

ODONATA

BY

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I am indebted to Dr. V. VAN STRAELEN for the opportunity of studying three large collections of *Odonata* comprising 2.569 specimens from the Parc National Albert and Uele, Belgian Congo. The latter area lies without the confines of the National Park but is included here for convenience : all material cited as from Uele, is shown in parenthesis [] in order to differentiate it from the National Park fauna.

The collections were made during the Missions of MM. G. F. DE WITTE and H. DAMAS and from their character, were probably incidental to the collecting of other and perhaps more interesting kinds of insects. Such incidental collecting, whilst it may procure occasional rare species, unfortunately, too often has the disadvantage of gathering a lot of common-place species, as well as a mass of duplicates. This is shown in the present collections by the presence of nearly 1.000 specimens of the ubiquitous *Brachythemis leucosticta* (BURM.) and over 400 specimens of the common *Enallagma subfurcatum* SELYS, as well as some 200 specimens of *Agriocnemis gratioiosa* GERSTAECKER, these 3 species totalling together more than one third of the whole of the collections.

The 2.569 specimens comprise 42 species included under 22 genera, of which one is a new species, one a new subspecies and a third is the undescribed nymph of the common *Brachythemis leucosticta* (BURM.).

Specimens were collected from the following localities :

Mushumangabo, 2.075 m., 14-26.VI.1935, G. F. DE WITTE.

River Molindi, 1.000-1.200 m., 11.V.1934, G. F. DE WITTE.

May-ya-Moto, 950 m., 5-9.XI.1934, G. F. DE WITTE.

Rutshuru, 1.285 m., 1.VI.1934, G. F. DE WITTE.

Vitshumbi, 925 m., 27.IX-8.X.1933, G. F. DE WITTE

- Kanyazi (Kamande), 925 m., 10-16.XI.1933, G. F. DE WITTE.
 Tshambi, 975 m., 26.X.1933, M^{me} DE WITTE.
 Ruanda, Ruhengeri (sources Kirii), 1.800-1.825 m., 1.X.1934, G. F. DE WITTE.
 Ruanda, Kundhuru-ya-Tshuve, Rutabagwe, 2.600 m., 13-14.IX.1934, G. F. DE WITTE.
 [River Bili (Uele) Monga, 450 m., 18.IV-8.V.1935, G. F. DE WITTE.]
 Bugazia (River Mosenda), 912 m., 18.V.1935, H. DAMAS.
 [Kayanza (Uganda), 912 m., 6.V.1935, H. DAMAS.]
 Kibuga, 1.100 m., 26-28.VI.1935, H. DAMAS.
 Kisenyi (lac Édouard), 1.460 m., 17.VI.1935, H. DAMAS.
 Kamande, 912 m., 4-11.V.1935, H. DAMAS (River Katukuru).
 Ishango, 5-12.XII.1935, H. DAMAS.
 [Kasinga (Uganda), 912 m., 11.VI.1935, H. DAMAS.]
 [Katwe, 920 m., 11-12.VI.1935, H. DAMAS.]
 Kalondo, 1.715 m., 6-9.VIII.1935, H. DAMAS.
 Vitshumbi and E. Rwindi (Lake Édouard), 15-16.I.1936, H. DAMAS.
 Ondo, 1.200 m., 29-31.VII.1935, H. DAMAS.
 N'gesho, 1.900 m., 3-4.VIII.1935, H. DAMAS and M. LIPPENS.
 [Kasinga Channel (Uganda), 912 m., 11.VI.1935, H. DAMAS and M. LIPPENS.]
 Kimboho (near Lake Luniasenge), 925 m., 26-27.XI.1935, H. DAMAS.
 Katanga, 950 m., 30.XI.1934, H. DAMAS.
 [Luvomiga, 27.IX.1935, H. DAMAS.]
 Kamande Lemera, 925 m., 25-27.XI.1935, H. DAMAS.
 Lukulu, 1.700 m., 13.VIII.1935, H. DAMAS.
 Kamande Talia, 925 m., 21.XI.1935, H. DAMAS.

Of the total collected, 1.668 came from the Mission DE WITTE and 875 from that of H. DAMAS, all from the Parc National Albert : the remaining 83 specimens were collected by the former explorer at Uele and nearly all belong to one species. — *Palpopleura lucia* and its variety *portia* (DRURY).

The localities between [] are without the Park's boundaries.

London, 30 April 1948.

SYSTEMATIC

Order **ODONATA**

Suborder **ZYGOPTERA**.

Family **COENAGRIIDAE**.

Genus **PSEUDAGRION** SELYS.

Pseudagrion SELYS is quite the most dominant genus of the Ethiopian Zygoptera and this is undoubtedly due to their ability to adapt themselves to wide variations of climate, habitats and altitudes. They breed with equal facility in running and static waters, they are able to exist in the hot moist jungles of the Congo as equally as in the aridity of the Soudan and Egypt, and they are found from sea-level to altitudes of well over 7.000 feet. The genus is Oriental and Ethiopian in distribution but appears to have originated in the Orient, since the venation of the latter group is more archaic in nature than in the majority of African species. Evolutionary trend has been towards a broadening of the wing and shortening of the petiolation : in the Oriental forms, the Anal vein leaves the posterior border of the wings at the level of *Ac* (Anal tracheal crossing or cross-vein), but in the Ethiopian, the departure of the Anal vein as an individual structure, is usually more proximal and so leads to a shortening of the petiole. In a number of the African species, we find one type of venation in the forewing and the other in the hindwing, thus exemplifying Tillyard's dictum that « the evolution of the hindwing is always a step in advance of the forewing ». No less than 35 species are known from Africa and 22 others have been described from Madagascar : in the present collection, 11 species, including one new one, are listed as follows :

1. — **Pseudagrion gerstaeckeri** KARSCH.

This appears to be the dominant species found in the Belgian Congo as I find some 200 specimens in the collection, but as the majority were collected on the borders of the Molindi River, it may well be that the species exists in plenty, locally rather than widely. Examples come from 10 localities, viz, River Molindi, 1.000-1.200 m.; Tshambi, 975 m.; May-ya-Moto, 950 m.;

Kalondo, 1.715 m.; Kibuga, 1.100 m.; Ishango, Rutshuru, 1.285 m.; Katwe, 920 m.; Mushumangabo and Kamande (R. Katukuru). The species probably breeds in running water rather than in static.

2. — **Pseudagrion melanicterum** SELYS.

This is another dominant species exemplified in the present material by some 60 specimens, all, with the exception of one pair, from Mushumangabo, 2.075 m., from the borders of the River Molindi, 1.000-1.200 m. It may be noted that its habitat is the same as the preceding species and that it is unusual to find two dominant species belonging to the same genus, inhabiting a common habitat. Primarily, the species is a West African one.

3. — **Pseudagrion kersteni** GERSTAECKER.

Represented by only 2 males, from the River Molindi. The species is one of the most widely distributed of the genus but is perhaps more common throughout East Africa.

4. — **Pseudagrion inconspicuum** RIS.

I place here with some little doubt, a single male from the River Molindi, 1.000-1.200 m., 11.V.1934. The anal appendages, which I figure, agree closely with Ris's figure of same. All markings are restricted, the postocular spots much reduced, the greenish antehumeral stripes very narrow and the blue markings of the abdomen confined to the dorsal surfaces of the 8th and 9th segments.

5. — **Pseudagrion nubicum** SELYS.

There is only a single male of this small but beautiful species, from Kibuga, 1.100 m., 26.VI.1935, H. DAMAS. It resembles in colouring, coloured figures which I have made from some Soudanese specimens: the face is turquoise blue, the markings of the rest of the head, thorax and abdomen, save the terminal segments, are a beautiful shade of pea-green merging into azure blue on the sides. The postocular spots are of the open character and broadly confluent across the occiput and but partially enclosed posteriorly by narrow black lines. In the female, not represented in this collection, the dorsal surface of the prothorax and thorax is carneous, whilst the face is a delicate shade of pink.

6. — **Pseudagrion angolense** SELYS.

There are 19 males and 7 females in the collection from Rutshuru, Mayya-Moto and the River Molindi, all quite typical. In the bright orange colouring of the face, this species resembles the following, *massaicum*, but the anal appendages are very differently shaped. It is widely distributed and as common in Central Africa as in the East and West.

7. — *Pseudagrion massaicum* SJÖSTEDT.

20 males and 5 females, from Ishango, 5.XII.1935, coll. H. DAMAS, and a single female from Ngesho, 1.900 m., 3.IV.1935. The species is easily distinguished by the bright brick-red markings of the face, dorsum of head and thorax; the sides of the latter and the ground-colour of the abdomen azure blue. In the female, the red is replaced by sage-green fading to pale blue on the sides. Although widely distributed, individual colonies appear to be closely restricted to certain areas, as in the present case to Ishango.

8. — *Pseudagrion acaciae* FORSTER.

This species which is peculiar to arid regions, is represented by 2 males and a single female, from Ishango, which were taken apparently at the same time as the preceding species. The head, to the level of the ocellar space, is bright ochreous, a broad black band extending from eye to eye borders this area posteriorly and encloses very large pale blue postocular spots. The dorsum of the thorax is bright ochreous with narrow median and humeral black stripes : the sides are bluish green. Segment 2 of the abdomen, as well as 8 and 9 are azure blue, the former with a black U-shaped marking which may or may not be confluent with a basal black annule to shut in a spot of the ground-colour. This marking is subject to great variation but the U-mark is usually open and resembles a similar marking found in the European species *Coenagrion puella*.

9. — *Pseudagrion sjöstedti* FORSTER.

There is a single male in the present collection from May-ya-Moto, 950 m., 5.XI.1934, coll. G. F. DE WITTE. This species is mainly confined to West Africa but is rare everywhere : in its colouring and markings, it closely resembles the next species from which however it is easily distinguished by the shape of its anal appendages, the superiors being distinctly shorter than the inferiors and without a notch at the apices as seen in profile. Segment 2 may or may not have a dorsal blue spot and when present, it is always finely linear.

10. — *Pseudagrion wittei* sp. nov.

1 male, River Molindi, 1.000-1.200 m., 11.V.1934, coll. G. F. DE WITTE, the *type*. 10 males, Ishango, 1-4.VI.1935 and 5-12.XII.1935, coll. H. DAMAS, and 1 male, Rutshuru, 1.285 m., 1.VI.1934.

Male. Abdomen 31-32 mm. Hindwing 20-21 mm.

Head : labium straw coloured, labrum, bases of mandibles, genae, epistome and frons to as far posteriorly as the bases of antennae bright brick-red. A narrow black band at base of labrum, 3 small black points

on epistome which may be confluent to form a transverse line, and a small median black point in the centre of frons. Rest of head black enclosing posteriorly on each side very large subtriangular pale greenish blue postocular spots. Prothorax black with the sides pale blue and with 2 large brick-red spots on dorsum of middle lobe. Posterior lobe evenly rounded, minutely emarginate at centre, brick-red finely margined with black. Thorax black on dorsum, this extending slightly beyond the level of the humeral sutures : broad brick-red antehumeral stripes which narrow slightly above where they present a well-marked constriction. Laterally

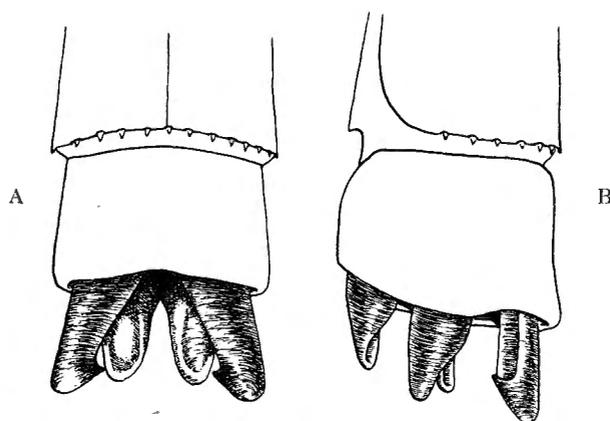


FIG. 1.
Anal appendages of *Pseudagrion wittei* sp. nov.
A. Dorsal aspect.
B. Seen from the left latero-dorsal aspect.

pale blue changing to pale green and then pale yellow beneath : a narrow black stripe on the first lateral suture incomplete below, and a small black point on the superior end of the postero-lateral suture. (One very adult specimen has a complete black stripe on the whole length of the posterior suture). Legs black, extensor surfaces of tibiae bright ochreous. Wings hyaline, pterostigma blood-red, covering less than one cell, about half as long again as broad : 13 postnodals in forewings, 10-11 in the hind : Anal vein leaving posterior border of forewing well proximal to the level of *Ac* but at that level in the hindwing. Abdomen black on dorsum marked with blue as follows : the sides and beneath of segments throughout, a narrow apical annule to segment 1 and a basal to segment 2 which also has a middorsal longitudinally oval azure blue spot and a broadly interrupted apical annule : segments 3 to 7 with interrupted basal annules, and the dorsal black is again constricted apically : segments 8 and 9 broadly blue on dorsum and sides marked with apical triangular black spots covering the apical third of segment 8 and the apical half of 9. (The very adult specimen

mentioned above, has the black triangles covering the apical two thirds of segment 8 and extending right to the base of segment 9). Anal appendages black, of equal length : superiors distinctly notched as seen in profile, narrowly unguulate and obtuse at apex which has a short crochet-like hook on the inner side. Inferiors broad at base, tapering to an obtuse apex which is directed slightly upwards and posteriorly and markedly hollowed out above.

This species by its colour and markings seems to lie closely to *P. sjostedti* but there are fewer postnodals in the wings and the anal appendages are altogether differently shaped.

11. — *Pseudagrion conspicuum* FRASER.

3 males and a single female from the River Molindi and Rutshuru, 1.000-1.285 m., 11.V.1934 and 1.VI.1934. The anal appendages are not unlike those of *P. inconspicuum* RIS but whereas the markings of the latter are very restricted and inconspicuous, those of *conspicuum* are broad and brilliant, the dorsal markings of head and thorax being of a bright chrome yellow. Moreover, the dorsum of segments 8 and 9 are entirely azure blue in *inconspicuum* whilst they are broadly marked with black in *conspicuum*, as broad apical annules deeply cleft by the blue dorsally.

Genus *AGRIOCNEMIS* SELYS.

The genus *Agriocnemis* SELYS contains the smallest known species of Odonata and is characterized by the extreme distal position of the arculus in relation to the antenodal cross-veins. Although essentially an Oriental genus, seven species are known to occur within Ethiopian limits, of which two, *gratiosa* GERST., and *inversa* KARSCH, are represented in the present collections. Both of these are comparatively rare in collections, so that it is astonishing to find not less than 200 specimens of the former, a fact pointing to its very local nature. Three other species are mentioned as from the Belgian Congo by Dr. H. SCHOUTEDEN, viz, *exilis* SELYS, *maclachlani* SELYS and *flavilabris* CAMPION, but the latter is a synonym for *forcipata* LE ROI. CAMPION was not aware that the latter species and *forcipata* SJOSTEDT were the same species and that the two authors, by a curious coincidence, acting individually, had chosen the same name for the same species. I find that Dr. RIS shared this opinion with me as in his Synonymic Catalogue of Odonata occurs the following passage : « (SJOSTEDT hat ohne Kenntnis der Arbeit von LE ROI dieselbe Spez. unter demselben Namen beschreiben) ». Therefore *A. forcipata* SJOSTEDT, and *A. flavilabris* CAMPION are both synonyms of *A. forcipata* LE ROI. Dr. RIS has overlooked CAMPION's name *flavilabris* and reference to *forcipata* SJOSTEDT in his Catalogue.

1. — *Agriocnemis gratiosa* GERSTAECKER

(= *A. consimilis* GRÜNBERG.).

There are about 200 specimens representing both sexes and collected from some 10 localities but the most important ones being Lac Edouard, and the

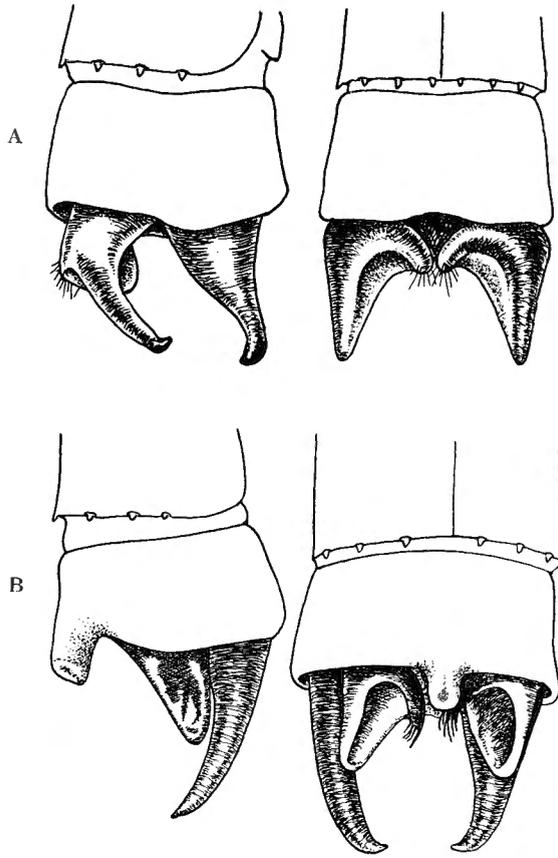


FIG. 2. — Anal appendages.

A. *Agriocnemis gratiosa* GERST., right lateral and dorsal aspects.

B. *Agriocnemis inversa* KARSCH, right lateral and dorsal aspects.

environs of the River Molindi : Mushumangabo, 2.075 m., 14-26.VI.1935; Ishango, 5-12.XII.1935; Kalondo, 1.715 m., 6-9.VIII.1935; Kibuga, 1.100 m., 26-28.VI.1935; Katanda, 950 m., 30.XI.1935; Kamande, 912 m., 6.V.1935; lac Édouard, Vitshumbi, 925 m., 15-16.I.1936; E. Rwindi, 15.I.1935 and Kisenyi, 1.460 m., 17.VI.1935.

2. — Agriocnemis inversa KARSCH.

Only a single male from lac Édouard, Kisenyi, 1.460 m., 17.VI.1935, evidently taken by chance among specimens of *gratiosa*.

(As the greater number of specimens of *gratiosa* have the end segments of the abdomen missing, it is possible that some specimens of *inversa* are concealed among them ?)

Genus ENALLAGMA (BURMEISTER).

The genus is a palearctic one but certain species have managed to penetrate and acclimatize themselves in the tropics. Sixteen species have been reported from Africa but some of these are mere synonyms : only two are found in the present collections, viz. *subfurcatum* SELYS and *elongatum* (MARTIN), the latter originally described as an *Ischnura*. [The synonymy of the latter has been recently fully explained by myself in the *Proc. R. ent. Soc. Lond.* (B) 16 : 143 (1947).]

1. — Enallagma subfurcatum SELYS.

Represented by nearly 400 specimens in the present collections : it is by far the most common of the genus and is distributed widely throughout the continent of Africa but appears to be more restricted to the east and central parts. *Micronympha bilobata* GRÜNBERG is a synonym for this species. Localities in which specimens were taken are : Mushumangabo, 2.075 m., 14-26.VI.1935; Rutshuru, 1.285 m., 1.VI.1934; Kalondo, 1.715 m., 6-9.VIII.1935; N'gesho, 1.900 m., 3.VIII.1935; lac Édouard, Rwindi, 15.I.1936; May-ya-Moto, 950 m., 5-9.XI.1934; River Molindi, 1.000-2.000 m., 11.V.1934; Lukulu, 1.700 m., 13.VIII.1935; Ruanda, Ruhengeri (sources Kirii), 1.800 m., 1.X.1934; Kibuga, 1.100 m., 26-28.VI.1935; Katwe, 920 m., 11-12.VI.1935; Ishango, 5-12 XII.1935; lac Kivu, 1.400 m., 19.II.1934; lac Magera, 2.000 m., 27.II.1934.

2. — Enallagma elongatum (MARTIN).

A comparatively rare species which appears to have been taken by chance among specimens of *subfurcatum* with which they were mingling ? On the wing it would be indistinguishable from this species even by a specialist in the Order. Localities were : Mushumangabo, 2.075 m., 14-26.VI.1935; Lukulu, 1.700 m., 13.VIII.1935; Ruanda, Kundhuru-ya-Tshuve, Rutabagwe, 2.600 m., 13-14.IX.1934 and Ruanda Ruhengeri (sources Kirii), 1.800-1.825 m., 1.X.1934.

[3. — **Enallagma glaucum** (BURMEISTER).]

This species is not represented in the present collection but I mention it in order to correct what appears to be an error committed by SJÖSTEDT and copied by Dr. SCHOUTEDEN in his « Les Odonates du Congo Belge ». *Coenagrion glaucum* SJÖSTEDT is an obvious error for *Enallagma glaucum*. RIS in his Catalogue (as yet unpublished but a copy in my possession) queries the determination of SJÖSTEDT and I agree with his opinion. Dr. SCHOUTEDEN gives a definition of the genus *Coenagrion* apparently copied from SJÖSTEDT and states : « Femelle à épine vulvaire », but whereas the females of *Coenagrion* do not possess a ventral spine under segment 8, those of *Enallagma* do and *glaucum* would possess one such. I am therefore of the opinion that the examples mentioned as from Ruki are actually *Enallagma glaucum* (BURM.).

Genus **ISCHNURA** CHARPENTIER.

Only a single species is found in the Belgian Congo and this holds good for the whole of Africa save for a minor invasion of the north Algerian coast where some European species have established themselves. There are 13 males and 6 females of *I. senegalensis* RAMB., a species which is a new record for the Parc National Albert : all save one pair from May-ya-Moto, 950 m., 5-9.XI.1934 and two pairs from Mushumangabo, 2.075 m., 14-26.VI.1935, are from the River Molindi area, 1.000-1.200 m., 11.V.1934. It is a remarkable fact that although this is the sole species found in tropical Africa, yet it has spread throughout the whole of southern Asia to as far as the Philippines, a number of other species belonging to the same genus being found in company with it. *Senegalensis* is a dominant species probably on account of its ability to adapt itself to temperate as well as tropical climates and to exist from sea-level up to heights of over 7.000'.

Genus **GERIAGRION** SELYS.

Represented in the collections by the common and widely distributed *C. glabrum* (BURM.) of which there are 16 males and 7 females. Localities are : River Molindi, 11.V.1934; Kibuga, 1.100 m., 26-28.VI.1935; May-ya-Moto, 950 m., 5-9.XI.1934 and Ondo, 1.200 m., 29-31.VII.1935, the majority from the last mentioned, collected H. DAMAS.

Genus **MESOCNEMIS** KARSCH.[**Mesocnemis singularis** KARSCH.]

There are 6 males of this remarkable species, all from Kimboho, near lac Luniasenge, 925 m., 26-27.XI.1935, H. DAMAS coll. I possess a number of both sexes from Dwaji Isle, Lake Victoria, collected by G. HALE CARPENTER : all these are more or less heavily pruinosed, especially on the thorax. In some respects, viz the short petiolation of the wings and the remarkably proximal position of the arculus, about midway between the two antenodals, places the species as the most highly organized of the *Coenagriidae*. RIS and KARSCH placed the genus in the *Protoneuridae* but it seems to me that it is more nearly related to the *Argias*.

Family **AGRIIDAE**.Genus **CHLOROCYPHA** FRASER.

Represented by two species, the common and widely distributed *caligata* (SELYS) and *molindica* FRASER, a local form known only from the Parc National Albert.

1. — **Chlorocypha caligata** (SELYS).

There are 11 males and 5 females from the River Molindi, 1.000-1.200 m., 11.V.1934; Kibuga, 1.100 m., 24-28.VI.1935 and Rutshuru, 1.285 m., 30.IV.1934. The species is distributed mainly in East and Central Africa and more especially in the Upper Nile Valley.

2. — **Chlorocypha molindica** FRASER.

Two pairs of this rare and apparently local species from the River Molindi. So far known only from the Parc National Albert : type and allotype in the Institut Royal des Sciences Naturelles de Belgique.

This species is most closely related to *C. tenuis* LONGFIELD but is easily distinguished from that species by the black markings on the dorsum of segment 2 of the male. *Tenuis* and *molindica* form a small group within the genus characterized by the rather long and slim abdomen and the reversal of the dorsal pattern of yellow markings of the thorax.

Order **ANISOPTERA**

Family **GOMPHIDAE**.

Only two genera are represented belonging to this family although the region is peculiarly rich in species belonging to several genera.

Genus **PODOGOMPHUS** KARSCH.

A single female which I have been unable to determine but which is probably *lujai* SCHOUTEDEN, resembling it most closely in its markings.
Habitat : Rutshuru, 1.285 m., 1.VI.1934.

Genus **ICTINOGOMPHUS** COWLEY.

Ictinogomphus ferox (RAMBUR).

Four males from the following localities : N'Goma, 1.460 m., 19.IV.1935; Mushumangabo, 2.075 m., 14.VI.1935; Tshambi, 975 m., 26.X.1933 and Kanyazi (Kamande), 925 m., 10.XI.1933. All quite typical.

Family **AESHNIDAE**.

Genus **ANAX** LEACH.

Anax mauricianus RAMBUR.

A single male from Kayanya, 912 m., 6.V.1935, coll. H. DAMAS. A wide spread species throughout East and Central Africa and Mascarenia, very closely related to the palearctic *Anax imperator* LEACH and regarded by some as a mere race of this latter. Slight differences in the shape of the anal appendages of the male and the frontal marking are the only characters separating the two.

Genus **AESHNA** FABR.

Aeshna ellioti KIRBY.

A single specimen of this rare insect collected by G. F. DE WITTE, at Rutshuru, 1.285 m., 26.XI.1935. It is confined to the montane areas of Central and East Africa. I possess a pair from the Ruwenzori Range, collected by G. HALE CARPENTER, in which the female has the apical half of all wings tinted a golden amber.

Genus **GYNACANTHA** RAMBUR.

Gynacantha bullata KARSCH.

A single male from Ondo, 1,200 m., 29.VII.1935, coll. H. DAMAS, and which probably came to light. Nearly all species of this genus are crepuscular in habit and so are rarely seen on the wing during daylight. They may however be beaten from or sought for in their diurnal resting places where they often congregate in numbers. I have taken them with my fingers under the densest shade or beaten them from bamboo clumps. When so put up, they quickly come to rest again and if marked down, are then quite easily captured without a net.

Family **LIBELLULIDAE**.

1. — **Brachythemis leucosticta** (BURMEISTER).

This, the commonest African Odonate, was collected the whole year round and in almost every locality mentioned in the preface to this paper. The number of specimens taken was just short of 1,000 and comprised more than one third of the whole of the three collections.

All age varieties are exhibited, from specimens with the wing markings almost obsolete, to those with the black bands sharply defined : andromorph females with rudimentary black bands to the wings and heteromorphs with the wings hyaline, these latter preponderating.

The species breeds in lakes and marshes and has successfully populated the whole of the areas drained by the Senegal, Niger, Nile and Congo, but more especially the Nile from its source to its outlet. I have myself seen it in great numbers in marshes bordering the lower Nile, to the almost total exclusion of other species. Although so common an insect, I can find no published description of its nymph of which there are 7 specimens in the present collection.

Nymph of **Brachythemis leucosticta** (BURMEISTER).

Length 20 mm.; greatest breadth at segments 5 and 6 : 7,5 mm.; head 6,5 mm. wide; hind femora 8,75 mm. in length.

Colour pale brownish but probably olivaceous brown during life, without any visible markings. Shaped similarly to that of *B. contaminata* (FBR) (FRASER, 1934, *Fauna Brit. Ind. Odonata*, 3, fig. 48). Head rather broadly rectangular with rather prominent eyes projecting from the antero-lateral angles : the occipital area behind the eyes bearing a number of spine-like bristles. Wing-cases parallel, extending to end of the 5th abdominal segment. Abdomen with stout backwardly directed spines situated mid-dorsally on segments 6 to 9, and lateral spines on segments 7, 8 and 9. Legs moderately robust and rather long; femora armed with 4-5 large, widely-

spaced spines, tibiae almost naked but with rows of minute spines on outer and posterior surfaces. Mask (labium) kite-shaped, mid lobe projecting moderately anteriorly, the fore-border fringed with minute inwardly curled teeth; 12 setae on each side of lobe. Lateral lobes with a rather short but stout moveable hook, 6 setae and a number of slim spines along the outer

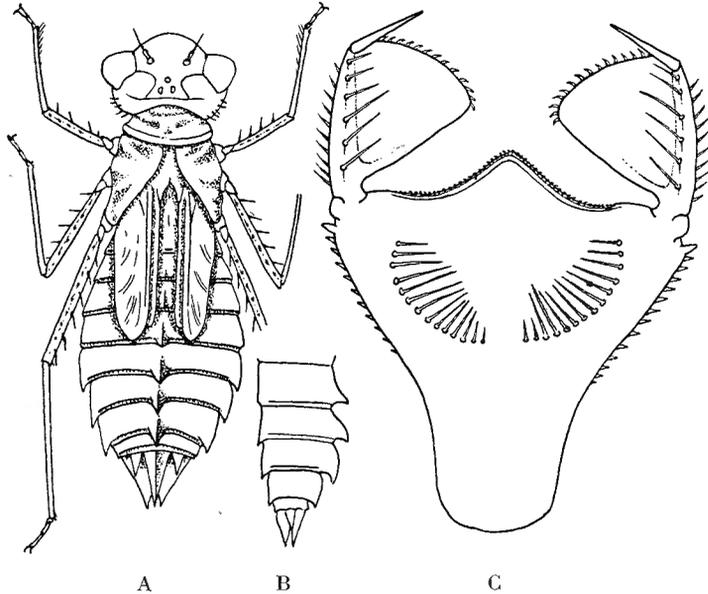


FIG. 3. — A. Nymph of *Brachythemis leucosticta* (BURM.).

B. Lateral view of the terminal abdominal segments.

C. Labial mask from the dorsal aspect.

border. The outer angles furnished with a stout short spine which is followed along the border posteriorly by a number of short gradually shortening spines.

7 exuviae, Burunga (Mokoto), 9-10.III.1934.

2. — ***Orthetrum chrysostigma chrysostigma*** (BURMEISTER).

2 males only from May-ya-Moto, 950 m., 5-9.XI.1934. Usually a common and wide-spread species, especially in East Africa.

3. — ***Orthetrum brachiale*** (PAL. DE BEAUVAIS).

2 males, Kibuga, 1,400 m., 25-28.VI.1935; 2 males River Molindi, 1,000-1,200 m., 11.V.1944.

2 males, Uele (Monga), 450 m., 18.IV.1935.

A widely spread species which has established itself in all but the desert areas and has extended into the Indian Ocean to as far as Mauritius.

4. — **Orthetrum microstigma** RIS.

13 males and 7 females from Ondo, 1.200 m., 29-31.VII.1935. A local species not common in collections. 1 male from the River Molindi area and another from Rutshuru, 1.000-1.285 m., 1.VI.1934.

5. — **Orthetrum farinosum** FOSTER.

2 males from the River Molindi area, 3 from Rutshuru, 1 male from Ondo, 2 males from Kibuga and 1 from Ishango, dates respectively 11.V.1934, 1.VI.1934, 26-28.VI.1934 and 5-12.XII.1935. A very distinctive species in the adult state by reason of its general high pruinosity. Appears to occur thinly over a wide area of tropical Africa and is never common in collections.

[6. — **Orthetrum stemmale capense** CALVERT.]

6 males, 2 females, River Bili, Uele, Monga, 450 m., 18.IV-8.V.1935.

14 males and 5 females from Ondo, 1.200 m., 29-31.VII.1935; 1 male from Rutshuru, 1.285 m., 1.VI.1934. A moderately common but somewhat localised species.

7. — **Orthetrum caffrum** SELYS.

Only a single male of this comparatively rare species, from Kibuga, 1.100 m., 26-28.VI.1935.

8. — **Orthetrum stemmale congoense** nov. subsp.

2 males from Ondo, 1.200 m., 29-31.VII.1935.

This new subspecies differs only from *stemmale stemmale* by the presence of dark brown rays in the subcostal and cubital spaces of the hindwings, extending to as far as the Cu₁ and to one cell beyond the membrane; present also in the forewing but much less visible. There is also only a single row of cells between Rs and Rspl, whilst the increased number of antenodals, 16, indicates a rather closer venation.

Palpopleura lucia (DRURY).

80 specimens including both sexes and the usual variations, which seem numberless, from the River Bili (Uele) Monga, 450 m., 18.IV-8.V.1935. Four of these belong to the variety *portia* DRURY. Distributed throughout the whole of tropical Africa and Madagascar: occurs in colonies and is extremely abundant where found. It is a mimic of certain Hymenoptera both in appearance and mode of flight, which is low and circling, a rare phenomenon in the Order Odonata.

1 male also from Mushumangabo, 14-26.VI.1935; 1 male from Ishango, 5-12.XII.1935; 2 (including one var. *portia*) from Rutshuru, 1.VI.1934 and 2 males from Kibuga, 26-28.VI.1935.

Acisoma panorpoides ascalaphoides RAMBUR.

A single male from Ishango, 5-12.XII.1935 and 2 males and a female from the River Molindi area, 1.000-1.200 m., 11.V.1934. The species is a common one and widely spread throughout East and Central Africa.

Hemistigma albipuncta (RAMBUR).

Only a single female of this moderately common species is present collected at Vitshumbi, 925 m., 18-24.IX.1933. and calls for no remarks.

Genus **TRITHEMIS** BRAUER.

The genus is essentially an African one with off-shoots distributed throughout southern Asia; out of the 17 African species, 4 only are represented in the present collections, viz.

1. — **Trithemis violaceae** SJÖSTEDT.

Although considered a rare species, there are no less than 28 males from . Rutshuru, 1.285 m., 1.VI.1934; 1 from May-ya-Moto, 950 m., 5-9.XI.1934; 2 males, River Molindi, 1.000-1.200 m., 11.V.1934; 1 male Kibuga, 1.100 m., 26-28.VI.1935 and 1 from Kimboho, 925 m., 26.XI.1935. The species stands near the Oriental *T. aurora* BRAUER from which it is only distinguishable by details of its genitalia.

2. — **Trithemis arteriosa** (BURMEISTER).

A very wide-spread species and one of the commonest of the genus. 14 males and 1 female are reported from : 8 males and 1 female from Kibuga, 1.100 m., 26-28.VI.1935; 4 males from the River Molindi, 1.000-1.200 m., 11.V.1934 and 2 from Bugazia (River Mosenda), 912 m., 18.V.1935.

3. — **Trithemis nuptialis** KARSCH.

2 males only from the River Molindi, 11.V.1934. Dr. SCHOUTEDEN cites the species from a large number of localities, but it is not one which I have received in plenty in the numerous collections reaching me : it appears to be confined to the tropical zones of West and Central Africa.

[4. — **Trithemis donaldsoni basitincta** Rrs.]

There is a single male of this very rare species from Uele, Monga, 450 m., 18.IV-8.V.1935. The type is from the Cameroons but all other examples are from the Belgian Congo which appears to be its headquarters.

Grocothemis erythraea (BRULLE).

This very common, very wide-spread species is represented by 2 males from Ishango, 5-12.XII.1935; probably it was recognized as an ubiquitous insect and ignored by the collectors. The genus includes two other African species which are apt to be overlooked on the wing and mistaken for *erythraea*; these are *sanguinolenta* (BURM.), and *divisa* KARSCH, both of which have been reported from the Belgian Congo.

Zygonyx chrysobathes (RIS).

[**Pseudomacromia chrysobathes** RIS.]

The genera *Zygonyx* and *Pseudomacromia* can not be separated; the only point of difference is the down-curved ends of the main longitudinal veins; all other differences are bridged and some of the African species lie nearer to the Oriental species of *Zygonyx* than they do to the other African species. Dr. RIS held them separated purely on geographical grounds, but since his monograph was written, the most widely distributed African species *torrida* has been reported from southern Asia. There is a single female of the magnificent species *chrysobathes* RIS from Rutshuru, 1.285 m., 1.VI.1934, known only from 2 males and a female from Sierra Leone. This specimen agrees fairly closely with the type in the British Museum but the apices of the wings are uncoloured: there are a few duplicated cells in the right hindwing between MA and Msp1; 2 cubital cross-veins in the left hindwing in which also the triangle has 2 cross-veins, the usual one supported by another running from the base to the distal side; in the right hindwing, this latter vein stands alone, the costo-distal one being absent. The specimen is slightly larger than the type, with abdomen 46 mm. and hindwing 55 mm. All species of the genus breed in swift clear running streams and on account of their habit of hovering far out in mid-stream, are difficult to catch.

Tholymis tillarga (FBR.) (Nymph).

This common but crepuscular species is represented by a single nymph. The latter has been figured by myself in the Rec. Ind. Museum, 16, pl. 32, fig. 2. The imago is wide-spread throughout Africa and southern Asia but on account of its crepuscular habits, is apt to escape notice. It flies only from dusk until dawn.

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