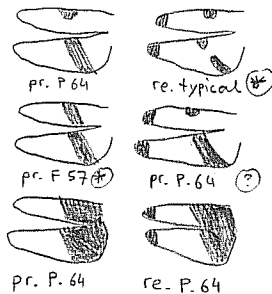


SPECIOSA

- ♂ speciosa (Karsch, 1891), rougeoti Pinhey, 1960
- ♀ pretiosa (Karsch, 1891).



REGISALBERTI

- ♂ Fraser, 1957
- ♀ regisalberti (Schouteden, 1934)

PRETENTIOSA

- ♂ Pinhey, 1964
- ♀ pretentiosa Fraser, 1957, umbrosa Fraser, 1957 (Pinhey 1964)  
(or regisalberti or eusebia?)



umbrosa = eusebia?  
(because pr. & re. became black basally when melanic)

EUSEBIA

- ♂ prodigiosa Fraser, 1958
- ♀ eusebia (Ris, 1912)



questions:

- \* what is umbrosa; eusebia, regisalberti or pretentiosa?
- \* are regisalberti and pretentiosa the same?
- \* how close are eusebia and chrysobaphes?
- \* how close are fallax and flavicoستا?
- \* are ikomae and natalensis the same?

my guess
<u>eusebia</u>
yes
not very
very
yes

## Dragonflies (*Odonata*) of the Angola-Congo borders of Rhodesia

This paper deals mainly with *Odonata* collected on the Angola border of North western Rhodesia, in the Ikelenge area of north Mwinilunga District, during the period April-May, 1963. The author is grateful to Mr. PAUL QUIRK who sponsored the expedition and who, accompanied by Mr. J. C. O. CHITTY, joined the author's camp on the banks of the Upper Zambezi Rapids, for part of the time. And he is also deeply indebted to the individuals who made the Congo visit a success and to Miss LONGFIELD who kindly gave her opinion on an abnormal *Actiaqriion* from Angola.

Previous papers by the author (1961b and 1962c) have recorded the *Odonata* of this area, but several interesting new finds were made on this latest visit. Ecologically the collected area consists mainly of gallery forests, with some outlying swampland. Brief excursions were made over the Angola border as far as Caianda, Eastern Angola and two very remarkable species were collected on the Lutchigena River.

On the way to Mwinilunga the author decided to pay a short visit to I.N.E.A.C., Institut National pour l'Etude Agronomique du Congo, situated a few miles from Elisabethville, where, after much difficulty, the SEYDEL collection of insects had been traced. It was as a result of this visit that clarification was possible for the species, *Tragomphus seydeli* SCHOUTEDEN and *Ictinogomphus dundoensis* PINHEY. And this short detour, combined with anticipated and successful results at Mwinilunga, paved the way to a revision of the Continental African species of the genus *Zygonyx* HAGEN. Some species of this spectacular genus had previously only been known from one sex or the other.

### Family LESTIDAE

*Lestes virgatus* (BURMEISTER), 1839, *Handb. Ent.* 2: 824.

This widespread species was found in some numbers on the Lutchigena River, East Angola, 10 May, but all were teneral or juvenile individuals.

*Lestes disarmanus* FRASER, 1961, in PINHEY, *Publication British Mus. (Nat. Hist.)*: 11, f.

On the return journey to Southern Rhodesia a series of both sexes of this species was collected in bush fringing the Maramba River, near the Victoria Falls, 18 May. This series confirms the record of a solitary female captured in the Victoria Falls «rain forest» in July, 1955.

### Family PROTONEURIDAE

Of interest in this family was the discovery of a third species of the genus *Elatoneura* COWLEY (1935) in the Ikelenge region, North Mwinilunga. The two species previously known

were *E. glauca* (SELYS, 1860) and *E. fremulata* (HAGEN, 1860). The new record, *E. acuta* KIMMINS, is closest to the latter species.

*Elatoneura fremulata* (HAGEN), in SELYS, 1860, *Bull. Acad. Belg.* (2) 10: 444 (p. 17 sep.). (fig. 1).

A common species in the Mwinilunga District and in other parts of Northern Rhodesia, but on this occasion an example of *E. acuta* KIMMINS was taken on the Kanyita stream, Ikclenge.

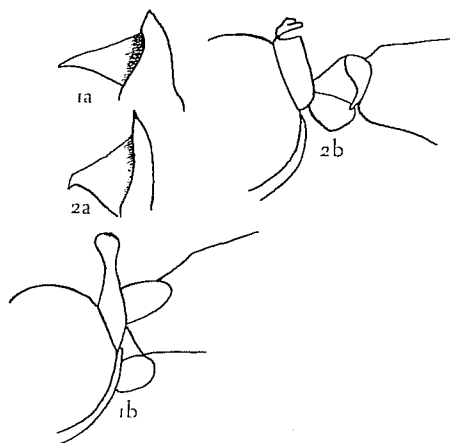
The difference between these two species can be detected in the superior appendage of the male (fig. 1a, 2a) which, in *fremulata*, has a broad ventral flange terminating smoothly in an acute apex whilst in *acuta* the flange has a small hook on the end.

*Elatoneura acuta* KIMMINS, 1938, *Ann. Mag. nat. Hist.* (11) 1: 300, ff. (fig. 2).

*Male.* Face yellow, frons and vertex black, with faint traces of white pruinosity.

Prothorax blackish strongly marked with reddish orange, especially on anterior and medial lobes. Synthorax black to first lateral suture, with greenish antehumeral stripe, as wide as mesepisternum at ventral end but tapering dorsally. Lower sides greenish yellow with very broad black stripe on second suture. Legs black.

Abdomen black, with very narrow, discontinuous whitish lateral line on segments 2-6. There are very faint traces of white pruinosity on thorax and abdomen, but without the broad blue pruinose thoracic bands found generally on thorax of *fremulata*. Venation and pterostigma black.



Figs. 1, 2.— 1. *Elatoneura fremulata* (HAGEN): a. right superior appendage of ♂; b. prothoracic stylets of ♀ from left. — 2. *Elatoneura acuta* KIMMINS: a. right superior appendage of ♂; b. junction of pro- and synthorax of ♀ *acuta* KIMMINS from left.

Abdomen 27 mm, hindwing 18.5 mm.

KIMMINS' type male (Lagos) was teneral and consequently much paler. It was a larger specimen, the abdomen 30 mm, hindwing 18 mm.

An example taken on the Lisombo River, April 1963, is probably the unknown female of *acuta*:

*Female.* Face and vertex black, with a creamy white transverse band across postclypeus and front of frons, extending to the eye on either side. Prothorax and synthorax black, with a white lateral band, extending on to mesepisternum as the narrower and tapering antehumeral stripe. A broad white band across metastigmal region and another on lower half of metepimeron.

The stylar region at back of prothorax is quite different to that of *fremulata* (fig. 1b, 2b). There are no stylets. The posterior lobe of the prothorax is bisected in the middle; the mesostigmal lamina is concave, with a pyriform posterior flap.

In *fremulata* there is a stylet divided into an elongate anterior erect portion and a posterior, rounded depressed extension. Legs of *acuta* black. Abdomen black. A fine white dorsal line on distal half of segment 8 and along segment 9. Cerci moderate, ovipositor sheath extending beyond segment 10 and as far as cerci.

Venation and pterostigma black. Pterostigma almost a rectangle. Forewing with 15 Px. Abdomen 29.5 mm, hindwing 19.5 mm

These two examples, male and female, were collected in the Ikclenge region in April, 1963.

Further examination of a series recorded by the present author from Lubudi, Katanga, in 1960, has shown these to be large examples of *fremulata*, not *acuta* (PINHEY, 1961b: 16). The measurements for these are abdomen, male 33 mm, female 34 mm, hindwing, male 22 mm, female 24 mm.

Family COENAGRIIDAE

### *Ceriagrion* Selys (1876)

The following species were taken on the Lutchigena River, Angola, May, 1963:—

*C. bakeri* FRASER (1941), *C. corallinum* CAMPION (1914), *C. platystigma* FRASER (1941) and the widespread *C. whellani* LONGFIELD (1952).

Of these species *C. corallinum* CAMPION has not yet been found in Mwinilunga District.

### *Ceriagrion corallinum* Campion

(Fig. 3)

*Ceriagrion corallinum* CAMPION, 1914, *Ann. Mag. nat. Hist.* (8) 14: 278.

A few examples, including one pair in copula, were found at the Lutchigena River, Angola, 10 May, 1963.

*Male* (in copula). Lower part of face bright yellow, upper part and frons green, head above reddish brown.

Thorax green, legs yellow. Abdomen vermilion dorsally on most segments, yellow ventrally, the distal segments browner. Superior appendage shorter than inferior, the superior with apical hook, the inferior with two terminal teeth, well separated (fig. 3a, b).

Wings tinged with greenish yellow in basal half. Pterostigma a brown parallelogram. Forewing with 10 Px. Ac at end of petiole and midway between the antenodals.

Abdomen 25 mm, hindwing 18 mm.

*Female* (in copula). Face and frons greenish yellow, head above brown. Thorax a darker green than in the male. Hind-edge of posterior lobe of prothorax (fig. 3c) evenly rounded; mesostigmal lamina curved over dorsally to enclose a rounded, hollow gripping-point. Legs ochreous.

Abdomen mainly brown. Cerci very short.

Abdomen 26.5 mm, hindwing 19.5 mm.

In *C. whellani* LONGFIELD the anal appendages of the male are of equal length and the mesostigmal lamina has a smaller depression.

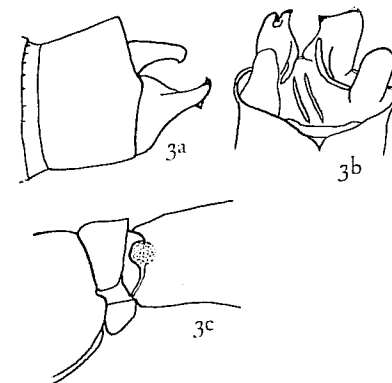


Fig. 3.— *Ceriagrion corallinum* CAMPION: a, b. ♂ (in copula), anal appendages from left and dorso-posteriorly; c. ♀ (in copula), junction of pro- and synthorax from left.

### *Aciagrion Selys* (1891)

A species taken in Eastern Angola and attributed to this genus shows extraordinary structural abnormalities which may require drastic changes in the generic diagnosis if this species is retained in *Aciagrion* SELYS. Yet in most features it appears to represent the species *A. gracile* (SJÖSTEDT).

### *Aciagrion gracile* (Sjöstedt)

(Figs. 4, 5)

*Aciagrion gracile* (SJÖSTEDT), 1909, *Wiss. Ergeb. schwed. zool.* (1) 14: 44.

Series from Mwinilunga and from Lutchigena River, Eastern Angola differ from typical *gracile* in being duller in colour, lacking the blue colour, even in life, and the postclypeus is pale not black. The anal appendages of the male, however, seem to be typical. A possible explanation is either that the Mwinilunga-Angola series is a distinct race or else that it is a seasonal form: all have been collected by the author in May 1961 and May 1963 which is in the dry weather after the rainy season. Although May is still in the wet season in the Usambara Mountains where SJÖSTEDT's types were collected these were actually found in June, which is normally just after the rains. Thus, it does not appear likely that the Mwinilunga series is a seasonal form and, in fact, they would seem to represent a westerly race of the species.

However, a fresh dilemma arises in the material in question. Whilst males from both forest streams, Lisombo River, Mwinilunga, and Lutchigena River, Angola, are similar in appearance and general features, yet the Lutchigena River series differs in one striking venational feature, in both sexes: the petiole tends to continue well beyond the anal crossvein, as in the Telebasine group (fig. 5a). This tendency for the anal vein to cling to the posterior margin for some distance seems to be a strong feature in this Angola series.

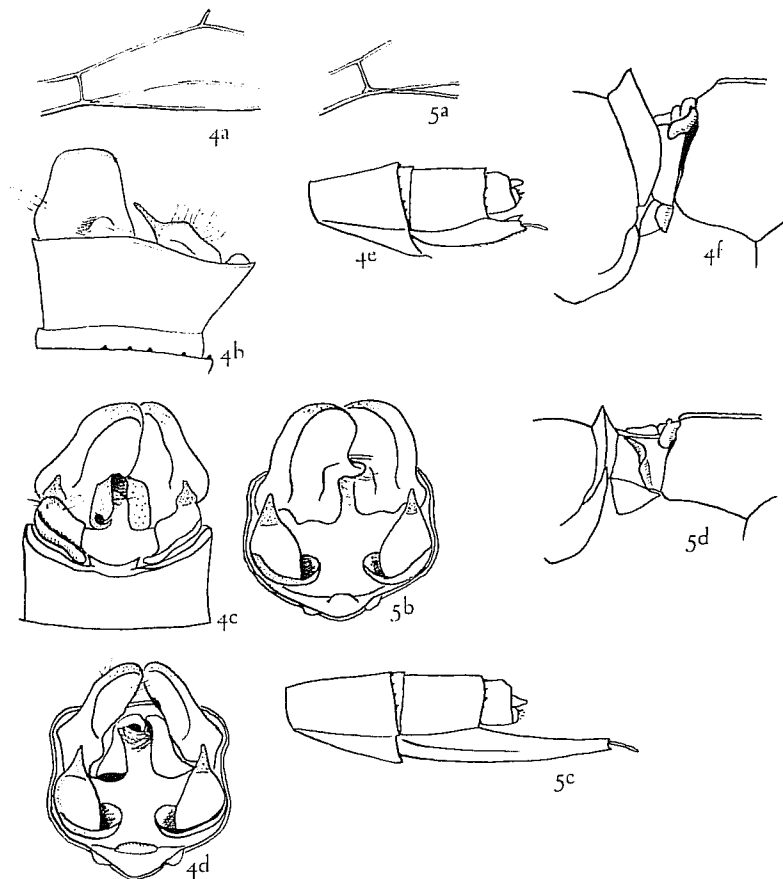
Then, again, the Lutchigena females ascribed to this species are remarkable for two other reasons. Firstly, there is no ventral spine in the 8th. abdominal segment. The presence of this spine is considered one of the characteristics of the genus *Aciagrion* SELYS, distinguishing this genus from *Pseudagrion* SELYS. Admittedly, the spine does appear to vary in prominence, but it should at least be present. Yet the Lutchigena females (10 examples) were collected on exactly the same day as the males (10th. May, 1963), in the identical part of this gallery forest, flying together. No mating pairs were collected, most of the females being teneral. The resemblance between females and males of the Lutchigena series, in colour, marking and size, is, however, so close that there is little reason to doubt their conspecificity! The second peculiar feature is an abnormally long ovipositor in the female.

A description of examples from both series might be of value in assessing this conundrum.

**Males** (Lisombo River, Mwinilunga, May, 1961). Labium ochreous, labrum and genae brownish ochreous, epistome, frons and head above pale brown; with sparse blackening markings: three small basal dots on labrum, one centro-basal dot and two lateral dots on postclypeus and a very fine line in front of the very large green postocular spots which are linked across back of occiput.

Prothorax pale brownish with two black stripes on middle lobe, linked by a transverse line at base of posterior lobe. Synthorax pale greenish brown in front, still paler at sides; a slender black stripe on either side of median carina. A very fine black line on humeral suture, ending dorsally in a spot; a small spot at ventral end of mesepimeron and another spot at dorsal end of second lateral suture. Legs pale ochreous with black spines; a vestigial dark external streak on each femur.

Abdomen pale greenish to brownish on segments 1-7; 8-10 faintly violaceous. The black markings have not fully developed and it is probable that the males captured are not fully mature. Segment 1 with small black basal spot; segment 2 with a middorsal stripe, inflated triangularly at 2/3 but not reaching distal end; 3-7 with dorsal brownish suffused band and, at distal end,



Figs. 4, 5. — 4. *Aciagrion gracile* (SJÖSTEDT) (Mwinilunga): a. relation of anal vein and Ac in right forewing; b-d. Anal appendages of male, from right, dorsally and posteriorly; c. terminal segments of abdomen of ♀ from left; d. mesostigmal lamina of ♀ from left. — 5. *Idem* (Lutchigena River): a. relation of anal vein and Ac in right forewing; b. anal appendages of ♂ posteriorly; c. terminal segments of abdomen of ♀ from left. d. mesostigmal lamina of ♀ from left.

a distinct black annulus. Terminal segments unmarked. Segment 10 with a pair of dorsal lobes at distal end. Superior appendage very short, directed ventrad to an acute spine; inferior a large broad lobe, as long as segment 10, having an inner basal shelf (fig. 4b-d).

Venation brown; pterostigma a small brown rhombus, shorter than the cell below it. Forewing with 12-13 Px, Ac at end of petiole.

It is probable that a more mature male would be bluer or greener on the thorax and, perhaps, the face.

Abdomen 35 mm, hindwing 23.5 mm.

SJÖSTEDT's type male differs chiefly in the following respects: Labrum blue, postclypeus black, rest of face and head mainly green. Thorax pale bluish green and abdomen bluish, with continuous black dorsal band on segments 1-7. Forewing with 14 Px.

? *Female* (Mwinilunga). Face and head as in the above male.

Prothoracic hindlobe evenly rounded, as in male, rather erect. Synthorax as in male but *without* the dark stripe on either side of the median carina and the spot at ventral end of the mesepimeron is faint. Mesostigmal lamina with a raised, sinuous lobe at dorsal end, with a depression at its base, posteriorly; and with a small raised lobe at latero-ventral end (fig. 4 f).

Legs as in male. Abdomen marked as in male, but the band on segment 2 almost reaches the distal end. Segments 8-10 violaceous; 8 with ventral spine, cerci short, ovipositor of normal length. Wings similar, with 12-14 Px.

Abdomen 33 mm, hindwing 25 mm.

*Males* (Lutchigena R.). All colour and markings on head, thorax and abdomen as in the Mwinilunga males. Segments 8-10 pale blue to violaceous. Anal appendages similar. Wings also similar. Size similar. Yet the anal vein shows the strong tendency to leave the margin at a point well distal to Ac (fig. 5a).

*Females* (Lutchigena R.). Face, head and thorax marked as in the Mwinilunga male, including the dark stripe on either side of the median carina. Legs with scarcely any trace of the dark exterior femoral streak. Abdominal segments 1-7 also similar; segments 8-10 violaceous, but with some black marking: a small dorso-basal triangle on 8, and two short basal streaks on 9. Segment 8 *without* ventral spine and having the ovipositor sheath extended to a total length of about twice the length of 9+10 combined (fig. 5c).

The male gripping-point structures are rather different to the Mwinilunga female: prothoracic hindlobe shorter. Mesostigmal lamina with dorsal erect lobe smaller; the anterior edge of the lamina raised into a sinuous fold (fig. 5d).

In a few cases the wing petiole is less extended, the anal vein starting almost at Ac.

Abdomen (without ovipositor) 32-35 mm, hindwing 22-24 mm.

*Conclusion.* It appears certain that despite the anomalous condition of the anal vein the Mwinilunga and Lutchigena males are conspecific. The lack of a ventral spine on the 8th segment of the series of Lutchigena females, however, is a more difficult problem and may indicate at first glance that the females are not even congeneric. It seems a remarkable coincidence, on the other hand, that in the same few square yards of gallery forest on the Lutchigena River males and females of two different genera, so closely alike in size, shape, colour, markings and venational features should be flying together.

To the present author the tentative deduction is that the Lutchigena females are the true females of this relative (possibly a subspecies) of *A. gracile* SJÖSTEDT, and that the single Mwinilunga female may belong to a separate species of *Aciagrion* SELYS. If further research should prove this to be the case then the diagnosis for the genus must be altered or this species or race withdrawn from the genus.

Examples were submitted in 1963 to Miss LONGFIELD who agreed that in all characters except the abnormal features mentioned above the Lutchigena series resemble other *Aciagrion* SELYS and that the males and females are conspecific. She considered that the extended petiole of both sexes and the exceptionally long ovipositor of the female indicate a local population characteristic due, presumably, to conditions of the habitat. The Lutchigena River habitat is a forest swamp on this river. Perhaps the elongated ovipositor may have developed through the necessity of inserting it through a barrier of mud or debris? Observations at the locality would assist in determining whether there is any foundation for this theory.

The complete lack of a ventral spine in all the Lutchigena females is an indication that this species or race is a «taxonomic misfit», according to LONGFIELD, who also considers that the Mwinilunga female is *not* conspecific with the Mwinilunga males. On the genus LONGFIELD thinks that «*Aciagrion* may be a relict genus where found, rather than a new introduction. It seems to be more primitive than *Pseudagrion*...» and «primitive genera are always inclined to be unreliable in the venational characters» (letter dated December 1963). It would seem in the present case that instability extends also to structural body features.

### *Pseudagrion* Selys (1876)

Species taken on the Lutchigena River, Angola, were:—

*Pseudagrion fisheri* PINHEY (1961), *P. kibalense* LONGFIELD (1959), *P. makabusiensis* PINHEY (1950), *P. melaniterum* SELYS (1876), *P. rufostigma* LONGFIELD (1945) and a remarkable new species described below, which is probably polychroic.

All these, except the last, are known from Mwinilunga District.

### *Pseudagrion coeruleipunctum* spec. nov.

(Fig. 6)

A very distinctive species collected by the author in Eastern Angola. Unfortunately, despite intensive search, no males were discovered. However, the series of females is constant in marking but apparently polymorphic. A small but not slender species.

*Holotype female* (mature). Labium and part of occiput below white; labrum and epistome jet black; genae and frontal area bright cobalt. Vertex black with greenish sheen, and enclosing large, isolated triangular blue postocular spots. Back of occipital lobes mainly black.

Prothorax black, bordered sublaterally by cream. A blue triangle near anterior margin. No prothoracic stylets. Hindlobe of prothorax even; somewhat erect, with only the merest trace of a lateral kink. Synthorax black with greenish sheen to humeral suture at dorsal end, but this black area (as in fig. 6a) extending diagonally nearly to base of posterior leg. Mesostigmal lamina irregularly depressed. Side of thorax cobalt with short dash and a dot on first lateral suture and an irregular band on second suture. Bases of legs and part of anterior surfaces of femora white, the legs otherwise black. Claws reddish with black apices, the hook very short.

Abdominal segments 1-2 and, dorsally, 8-10, bright cobalt. Segment 1 with large black basal spot, segment 2 with a black saddle-mark at 2/3 of its length, segments 3-7 greenish black dorsally, pale greenish sublaterally; segment 7 with small blue triangle on distal end. Segment 8 with black lateral streak, 9 with irregular black dorso-lateral area which divides the blue into a trifoliate mark in dorsal view. Segment 10 all blue, the cerci short, obtuse, black.

Venation black. Pterostigma dark chocolate brown, with pale edge, between black veins; a parallelogram. Quadrilaterals normal, Ac at end of petiole. R<sub>4+5</sub> arising exceptionally close to IR<sub>3</sub> in all wings. Forewing with 12-13 Px.

Abdomen 26 mm, hindwing 22 mm.

In life all bright areas, including the eyes, were cobalt. Paratypes, otherwise similar, have a different number of postnodal crossveins, in one with 14 on both sides, in another with 11 on one side, 14 on the other.

? *Var. A*. This single female differs from the type in a peculiar manner, namely only in the pale colours of head and thorax: frons, genae and postocular spots; prothoracic spot, antehumeral marks and sides of thorax, all pale yellow in preserved condition but the head and antehumeral spots were bright orange in life. Abdominal colours blue like the type. Mesostigmal lamina as in the holotype. It seems most unlikely that with so much similarity and differing *only* in colour, that this might represent a distinct species. However, the author hesitates to give this example a name, other than var. A.

The name of this new, and apparently polymorphic species, is of obvious derivation. Four typical examples as well as var. A. were collected on the Lutchigena River, 12 miles East

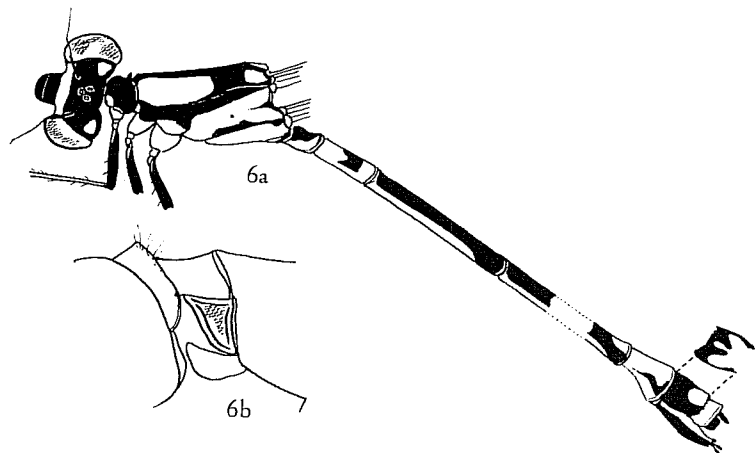


Fig. 6. — *Pseudagrion coeruleipunctum* spec. nov.: a. type ♀ from left; b. mesostigmal lamina from left.

of Caianda in Eastern Angola, May, 1963, three on the 3rd. of May, 1 typical and the var. A on the 10th. The locality is a swamp-gallery forest. It seems probable that males must have been some way out over the inaccessible swamp. The females were all in the thick jungle on the fringe of this swamp.

With its very distinctively bisected broad antehumeral band this species, evidently belonging to the *glaucescens* - *massaicum* group of the genus, is easily separated from all known African species. The very close approximation of veins IR<sub>3</sub> and R<sub>4+5</sub> at their origins is also a peculiar feature. *P. flavipes* SJÖSTEDT (1899) also has a divided antehumeral stripe (in both sexes) but the parts of the band are less widely separated and that insect is a much more slender species. *P. epiphonematicum* KARSCH (1891), normally has a divided antehumeral in both sexes, although the band is slender, and the spots are much closer. It is a much larger and darker insect. Both these species belong to the *kersteni* group of the genus and so are only distantly connected with the new *P. coeruleipunctum*.

Type and two paratypes in National Museum, Bulawayo. 1 paratype to British Museum (Natural History).

### *Ischnuragrion* Longfield (1945)

Hitherto only the Angolan type species *I. rarinum* LONGFIELD (1945) has been known in this genus. The following new species, collected in the Ikelenge region, North Mwinilunga, appears to represent a second member.

### *Ischnuragrion nodosum* spec. nov.

(Fig. 7)

*Holotype male* (mature). A slender species, like an *Aciagrion* SELYS, but differing in appendages.

Labium whitish; entire face in front bluish green, darker on frons, with traces of black: basal line and lateral dot on postclypeus, basal line on frons. Antenna brown, its base in the green zone. Vertex black, with large triangular green postocular spots, not linked across occiput; occipital lobes green below.

Prothorax green laterally and on anterior lobe, the median lobe black with large green lateral spot. Synthorax green, with black stripe against median suture and a narrow black humeral line; a dorsal black dot on each lateral suture. The mesostigmal lamina has an oblique raised lappet (fig. 7d). Legs white, with black spines and short black streaks on femora and tibiae. Claws yellow with black apices and claw-hooks.

Abdomen slender, greenish. A narrowish black band on segments 1-2, broadening on segments 3-6 and swollen at distal ends of segments; segments 7 and 10 almost completely black; 8-9 bright blue, 9 with black triangle at distal end. Segment 10 with a pair of dorsal prolongations. Anal appendages (fig. 7a-c) black, short, of about equal length; the superior subconical in lateral view but knobly in dorsal aspect, hence the name «*nodosum*». Superior with broad inner ventral spine. Inferior appendage with apical spine.

Venation blackish, pterostigma rhomboidal, black, less than one cell long. Ac at end of petiole and approximately halfway between the antenodals. Forewing with 12 Px.

Abdomen 32.5 mm, hindwing 21 mm.

In life, the face, postocular spots, thorax and base of abdomen were emerald, segments 8-9 cobalt.

*Female allotype* (mature, not taken in copula). Labium whitish; face and frons pale blue, with sparse black markings as in male and large blue pyriform postocular spots, linked across back of occiput.

Prothorax and synthorax coloured and marked as in male. Posterior lobe of prothorax evenly rounded. Mesostigmal lamina with cavity at dorsal end surmounted by short anterior and posterior tongues, like small lips over the concavity (fig. 7c). Legs as in male.

Abdominal segments 1-7 as in male, segment 7 with small blue latero-basal triangle; segments 8-10 cobalt blue, 9 with paired black basal triangles, 10 with black dorsal band. Cerci short. Ovipositor sheath extending slightly further than cerci. Segment 8 with ventral spine.

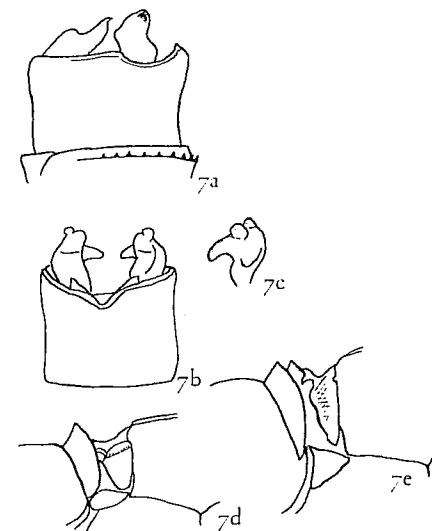


Fig. 7. — *Ischnuragrion nodosum* spec. nov.: a, b. anal appendages of ♂ from right and from above; c. left superior appendage obliquely from within; d. junction of pro- and synthorax of ♂ from left; e. junction of pro- and synthorax of ♀ from left.

Venation and pterostigma as in male. Ac slightly nearer second Ax. Forewing with 11 Px. Abdomen 22.3 mm, hindwing 20 mm.

In life, the face, postocular spots and thorax greenish blue, segments 8-10 sky blue.

Paratype females similar but deeper blue. A paratype male unfortunately lacks the terminal three segments of the abdomen.

All were collected in the Ikelenge area, north Mwinilunga District: holotype, Chinyaji River, 6 May, 1963; paratype ♂, Ikelenge February, 1960; allotype, Lisombo River, 13 May, 1963, 2 paratype ♀♀ Ikelenge, March, 1962. Also a teneral ♀, very pallid, Lisombo River, April, 1963. The damaged paratype ♂ and one paratype female will be sent to the British Museum (Natural History).

This species is much larger than the type species, *Ischnuraqron rarum* LONGFIELD (1947); paler on the postclypeus and thorax; and differs in the anal appendages: in *rarum* the inferior appendage has a dorsal spine but the appendage is longer than the superior; the superior has a ventral spine but the apex of the superior is smooth, not knobly.

### *Agriocnemis* Selys (1869)

In the swamp outside the gallery forest on the Lutchigena River, Angola, a few examples were taken of *Agriocnemis forcipata* LE ROI f. *victoria* FRASER (1928). This small form of a Congo species is also common on the Sakeshi River, Mwinilunga.

#### Family AGRIIDAE

The widespread *Phaon iridipennis* (BURMEISTER, 1839) was found on the Lutchigena River, as was to be expected. It is common in forests on the Mwinilunga side of the border.

#### Family CHLOROCYPHIDAE

### *Chlorocypha* Fraser (1928)

The distribution of the three red-bodied species of this genus in this area can be recorded now.

*Chlorocypha luminosa* (KARSCH), 1893, *Berl. ent. Z.* 38: 33.

This is the commonest and most widespread of the species, in fact one of the commonest of the entire genus. Some of the males, in life, have prominent white streaks on the face.

Localities: Kabompo River (on the border of Solwezi District); Ruakera River, Mwinilunga and Ruakera Falls; Sakeji River, Lwinga River, Nseloki River, Zambezi Rapids and a stream 5 miles East of Sakeji School, all in Ikelenge, North Mwinilunga.

Elsewhere, this species is found in Moçambique, the Eastern border of Southern Rhodesia, Nyasaland, other parts of Northern Rhodesia, Katanga and in tropical Africa, Ghana, Southern Nigeria.

*Chlorocypha frigida* PINHEY, 1961, *Occ. Pap. Rhodes-Livingstone Mus.* 14:43.

This species, characterized by the blue epistome, has so far only been found in Mwinilunga District:

Matonchi Farm, 30 miles west of Mwinilunga Boma; Chinyaji River, Lisombo River, Ksombo-Sombo River, Zambezi Rapids and 5 miles East of Sakeji, all in Ikelenge.

*Chlorocypha wittei* FRASER, 1955, *Proc. Nat. Upemba* 38: 10.

*C. fabanacula* PINHEY, 1961, *Occ. Pap. Rhodes-Livingstone Mus.* 14: 41.

The localities for this species are:

Chingola; Solwezi; Kabompo River; Sakeji River, Kanyika River, Zambezi Rapids and 5 miles East of Sakeji, in Ikelenge; and Lutchigena River, 12 miles East of Caianda, Angola.

Form *fabanacula* PINHEY occurs amongst typical examples, as recorded previously (PINHEY, 1962c).

Elsewhere this species occurs in Upemba National Park, Katanga, and Garamba Park, northern Congo.

### *Platycypha lacustris chingolae* Pinhey

*Platycypha lacustris chingolae* PINHEY, 1962, *Occ. Pap. Nat. Mus. S. Rhod.* 26 (B): 904, ff.

Further males were collected in the type locality, a gallery forest on a river 4 miles west of Chingola, May, 1963. Numerous females of the genus were also collected there, but no examples which could definitely be assigned to *P. lacustris chingolae* PINHEY. Females of *Chlorocyphidae* are by no means easy to separate, but all females taken on this river so far seem to be either *P. caligata* (SELYS, 1853), or *Chlorocypha wittei* FRASER, both of which have been recorded previously from this river. The body pattern, on which specific differences in the female are largely founded, is somewhat variable. A further revision of the genus is certainly desirable.

#### Family GOMPHIDAE

### *Cinitogomphus* gen. nov.

The unknown male of the species named *Ictinogomphus dundoensis* PINHEY (1961c) has now been examined. When the author described the single female from Dundo, Angola, there was some doubt whether this required the erection of a new genus, but on FRASER's advice and with a solitary female, it was decided to include it in *Ictinogomphus* COWLEY (1934). Further examples of the female have been obtained from near Ndola in Northern Rhodesia and a male and female from Elizabethville in the Congo.

Further examination now, of both sexes, indicates that this species has characters both of *Ictinogomphus* COWLEY and *Gomphidia* SELYS (1854). It is rather less robust than the former, has reduced foliations on the eighth abdominal segment and has a discoidal cell shaped more like *Gomphidia* SELYS. It differs from this latter in being of heavier build and in possessing distinct foliations on the eighth segment, although not so large as in *Ictinogomphus* COWLEY. The name is an anagram of *Ictinogomphus*.

*Generic Characters.* Body with the robust build of *Ictinogomphus* COWLEY. Foliations on abdominal segment 8 moderately developed in both sexes but not large as in *Ictinogomphus* COWLEY. Superior appendage simple, unbranched. Head broad, frons and vesicle prominent, as in *Ictinogomphus* COWLEY. Legs slightly more slender. Posterior lobes broad, rounded, inner hamules with very long, slender hook (fig. 8c, d). Pterostigma elongate. Forewing with 18-20 Ax; subpterostigmatal cellules slightly larger than those below them. Sectors of arculus widely separated at base.

Discoidal cell in forewing an isosceles triangle, not elongate as in *Ictinogomphus* COWLEY; of 3 cellules; hypertriangle crossed once or twice; subtrigone of 2-3 cellules. Discoidal field with 3 cells at triangle, then 2 rows, expanding considerably, well before nodal level. Forewing

with 3 Cu<sub>q</sub>, hindwing with 2-3 Cu<sub>q</sub>. Anal loop of 5 cellules. Cu<sub>2</sub> originating at lower angle of triangle in hindwing. Anal triangle of 5 cellules.

Type species *Ictinogomphus dundoensis* PINHEY.

*Ictinogomphus* COWLEY has the discoidal cell more elongate in forewing and composed of 4 cellules. The anal loop of the hindwing is frequently of 6 cellules, occasionally even 7. In *Gomphidia* SELYS the discoidal cell is also elongate in the forewing and is normally composed of 4 cellules, but the anal loop of the hindwing only has 3-4 cellules.

KEY TO THE ETHIOPIAN GENERA OF *COMPHIDAE*, SUBFAMILY *LINDENIINAE*

1. Abdomen robust in both sexes and both sexes having foliations on segment 8 ..... 2.
- Abdomen slender in the male, sometimes broad in the female; male without abdominal foliations but narrow foliations sometimes present in female ..... 3.
2. Discoidal cell in forewing with anterior edge distinctly longer than basal edge, and enclosing 4 cellules. Foliations on segment 8 as broad as the segment ... *Ictinogomphus* COWLEY
- Discoidal cell of forewing a right angled isosceles triangle enclosing 3 cellules. Foliations on segment 8 much narrower than the segment ..... *Cinitogomphus* gen. nov.
3. Subpterostigmatal cells smaller than those below them. Superior appendage of male strongly bifurcate ..... *Diastatomma* BEAUVOIS
- Subpterostigmatal cells as large as those below them. Superior appendage of male simple, unbranched ..... *Gomphidia* SELYS

*Cinitogomphus dundoensis* (Pinhey)

(Fig. 8)

*Ictinogomphus dundoensis* PINHEY, 1961, *Publ. cult. Cia. Diamantes Angola*, 56: 73-74, ff.

*Allotype male* (mature). Smaller than an *Ictinogomphus* COWLEY, more robust than a *Gomphidia* SELYS. Labium greenish yellow. Face and frons greenish yellow with blackish marking; a median line down the labrum, narrowing ventrally; black dot on postclypeus at junction of anteclypeus; a band across front of frons and a basal triangle on frons. Vertex black; vesicles prominent, yellow; occipital plate rectangular, black, with yellow transverse stripe in middle.

Prothorax black, with yellow peripheral spots; hindlobe narrow, with discontinuous yellow line along the border. Synthorax brown, with greenish yellow markings as in the female; mesothoracic collar and ventral end of median carina yellow, and two antehumeral stripes, the oblique inner one just touching the lateral end of the collar. Side of thorax with three yellowish stripes, one each, on mesepimeron, metepisternum (with ventral end abruptly narrowed) and metepimeron. Bases of legs and the femora yellow, with black «knees»; tibiae and tarsi black.

Abdomen more yellow on middle segments than in any known African relatives (the three genera mentioned above). Segment 1 black with yellow distal annulus, incomplete dorsally; segment 2 black with yellow median line and distal yellow spot, the oreillets and accessory appendages also yellow (fig. 8c, d); segments 3-6 yellow with black annulus at distal end and three black lines, one medial, one on each side, linked by a black central annulus, the marking somewhat like a television aerial. Segment 7 yellow with short black median line on basal half and broad black distal annulus; segment 8 black with yellow lateral spot at each end, narrowly

connected before the black foliation (fig. 8e); segment 9 similarly marked, but without foliation; 10 black with yellow distal band (fig. 8a); superior appendage more robust than in *Gomphidia* SELYS, yellow; inferior black, about one third as long (fig. 8a, b). Superior with a few small subapical teeth on inner surface.

Venation mainly black, but costal edge and the costal-subcostal crossveins yellow; pterostigma black. Forewing with 18-20 Ax, the 7th. being primary; 9-11 Px. 6 1/2 subpterostigmatal cellules, these being slightly larger than the cellules below them. Anal loop in hindwing of 5 cellules. Membranules brown.

Abdomen (without appendages) 49 mm, hindwing 38 mm, pterostigma 5 mm.

Lubumbashi, Elizabethville, October 1951, leg. C. SEYDEL. In the SEYDEL collection this had been labelled *Ictinogomphus ferox* (RAMBUR), which is a much larger insect apart from generic differences; and the markings on the abdomen are very distinct.

*Diastatomma selysi* SCHOUTEDEN, 1934, *Ann. Mus. Congo Belg. Zool. Sér. 3* (1): 58.

Previously only two females of this species have been collected in Mwinilunga District, both on the Lisombo River. A series of both sexes was taken on the same river in May, 1963.

*Neurogomphus wittei* SCHOUTEDEN, 1934, *Ann. Mus. Congo Belg. Zool. Sér. 3* (1): 67.

As in May, 1961, this little known species was again in evidence in May in grassland at Katambora, Zambezi River, upstream from the Victoria Falls.

*Paragomphus? cognatus* (RAMBUR), 1842, *Névr.* 167.

Some large examples, all females, were attracted to the mercury vapour light trap at the Zambezi Rapids camp. Larger than average it is not possible to say whether they are this species until a male is found. In markings they are similar but the abdominal foliations are somewhat broader.

Abdomen 35 mm, hindwing 31 mm.

A large female *P. cognatus* (RAMBUR), from Rhodesia, measures: abdomen 34 mm, hindwing 30 mm.

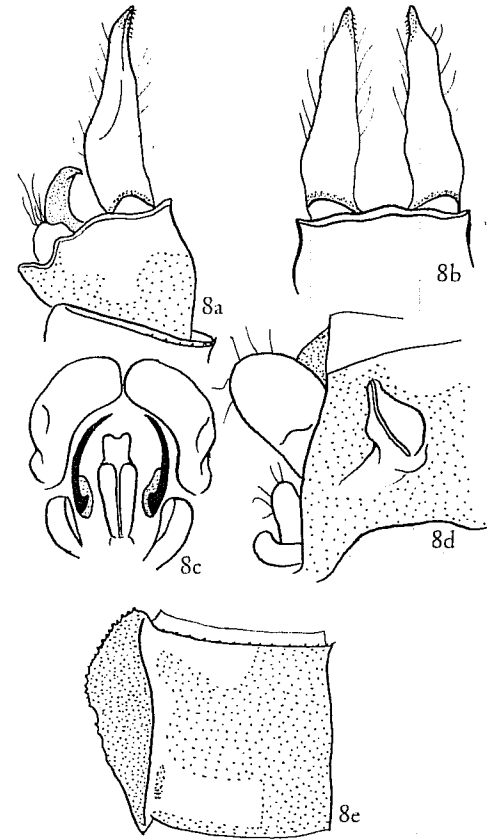


Fig. 8. — *Cinitogomphus dundoensis* (PINHEY) ♂: a, b. anal appendages, from right and from above; c, d. accessory appendages from below and from right; e. abdominal segment 8 from right.

*Onychogomphus Selys (1854)*

Two species of this genus were found in the Mwinilunga District, *O. kitchingmaui* PINHEY (1961b) of which a single male was taken at the type locality, Ruakara River, and examples at light of what is a new species or a new subspecies of the Western Uganda *O. styx* PINHEY (1961a).

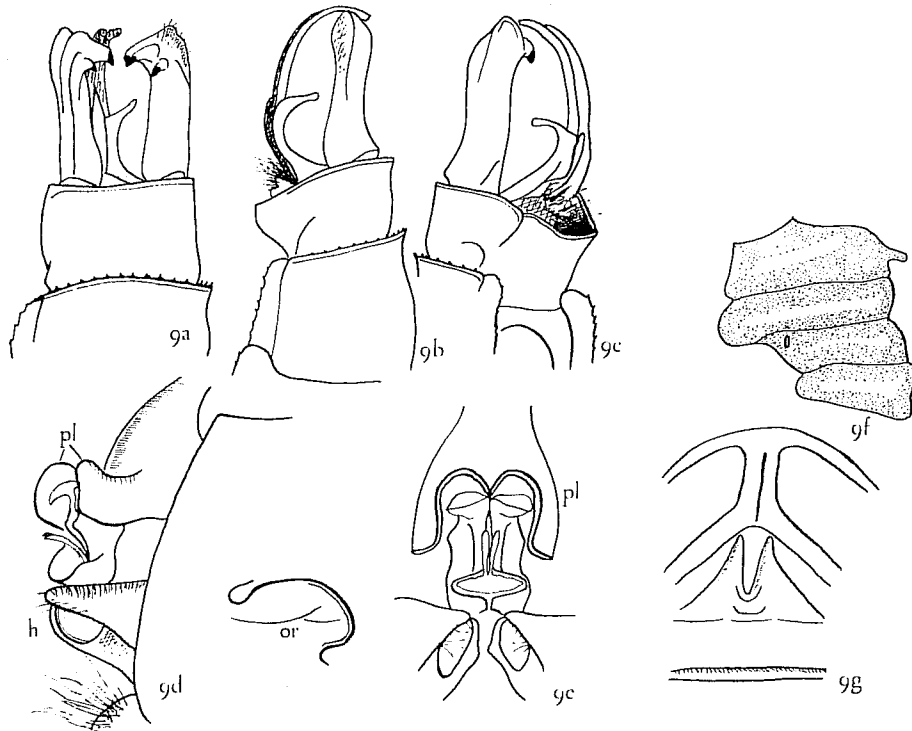


Fig. 9. — *Onychogomphus quirrkii* spec. nov.: a-c. anal appendages of ♂ from above, from right and obliquely from left; d. second abdominal segment of ♂ from right. h = hamules, or = oreillet, p. l. = posterior lobes; e. penial lobes and hamules from below. p. l. = posterior lobes; f. thorax of ♂ from left; g. vulvar scale of ♀ from below.

*Onychogomphus quirrkii* spec. nov.

(Fig. 9)

A moderate-sized dark species.

*Holotype male* (mature). Labium yellow but suffused everywhere, except at periphery, with greenish grey. Face in front and frons, except at crest, darkish brown, the labrum orange at lateral edges, the anteclypeus greenish. Frons above and at crest green, with very broad black basal band. Vertex and the rectangular occipital plate black.

Prothorax black. Synthorax blackish ferruginous to black with green markings (fig. 9f): green at collar and a fusiform antehumeral stripe, as well as a very faint dorsal dot; narrow green stripes on mesepimeron, metepisternum and metepimeron. Legs black; mid-femora ferruginous in basal half, hind-femora ferruginous except distal ends.

Abdominal segments 1-3 ferruginous; segment 1 with dorsal and lateral green patches; segment 2 with a constricted green dorsal band and broad sublateral band, the oreillet also green, convexly rounded. Segment 3 with broad greenish basal annulus connected dorsally to a small greenish mid-dorsal spot; segments 4-6 black with narrow green basal annulus and a small mid-dorsal spot. Segments 7-10 ferruginous, blackish dorsally; 7 yellow on basal half. Foliations narrow. Superior appendages (fig. 9 a-c) ferruginous, inferiors mainly black except at base. Superior robust, with two inner subapical teeth; inferior slender, with vertical branch at mid-way. Accessory genitalia (fig. 9e) with robust conical outer hamules. Penial flagellum with pair of delicate basal, ventral filaments and with terminal funnels.

Wings faintly fumose. Venation black or blackish. Pterostigma dark brown, between black veins. Only a trace of a whitish membranule. Forewing with 12-13 Ax, the 5th. primary; 9-11 Px. Discoidal field of two rows (2-3 cellules at triangle) expanding from nodal level. 1 Cuq, but 2 in right forewing; all triangles and subtrigones free, but triangle in left hindwing with one crossvein.

Abdomen (without appendages) 32 mm, hindwing 28 mm, pterostigma 3 mm.

In life the eye was coeruleous; body markings pale blue-green, that on abdominal segment 7 greenish white.

The single male came to a mercury vapour light trap at about 9 p. m., Zambezi Rapids, Ikelenge, 4th. May, 1963.

*Allotype female* (mature). Marked entirely like male. Abdomen stouter. Cerci reddish, about 1 1/2 times as long as segment 10, tapering. Vulvar scale as in fig. 8g.

Forewing with 12-13 Ax.

Abdomen 32 mm, hindwing 29.5 mm, pterostigma 3.5 mm.

*Paratype female* (mature). Similar. Forewing with 13 Ax.

Both females were taken at mercury vapour light, Zambezi Rapids, 11th. May, 1963.

This species with its dark thorax is closest to *O. styx* PINHEY (1961a) (Uganda). This latter species has a slightly shorter antehumeral stripe and broader lateral thoracic stripes. Anal appendages are very similar, with the two subapical teeth on the superior, but the inferior is paler. Accessories also paler. The penial flagellum differs in *styx* in lacking the basal filaments and the funnels are less developed. This Mwinilunga insect probably represents a southern race of *styx*. Holotype and allotype in National Museum, Bulawayo, paratype female in British Museum (Nat. Hist.).

*Crenigomphus Selys (1892)*

*Tragogomphus seydeli* SCHOUTEDEN, 1934, *Ann. Mus. Congo Belg. Zool. Sér. 3* (1): 64.

The anomalous species *Tragogomphus seydeli* SCHOUTEDEN, the description of which does not seem to indicate that it belongs to *Tragogomphus* SjöSTEDT (1899) but nearer the *Paragomphus* COWLEY group (vide PINHEY, 1962b: 186, suggesting possibly *Crenigomphus* SELYS) is evidently a *Crenigomphus* SELYS. The late C. SEYDEL who collected the type female (now in the Musée Royal d'Afrique Centrale) on the Lubumbashi River, Elizabethville, labelled a second female «*Tragogomphus seydeli* SCHOUTEDEN». This specimen has now been examined by the author and it is definitely a *Crenigomphus* SELYS. The body is rather stained but of known species it is nearest to, and certainly a form of *C. cornutus* PINHEY (1956).

In this second female, taken by SEYDEL at Elizabethville, July, 1952 (E9317), the venation on the right forewing is slightly aberrant, having 3 crossveins between the sectors of the arculus



prior to the bifurcation of RS, and this feature probably led to the assumption that it belonged to the genus *Tragomphus* SJÖSTEDT. Such an abnormality is not rare in *Crenigomphus* SELYS and a paratype of *C. cornutus* PINHEY has this condition. The left forewing of SEYDEL's example has the normal venation. It is evident that the third crossvein between the sectors varies in position. Furthermore, the specimen has 13 Ax, 7-8 Px in the forewing, whereas in the type female *T. seydeli* there were 12 Ax, 9 Px. In size, the abdomen is 30 mm, hindwing 28 mm, which is smaller than the type, which had an abdomen of 33 mm, hindwing 30 mm. These differences are, however, within the range of variation of *C. cornutus* PINHEY. In other features it agrees and the author proposes the following synonymy:—

*Crenigomphus seydeli* (Schouteden, 1934)

syn. nov. *Crenigomphus cornutus* Pinhey (1956)

*Crenigomphus cornutus* PINHEY has been recorded from various parts of Northern Rhodesia and this now extends the range to southern Katanga. The SEYDEL collection also contained a male from Elizabethville area which agrees with *C. cornutus* PINHEY.

Family AESHNIDAE

*Aesbna rileyi* Calvert

*Aeschna rileyi* CALVERT, 1892, *Trans. Amer. ent. Soc.* **19**: 164.

*Aeschna subpupillata* MCLACHLAN, 1896, *Ann. Mag. nat. Hist.* (6) **17**: 422.

The examples of this species collected in the Mwinilunga District of Northern Rhodesia are constantly small in size, like *f. subpupillata* MCLACHLAN, and fumose on the wings. It appears reasonable to consider these as a localized race.

*Aesbna rileyi raphaeli* subsp. nov.

*Holotype male* (mature). Head and face markings typical. Green antehumeral stripe more pronounced and extending upwards almost to meet a dorsal green spot. Wings strongly fumose, the apices darkened. Anal and accessory appendages typical.

Abdomen (without appendages) 42 mm, hindwing 41.5 mm, pterostigma 4 mm.

Other males, including a paratype, show variation in the development of the antehumeral stripe, in one case being complete in others like the type or rather less complete.

*Allotype female*. Antehumeral stripe as incomplete as in typical *rileyi* but the wings strongly fumose.

Abdomen 41 mm, hindwing 46 mm, pterostigma 4.5 mm.

These males and two females were collected at dusk on the Sakeshi River, Hillwood Farm, Ikelenge, April 1963, by RAPHAEL MPALA after whom this race is named. They fly very fast and erratically, as the author noted when he saw them on the wing. One male and one female were also collected in February 1960, and a female in April 1961, on earlier expeditions. Holotype and allotype in National Museum, Bulawayo, a paratype of each sex in the British Museum (Nat. Hist.).

*Anax congoliath lisomboae* PINHEY, 1962, *Occ. Pap. Nat. Mus. S. Rhodesia* **26** (B): 908.

Known previously only from the single holotype collected on the Lisombo River, close to the Angola border, a further series of males was collected at the end of April and early in May, 1963. Females of this very robust species were seen ovipositing on debris in this river and its tributary the Ksombo-Sombo, but they proved elusive. They were seen close enough when ovipositing to indicate, as in other species of the genus, close similarity in colour and markings to the male.

Three species of *Gynacantha* RAMBUR (1842) (*Acanthagyna* KIRBY, 1890) were collected: *G. villosa* GRÜNBERG (1902) and *G. nigeriensis* GAMBLES (1956), flying at dusk; and the little known *G. ochraceipes* (PINHEY, 1960) of which one male was found dead at the bridge over the Lutchigena River, East Angola.

The most interesting Aeshnid discovered, however, was a single small female *Heliaeschna* SELYS (1882), captured whilst ovipositing in a small patch of swampland on the Zambezi River near the Rapids, Ikelenge, 6 May, 1963. Unfortunately as so often happens in the females of *Heliaeschna* SELYS and *Gynacantha* RAMBUR, the cerci, which assist identification, had broken off during the ovipositing process. It appears to be near *H. trimaculata* FRASER (1955), which was, in fact, recorded from Upemba National Park, Katanga, an area related faunistically to Mwinilunga.

Family CORDULIIDAE

Three species of *Macromia* RAMBUR (1842) were collected. Commonest of these was *M. monoceros* FÖRSTER (1906). The other two are large dark species with a single yellow band encircling the synthorax.

*Macromia unifasciata* FRASER, 1954, *Rev. Zool. Bot. afr.* **49**: 67, ff.

Only one male and one female had previously been collected in the area, the male on the Sakeshi River, Hillwood Farm, the female by a member of Sakeji School. It had been noted (PINHEY, 1961b) that the male had unusually golden eyes. In one of a series collected on this last expedition, however, the eyes were yellowish green.

*Macromia sophia?* SELYS, 1871, *Bull. Acad. Belg.* (2) **31**: 550.

A single male of this magnificent species, larger and blacker than *M. unifasciata* FRASER, was captured by the Assistant, RAPHAEL MPALA, on the Nseloki River, Ikelenge, April, 1963. This is the first recorded example outside the equatorial zone (!).

Family LIBELLULIDAE

*Monardithemis flava* LONGFIELD, 1945, *Arch. Mus. Bogaë* **16**: 22, 29, ff.

A solitary female of this species, only known from the type material collected in southern Angola, was found on the Lisombo River, near the Angola border, 8 May, 1963. The wings are tinted with yellowish along the costal zones and there is an amber basal spot on each wing. Venationally, it agrees with typical examples, but the triangles on the forewing are free (which is a possibility recorded in the diagnosis). The anal loop has about 15 cells.

*Allorbizucha* Karsch (1890)

The species *A. preussi* KARSCH (1891) was again in evidence in the Ikelenge region of Mwinilunga, as well as two examples of a new and larger species. On a previous visit a third

(!) The author has more recently examined the type of *sophia* and it is *not* the species recorded as *sophia* SELYS by FRASER. (PINHEY)

species, *A. klingi* KARSCH (1890) has been taken there and so this new one is the third member of the genus in the District.

*Allorbizucha longistipes* spec. nov.

(Fig. 10)

*Holotype male* (mature). Labium yellow with broad black median band, covering also the posterior lobe. Labrum black; epistome and sides of frons greenish yellow; frons above

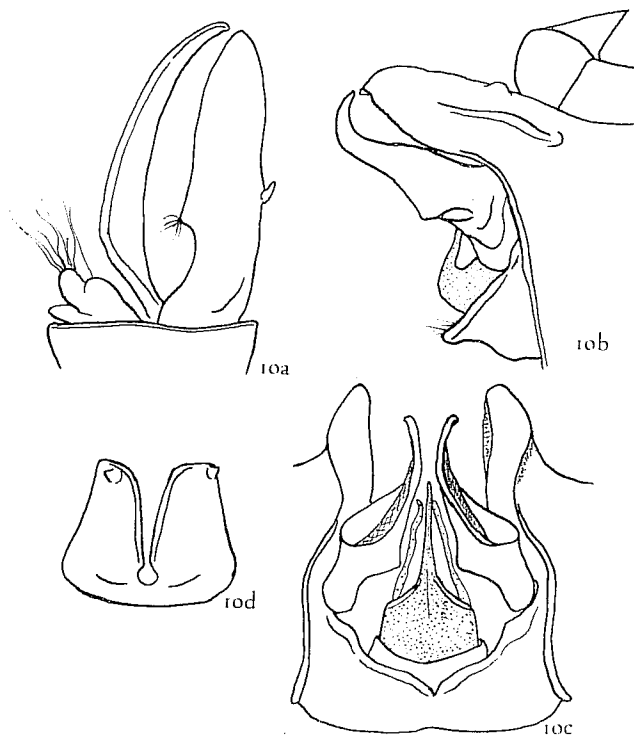


Fig. 10. — *Allorbizucha longistipes* spec. nov.: a. anal appendages of ♂ from right; b, c. accessory genitalia of ♂ from right (penial complex dotted); d. vulvar scale of ♀ from below.

metallic greenish blue, the sulcus moderate; vesicle metallic steely blue. Occipital triangle blackish with orange spot.

Prothorax not distinctly visible. Synthorax steely blue, with traces of white lateral pruinosity. A broad greenish yellow antehumeral band (as in *A. preussi* KARSCH), tapering somewhat dorsally. A broad greenish yellow lateral band covering almost all the metepisternum

and slightly encroaching on to the mesepimeron; a narrower band on posterior half of metepimeron. Legs black; a yellowish streak on fore femur.

Abdominal segments 1-3 mainly greenish yellow, with rather ill-defined blackish marking: on dorsum of 1; a laterobasal spot on 2, a basal twin-spot on segment 3, which is a short segment. Segments 4-7 yellowish on basal half, black distally; 8 black with diffuse reddish basal patch, segments 9-10 all black, 10 being a small segment. Appendages black. Superior appendage (fig. 10a) about two and a half times as long as segment 10, very robust, tapering slightly, stump-like; a minute tooth on dorsal surface at about halfway, and a small tufted angle on ventral surface. Hamule (fig. 10b, c) very robust, with long hook, posterior lobe elongate, stump-like in lateral view.

Wings hyaline, with trace of yellow at base of hindwing. Venation and pterostigma black. Forewing with 11 and 13 Ax, 7 Px. Veins very straight. Arculus distal to second Ax. No accessory Bs<sub>q</sub> or Cu<sub>q</sub>. Anal loop of 4 cells.

Abdomen 22 mm, hindwing 27 mm, pterostigma 2.8 mm.

In life, the eye was blue-green, labium yellow, epistome whitish yellow; markings on thorax and base of abdomen pale green; pale markings on segments 3-9 dull orange.

*Allotype female* (mature). Labium with narrower black median band, but extending on to posterior lobe. Labrum black with trace of yellow at base. Frons above partly orange with metallic blue zone restricted. More orange on occipital triangle.

Prothorax mainly blackish. Synthorax greener in front, blacker laterally, with some pale bands. Legs as in male.

Abdomen broader. Segments 1-4 mainly yellow; segments 3-4 with discontinuous black dorsal band and a short disto-lateral black bar below the lateral carina. Segment 5 yellowish, mainly black on distal half, black below lateral carina; segment 6 yellowish with short black distal bar; 7 similar with broader distal patch; segment 8 black with small reddish basal spot; 9-10 black. Cercus blackish, slender, about as long as segment 10, vulvar scale (fig. 10d) broad, deeply bifid.

Wings slightly fumose; a trace of basal amber on hindwing. Discoidal field of forewing with one row of cells to nodal level and then increasing to two or three; arculus nearly at third Ax; 13 Ax, 7 Px. Otherwise as in male but anal loop with 5 cells.

Abdomen 22.5 mm, hindwing 31.5 mm, pterostigma 3 mm. In life, the eye blue-grey; thoracic bands pale green; abdominal segments 1-2 green, the rest of the abdomen marked with orange-yellow.

These two examples of this large species, named «longistipes» because of the long, stump-like anal and accessory appendages of the male, were collected in forest on the Lisombo River, Ikclenge, the female (by the African assistant) on 28 April, the male on 1 May, 1963.

Apart from its large size this species differs in many respects from the three known species. *A. champion* RIS (1915) differs in the appendages, which are more like those of *A. klingi* KARSCH; and in having 3-5 Cu<sub>q</sub> in the forewing. In the number of Cu<sub>q</sub> the new species is like *A. klingi* KARSCH and *A. preussi* KARSCH, and in thoracic markings it is nearer *preussi*, differing again in having a wider black band on the labium. The superior appendage is much more robust than any of the other species, apart from its shape and other characters of the appendage; and the extremely long hamular hook is distinctive.

The two types are in the National Museum, Bulawayo.

*Notiothemis robertsi* FRASER, 1944, *Proc. R. ent. Soc. Lond.* (B) 13: 42, ff.

Described from Uganda, this is a common species in Ikclenge gallery forests and on a previous visit the present author obtained the unknown female (PINHEV, 1961b). Two further females were collected on the recent expedition.

### *Hadrothemis* Karsch (1891)

Known in Mwinilunga District and again collected there were the two species *H. defecta* (KARSCH, 1891) and *H. versuta* (KARSCH, 1891). A single example of another species was collected by the Assistant, RAPHAEL MPALA:—

*Hadrothemis scabrifrons* RIS, 1909, *Coll. Zool. Selys* 10: 172.

The solitary example is a teneral male taken at the Zambezi Rapids, 6 May, 1963. Unlike mature specimens seen or collected by the present author in Tanganyika, this immature specimen is beautifully suffused with amber on the wings, this colour deepening to a rich orange along each subcostal zone. The pterostigma is orange. The sides of the thorax and the dorsum of the abdomen are orange-brown.

In the mature male the abdomen is bright red and the wings are hyaline with only traces of orange in the subcostal spaces.

### *Orthetrum* Newman (1833)

Several species of this genus are known from Mwinilunga District of which the more interesting ones include the large *O. angustiventre* (RAMBUR, 1842), in grassland; *O. macrostigma* LONGFIELD (1945), of which a series was collected by pupils of Sakeji School; *O. microstigma* RIS (1911), common in swampy stretches of streams; and *O. rhodesiae* PINHEY (1961b).

A further addition on this expedition was a short series of the largest member of the genus, the very robust *O. austeni* (KIRBY, 1900), which was found in swampy patches.

On the Lutchigena River, Angola, the two species taken were the widespread *O. abboti* CALVERT (1892) and *O. chrysostigma* (BURMEISTER, 1839).

### *Palpopleura* Rambur (1842)

*P. jucunda* RAMBUR (1842) and *P. lucia* (DRURY, 1773) form *portia* (DRURY, 1773) were flying together on the Sakeshi River, Ikelenge. The interesting feature was the great variability, on the one stream, of *P. lucia* f. *portia* (DRURY), the male varying from examples heavily marked with black on the wings to smaller individuals with great reduction in the black. In flight the small poorly marked specimens were almost indistinguishable from *P. jucunda* RAMBUR, which, itself is normally small and has restricted wing marking.

*Aethiothemis solitaria* RIS (1908), common in Mwinilunga District and elsewhere in Northern Rhodesia, was found also on the Lutchigena River, Angola.

### *Porpacithemis* Fraser

*Porpacithemis* FRASER, 1954, *Rev. Zool. Bot. afr.* 50: 261.

Syn. nov. *Lokithemis* PINHEY, 1956, *Occ. Pap. Coryndon Mus.* 4: 33.

It is evident by the variability of examples of *Porpacithemis dubia* FRASER (1954), which is moderately common in Ikelenge forests, that *Lokithemis* PINHEY must fall in synonymy.

*P. dubia* FRASER was again collected at Ikelenge and also on the Lutchigena River, Angola. *P. leakeyi* (PINHEY, 1956) is only known from Abercorn, Northern Rhodesia.

A third known species of the genus is *P. trithemoides* FRASER (1958a).

### *Porpax* Karsch (1896)

Until 1962 only a single species of this genus was known from Mwinilunga, *Porpax asperipes risi* PINHEY (1958), which occurs sparingly in swamp near the Sakeshi River. Then pupils of Sakeji School, nearby, sent the author a few males of *Porpax asperipes* KARSCH (1896). Consequently it is evident that the former insect is a distinct species *P. risi* PINHEY.

*Sympetrum navasi* LACROIX, 1921, *Ann. Soc. ent. Belg.* 61: 378.

A solitary male of this species was captured on Mr. GRAHAM GUY's expedition up the Zambezi River in December, 1961, at Shesheki.

Although not a species recorded on the expedition detailed in this paper this is a most interesting new record for this species. Described from Gambia in West Africa it has previously only been found elsewhere on the northern shores of Lake Victoria, in Uganda. In that locality it is abundant in the fringing reeds of the lake and the off-shore islands (PINHEY, 1961a).

### *Trithemis* Brauer (1868)

Species taken on the Lutchigena River, Eastern Angola, were some of those which are well known in the Mwinilunga District: *T. dichroa* KARSCH (1893), *T. pluvialis* FÖRSTER (1906) and *T. stictica* (BURMEISTER, 1839).

### ZYGONYX HAGEN

*Zygonyx* HAGEN, 1867, *Verh. zool. bot. Ges. Wien* 17: 62; PINHEY, 1962b: 274.

Further material from the Congos and from the author's expedition to the Angola and Congo borders of Rhodesia, particularly the Mwinilunga District, in April-May, 1963, has brought more light on the continental African species. It is now possible to make at least a partial revision of this genus.

These species are divisible into three groups, as follows:—

1. *Torrída* Group. Small to moderately large species, with narrow hindwing. Thorax all brown or blackish, without a white transverse stripe across the mesepisterna, with or without pale lateral stripes. Females closely similar to males. Wings without dark fasciation. Hindwing up to about 50 mm.
2. *Speciosa* Group. Moderate to large species, with narrowish hindwing. Thorax all brown to blackish, generally with whitish transverse stripe across the mesepisterna, and with whitish or yellow lateral stripes. Abdominal segment 7 normally with a broad white or yellow band. Females generally more or less distinct from males, particularly in wing markings; male with black basal patch; female with black or brown basal patch and usually other fasciae in the centre or at the apex. Females occasionally di- or polymorphic. Hindwing 45-48 mm.
3. *Eusebia* Group. Very large species, the hindwing exceptionally broad near base. Thorax dark in front with pale bands and stripes; pale at sides with traces of dark markings. Male with traces of brown at tornus of hindwing; female with the wings extensively deep yellow with marginal or apical fasciation. Hindwing 53-61 mm.

ACCESSORY APPENDAGES IN *SPECIOSA* AND *EUSEBIA* GROUPS



Figs. 11-16. 11-15. — *Zygonyx* HAGEN. Accessory genitalia of ♂ from right: 11. *Z. atritibiae* spec. nov. (Mwinilunga); 12. *Z. regisalberti* (SCHOUTEDEN) (Ituri); 13. *Z. speciosa* KARSCH (Ikoni); 14. *Z. pretentiosa* FRASER (Mambili Forest, M. Congo); 15. *Z. eusebia* (RIS) (Mwinilunga). 16. Penis of *Z. pretentiosa* FRASER (allotype, Ketta Forest).

In the *Speciosa* Group the males are all very similar in general appearance and this similarity is reflected in the accessory appendages to such an extent that it might be thought that the four species considered here are subspecifically connected. The known distribution is not yet sufficiently illuminating for this hypothesis and the females are at least distinctive. The loan of the type male of *Pseudomacronia speciosa* KARSCH by Berlin Museum has shown the necessity of reorganizing the species of this group.

In the male accessory appendages of *atritibiae* spec. nov. (fig. 11) the hamule is broad, the hook moderately long and slender. The anterior lamina is robust, the posterior lobe angular. In *regisalberti* (SCHOUTEDEN) (fig. 12) the hamule is less robust, the hook slightly longer, the anterior lamina also less robust, the posterior lobe more rounded. In *speciosa* (KARSCH) (which may be the male of *pretiosa* (KARSCH)) the condition (fig. 13) is nearer *atritibiae* spec. nov., but with a long hook; posterior lobe angular. In *pretentiosa* FRASER the hook and hamule are large but the posterior lobe is rounded (fig. 14).

Of the *Eusebia* Group the author has only examined the accessory genitalia of *eusebia* (RIS) (fig. 15). These are very different from the *Speciosa* Group, the anterior lamina and posterior lobe being different in shape. The posterior lobe is elongate but not strongly buttressed by a fold from the body wall, as it is in the *Speciosa* Group. The hamular hook is broad and massive. The apical hair (fig. 15) on the anterior lamina is very thick in the *Mwinilunga* examples but much less so in specimens from Ketta Forest, etc. in the Moyon Congo which, to judge by FRASER's figure for the type of *prodigiosa* (FRASER, 1958b), is possibly more like the typical condition.

KEY TO CONTINENTAL AFRICAN SPECIES

1. Thorax at sides mainly dark brown or else pruinosed. Hindwing not very broad, with less than 6 rows of cells between anal loop and base ..... 2.

- Thorax at sides never pruinosed, mainly pale yellowish, pale brownish, or pale greenish. Hindwing very broad near base, with 6-8 rows between anal loop and base ..... 14.
- 2. Thorax either entirely dark metallic or entirely pruinosed, without yellow or whitish stripes ..... 3.
- Thorax without or with scarcely any pruinosity and always with irregular yellowish lateral stripes ..... 4.
- 3. Mature male pruinose blue. Abdomen 34-37 mm, rarely 38 mm ... *nataleensis* (MARTIN)
- Mature male very dark, non-pruinose. Abdomen 38.5 mm ..... *ikonae* PINHEY
- 4. Abdomen with distinct large rounded orange lateral spots but without a broad white or yellow band across segment 7 ..... *torrida* (KIRBY)
- Abdomen with or without elongate yellow (not orange) lateral spots, often with a broad yellow band across segment 3 and always with a broad pale band across segment 7 ..... 5.
- 5. Hindwing with a narrow dark brown band along anal margin; wings without other dark fasciae. Thorax in front without whitish transverse band. Abdomen 40 mm or less, hindwing 45 mm or less. Abdominal segment 7 not inflated ..... 6.
- Hindwing usually with black basal patch but no stripe along anal margin. Abdomen generally over 40 mm, hindwing over 45 mm, but if abdomen not more than 40 mm then abdominal segment 7 is inflated or the wings have dark fasciae ..... 7.
- 6. Abdomen short, 36 mm; hindwing about 40 mm ..... *flavicosta* (SjÖSTEDT) and ssp. *mwinilungae* PINHEY
- Abdomen elongate, 38-40 mm; hindwing 43-45 mm ..... *fallax* (SCHOUTEDEN)
- 7. Tibiae black in both sexes; labium partially or wholly black. Hindwing 45-46 mm. Female with black or brown markings confined to the basal area of the wings; wings suffused to a variable extent with amber ..... *atritibiae* spec. nov.
- Tibiae rufous; labium orange brown, occasionally darker only on posterior lobe ... 8.
- 8. Males ..... 9.
- Females ..... 11.
- 9. Hindwing 43-47 mm. Basal dark patch on hindwing restricted, especially in cubital space, not reaching Cuq ..... *regisalberti* (SCHOUTEDEN)
- Hindwing 48-52 mm ..... 10.
- 10. Basal black on hindwing extended in cubital space to reach Cuq ..... *speciosa* (KARSCH)
- Basal black on hindwing restricted in cubital space, not reaching Cuq ... *pretentiosa* FRASER
- 11. Apex of wing without brown patch ..... 12.
- Wing apices with distinct brown fasciae ..... 13.
- 12. Thorax in front without pale transverse band. Hindwing mainly bright amber with an irregular brown band extending obliquely from tornus to pterostigma.. *speciosa* (KARSCH)
- Thorax in front with whitish transverse band. Hindwing not mainly amber; with either a curved medial band or the basal half of the wings all brown... *pretentiosa* FRASER
- 13. Medial area of hindwing with a small brown posterior fascia; or the basal area of all wings entirely brown. Hindwing 52-53 mm ..... *regisalberti* (SCHOUTEDEN)
- Medial area of both wings with very broad, irregular band. Hindwing 57-58 mm ... *pretentiosa* form *umbrosa* FRASER
- 14. Males ..... 15.
- Females ..... 16.
- 15. Labrum black ..... *chrysobaphes* (RIS)
- Labrum orange ..... *eusebia* (RIS)
- 16. Hindwing without a brown band along posterior margin ..... *chrysobaphes* (RIS)
- Hindwing with a distinct but discontinuous brown band along posterior margin ... *eusebia* (RIS)

1. TORRIDA GROUP

*Zygonyx torrida* (KIRBY), 1889, *Trans. zool. Soc. Lond.* **12** : 299, 340; PINHEY, 1962b: 227.

Both sexes have the body metallic blackish, with irregular orange thoracic stripes and with orange lateral spots along the abdomen. The female only essentially differs from the male in having a broader base to the abdomen. Hindwing 45-49 mm. Widespread throughout Africa but only a few examples have been observed at Mwinilunga.

*Z. natalensis* (MARTIN), 1900, *Bull. Mus. Hist. nat. Paris*: 106, 107; PINHEY, 1962b: 276.

The body here is more strongly metallic and the orange markings are less conspicuous. In the mature condition the body markings are largely obliterated and, in the male, pruinosity develops, particularly on the thorax and at both ends of the abdomen. Hindwing 37-41 mm. Widespread from south to tropical Africa, this species, again, is not much in evidence in the Mwinilunga District.

*Z. ikomae* PINHEY, 1961, *Ent. mon. Mag.* **96** : 270, f.

A very dark species closely related to *Z. natalensis* (MARTIN), still only recorded from the Cameroons-Nigerian border where the author found it flying amongst that species. Female unknown, in fact the only known Continental African species in which this sex has still definitely eluded capture. Hindwing 41 mm.

*Z. flavicosta* (SjÖSTEDT), 1899, *Bih. svensk. Vetensk. Akad. Haudl.* **25** : 24; PINHEY, 1962b: 276.

*Z. flavicosta mwinilungae* PINHEY, 1961, *Occ. Pap. Rhodes-Livingstone Mus.* **14** : 90.

This small dark species is characterized by its short abdomen which is *not* inflated on the distal segments, in either sex. The thorax has pale lateral lines and abdominal segment 7 has a broad white band. Abdomen 36 mm or less, hindwing about 40 mm.

The subspecies *mwinilungae* PINHEY is distinguished chiefly by facial marking, with more black on the labium.

This is by far the commonest member of the genus in the Mwinilunga area, including streams on the Angolan side of the border. It may be seen hovering over most stretches of faster running water.

The species itself extends northwards to the equatorial region.

*Z. fallax* (SCHOUTEDEN), 1934, *Ann. Mus. Congo Belg. Zool. Sér.* **3**(1): 32; PINHEY, 1962b: 276.

Closely allied to the last species but generally slightly larger, the abdomen more elongate. Abdomen 38-40 mm, hindwing 43-47 mm. Equatorial Congo.

2. SPECIOSA GROUP

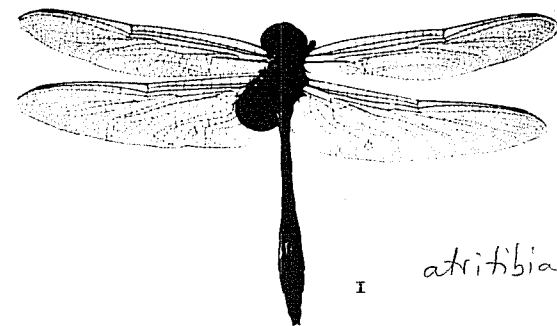
*Zygonyx atritibiae* spec. nov.

(Pl. I, fig. 1, 2; text fig. 11).

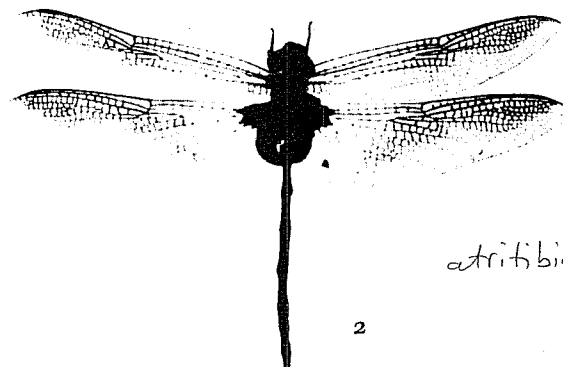
*Zygonyx speciosa* Auctt.

This is a small, distinct species of this group occurring in parts of Northern Rhodesia and Southern Congo. Angola records of *speciosa* possibly refer to this new species since it is common on the Angola border of Northern Rhodesia on rivers flowing into Angola.

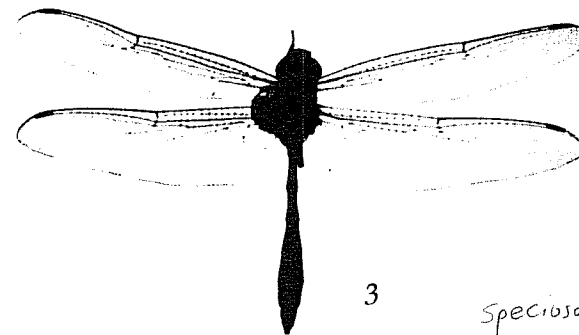
Like other species of this group there is a distinct white band across the front of the thorax; yellowish lateral stripes; and a broad white band on abdominal segment 7. The subterminal



I *atritibiae* ♂



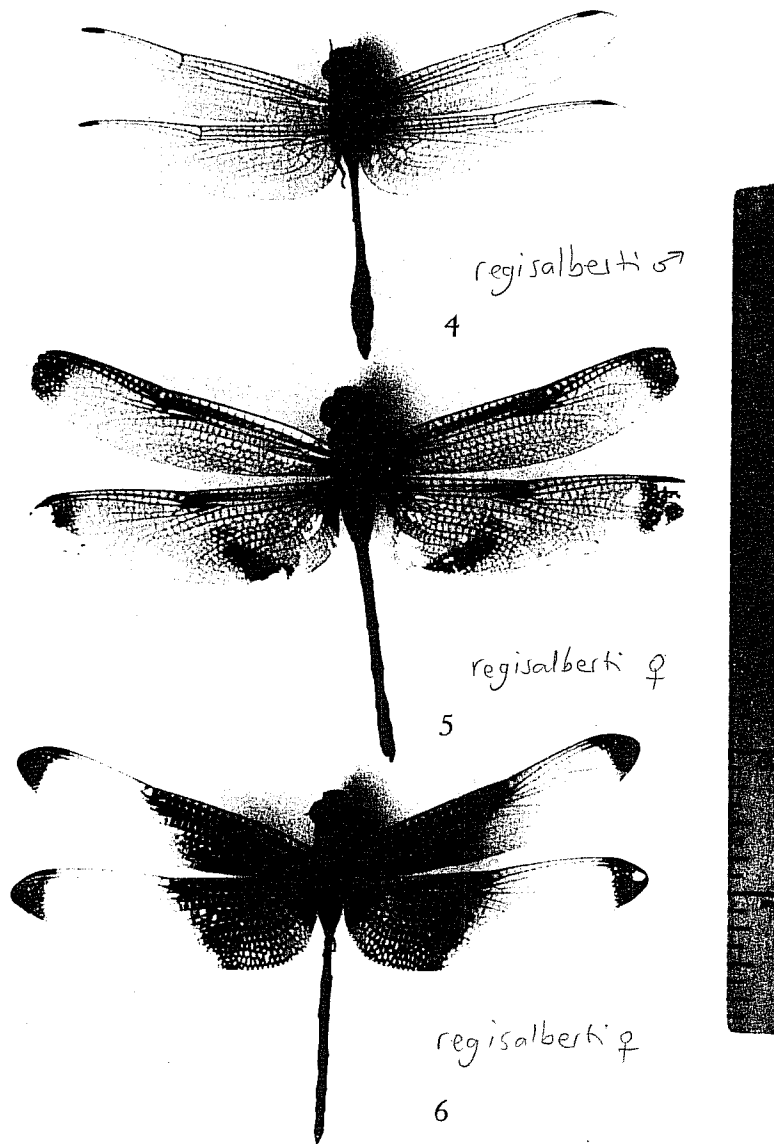
2 *atritibiae* ♀



3 *speciosa* ♂

*Zygonyx* (approx. nat. size) 1. *Z. atritibiae* spec. nov. ♂ (Ndola, N. Rhodesia); 2. *Z. atritibiae* spec. nov. ♀ (Ikelenge, N. Rhodesia); 3. *Z. speciosa* (KARSCH) (*nugentii* PINHEY, holotype ♂) (Mamfe, Cameroons).

PLATE II



*Zygonyx regisalberti* (SCHOUTEDEN) (approx. nat. size): 4. ♂ (Ituri Forest, Uganda-Congo border); 5. ♀ (Luhua River, Congo); 6. ♀, melanic (Kabongo, Congo).

segments of the abdomen are markedly swollen in the male. This species differs from its relatives, however, in having the tibiae black instead of rufous or orange brown, and the labium is partially or wholly black. The female differs from other members of the *speciosa* group in having the black wing markings confined to the bases of the wings.

*Holotype male* (mature; Mwinilunga). Labium pale brown, black in posterior half; labrum black; epistome and front of frons ochraceous; frons above and vesicle metallic steely blue.

Thorax ferruginous. A broad ivory white transverse band across the mesepisterna, severed by the median carina. Side of synthorax with two yellow stripes broadly framed with black, one just above first lateral suture, the other on the posterior half of the metepimeron. Femora ferruginous, blackened at knees; tibiae and tarsi black.

Abdomen inflated on subterminal segments; black; a yellow lateral dot on distal end of segment 2; a broad ivory band on base of segment 3, expanding ventrally; a yellow band on basal half of segment 4; a small yellow ventro-basal spot on segment 5; a yellowish white band on basal half of segment 7.

Venation blackish but pale brown in subcostal zone; pterostigma black, membranule pale brown. Traces of black at base of forewing; on hindwing this black just covering three or four cells at base of anal field. Forewing with 13-14 Ax, 7 Px.

Abdomen (without appendages) 38 mm, hindwing 46 mm, pterostigma 3 mm.

Paratype males have more or less black on the labium. Wings may be faintly fumose or hyaline. Hindwing 45-46 mm.

*Allotype female* (mature; Mwinilunga). Differs from the male as follows: frons with only a violet basal stripe, dorsally.

Abdomen slightly broader, not inflated sub-terminally; with more pale marking: segment 2 with broad ivory annules at two-thirds from base; segment 3 the white more extensive; segments 4-5 with traces of white at base and a lateral ivory stripe; segment 7 yellow on basal three quarters.

Wings suffused with amber, particularly in the anterior half. Basal brown more extensive in both wings than in the male: on hindwing this dark brown reaching beyond second Ax and in cubital field almost to triangle.

Abdomen 37 mm, hindwing 46 mm, pterostigma 3 mm. Paratypes similar but variable in size: hindwing 42.5-48 mm.

In life the eye of the female is pale greenish grey; frons and clypeus pale reddish brown; pale body markings ivory white. In the male the eye is whitish grey, pale body markings ivory white.

Holotype (Mwinilunga) and three paratype males (Abercorn, Ndola and Mwinilunga), allotype and three paratype females (Mwinilunga) in National Museum, Bulawayo; one paratype male (Abercorn) in the British Museum (Nat. Hist.).

*Z. pretentiosa* Fraser <sup>= eusebia?</sup>

(Pl. III, figs. 7-10; text fig. 14, 16).

*Z. pretentiosa* FRASER, 1957, *Rev. Zool. Bot. afr.* 55: 344; PINHEY, 1962b: 277.

Syn. nov. *Z. chrysobaphes umbrosa* FRASER, 1957, *ibid.* 55: 345.

The present author (PINHEY, 1962b: 277) had at one time thought the male of this species, described from a female, might be *Z. prodigiosa* FRASER, described from a male, since examples of the latter and *Z. pretentiosa* FRASER had been sent to the National Museum, Bulawayo from the same part of the Moyen Congo. Further material, however, has shown that the male of

*Z. pretentiosa* FRASER is one of the *Speciosa* group and an expedition to the Angola border of Northern Rhodesia has proved that *Z. prodigiosa* FRASER is the unknown male of *Z. eusebia* (RIS).

The male *Z. pretentiosa* FRASER is larger than *Z. atritibiae* spec. nov., the abdomen is rather more elongate, and the distal segments are not usually so markedly inflated as in *Z. atritibiae* spec. nov. and *Z. regisalberti* (SCHOUTEDEN). Hindwing 48-49 mm.

*Allotype male* (Ketta Forest). Labium orange-brown, with black median line on the small posterior lobe. Labrum black; face orange-brown. Frons and vesicle entirely steely blue above. Occipital triangle blackish.

Prothorax brown. Mesepisternum blackish brown with ivory white dorsal transverse band, severed in middle; sides reddish brown tinged with black and having an ivory stripe on first lateral suture and a smaller one on posterior part of metepimeron. Femora and tibiae dark ferruginous, knees and tarsi black.

Abdomen rather more slender than in *speciosa* (KARSCH) and less inflated on subterminal segments. Blackish brown, to black on distal segments. Basal half of segment 4 yellowish; basal half of segment 7 ivory white. Anal appendages black.

Wings slightly fumose, venation and pterostigma black.

Base of both wings with dark brown patch, on hindwing extending down anal field halfway to tornus. Forewing with  $17\frac{1}{2}$  to  $18\frac{1}{2}$  Ax.

Accessory genitalia text figs. 14, 16.

Abdomen (without appendages) 40 mm, hindwing 50 mm, pterostigma 4 mm.

Paratype males, all from Moyon Congo, are very similar. Hindwing 48-50 mm. Allotype and three paratype males in the National Museum, Bulawayo, one paratype male in the British Museum (Nat. Hist.):

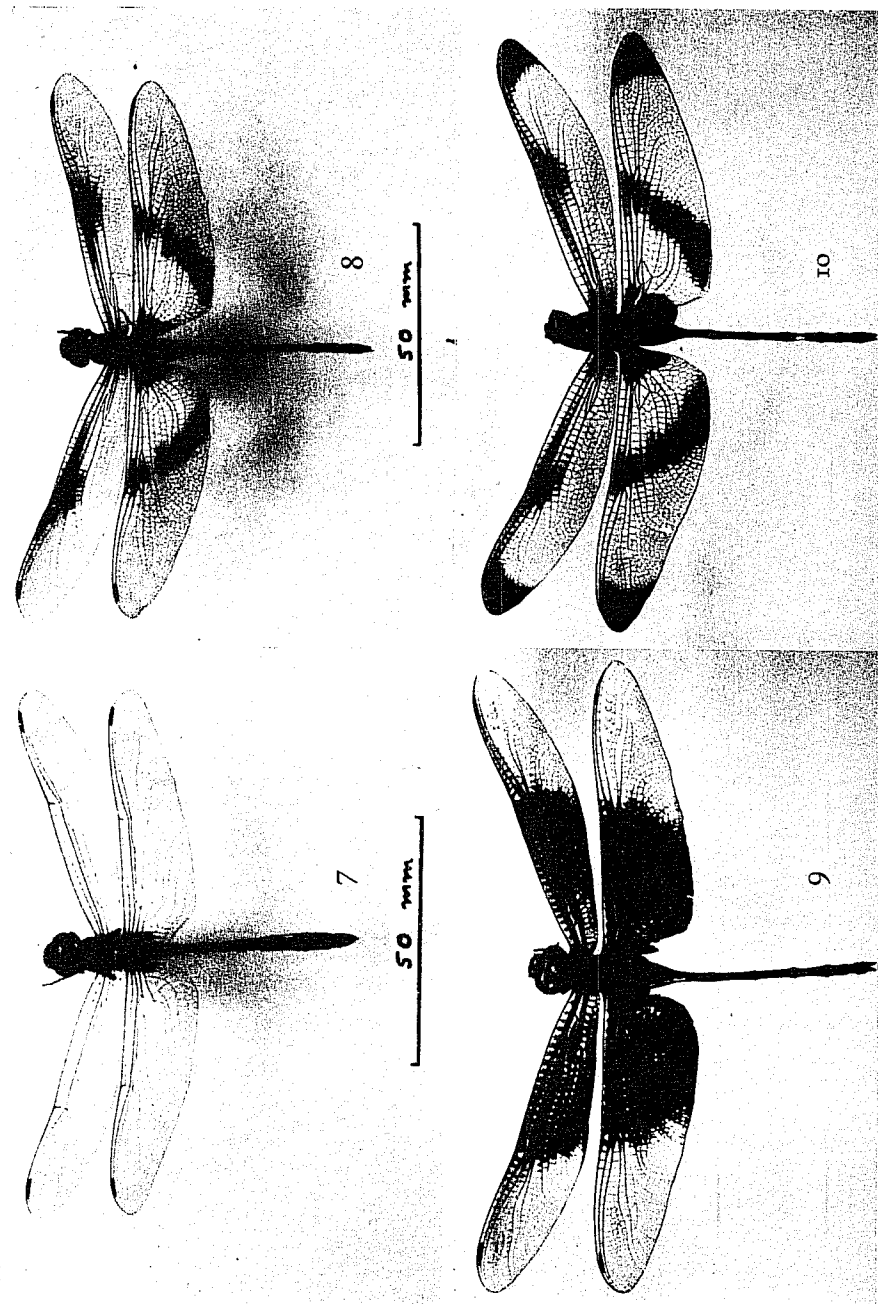
Allotype, Ketta Forest, Ouessou District, 30-IV-60, paratypes, Etoumbi Forest, Makoua District, VIII-60, II-62, XII-62, XII-62.

The normal female has a larger dark basal patch on all the wings than in *Z. speciosa* (KARSCH) and a curved dark nodal band across both wings, even in the teneral state, this band ending at the tornus of the hindwing. In tenerals and juveniles the band is narrow and, on the forewing, incomplete below the nodal zone. In FRASER's type female the band is broader and is continuous across both wings. The type was collected at Kalenge in the former Belgian Congo. Material seen by the present author came from the former French or Moyon Congo and one male from Lomic, Cameroons. Further examination of the type series of *Z. rougeoti* PINHEY (1960) indicates that one damaged male from Lastoursville, Gabon, is really *Z. pretentiosa* FRASER. Females from the Moyon Congo include occasional examples having the entire area of all wings from base to nodus dark brown. It was first thought that this might represent the normal final condition of an old female. However, a second female sent from that area is evidently not so mature and the answer now seems to be that the female has more than one form. Hindwing of the female series 54-55 mm.

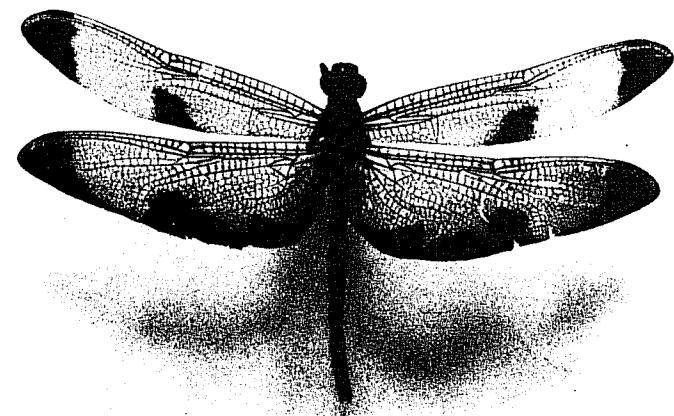
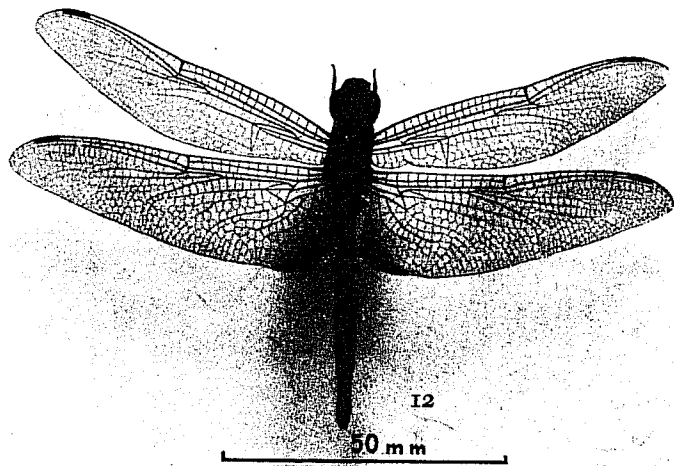
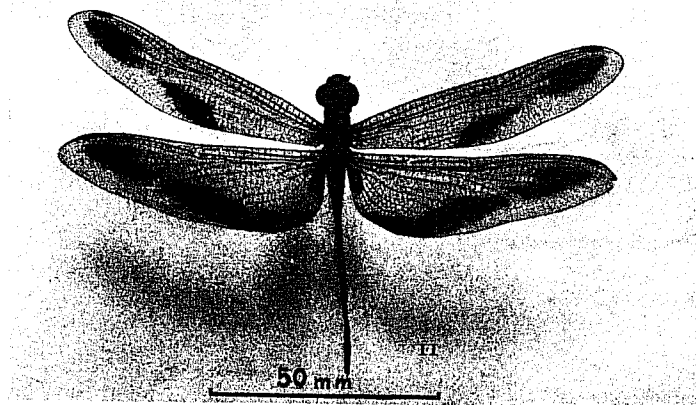
The female illustrated here as the form *umbrosa* FRASER is from Kelle, Moyon Congo, March, 1963, and included in the consignment were males and the more normal females. This female has the band less heavily developed than FRASER's type but the wing apices have the brown patch. It is also, apparently, shorter in the abdomen, even allowing for the appendages which FRASER included in his measurement:

Kelle ♀, abdomen (without appendages) 45 mm, hindwing 57 mm; FRASER's type ♀, abdomen (with appendages) 50 mm, hindwing 58 mm.

FRASER himself was dubious about linking *umbrosa* as a race of *chrysohaphes* (RIS). In his figure (FRASER, 1957: 343, fig. 2 f) the hindwing is too narrow for *chrysohaphes* and the description indicates that the side of the thorax is reddish brown with yellow stripes, a condition of the *Speciosa*, not the *Eusebia* Group. There seems to the present author little doubt that *umbrosa* is in fact another form of this interesting species, polymorphic in the female, this form distinguished by the brown apices, in which respect it resembles *Z. regisalberti* (SCHOUTEDEN).



*Zygonyx pretentiosa* FRASER (approx. nat. size): 7, ♀ (Etoumbi Forest, Moyon Congo); 8, ♂ (Etoumbi Forest, Moyon Congo); 9, ♀ (Kelle, Moyon Congo); 10, ♂ (Etoumbi Forest, Moyon Congo).



Zygonyx (approx. nat. size): 11. *Z. pretiosa* (KARSCH) ♀ (Ikom, E. Nigeria); 12. *Z. euschia* (RIS) ♂ (Ketta Forest, Moyen Congo); 13. *Z. euschia* (RIS) ♀ (Ikelenge, N. Rhodesia).

### *Z. regisalberti* (Schouteden)

(Pl. II, fig. 4-6; text fig. 12).

*Z. regisalberti* (SCHOUTEDEN), 1934, *Ann. Mus. Congo Belg. Zool. Sér.* 3(1): 33; PINHEY, 1962b: 277.

Rather smaller than *pretentiosa* FRASER, the male is very like *speciosa* (KARSCH) and has the subterminal segments of the abdomen similarly inflated. Hindwing 43-47 mm. The normal female, however, differs from its relatives in having a brown apical patch as well as a basal one. The curved band of *pretentiosa* FRASER is reduced here to traces, chiefly a posterior median spot on the hindwing.

An example from Kabongo, in the Congo (leg. SEYDEL), appears to be an aged female of this species. The wing apices are brown and the entire area of the wings from nodus to base is uniformly brown (as in one of the forms of *pretentiosa* FRASER). It is also possible that the female here is dimorphic. Abdomen 45 mm, hindwing 52 mm.

The Congo specimens described by RIS (1912: 812, fig. 470) as *speciosa* (KARSCH) are probably *Z. regisalberti* (SCHOUTEDEN).

### *Z. speciosa* (Karsch)

(Pl. I, fig. 3, Pl. IV, fig. 11; text fig. 13).

*Z. speciosa* (KARSCH), 1891, *Ent. Nachr.* 17: 74.

*Z. pretiosa* (KARSCH), 1891, *ibid.* 17: 74. Syn. nov.

*Z. rougeoti* PINHEY, 1960, *Occ. Pap. Nat. Mus. S. Rhodesia* 24 (B): 514, f (Ikom). Syn. nov.

The type male was kindly loaned to the present author by Dr. KURT K. GÜNTHER of the Berlin Museum, to whom the author is deeply indebted. The type locality was Barombi Station, leg. S. PREUSS, no. 5319. The type lacks segments 5-10 of the abdomen. Males of *rougeoti* PINHEY collected over a river near Ikom and Mamfe on the Nigerian-Cameroon border in 1958 agree with the type *speciosa* (KARSCH) and on the occasion of their capture a strongly amber-winged female approached one of these males and hovered with it in flight for a few moments. In the same region females of *pretiosa* (KARSCH) a markedly amber-coloured insect were also captured and it appears reasonably certain that *pretiosa* (KARSCH) is, in fact, the female of *speciosa* KARSCH (= *rougeoti* PINHEY). The males are generally as large as those of *pretentiosa* FRASER, but with the dark brown basal patch of the wings more protuberant in the cubital zone of the hindwing. Hindwing 48-50 mm, rarely only 47 mm.

The female has a brown body with faint whitish lateral stripes on the thorax but apparently no transverse band on front of thorax. Abdominal segment 7 has a broad yellow band but is not inflated. The wings are deep amber except along the posterior region from a point halfway between triangle and nodus to apex on forewing, and from anal loop to apex on hindwing. There is also a small hyaline gap just beyond the dark basal patch on the hindwing. The zone between amber and outer hyaline area is demarcated by an irregular brown band from tornus to pterostigma. Abdomen 41 mm, hindwing 55 mm.



3. *EUSEBIA* GROUP

*Z. eusebia* (Ris)

(Pl. IV, fig. 12, 13; text fig. 15).

*Z. eusebia* (Ris), 1912, *Coll. Zool. Selys* 14: 814; PINHEY, 1962b: 276.

Syn. nov. *Z. prodigiosa* FRASER, 1958, *Rev. Zool. Bot. afr.* 58: 263; PINHEY, 1962b: 277.

This is the largest of the known species of the entire genus and one of the largest Libellulids in the World. In the Mwinilunga District both sexes, the male being *prodigiosa* FRASER, were found on the Lisombo River, the Zambezi River Rapids (Mwinilunga) and the Sakeshi River. On the Lisombo River the strikingly coloured females were travelling up or hovering over the channels in dense gallery forest, from about 11 a. m. until 2 p. m. Males, occasionally on these channels, were more in evidence hovering over a small tributary in the open just outside the forest. Females, with their bright colouring, would be too conspicuous in the open, although an occasional example of this sex would fly temporarily out of the forest.

In the male the thorax is brown in front with a network of cream-coloured lines; sides of thorax pale green with sparse brown markings. Abdominal segment 7 is only slightly inflated, and it has a broad cream band. The broad wings have a greenish tint and there is a brown marginal band at the tornus of the hindwing. This band is less marked in Mwinilunga examples than in specimens from Moyen Congo.

Abdomen 40 mm, hindwing 55 mm. Hindwing very broad at base.

In the mature female the thorax is reddish brown in front, without pale markings, greenish yellow at sides with only traces of brown lines. The abdomen is entirely reddish brown without any pale bands whatever. Evidently the vivid wing coloration is ample recognition pattern for the male and no abdominal signs are required. The wings are entirely deep amber with brown markings: subnodal and apical patches on forewing, irregular posterior marginal band and apical patch on hindwing. Abdomen 45 mm, hindwing 60 mm.

The SEYDEL collection included a male from Dikulwe, May, 1954, and a female from Kamina, 27 November, 1925 (which had been compared by SCHOUTEDEN with the type female in the Tervuren Museum).

*Z. chrysobaphes* (Ris)

*Z. chrysobaphes* (Ris), 1915, *Ann. Mag. nat. Hist.* (8) 15: 221; PINHEY, 1962b: 276.

This is a smaller insect than *eusebia* (Ris). No examples have been seen by the present author. The male is evidently rather like that of *eusebia*, but is readily distinguished by the labrum being black instead of yellowish. There also appear to be traces of brown at the tornus of the hindwing.

The female is less suffused with yellow on the wings than in *eusebia*. Dark brown areas are diffuse apical and nodal fasciae and a basal patch. Abdomen, male 41 mm, female 43 mm, hindwing, male and female 53 mm.

Described from Sierra Leone.

SUMMARY

This paper mainly deals with *Odonata* found on the Eastern border of Angola. Apart from new species, the most interesting of which is a polychroic *Pseudagrion*, there is the problem of abnormal body and wing structure in an *Aciagrion*; a revision of continental Ethiopian species of *Zygonyx*; a solution to the controversial species *Tragomomphus seydeli* SCHOUTEDEN; and new distributional records for other species.

New species, etc. are:

<i>Pseudagrion coeruleipunctum</i> spec. nov.	<i>Onychomomphus quirrkii</i> spec. nov.
<i>Ischnuragrion nodosum</i> spec. nov.	<i>Aeshna rileyi raphaeli</i> subsp. nov.
<i>Cimitomomphus</i> gen. nov.	<i>Allorhizucha longistipes</i> spec. nov.
<i>C. dundoensis</i> (PINHEY) allotype ♂	<i>Zygonyx atritibiae</i> spec. nov.

SELECTION OF REFERENCES

(For all other references to end of 1959 vide PINHEY, 1962b)

- FRASER, F. C. (1955) — *Odonata*, in *Mission de Witte, Parc Nat. Upemba* 38(1): 3-32, ff.  
 (1957) — Some further notes on the *Odonata* of the Belgian Congo. *Rev. Zool. Bot. afr.* 55: 338-346, ff.  
 (1958a) — *Odonata* new to the Belgian Congo, with the description of the male of *Porpacithemis dubia* Fraser, etc. *ibid.* 58: 39-42, ff.  
 (1958b) — *Zygonyx prodigiosa*, a new species of dragonfly from the Belgian Congo. *ibid.* 58: 263-266, ff.  
 LONGFIELD, C. (1945) — The *Odonata* of Angola; results of the Missions scientifiques suisses 1928-29, 1932-33. *Arch. Mus. Bocage* 16: 1-31, ff.  
 PINHEY, E. C. G. (1956) — A new Rhodesian dragonfly of the family Gomphidae. *Occ. Pap. Nat. Mus. S. Rhodesia* 21(B): 83-84, ff.  
 (1958) — Records of dragonflies from the Zambezi and Rhodesia; etc. *ibid.* 22(B): 97-116, ff.  
 (1960) — *Odonata* collected by Oxford University Tanganyika Expedition; etc. *ibid.* 24(B): 509-515, ff.  
 (1961a) — A Survey of the Dragonflies of Eastern Africa. *Publication Brit. Mus. (Nat. Hist.)* 214 pp., pls., ff.  
 (1961b) — Dragonflies (*Odonata*) of Central Africa. *Occ. Pap. Rhodes-Livingstone Mus.* 14: 97 + 12 pp., pls., ff.  
 (1961c) — A collection of *Odonata* from Dundo, Angola; etc. *Publ. cult. Cia. Diamantes Angola*, 56: 73-78 ff.  
 (1962a) — Some records of *Odonata* collected in Tropical Africa. *J. ent. Soc. S. Afr.* 25: 20-50, pl. ff.  
 (1962b) — A Descriptive Catalogue of the *Odonata* of the African Continent (up to Dec. 1959). *Publ. cult. Cia. Diamantes Angola* 59: 1-323, pls., ff.  
 — (1962c) — New or little known dragonflies (*Odonata*) of Central and Southern Africa. *Occ. Pap. Nat. Mus. S. Rhodesia* 26(B): 892-911, ff.  
 RIS, F. (1909-19) — Libellulinen monographisch bearbeitet. *Coll. Zool. Selys* 9-16: 1278 pp., pls., ff.  
 SCHOUTEDEN, H. (1934) — Cat. raisonné, Faune ent. Congo Belge. *Odonates. Ann. Mus. Congo Belg. Zool. Sér.* 3(1): 1-84, ff.