

## NEW OR LITTLE KNOWN DRAGONFLIES (ODONATA) OF CENTRAL AND SOUTHERN AFRICA

By ELLIOT PINHEY

The majority of dragonflies recorded in this paper are from the Rhodesias, supplementing works by the present author (1951, 1961) on the species of those territories. There is also a tentative key to most of the African females of the genus *Agriocnemis* Selys. Acknowledgements are due to Col. F. C. Fraser for information on *Neurogomphus* Karsch; to Dr A. H. Newton for bringing the author's attention again to a small *Pseudagrion* Selys, found in Zululand; and to Mr Peter Bomford for his assistance on the May expedition to Mwinilunga. This District, in the North-West corner of Northern Rhodesia, with its tropical African affinities, will no doubt produce further surprises in its Odonata fauna, as was the case in May 1961.

### Family LESTIDAE

*Lestes disarmatus* Fraser, 1961, in Pinhey, *Publ. Brit. Mus. Nat. Hist.* p. 11.

This species was described from a male taken in Northern Uganda. In July 1955 the present author collected a single female *Lestes* in the so-called 'rain forest' at the Victoria Falls which seemed to be almost certainly the unknown female of *disarmatus*. On another expedition, with the Rhodesian Schools' Exploration Society, a series of both sexes, certainly of this species, was taken near the Nuanetsi River, about 90 miles south-east of Nuanetsi village, Southern Rhodesia, near the border of Portuguese East Africa. The females were identical with the Victoria Falls example.

*Ne-allotype female* (mature) (Nuanetsi). Like the male in all essential details, size, form, colour, markings, venation and pterostigma. Face, head, thorax and abdomen light brown, slightly tinged with deeper ferruginous brown. Lower sides and ventral surface of thorax creamy white. There are ill-defined traces of brown on the sides of the thorax, but this is partly postmortem change. Legs creamy white with black spines; dark brown streaks on femur and tibia of foreleg. Pterostigma short, brown, edged with white at proximal and distal ends. 13 Px. Ac proximal to end of petiole in all wings (but this is variable in other females and it is more often at the end of the petiole). Abdominal segments 9-10 yellowish white; a brown mid-dorsal line on 7-9; cerci whitish, tapering, about two-thirds as long as segment 10. Abdomen 30 mm., hindwing 19 mm., pterostigma 1.3 mm.

The series, which included males and four other females, was collected in rather dense thickets two or three hundred yards from the nearest likely breeding haunt, a pan, mud-fringed, without much vegetation in the water. Ne-allotype and two paratype females in the National Museum, Bulawayo; one paratype female will be sent to the British Museum (Nat. Hist.).

*Lestes dissimulans* Fraser, 1955, *Rev. Zool. Bot. afr.* 51: 38, fig. 1e (Dakwa).

A teneral male taken at Chingola, Northern Rhodesia, in May 1961, is probably this species. The specimen somewhat resembles *L. simulans* Martin (1910), but it is larger, the abdomen being 33 mm. long. The thorax has irregular metallic green bands; the superior anal appendages are forcipate, but there are no sub-basal teeth, nor even angled tumours as found in *simulans*, merely a slight swelling as indicated by Fraser for *dissimulans*. Again, unlike *simulans*, there is no pale annulus on the 9th abdominal segment, but since it is a teneral example this cannot be taken as a diagnostic feature.

### Family COENAGRIIDAE

*Ceragrion? bakeri* Fraser, 1941, *Proc. R. ent. Soc. Lond.* (B), 10: 61 (Uganda).

A single, rather immature male taken in the Lisombo River forest is almost certainly this little known species. It is a large member of the genus, described from Uganda and known also in Nigeria.

*C. bidentatum* Fraser, 1941, *ibid.* p. 61.

Also described from Uganda, this is a small species with a green thorax, found in thick bush or forest. It has been found in the Lisombo River forest.

*C. platystigma* Fraser, 1941, *ibid.* p. 63.

Again, a local Uganda species, usually recognizable by its rhomboidal pterostigma. Apart from Abercorn in Northern Rhodesia, it has now been found in the Mwinilunga District, both on the Upper Zambezi and the Lisombo Rivers.

*C. suave* Ris, 1921, *Ann. S. Afr. Mus.* 18: 316.

A fairly widespread species, in fact in some localities, being almost as abundant as the nearly ubiquitous *C. glabrum* (Burmeister, 1839). It has now been found on the Lisombo and Upper Zambezi Rivers, in woodland at some little distance from the water's edge. In life the eye of the male is greenish brown above, with yellow transverse band; whiter below. Abdomen pink.

*C. whellani* Longfield, 1952, *Proc. R. ent. Soc. Lond. (B)*, 21: 42.

This moderately widespread species, described from Southern Rhodesia and known also from Northern Rhodesia, is mentioned here merely because of a pair taken in copula at Mwinilunga, in May 1961, in which the female is disproportionately small. Normally a female of this genus is as large as or larger than her mate. In this case the abdomen measures 29 mm. for the male and 23 mm. for the female.

*Pseudagrion kibalense* Longfield, 1959, *Publ. cult. Cia Diamant. Angola*, 45: 22.

This local species, described from Uganda and related to the West African *P. serrulatum* Karsch (1894) has now been discovered on the Lisombo River, Mwinilunga, over a thousand miles, in a direct line, from its known haunts. It was flying amongst its far commoner and more widespread relative, *P. melanicterum* Selys (1876) which it closely resembles in the field and like that species it has the widely gaping branches of the superior anal appendage. The wider antehumeral stripes distinguish it.

*P. jacksoni* Pinhey, 1961, *Brit. Mus. (Nat. Hist.) Publ.* 37.

Described from a solitary pair taken by Col. T. H. E. Jackson in Northern Uganda, a single male was captured on the Kabompo River, Mwinilunga, in March 1960 and, later, a series was taken six miles west of Chingola, Northern Rhodesia, in May 1961. The latter examples were settling on reeds in a quiet pool on the edge of a forested stream.

*Pseudagrion mozambicensis* sp. nov. (Fig. 1)

This species is very closely allied to *P. glaucescens* Selys and, in fact, the author finds he has confused the two in the field.

*Holotype male* (taken in copula). Labium ochreous. Labrum and sides of face, including lateral ends of frons and basal tumour of antenna bright orange; rest of face in front, frons and vertex to level of ocelli dull brick red; three minute black basal dots on postclypeus; basal segments of antenna ferruginous, the filament blackish; a black dot on either side of anterior ocellus. Back of head blackish, postocular spots very large, greenish. Prothorax and synthorax pale green (blue-green in life); becoming sky blue ventrally on synthorax; with very sparse marking: median carina narrowly black; an upper and a middle spot on humeral suture; a dot on first lateral suture and a larger spot on second suture. Legs entirely yellow, except for the black spines and traces of slender black streaks on femora.

Pterostigma pale brown. Forewings with 11 Px; Ac at start of petiole in all wings. Abdomen mainly pale blue, particularly on basal of three terminal segments. Segment 1 with black dorso-basal spot; 2 with black constricted spot (as in Fig. 1*d*) at distal half; 3-6 with black spot

at distal ends, constricted just before the margin, and a brown mid-dorsal line, which does not reach proximal ends of these segments; 7 mainly black; 8-10 all pale blue. Anal appendages (Fig. 1*b-c*) very like *glaucescens*; superior slightly more robust in side-view and less angled posteriorly on lower branch in dorsal view. Abdomen 35 mm., hindwing 24 mm. In some paratypes the face is more orange or less so (more brown). The black on segment 2 may show traces of thin lines running from the spot to proximal end; the streaks on the femora vary a little, and there may be one on the fore tibia. In variety A, the lines on segment 2 are noticeable and the insect is small: abdomen 31 mm., hindwing 21.3 mm.

*Allotype female* (taken in copula). Head and face pale brown, genae orange. Back of head as in male. Thorax very similar, but sides and ventral surface pale green. Legs similar. Prothoracic stylets pale brown, over half as long as median lobe of prothorax. Pterostigma more ochreous brown. Forewings with 11 Ax; Ac at end of petiole. Abdomen more greenish than male; 8 only blue at distal end, the basal third black; 9 with two black basal triangles. Abdominal segment 2 with an inverted black hemisphere (Fig. 1*e*).

This insect is so like *glaucescens* that it may prove to be a race\* of that species. The latter is normally a shorter insect, of similar build. Face and head above pale sky blue; black marks on synthorax even more reduced. Abdomen segment 2 with two thick lines from the black patch to the proximal end and a further black spot at distal border. Segment 10 with black mid-dorsal band. Anal appendages differ only slightly, as stated above.

A series of this Mozambique species was collected by the author in swampy rain pools on the Beira Road, a few kilometres from Dondo Forest, December 1960. Examples had also been taken at Vanduzi on a muddy stream in November 1956 and October 1957. Types and paratypes in the National Museum, Bulwayo, one pair of paratypes in the British Museum (Nat. Hist.) and a further pair in the Museum Dundo.

*Pseudagrion newtoni* sp. nov.

*P. angolense* Selys, in Pinhey (pars), 1951, *Transv. Mus. Mem.* 5: 76-77 (as dwarf *angolense*).

When Dr A. H. Newton sent the author some small *Pseudagrion* in January 1949 they were assumed to be dwarfs of *P. angolense* Selys, as under the above reference. However, in March 1961 Newton sent another pair as well as normal *angolense* from the same locality. He remarked that the antehumeral stripes of the smaller insect are orange in life. Since these stripes in *angolense* are always green the author examined the specimens closely and found that although very similar in many respects there are valid distinctions, apart from the thoracic stripes. In fact it is a new species, which will take the name of the discoverer.

\* A concurrent revision of the genus shows that it is a race, not a distinct species.

*Holotype male.* Labium ochreous; face and frons bright, deep orange, with black markings; three basal dots on labrum; most of postclypeus and a central basal streak on frons black. Antennae black but basal segment orange; head above jet black, with very narrow orange post-ocular spots, linked across occiput. Prothorax black above, greenish laterally, with orange spots on anterior lobe and dorso-laterally on median lobe. Synthorax black to well below humeral suture, with narrow, deep orange antehumerals, slightly broadened dorsally; sides

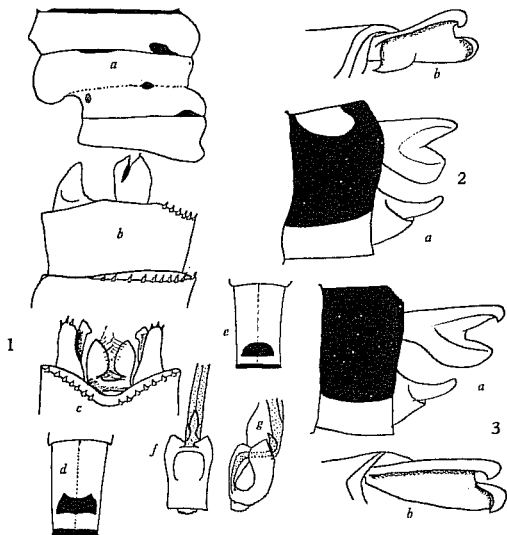


Fig. 1. *Pseudagrion mozambicensis* spec.nov. (type). a, thorax, from left; b-c, anal appendages of ♂ from right and from above; d-e, abdominal segment 2 from above, ♂ and ♀. f-g, penis.

Fig. 2. *P. newtoni* spec.nov. Anal appendages of ♂, a, from right; b, right superior viewed from inner surface.

Fig. 3. *P. angolense* (Nqutu, Zululand). a-b, as for Fig. 2.

of thorax and bases of legs greenish, with black bars at upper ends of both lateral sutures. Bases of legs very lightly dusted with white pruinosity. Legs ochreous, broadly black externally on femora, with black streaks on tibiae; tarsal segments black basally; tip of claw and the claw-hook black.

Pterostigma light reddish brown, *elongated* at distal angle. Forewing with 12-13 Px. Ac barely distal to petiole. Abdomen greenish, broadly

black dorsally, with some white pruinosity covering segments 1-2. On dorsum of 7-10 some cobalt blue marking (not violet as in *angolense*): covering distal three-quarters of 7, the entire dorsum and most of sides of 8-9, and a semi-lunar patch on 10. Superior appendage (Fig. 2) slightly shorter than 10, deeply and rather broadly forked as in *angolense*, but differing in having a broad basal tooth on the inner surface, which is absent in *angolense* (Fig. 3). Abdomen 26 mm., hindwing 18.5 mm.

Paratype males very similar.

*Allotype female.* Differs from male in having face and frons orange-yellow; a continuous black basal band on labrum; postocular spots orange-yellow and broader. Prothorax black, yellow laterally, the anterior border yellow; with angular yellow lateral spot. Stylet yellow, with black apex; over half as long as median lobe. Synthorax bronze-black to below humeral suture, sides and antehumeral stripe brownish orange, with the two black lines on lateral sutures; ventrally yellow. Abdomen yellow, with broad black dorsal band having greenish sheen; 8-10 with pale blue dorsal patches; 8 with spot on distal third; 9 covering distal half and extending towards base mid-dorsally; 10 all pale blue above. Legs yellow with black streaks on femora and tibiae; tarsi as in male. Pterostigma light brown, shaped as in male. Forewing with 12-13 Px. Abdomen 25 mm., hindwing 19.5 mm.

Paratypes similar, but a general example has rose-violet spots on end of abdomen instead of blue.

This species is closest to *angolense*. In the latter, a larger insect with abdomen up to about 40 mm., the postocular spots of the male are broader; markings on pro- and synthorax green instead of orange; stripe on second lateral suture broad and continuous; pterostigma reddish brown to deep purplish crimson (Katanga examples of *angolense*); abdomen violet on 8-9, black on 10. The superior appendage of *angolense* lacks the large basal tooth. In the female *angolense*, apart from its larger size, the prothoracic stylets are orange, not tipped with black. Newton collected the species in copula (in National Museum) at Nqutu, Zululand: ♂♂ 18 March 1961 (type), 10 December 1960, 12 January 1961, 16 February 1961; ♀♀ 16 February 1961 (allotype), 10 December 1960, 12 January 1961, 16 February 1961. One pair of paratypes will be deposited in the British Museum (Nat. Hist.).

*Acigrion attenuatum* Fraser, 1928, *Trans. R. ent. Soc. Lond.* 1: 126.

An additional record for this little known Central African species of this genus is from Mwinilunga District, in forested stretches of the Zambezi and Lisombo Rivers, May 1961.

*Enallagma subtile* Ris, 1921, *Ann. S. Afr. Mus.* 18: 332.

This slender, pallid species is being recorded in many unsuspected places. In May 1961 localities in Northern Rhodesia for it included Kitwe in the north and Katambora on the Zambezi River to the south-west.

*E. sinuatum* Ris, 1921, *ibid.* p. 330.

Apparently rather a scarce insect, with only solitary individuals being collected in different localities. From Northern Rhodesia the present author knows of it from Abercorn, Kapiri M'Poshi, Ndola and Mwinilunga. In May 1961 the author collected single examples of a smaller insect, very pallid in colour, which, in the field, were thought to be specimens of *subtile*, until the appendages were examined. It was then seen that the superior appendages were bent downwards, rather like *E. longfieldae* Fraser (1947) but not sharply angled as in that species.

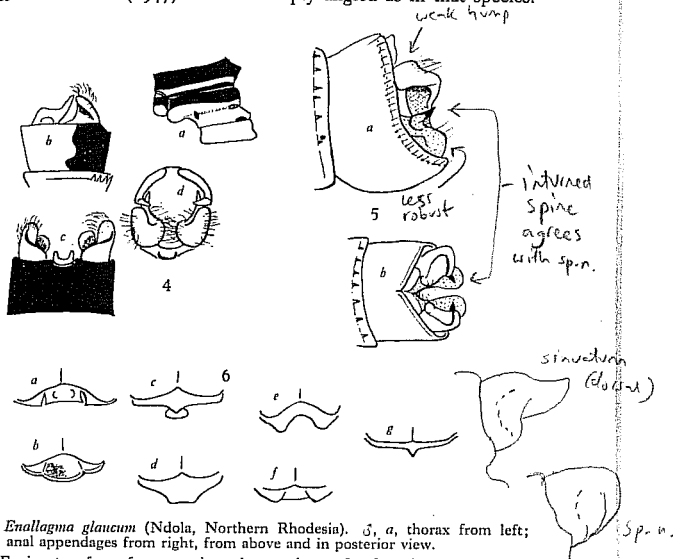


Fig. 4. *Enallagma glaucum* (Ndola, Northern Rhodesia). ♂, a, thorax from left; b-d, anal appendages from right, from above and in posterior view.

Fig. 5. *E. sinuatum fugax* f. nov. a-b, anal appendages of ♂ from left and (less enlarged) from above. (Inferior appendage stippled.)

Fig. 6. *Agriocnemis*, hindlobe of female prothorax. a, *fulcifera*; b, *inversa*; c, *forcipata*; d, *maclachlani*; e, *gratiosa*; f, *exilis*; g, *zerofica*.

In *subtile* the superior is horizontal. Closer examination failed to detect any valid differences between these appendages and those of *sinuatum*. It may be assumed at present that it is a form of this species (not a subspecies since its distribution somewhat overlaps the normal form). It seems possible that it may be an ecological or seasonal variety, appearing in late summer.

*Enallagma sinuatum* f. *fugax* f. nov.

*Holotype male* (Broken Hill). Labium, legs and ventral surface of thorax cream-coloured. Head and body coloration pale reddish brown. The faintest trace of a black line on the vertex divides off the postocular region. There are traces of black markings on the synthorax: a dot at ventral end of mesepisternum near mesothoracic collar; a dot at upper end of humeral suture and a linear division line on that suture; a dot at upper end of second lateral suture. Pterostigma pale pinkish brown. Forewing with 10 Px. Abdomen with a median black line on second segment and very narrow black annuli dividing off segments 2-7. Segments 8-10 violaceous pink. Anal appendages (Fig. 5) orange, similar in form to those of *sinuatum*. Abdomen 25.5 mm. (28-30 in the nonotypical form), hindwing 15.5 mm.

A general paratype male was taken on the Lisombo River and another on the Kabompo River.

In its size and pale coloration this form resembles *subtile*, but in its anal appendages it is like *sinuatum*. From the latter it differs in its size and in the reduction of black or metallic markings on head, thorax and abdomen. These three examples are in the National Museum, Bulawayo.

The appendages of a Northern Rhodesian melanice example of the common *E. glaucum* (Burmeister) are also illustrated (Fig. 4).

*Agriocnemis* Selys

An attempt is made here to diagnose the characters of some of the females of the Ethiopian species, as well as the related *Mortonagrion stygium* (Fraser). Identification of the latter in the female sex is difficult, despite the slight venational difference and so far the author has not seen any pairs in copula. No females were available of *A. angolense* Longfield, nor of *A. palaeforma* Pinhey. The only example of this sex for *A. gratiosa* Gerstaecker was immature; and the female *pygmaea* (Rambur) was damaged on the prothorax.

However, some preliminary information has been obtained and it is evident that the most important external feature is the shape of the hindlobe of the prothorax (Fig. 6). The amount of black on the thorax and legs is also important. But the development of black on the body in this genus seems to be rather slow. This results in the polychroic variation in the genus which, however, would appear to be merely the age of the specimen, and (except in the case of *gratiosa*) only mature females will be considered here. *A. forcipata* Le Roi and *victoria* Fraser, on the other hand, develop black extensively on the legs, although in juveniles the abdomen will be reddish, with reduced black marking.

*A. exilis* Selys, ♀. Abdomen under 17 mm., hindwing 12 mm. or less. Pterostigma pale yellow, about 2½ times as long as broad. Forewing with 7-8 Px. Labrum and postclypeus black. Postocular spots absent or narrow. Hindlobe of prothorax trilobed, with the lateral sections wider than the straight-edged middle portion. Synthorax black to first lateral

suture; with narrow antehumeral stripes or these obsolete. Femora with black line on extensor surface. Dorsum of segments 8-10 black. Cerci shorter than segment 10; ovipositor reaching end of abdomen.

*A. falcifera* Pinhey, ♀. Abdomen c. 20 mm., hindwing c. 14 mm. Pterostigma yellowish brown, about  $2\frac{1}{2}$  times as long as wide. Forewing with 9 Px. Face pale, or with light brown markings. Postocular spots narrow; connected. Prothoracic hindlobe trilobed, the middle portion rectangular. Synthorax black to humeral suture, with narrow antehumeral stripes. Femora with black external line. Abdominal segment 8 broadly black, 9 with black triangle on basal half, 10 with trace of basal black. Cerci as long as the dorsum of 10; ovipositor reaching end of abdomen.

*A. forcipata* Le Roi, ♀. Abdomen 20 mm. or more, hindwing 14-15 mm. Pterostigma yellowish brown with grey tint; about  $2\frac{1}{2}$  times as long as wide. Forewing with 8 Px. Labrum and postclypeus black. Postocular spots very large, broad in long axis of head, not usually quite connected to each other. Prothoracic hindlobe complete, angular posteriorly and with a ventral flap. Synthoracic black reaching first lateral suture; the antehumeral prominent but narrow. Femora broadly black and the tibiae and tarsi all black. Segments 8-10 completely black dorsally. Cerci longer than dorsum of 10; ovipositor extending beyond abdomen. In the oldest specimens postocular spots and antehumeral stripes are obsolete. A black stripe on second lateral suture.

*A. forcipata* forma *victoria* Fraser, ♀. Like the males the females are also very like *forcipata* and it would appear that this is only a dwarf form. The author has taken both forms in the same pool in a West African locality. Abdomen 17 mm. or less, hindwing 11-12 mm. Pterostigma as in *forcipata*, about  $2\frac{1}{2}$  times as long as broad. Face, prothorax, synthorax, legs and abdomen as in *forcipata*. Postocular spots not quite as broad; normally connected. Forewing also with 8 Px.

*A. gratiosa* Gerstaecker, immature ♀. Abdomen 20 mm., hindwing 13 mm. Pterostigma pale yellow, nearly three times as long as broad. Face pale. Postocular spots narrow; connected. Forewing with 8 Px. Prothoracic hindlobe convex in middle, broad laterally. Synthorax entirely light brown (probably darkens later). Femora with thin black lines. Segments 8-10 black above. Cerci shorter than 10; ovipositor reaching the end of the abdomen.

*A. inversa* Karsch, ♀. Abdomen about 20 mm., hindwing 12 mm. Pterostigma yellowish brown with pinkish tint; elongate, three times as long as broad. Forewing with 8 Px. Labrum and postclypeus black. Postocular spots broadish; connected. Prothorax trilobed posteriorly, the portions broadly rounded, edged with yellow; depressed in the middle. Synthoracic black overlapping humeral suture and reaching first lateral suture at dorsal end. Femora with black line, 8-10 black above. Cerci slightly longer than dorsum of 10; ovipositor reaching end of abdomen. Antehumeral stripes narrow.

*A. maclachlani* Selys, ♀. Abdomen about 22 mm., hindwing 14-

15 mm. Pterostigma yellowish brown with grey tint; about  $2\frac{1}{2}$  times as long as broad. Forewing with 10 Px. Labrum and postclypeus black. Postocular spots absent. Back of prothorax broadly truncate in middle. Synthorax metallic brown to humeral suture, without antehumerals. Femora with black stripe. 8-10 black above. Cerci as long as 10 above; ovipositor reaching end of abdomen.

*A. pygmaea* (Rambur), ♀. Abdomen 15-16 mm., hindwing 11-12 mm. Pterostigma yellowish brown; nearly  $2\frac{1}{2}$  times as long as broad. Forewing with 8 Px. Labrum and postclypeus black. Postocular spots rather broad. Prothorax damaged and features not discernible. Synthorax black to humeral suture; with very broad antehumeral stripes, almost at humeral suture and nearly half the width of the mesepisternum. Black line on femora. 8-10 black above. Cerci shorter than dorsum of 10; ovipositor not reaching end of abdomen.

*A. zerafica* Le Roi, ♀. Abdomen 15-16 mm., hindwing, 11-12 mm. Pterostigma yellowish brown,  $2\frac{1}{2}$  times as long as broad. Forewing with 7-8 Px. Prothoracic hindlobe very narrow, produced angularly in middle. Synthorax black to first lateral suture; with narrow antehumerals. Labrum and postclypeus black; postocular spots narrow or obsolete. Femora with black line. 8-10 black above. Cerci shorter than dorsum of 10; ovipositor reaching beyond abdomen.

?*Mortanagrion stygium* (Fraser), ♀. As indicated above, identification of this female is uncertain. Abdomen 15 mm., hindwing 11 mm. Pterostigma yellowish brown; twice as long as wide. Forewing with 8 Px. Labrum and postclypeus black. Postocular spots absent. Prothoracic hindlobe complete, rounded posteriorly. Black of synthorax reaching first lateral suture; antehumeral stripes narrow, linear or obsolete. Femora with black line. 8-10 black above. Cerci shorter than dorsum of 10; ovipositor reaching end of abdomen.

From the above data it is possible to suggest a key to the females of these two genera.\*

1. Antehumeral stripe nearly as broad as half the mesepisternum. Thoracic black not extending below humeral suture. Postocular spots broad. Ovipositor sheath not reaching end of abdomen; cerci short. *pygmaea* (Rambur) (Seychelles) 2
- Antehumeral stripe narrow or obsolete. 2
2. Prothoracic hindlobe tripartite. 3  
Prothoracic hindlobe complete. 5
3. Black on thorax not extending below humeral suture. Abdomen c. 20 mm., hindwing 14 mm. Mid-portion of posterior of prothorax rectangular. Labrum and postclypeus pale. *falcifera* Pinhey  
Black on thorax at least partially reaching first lateral suture. 4
4. Abdomen about 20 mm.; cerci longer than dorsum of 10th segment. Back of prothorax rounded in middle. Postocular spots rather broad. *inversa* Karsch  
Abdomen 15-16 mm. Cerci shorter than 10th segment. Back of prothorax narrow and straight in middle. *exilis* Selys

\* Omitting *ruberrima* Balinsky (1961).

5. Tibiae, tarsi and femora extensively black. Back of prothorax angled in middle, and with a ventral lobe. Black on synthorax reaching first lateral suture. Tibiae and tarsi not black, femora only with black line. 6  
7
6. Abdomen over 19 mm., hindwing 14-15 mm. Postocular spots very broad. *forcipata* Le Roi  
Abdomen 16-17 mm., hindwing 11-12 mm. Postocular spots moderately broad. *forcipata* f. *victoria* Fraser
7. Abdomen over 19 mm., hindwing over 12 mm. Pterostigma three times as long as broad. 8  
Abdomen under 17 mm., hindwing 11-12 mm. Pterostigma less than three times as long as broad. 9
8. Forewing with 8 Px. Back of prothorax not broad at middle. *gratiosa* Gerstaecker  
Forewing with 10 Px. Back of prothorax broad and truncate in middle. *maclachlani* Selys
9. Forewing usually with 7 Px. Back of prothorax very narrow, angled in middle. Ovipositor sheath extending beyond abdomen. *zerafica* Le Roi  
Forewing with 8 Px. Back of prothorax broadish, rounded in middle. Ovipositor not extending beyond abdomen. *? Mortonagrion stygium* (Fraser)

## Family CHLOROCYPHIDAE

Two more species were added to the Northern Rhodesian records of this family during the expedition of May 1961.

*Chlorocypha rubida* (Hagen). *Libellago rubida* Hagen, in Selys, 1853, *Bull. Acad. Belg.* 20 (Annexe): 58.

A solitary male of this tropical African species was taken at Mwinilunga, May 1961, the first record in this region. It is very similar to the more heavily marked forms of *C. wittei* Fraser (see below), particularly f. *fabamacula* Pinhey. The distal black spot on abdominal segment 2, however, is more mushroom shaped and the two spots are divergent.

*Chlorocypha wittei* Fraser, 1955, *Parc Nat. Upemba*, 38: 10 (Katanga). *C. fabamacula* Pinhey, 1961, *Occ. Pap. Livingstone Mus.* 14: 41.

In *wittei*, described from an incomplete male, the distal black spots on abdominal segments 3-4 are in the form of small hyphens. In *fabamacula* these spots are more like small wedges, linked to the posterior margins of these segments. Further specimens of *fabamacula* were obtained in May 1961, at Chingola and in the Mwinilunga District and it was found that there was appreciable variation in these particular abdominal spots. The species is the smallest of the Northern Rhodesian *Chlorocypha*, and the amber wing bases also help to distinguish this insect in the field. On examination it was found that in one extreme form of the adult male the distal spots on segments 2-5 were small and isolated (Fig. 7a), triangular on 2, in the form of hyphens on 3-5 (or 6). In other examples the spots on 2 were bean-shaped and connected to

the posterior margin; whilst in another extreme the spots on segments 3-4 were also linked to the posterior margins (Fig. 7b). It would appear that those with smaller spots (Fig. 7a) are *wittei*, and in this case *fabamacula* is only a form of that species. In fact, it is very probable that the differences are only developmental, in which case *fabamacula* falls into

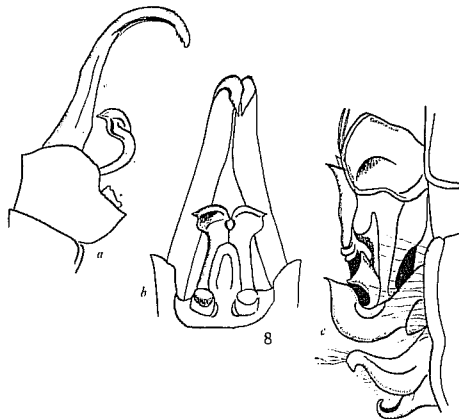
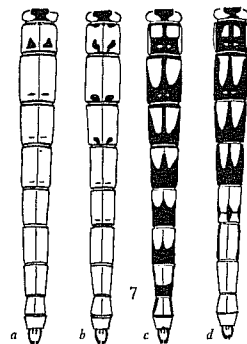


Fig. 7. *Chlorocyphidae*, abdomen of ♂. a, *Chlorocypha wittei*. b, *C. wittei* f. *fabamacula*. c, *Platycypha lacustris lacustris*. d, *P. lacustris chingolae* subsp. nov.

Fig. 8. *Paragomphus magnus*, neo-allotype ♂. a-b, anal appendages from left and from below; c, accessory genitalia.

synonymy with *wittei*. In further Rhodesian examples the thorax is very black, almost obscuring the antehumeral stripes; and in one specimen the bean-shaped spot on the second segment is linked to both distal and proximal ends of this segment.

The dorsum of the abdomen is scarlet in mature specimens and orange-red in less mature ones.

*C. frigida* Pinhey, 1961, *ibid.* 14: 43.

More material obtained in May 1961 confirmed the validity of this species. It is larger than the previous insect and, of Rhodesian species, is distinguished by its blue epistome.

*C. luminosa* (Karsch). *Libellago luminosa* Karsch, 1893, *Berl. ent. Z.* 38: 33.

This is widespread and common in Central Africa. In slightly immature males (in which the crimson on the abdomen may have fully developed) the genae and postclypeus are ivory white. These areas soon darken and the thorax also becomes very black.

*Platycypha lacustris* (Foerster). *Libellago caligata lacustris* Foerster, 1914, *Arch. Naturgesch.* 80 (A): 61 (Entebbe).

Males of this species have the abdomen sky blue dorsally as in the distinct and more widespread *caligata* Selys (1853), but they are easily distinguished in the field because the side of the thorax is pale greenish, not orange-red as in *caligata*; and the base of the abdomen is not strongly red at the sides, which is always the case in mature *caligata*. *P. lacustris* is distributed from the Ituri Forest eastwards through Uganda to the Kakamega District of Kenya. In May 1961 examples which were evidently a southerly race were taken near Chingola.

#### *Platycypha lacustris chingolae* subsp. nov.

*Holotype male*. Differs from typical *lacustris* as follows: the 'fish-hook' antehumeral stripes on the thorax are more slender at their free dorsal ends. The dorsal abdominal pattern differs as in Fig. 7c, d, the larger of the pale dorsal spots on the second segment being smaller and more triangular, and the black areas on segments 6-9 are considerably reduced. Tibial expansions, pterostigma and the amber basal areas on the wings are, however, similar to *lacustris*. Holotype and three paratypes were collected on a forested stream six miles west of Chingola, on the Solwezi Road. The female was not found during the brief halt. One paratype will be sent to the British Museum (Nat. Hist.), the rest of the types remaining in the National Museum, Bulawayo.

#### Family GOMPHIDAE

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

Described from Bambesa in the former Belgian Congo, two females of this species were captured in the Lisombo River Forest, Mwinilunga, in May 1961; one specimen by the author and the other by Mr Peter Bomford, this latter specimen being in his collection.

#### *Neurogomphus* Karsch (1890)

In the National Museum there are four species under this little-known genus of scarce gomphines, three of them from the Katambora area of the Zambezi River. *N. fuscifrons* Karsch (1890) the most robust species, with reddish brown body marked with greenish yellow stripes; in the others the body colour is black and green, *N. agilis* (Martin) (1908) (nec *uelensis* Pinhey, 1961), and a short series of both sexes of *N. wittei* Schouteden. The fourth species is *N. uelensis* Schouteden (1934), a male from Mekoum Forest, Souanke District of the former Moyen Congo.

*N. wittei* Schouteden, 1934, *Ann. Mus. Congo belg. Zool. Sér.* 3 (1): 67.

A series captured at Katambora in May 1961 includes two pairs taken in copula; and one of these particular males was, at the same time, feeding on a male of *Orthetrum brachiale* (Beauvois). Living colours, in this series, were: all pale markings yellowish green, slightly greener in male; eye of male light green above, paler below, of female olive above, yellow below. They were flying low over grass and low vegetation, near the banks of the Zambezi, in the manner of some Noto-gomphines.

*Phyllogomphus* Selys (1854).

A solitary female, in poor condition, was submitted by Mr D. H. Eccles, who collected it at the lights of a house at Monkey Bay, Nyasaland, 4 January 1961. It is the first record of this genus from the Federation of Rhodesia and Nyasaland, but unfortunately the body is too crushed for specific identification. It is evidently near *P. montanus* Fraser (1957) but may actually be an undescribed species. Members of this genus are very large gomphids of the subfamily *Gomphinae* and they are easily recognized by the elongate 10th segment and the large, prominent foliations on the 8th segment of the abdomen. In the latter respect they could be confused in the field with *Ictinogomphus* Cowley, which, however, is in the subfamily *Lindeninae*, having the triangles crossed, whereas in the gomphines these cells are free.

#### *Paragomphus magnus* Fraser

*P. magnus* Fraser, 1952, *Occ. Pap. Coryndon Mus.* 3: 6, Fig. 3 (Kenya).

This species was described from a solitary female taken by the present author on the Shimba Hills, near Mombasa, Kenya, in December 1950.

Surprisingly enough it has turned up again in Rhodesia, on the Umvumvum River, North Melssetter, where Mr Wheeler collected the unknown male and a second female. In the late morning the present author had seen the male perched high up on a thorn tree over the river. In the early afternoon of a sunny day (17 February 1961) a few of them flew over some dead branches away from the river and Wheeler took the two examples in quick succession. The female agrees with Fraser's description, except that the thoracic markings in the fresh specimens are light grass green, not saffron yellow, as described from the dead holotype.

*Ne-allotype male* (mature). Pale colours in life: eye cobalt, greenish above; face yellow; thorax pale grass green, basal segments of abdomen more yellowish green; rest of abdomen and most of superior appendage yellow. Markings on face, thorax and legs agreeing with the type female, the thoracic markings very like *cognatus* (Rambur). Abdomen more slender than female, but marked very similarly. Accessory genitalia as in Fig. 8c. Superior appendages (Fig. 8a, b) yellow on basal portion, blackish distally; inferior brown with black bulbous apices. Superior about three times as long as both the inferior and as segment 10; superiors curving distally downwards and closely touching each other. Apex with single, slightly incurved point, and with some fine spines just before apex, on outer surface. Costae of wings yellow; venation and pterostigma black; forewing with 14-15 Ax; discoidal field of 2 rows to nodus, then slightly expanding to margin; sectors of arculus well separated at origin; 1 Ac in all wings; anal triangle of 3 large and 1 small cell (+ extra small aberrant cell on right hindwing). Abdomen (without appendages) 38 mm., hindwing 32.5 mm., pterostigma 4 mm.

Dimensions of Umvumvum female: abdomen 40 mm., hindwing 37 mm., pterostigma 4.5 mm.

As Fraser suspected the male, by its general facies and appendages proves this very large species to be a true *Paragomphus*. In appearance it is near *cognatus*, in appendages nearer *acuminatus* Fraser and *sabicus* Pinhey, but it is larger and more robust than these. The locality was at the first bridge over the Umvumvum River after Melssetter Junction. The ne-allotype is in the National Museum.

#### Family AESHNIDAE

*Heliaeschna cynthiae* Fraser, 1939, *Proc. R. ent. Soc. Lond.* (B), 8: 89 (3, Uganda).

This species, hitherto only known from Uganda forests, was captured by members of Ikelenge School, Mwinilunga, Northern Rhodesia, October 1961. It is a male, in good condition. It is easily distinguished from other Rhodesian members of this family by having several sub-basal cross-veins in the median space. The wing-bases are strongly marked with dark brown.

*Acanthagyna manderica* (Gruenberg). *Gynacantha manderica* Gruenberg, 1902, *S.B. Ges. naturf. Fr. Belg.* 9: 234.

A long series of males of this small, broad-winged species was taken over a pool near the Nuanetsi River, 90 miles south-east of the village of that name in April 1961. This is the first record for Southern Rhodesia, although a few have been captured in Northern Rhodesia. They were all flying over this pool during the day-time, despite the crepuscular habits of this group of aeshnids. Most of them were flying low over the muddy banks below the shelter of some trees, but venturing out over the water whenever the sun was obscured by cloud. In life the lips, face and the eyes in front were greyish white, the eye above being grey-blue. The front and upper sides of the thorax were grass green. The pale markings on the abdomen were cobalt on the basal segments, whiter on the last three.

*A. villosa* (Gruenberg). *Gynacantha villosa* Gruenberg, 1902, *ibid.* p. 233.

Described from the Nyasaland-Tanganyika border, this is a fairly common insect in tropical Africa but has been hitherto unknown in the Rhodesias. In May 1961, however, it was found to be moderately common in the Mwinilunga District, fitting from tree to tree in the denser patches of swamp forest on the Lisombo and Zambezi Rivers of that district. In life the eye of the male was dark green above, with a pale blue, transverse reflecting arc; below yellowish green. Face, thorax and pale colour at base of abdomen green. The legs are slightly paler, more yellowish brown, than in examples from tropical Africa, in which they are reddish brown. The specimens were flying in the forest by day.

*A. sevastopuloi* Pinhey, 1961, *Publ. Brit. Mus. (Nat. Hist.)*, p. 100.

Described from Uganda, a solitary female was captured in the Lisombo Forest, Mwinilunga, in May 1961. In life the face, eyes, thorax and base of abdomen were a vivid light grass green; labium yellow; legs brownish yellow.

*A. sextans* (McLachlan), *comb. nov.* *Gynacantha sextans* McLachlan, 1895, *Ann. Mag. nat. Hist.* (6) 17: 413.

This species appears to be rather uncommon. It is easily recognized by the strong chocolate brown costal streak. A solitary male, taken in swamp forest on the Zambezi River, North Mwinilunga District by day, is the only known record for Rhodesia. In life the eye above was olive brown with a transverse bluish white streak; below pale brownish. Thorax brown. Another *Acanthagyna*, seen but not captured, on the Lisombo River, had an amber costal streak. This may, perhaps, have been a teneral *sextans*.



*Anax congoliath* Fraser, 1953, *Rev. Zool. Bot. afr.* 48: 301.

A smaller race of this massive insect, which Fraser described from Uele in the central Congo (former Belgian), has been discovered in Northern Rhodesia near the Angola border.

*Anax congoliath lisomboae* subsp. nov.

*Holotype male* (mature). Lips, face, frons, thorax, and the two basal segments of the abdomen vivid green. No markings on any of these portions in the preserved specimen, but in life the synthorax was distinctly dark brown at the sutures, and this could be detected in the hovering insect. In life the eye was dark green above, pale green below; and almost the basal third of abdominal segment 3 was white, except for a black mid-dorsal stripe, which stained to brownish yellow after death. Rest of the abdomen blackish brown, with minute orange dots at the distal ends of segments 3 to 6. Anal appendages as figured by Fraser for *congoliath*. Femora elongate, ferruginous; tibiae and tarsi black. Venation black, but with a thin yellow line along the black costal vein. Pterostigma short, blackish ferruginous. No amber on the wings except for the merest trace at the bases. Membranule grey with a white basal spot. Forewing with 21 Ax, the sixth or seventh being primaries: 13 Px; triangle in forewing of 4-5 cells, hindwing of 4 cells.

Abdomen (without appendages) 53 mm., hindwing 55 mm., pterostigma 3 mm.

A single male was captured hawking along the Lisombo River in dense forest, in May 1961; and others of similar size were seen. Except for its smaller size it differs little from the nominotypical race. In *congoliath*, the abdomen (with appendages, which measured 7 mm.) was 64 mm., hindwing 63 mm., pterostigma 3.75 mm.; the forewing, proportionately larger, had 23-24 Ax, 15-16 Px. The holotype male of *lisomboae* is in the National Museum, Bulawayo.

Family LIBELLULIDAE

*Orthetrum angustiventre* (Rambur). *Libellula angustiventris* Rambur, 1842, *Névr.* p. 59.

Although known from Angola this is mainly a tropical African species, particularly equatorial Africa. It is found usually in the open or in thin woodland, not in forest. A new record is the wooded area near Lisombo forest, Mwinilunga. In May 1961 it was common there, taking short flights and resting quickly on grasses. It is a large species with a long pterostigma and the body is light brown in both sexes at maturity, without the darkening or pruinosity that develops in other Ethiopian species.

*Thermochoria equivocata* Kirby, 1889, *Trans. zool. Soc. Lond.* 12: 339.

Common in tropical Africa this species has now been found in the Mwinilunga District of Northern Rhodesia, in May 1961. One example was seen at the Kabompo River. At Ikelenge, in the north of the District, it was very common in forest, particularly on the Lisombo River, where it was settling on bushes. All stages from typical *equivocata*, with well-developed black rays on the wings, through diminishing streaks to the form *Ris* mentioned (forma b., 1919), in which there are no rays. One teneral female had the rays fairly well developed, which suggests that it is not a question of maturation but of individual variation. Such variation seems, however, to be local. The present author has these variable examples from this area and from the former Belgian Congo. Those found further north and east appear to be normally typical.

*Aethiothemis? diamangae* Longfield, 1959, *Publ. cult. Cia Diamant. Angola*, 45: 35.

This species was described from a teneral male taken in Angola. A series taken in the Mwinilunga District of Northern Rhodesia in May 1961 appear to be this species. They were taken on the Kabompo River, the Lisombo River and the Zambezi River; and also at Chingola. Always in the open, settling on grasses in swamp land. Except in their slightly larger size, however, they are very like *A. bequaerti* *Ris* (1919). The abdomen is more slender than in the *mediofasciata-solitaria* group of *Aethiothemis*. In the mature male the abdomen is pruinose with pale blue. There is a trace of amber at the bases of all wings. The female is similar, without the pruinosity. In one female, however, all the wings are broadly amber as far as the nodus. In this specimen, taken near the banks of the Zambezi, the eye, in life, was reddish brown above, grey-blue below; the pale body markings light green. Examples in the National Museum, Bulawayo, from Abercorn which have been placed under *bequaerti* have smaller hooks to the hamule of the accessory genitalia.

*Crocothemis brevistigma* Pinhey, 1961, *Occ. Pap. Livingstone Mus.* 14: 80.

A slightly juvenile male of this insect, only recorded from Northern Rhodesia, was very pink in body coloration. It was collected at Mwinilunga in May 1961. In life the face in front was whitish, frons above olivaceous yellow, eye above pinkish brown; the whole dorsum and sides of thorax and basal segments of abdomen were a light pink; distal segments of abdomen tinged with ochreous.

*C. saxicolor* Rix, 1919, *Coll. Zool. Setys*, 16: 1164.

Described from Salisbury, Southern Rhodesia, where this is a very local insect, the species has only been recorded once outside the territory, in Nyasaland. In May 1961 a specimen was collected on the

Kabompo River, Northern Rhodesia, thus adding a little to its known distribution. This is a slender *Crocotthemis*, like *C. divisa* Baumann (1898), with the similar habit of resting on granite rocks. The body, however, is a mottled grey, although at certain times of the year this pattern is somewhat masked by a red bloom.

*Atoconeura biordinata biordinata* Karsch, 1899, *Ent. Nachr.* 25: 371 (Tanganyika).

Known from Congo, Tanganyika, Nyasaland, and having other races elsewhere including a smaller race in Southern Rhodesia, it was to be expected that this insect would be found in Northern Rhodesia. A solitary male was taken at the source of the Sakeshi River, Mwinilunga, May 1961.

*Zygonyx prodigiosa* Fraser, 1958, *Rev. Zool. Bot. afr.* 58: 263 (Congo).

The African members of the genus *Zygonyx* Hagen (1867) fall more or less into three groups, the *natalensis* group of smaller species; the *speciosa* group, somewhat larger in size, but with the hindwing not noticeably broader near the base, the abdomen of the male distinctly fusiform and the thorax having a white transverse bar; and the *eusebia* group of very large species, having the anal field of the hindwing increased in size with a consequently broader wing-base. *Z. prodigiosa* belongs to this last section. Two males taken in the Mwinilunga District of Northern Rhodesia, one hovering over the water just outside the thick bush on the Sakeshi River source, the other hawking over the Lisombo River in dense forest, add an interesting record to this territory.

These males are very similar to examples collected in the Congo Republic (former French Moyen Congo), only differing in very minor respects. The outer black antehumeral is narrower; but since this stripe varies in thickness in the two Mwinilunga specimens it cannot be considered a valid difference. The reddish brown ternal patch on the hindwing is, however, much reduced. Face in front and at sides greenish yellow; frons steely blue. Thorax greenish white, with a broad black medial band and an outer antehumeral stripe on each mesepisternum. Legs brown, blackened at knees. Wings very faintly tinted; pterostigma dark brown; a small brown patch at tornus of hindwing. Abdomen pale greenish on first three segments, with a black dorsal band which is broken into a spot at base of each segment; the rest of the abdomen black, with a whitish patch covering basal two-thirds of segment 7. In life the eye was greenish brown above, greenish yellow in front. Abdomen 44 mm., hindwing 55 mm., very slightly smaller than in the type description by Fraser.

The present author had considered that examples of *Z. pretentiosa* Fraser (1957) (known only in the female) which were submitted from the Moyen Congo, together with the males of *prodigiosa*, might represent the females of the latter; i.e. the species being *pretentiosa* since this has priority. The female has a basal brown patch on each wing as well as an

oblique band, extending (with interruption) from the nodus of the forewing to the tornus of the hindwing. However, at the Lisombo locality in Mwinilunga a very amber-winged female, somewhat recalling *pretiosa* Karsch (1891), but appearing to have less brown on the wings, was seen hovering over the stream. This might either represent still another Rhodesian species or it might be the female of *prodigiosa*. It is also just possible that the female of this species may be either polymorphic or else exhibit a different racial form in this area.

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