer than scapus, flagellum with first segment the longest, remaining four segments of equal length, last segment with long pointed tip.

Mouthparts: labrum of the usual shape, outer margin slightly inclined. Mandibulae: left mandible with a row of four apical teeth and two proximal teeth; right mandible with four apical teeth, one intermediate marginal denticle and two proximal teeth. Maxillae: outer lobe (palpus) simple, covered with numerous long hairs; inner lobe on top with seven strong curved teeth of unequal size, more proximally followed by a row of long hairs. Labium reaching backward to between the middle coxae, praementum triangular, side margins in the distal part with a row of about eight spiniform setae; median lobe $\frac{1}{3}$ as high as wide at base, its outer margin bearing more than twenty flattened setae; premental setae seven to eight. Lateral lobe with five palpal setae, outer margin with three short flat setae; movable hook of moderate size, a little longer than the last palpal seta; distal margin of palpus

Figs. 11-17. *Gynothemis uniseta* spec. nov., larva (male exuviae). 11, habitus in dorsal view; 12, right antenna; 13-14, left and right mandible, inner side; 15, right maxilla, ventral side; 16, right half of prementum and side-lobe; 17, left side view of abdomen.



with ten small crenations, each armed with one longer and two to three smaller flattened setae; inner margin with about twenty of such setae.

Prothorax large, dorsum flattened to a transverse area, the margins with minute black points and dots.

Synthorax small, dotted with minute brown spots; wing pads reaching to end of 6th abdominal segment.

Legs long, stalky, fore legs singularly banded on tibia, hind femur with two darker, more or less confluent bands in the middle. Outer side of fore tibia and of middle femur and inner side of hind tibia armed with three spine-like hairs. The underside of the first and second tarsal segments armed with short simple setae, the last segment without setae. Claws very long, simple.

Abdomen long oval, clean, smoothly dotted with brown, widest on segments 5 to 6, ventrum flat, dorsum roof-like, gradually tapering from segment 6 to segment 10. Dorsal hooks present on segments 3 to 9, conspicuous, curving backward, the hooks on segments 8 and 9 declined. Lateral spines on segments 8 and 9 short, curved inward, those of segment 9 not surpassing segment 10. Segment 10 smallest of all abdominal segments, tube-like; appendices a little longer than segment 10, epiproct triangular, cercoids reaching to $3/4$ the length of the paraprocts.

Total length, 11 mm; head, 2 mm, thorax, 3 mm, abdomen, 6 mm.

Length of legs in mm :	I	II	III
femur	1.9	2.4	3.0
tibia	1.8	2.1	3.1
tarsus	0.9	1.0	1.3
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Total length	4.6	5.5	7.4

This larva is described from the exuviae found in company with the emerged male specimen, here described as the holotype of this species. It was collected in Surinam at a small creek in the forest at Stoelmans Island, Lawa River, on August 14, 1953, by the author.

Of the six genera in the Macrothemini, *Gynothemis* was the only genus, of which the larva was not yet known. As it has dorsal hooks on abdominal segments 3 to 9, it belongs to the group *Dythemis-Macrothemis*. In the genera *Scapanea* and *Brechmorhoga*, the larvae have dorsal hooks on abdominal segments 2 to 9, in *Paltothemis* on segments 2 to 6.

The number of lateral setae on the labial palpus is 6 to 7 in *Dythemis*, 6 in *Macrothemis*, 5 in *Gynothemis*, while in the other genera of this tribe there are 7 to 9 lateral setae.

Concerning the development of the crenations on the distal margin of the labial palpus, *Dythemis* has obsolete crenations, *Macrothemis* high and low crenations, and *Gynothemis* low obsolete crenations.

The length of the antennae is much larger in *Dythemis* than it is in *Macrothemis* and *Gynothemis*, but the larvae of *Scapanea* and of *Brechmorhoga* have also short antennae.

The larva of *Gynothemis* resembles that of *Scapanea* in the shape of abdomen more than those of *Macrothemis* and *Dythemis*, who have a flat, rounded abdomen with the last segment (10) retracted at base in segment 9, with the result that the lateral spines of segment 9 partly surpass the appendices. In *Gynothemis* and in *Scapanea* the abdomen is longer, narrowing gradually towards the tip, with the lateral spines of segment 9 reaching to base of segment 10, but not to the appendices.

Summarizing these data, we arrive to the conclusion that from a systematic point of view, the larva of *Gynothemis uniseta* shows not only a relation with the *Dythemis-Macrothemis* group, but also with the other genera of the tribe, especially with *Scapanea*.

SUMMARY

Descriptions are given of a new species of *Gynothemis* for both sexes and its larva, found in Surinam. Up to now three species of this genus have been described, all from southern Brazil and Paraguay. This new species is the first record of a member of *Gynothemis* from the northern part of the South American continent.

Attention is given to the heterogeneity of the species within this genus. Of the six genera belonging to the tribe of Macrothemini, *Gynothemis* was the only one of which the larva had not been described. The larva of *G. uniseta* spec. nov. proves to be different from any of the known larvae of this group, although it has characteristics in common with several of them.

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