

and Abercorn, in the Rhodesias. In the field it can be distinguished by its smaller size and the reddish thorax of the female.

General examples of *Rhyothemis semihyalina separata* taken at Salisbury showed most of the normal black of the mature insect on body and wings, but the thorax and the sides of abdomen 1-6 were orange-brown; the face paler. Eye brown above, grey below.

I find that *Triethemis hecate* Ris (= *aureola* Ris) occurs near Salisbury, the first record for Southern Rhodesia. Lastly, I might record seeing a female *Pantala flavescens* (Fabr.) trying repeatedly to oviposit on the shiny, greenish white bonnet of a motor car (1955, Ford Zephyr), at 5 a.m. It was already fairly bright at that early hour (14 November 1956), despite an overcast sky. The locality was in the Fort Victoria District.

A GYNANDROMORPH LIBELLULID DRAGONFLY (Fig. 7)

Orthetrum brachiale (Beauv.)

Libellula brachialis Pal. de Beauv., 1805, *Ins. Afr. Amer.* 171 f.

Amongst some Odonata sent by Dr P. Corbet to be determined was an example of this species which showed hermaphrodite features.

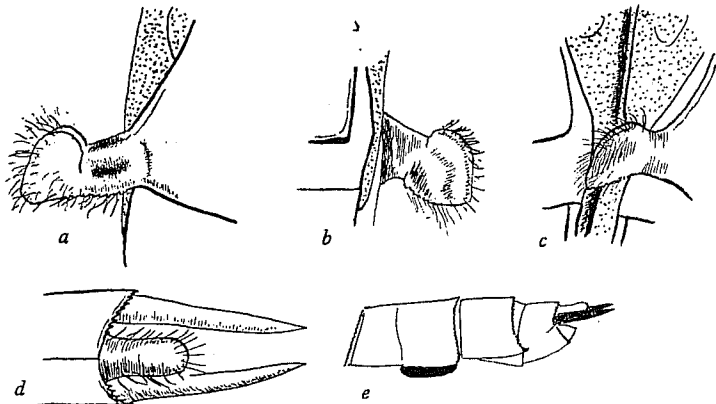


Fig. 7. *Orthetrum brachiale*, gynandromorph (primarily female). a-c, ventral portion of abdominal segment 2, from left, right and below, showing the single left posterior lobe. The dotted area represents the ventral fold; d, terminalia of the abdomen, from above; e, segments 8-10 and appendages, from left side.

Primarily a female, this specimen has the second abdominal segment normal for this sex, but for the presence of a well-developed left posterior lobe. The abdominal segments and anal appendages are typically female except for the foliations on the 8th segment. These are normal but appear to be rather narrow on the right side; on the left the foliation is only developed at the distal half of this segment. In markings and coloration the specimen is normal. The pterostigma is of the usual yellowish brown colour. Abdomen 27.5 mm., hindwing 32 mm.

Dr Corbet collected this insect on the Swynnerton Memorial Hill at Shinyanga, Northern Tanganyika, 26 August 1956. I have returned the specimen to him.

Completed
Odon. 179
1958

RECORDS OF DRAGONFLIES FROM THE
ZAMBEZI AND RHODESIA; A REVISION OF
THE GENUS *PLATYCYPHA*; A GYNANDRO-
MORPH DRAGONFLY FROM UGANDA

By E. C. G. PINHEY

The majority of these records are the results of four brief visits I made to the Victoria Falls area on the Zambezi River, two in the dry season at the end of September, another in the early rains between Christmas and the first week of January 1956. On this latter occasion insects were, naturally, far more abundant. I also visited Katimbora, about 40 miles up the river from the Falls. A similar visit in February 1957 was slightly less productive than the January one a year previously.

A few other species and genera are also discussed in this paper.

Odonata collected at the Victoria Falls, or at Katimbora, 40 miles further up the Zambezi River:

In the genus *Lestes* Leach there were *L. amicus* Martin, common in the dry season in the swampy 'forest' overlooking the Falls, which is known as the 'Rain Forest'; *L. pallidus ochraceus* Selys, the large *L. unci-fer* Karsch and *L. simulans* Martin were in thick patches of bush along the Maramba River. The last-named species was very similar to examples taken in East Africa. *L. pinheyi* Fraser was found in the rain forest in September 1957.

Elatoneura Cowley is represented by the bush species, *E. glauca* (Selys) and *E. fraenulata* (Hagen). *Metacnemis singularis* (Karsch) is common on the open river; sometimes with the *Metacnemis* position of the arculus, rather than the *Mesocnemis*. One female at Katimbora, February 1957, was feeding on a caddis fly, determined by Mr D. E. Kimmins as *Protomacronema pubescens* Ulmer.

Of *Ceriagrion* Selys there are the ubiquitous species, *C. glabrum* (Burm.) and *C. suave* Ris.

Pseudagrion Selys is well represented near the Falls, particularly on the Maramba River. Apart from the common species *kersteni* Gerst., *natalense* Ris and *salisburyense* Ris, there are my three black species: *nigerrimum*, *rubroviridis* and *whellani*; *pseudomassaicum* Pinhey; and the

rather more elusive species, *P. acaciae* Foerster, *P. nubicum* Selys, *P. coelestis* Longf. and *P. glaucescens* Selys. With this wealth of species it is by no means easy to select females, unless taken *in copula*.

Other common Zygoptera are *Agriocnemis exilis* Selys, *Ischnura senegalensis* (Ramb.), *Phaon iridipennis* (Burm.) and *Platycypha caligata* (Selys).

All the Gomphidae seen, apart from *Ictinogomphus ferox* (Ramb.), were of interest and will be discussed below. They were: *I. ferox* (Ramb.), *Gomphidia quarrei* (Schout.) (common at the Falls and Katembora), *Lestinigomphus africanus* (Fraser), *Neurogomphus uelensis* Schout., *N. fuscifrons* Karsch, *Crenigomphus cornutus* Pinhey, and four species of *Paragomphus*, all perched on twigs in a zone of thick patches of bush near the Maramba River: *elpidius* (Ris), *sabicus* Pinhey, *nyassicus* Kimmins and ? *lacustris* (Karsch).

The few Aeshnids seen were *Anax imperator* Leach, *A. tristis* Hagen and a glimpse of what was evidently an *Acanthagyna*, both in the gorge known as Palm Grove and again another example in thick bush at Katimbora.

The only Cordullids were a male *Macromia*, allied to *subtropicalis* Fraser outside the so-called 'Rain Forest' and *M. picta* Selys.

Orthetrum examined were *abbotti* Calvert, *brachiale* (Beauv.), *capense falsum* Longf., *chrysostigma* (Burm.), but no signs of *stemmale kalai* Longf. Other common Libellulids included *Palpopleura lucia* (Drury) as well as its form *portia* (Drury), *Hemistigma albipuncta* (Ramb.), *Brachythemis lacustris* (Kirby), *B. leucosticta* (Burm.), *Acisoma panorpoides ascalaphoides* Ramb., *Diplacodes lefebvrei* (Ramb.), *Crocothemis erythraea* (Brullé), *C. sanguinolenta* (Burm.) and the low veld species *Philonomon luminans* (Karsch). Scarcer species included one *Tetrathemis polleni* (Selys) and a *Palpopleura deceptor* (Calvert) and, at Katembora, a short series of *Chalcostephia coronata flavifrons* Kirby.

Nesciothemis farinosum (Foerster) occurred in the bush fringing the river at Katimbora as a dwarf form, hindwing ♂, ♀ 27–29 mm. An example of the normal-sized male was later taken close by near some channels created by flood water. It is interesting to note that Gambles is hoping to prove that the dwarf form is restricted to faster waters, the normal form to quiet pools, etc. Admittedly at Katimbora both conditions can apply side by side, especially when the Zambezi is in flood. And it might be suggested that the same ecological problems may account for the dwarf *Trithemis stictica* (Burm.) mentioned below. However, one of the localities where the normal form of the ubiquitous *Nesciothemis farinosum* is most abundant and at times the dominant dragonfly is in the forested slopes of the Usambara Mountains around and below Amani. Here most of the streams are fast-flowing and the swampy areas are possibly too stagnant for this species. There are, however, a few lacustrine areas like Nderema, but whether these could support the *farinosum* population is rather open to doubt.

Eleuthemis buetti-kofferi Ris occurs in the fringing bush along the river banks. Females were the commoner in January, the males in February. Both sexes were fairly common in September 1957.

There are the ubiquitous *Trithemis arteriosa* (Burm.) and *T. kirbyi ardens* Gerst.; a form of *T. basitincta* Ris, with genitalia like the species I described (1951, *Transv. Mus. Mem.* v, 265), but usually with short basal brown rays on the wings; *T. annulata* Beauv., with some examples having the coloured patch of the hindwing restricted and deepened, very like *violacea* Sjoest.; *T. donaldsoni* Calvert; and *T. ellenbecki* Foerst., of which I think Longfield's *risi* is a form only. In a short stretch of long grass on the northern bank of the Zambezi I found in January a dwarf race of *T. stictica* (Burm.): abdomen 19 mm., hindwing 25 mm. (in the nomino-typical race, abdomen 22–25 mm., hindwing 27–30 mm.). Females of this race were moderately numerous, but the venation was very unstable. Only a single male was captured and this was quite normal except for its small dimensions. Since the normal *stictica* is so widespread in Central and East Africa, I regard these dwarfs as representing no more than an ecological form. In February 1957 there was only one dwarf female and a normal sized male.

Zygonyx natalensis (Martin) is abundant, especially near the Falls; but *Z. torrida* (Kirby) appears to be infrequent there. *Olpogastra lugubris* Karsch is abundant at overflowing, reedy pools beside the Zambezi and on bushes in the Katimbora locality; in the same places, but also along the more torrentially flowing waters, *O. fuelleborni* Gruenberg was also common. There were scattered individuals of the migrants, *Pantala flavescens* (Fabr.) and *Trapezostigma basilaris* (Beauv.). In thick bush near the Maramba River two crepuscular species, *Tholymis tillarga* (Fabr.) and the little known *Zyxomma flavicans* Martin, could be found with a little searching. In another paper I am placing the latter in a separate genus, as it is manifestly not a true *Zyxomma*.

At Katimbora in February there were a few examples of *Rhyothemis semihyalina* (Desj.), one of the *R. fenestrina* (Ramb.), a few *Urothemis assignata* Selys and *U. edwardsi* Selys, and a series of *Aethriamanta rezia* Kirby.

This brings the list of species in the Falls–Katimbora area to close on eighty species. It indicates that it is a rich zone for these insects; evidently because of the varied habitats and seasonal changes. For although the majority of species are seen in the hotter months, such as December and January, yet a few species have only been observed in the dry season month of September. Certainly after the rains have just started there is a wealth of differing habitats, fast waters, slow or stagnant; open grasslands, bush and forest. But as is noticeable in other localities heavy rains make the river too turbulent and muddy, the waters possibly too deep, and there is a tendency for the river-breeders to thin out or disappear from the vicinity of the river.

ZYGOPTERA

Chlorolestes elegans Pinhey (Fig. 1)

C. elegans Pinhey, 1951, *Transv. Mus. Mem.* v, 36.

The single male I recorded in 1951 from Penhalonga (a specimen which is in the National Museum, Bulawayo) is of smaller dimensions

than the typical series, and the wings are short in proportion to the abdomen, giving a rather high ratio of abdomen/hindwing. I thought it possible that this individual from the Rhodesia-Mozambique frontier might prove to be a race. However, in November 1946, I took a long series of a *Chlorolestes* on the Vumba Mountains at about 5600-5700 ft.

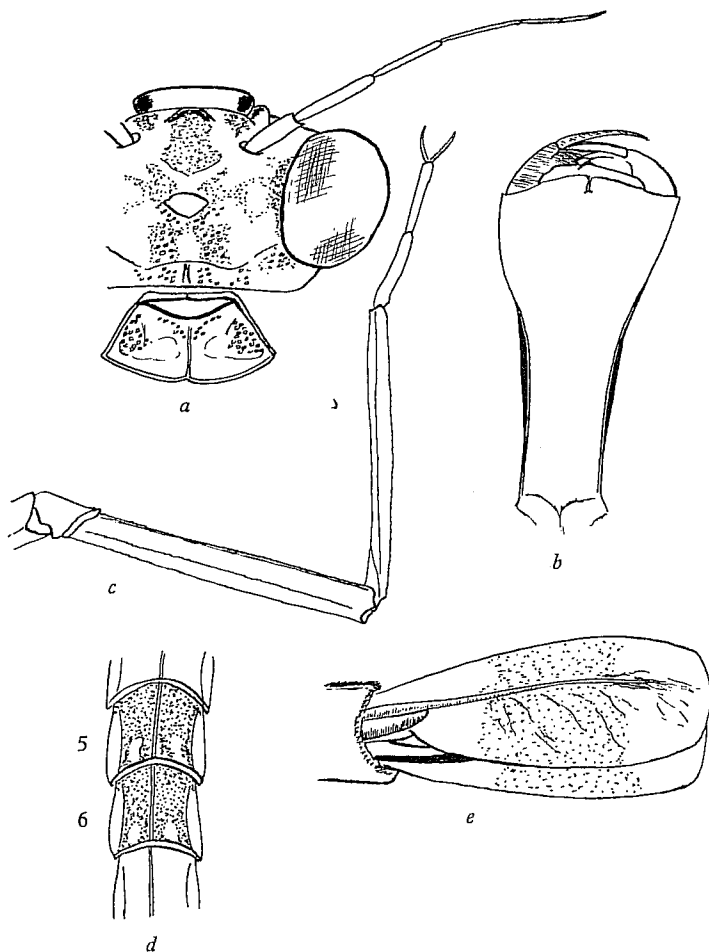


Fig. 1. Larva of *Chlorolestes elegans*. a, Head from above; b, labium, with left lateral lobe and movable hook shaded; c, right foreleg; d, part of abdomen, from above; e, caudal gills, from left.

and I find these are essentially similar to those from the type locality of Woodbush in the Transvaal in coloration, markings, anal appendages, accessory genitalia, legs and their claw-hooks. In dimensions they are very constant, approximating to the rather smaller Woodbush specimens. The wings are narrow, but hyaline, without bands. This, again, is like

the tendency in typical *elegans* and other *Chlorolestes* where the banded males often have rather broader wings. The pterostigma differs no more than in variations in the Woodbush ones, but it appears to darken more quickly with age, even in the female. Thus, the Woodbush and Vumba examples are all the same race; and since the Penhalonga Range extends very close to the Vumba Mountains I believe that further examples from that area will probably conform more to the type. Incidentally, the pterostigma in the Penhalonga specimen is slightly narrower than in the others. A comparative table of sizes might be of use (lengths in millimetres):

	Woodbush		Vumba		Penhalonga ♂
	♂	♀	♂	♀	
Abdomen (without appendage)	46-47.5	44	47-47.5	42.5	46.5
Hindwing	31.5-34	35	31.5	33.5	29
Abdomen/hindwing ratio	1.4-1.5	—	1.5	—	1.6
Pterostigma	Over 2	Over 2	Under 2	2	Under 2

The Vumba series was found in certain of the higher forest streams on the Vumba Mountains, flying up from the water to sunlit twigs. All were fresh in November, mostly a little teneral, a few older ones but none of them banded on the wings. Perhaps banded males will appear later in the wet season. In life the eye in both sexes is dark brown above, white below.

The species is far less robust than *draconica* Balinsky (1956), apart from the other differences, such as the increased dark areas on the thorax in that species and the narrower pale humeral stripe which crosses the upper end of the humeral suture.

Larva. Full-grown (and one younger) larvae of *elegans* were dredged in the small, shallow, muddy forest stream. They are typical of the genus in appearance, with large eyes, slender body, with prominent lateral carinae. Length of full-grown larva, including gills, 27-28 mm., gills about 4.5 mm. Body darkish brown, with diffuse yellowish markings on head and abdomen, and a yellow lateral stripe along the lateral carinae of the abdomen. Abdomen with a yellowish dorsal carina developed on last five segments. Labrum with black lateral spot and diffuse blackish marks on head above. Caudal gills rather elongate; yellowish, with very broad diffuse brown transverse band. Labium elongate, constricted posteriorly; medium lobe only slightly convex, the cleft narrow; lateral lobe and hooks as illustrated. No mental or lateral setae. Legs slender.

Lestes uncifer Karsch (1899) is mainly a tropical species and, apart from a record in Mozambique, the Victoria Falls specimens furnish the most southerly trend of this species so far known. The smaller species I described under this name (Pinhey, 1951, *Transv. Mus. Mem.* v, 48) has since been named *pinheyi* by Fraser (1955, *Parc Nat. Upemba*, xxxviii (1), 10). This is locally common in Rhodesia, but is not known

elsewhere. All the localities given by Fraser in this paper for these two species refer in fact to *uncifer*.

At Balla Balla, December 1956, there were unusually large numbers of *Lestes* at rain pools. Apart from *plagiatus* (Burm.), *virgatus* (Burm.) and *pallidus ochraceus* Selys there were further examples of *simulans* Martin, similar to those at the Falls. One of the *ochraceus* differed slightly from the abundant typical examples, but there was one unusual distinction: the presence of black markings on the thorax. These consisted of linear black at medial and humeral sutures; two black spots in upper half of mesepisternum and traces of dots in lower half, these representing an antehumeral stripe; a similar discontinuous stripe on mesepimeron; black dot at upper end of each lateral suture. The anal appendages were of the *pallidus* form, otherwise I would have suspected this was a distinct species. In this specimen the eye was deep blue, darker on top, sky blue below; labrum, anteclypeus and genae pale greenish blue. Thorax and first two segments of abdomen olive above, apple green at sides, to whitish below; rest of pale parts of abdomen pale grey green. In the other *ochraceus* males the eye and labrum were sky blue, the eye blackish on top; abdomen 1-6 mm. partly dull sky blue. In *virgatus* the eye was deep blue, black on top, pale sky blue below; labrum sky blue; abdomen 1-6 mm. greenish blue.

Recently I have found further localities for *Chlorocnemis marshalli* Ris, a teneral male in the Honde Gorge, below Inyanga, and, more surprisingly, a male at Mr Wheeler's Calgary Farm, near Salisbury: despite the fact that it is normally a fairly high altitude forest insect. Calgary Farm in the past has also been noted for *Tetrathemis polleni* (Selys) and *Notiothemis jonesi* Ris.

Enallagma subtile Ris, common in parts of tropical Africa and recorded from South-West Africa, has been found in the Vimba Forest at 1000 ft., South Melssetter District, as well as in the better known forests of the Vumba Mountains at 5500 ft., Umtali District. In the Honde Gorge below Inyanga I took a solitary male of the little-known *E. rotundipenne* Ris and, also this year, a male of *E. nigridorsum* Selys, at Balla Balla.

I should like to record here that Mr C. G. C. Dickson took a male of *Agriocnemis gratiosa* Gerst. sometime ago in the vicinity of Durban. Previously, the most southerly record of this was Abercorn, in Northern Rhodesia.

The *Pseudagrion* I recorded as *sjoestedti* Foerster (Pinhey, 1955, *Occ. Papers Coryind. Mus.* iv, 21, and footnote), from Turiani in Central Tanganyika, also occurs on the Hunyani River about 12 miles south-west of Salisbury. Whellan took a few there some years ago, and in November 1956 I collected a series of both sexes, there and again in the Honde Gorge, below Inyanga. I find the humeral black rather variable in extent, generally more or less linear but sometimes almost as broad as in *massaicum* which inhabits rain pools in the same vicinity. The female of *sjoestedti* (several of which were in copula) had long prothoracic stylets as I had depicted in 1955 for the Tanganyika example; unlike *massaicum*, *pseudomassaicum* and *acaciae*, where these structures are abortive. In

November 1956, I took further specimens of *makabusiensis* Pinhey, both in the type locality, near Salisbury, and in the Honde Gorge. At Salisbury, also, there was a solitary male of my *assegaii* and a few *coelestis* Longfield. In life the latter is pale cobalt blue; eye green, paler below (or white below in female); antehumerals very broad, green. At Vanduzi, Portuguese East Africa, the same month, there were a few males of *glaucescens* Selys. The pale colours of this in life were: face yellow; sides of thorax, base of abdomen and terminal segments turquoise; eye green on top, yellow below; postocular spots large and green. One male *rubroviridis* has the antehumerals severed at upper third.

***Aciagrion steeleae* subsp. *abercornensis* n.subsp. (Fig. 2)**

A. steeleae Kimmins 1955, *Entomologist*, LXXXVIII, 109-10 ff. (Lake Bangweulu)

Kimmins described the species from the Bangweulu area of Northern Rhodesia. I have examples from Abercorn, farther north, which are distinctly darker and constant in their pattern in both sexes.

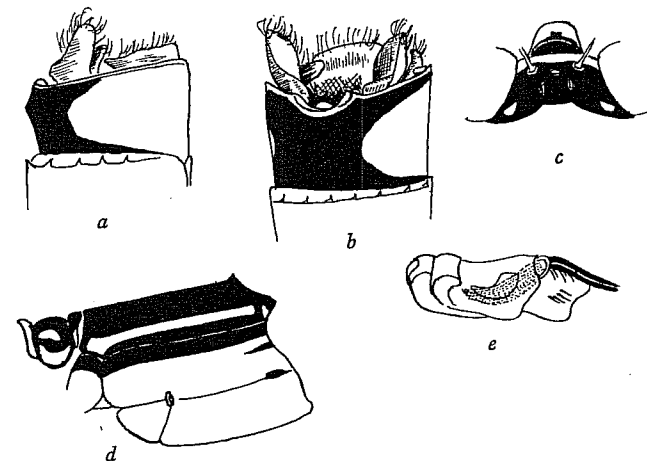


Fig. 2. *Aciagrion steeleae abercornensis* n.subsp. Male. a, 10th segment and appendages, from left; b, the same dorsally and slightly from left; c, head, above; d, thorax, from left; e, penis.

♂. Labium whitish. Face, the occiput and frons in front light blue-green; a black spot at base of labrum; vertex and occiput above black, with blue-green postocular spots. Prothorax mainly black, with very pale blue at anterior margin, a large lateral patch on median lobe more or less traversed by a black bar, a small lateral spot on posterior lobe. Synthorax black to below humeral suture, with narrow pale blue antehumeral; sides pale blue (rather violet in stained examples) with black spot at upper end of each lateral suture. Legs yellowish with black external streaks on femora. Venation brown. Pterostigma rhomboidal,

very pale yellow, with brown central suffusion, enclosed between brown veins. Anal vein leaves margin at anal crossing. Forewing with 9-10 Px, hindwing with 8.

Abdomen pale blue laterally with broad continuous, greenish black dorsal band from 1 to 7. 8-10 pale blue (tending to violet staining in preserved condition: as in so many cases in this and related genera, *Enallagma* and *Pseudagrion*). 10 with black dorsal saddle. Appendages much shorter than 10; superiors with small black inner branch; inferiors broad, very short, black anteriorly; on their outer side with blackish tooth.

♀. Very similar, but the pale colours on head, thorax and sides of abdomen ochreous; postocular spots pale green. Legs with reduced black streaks. Forewing with 11 Px. The black on abdomen is less metallic, and covers most of the dorsum of 8 and two-thirds of 9. Cerci very short and thick.

♂, ♀. Abdomen 23-25.5 mm., hindwing 16-17.5 mm.

This Abercorn insect is similar to *steeleae* in size, genitalia and appendages, in most respects; but differs in markings: the black postclypeus; the much broader black on prothorax and synthorax; the presence of the black lateral spots on the thorax. The pterostigma is not bluish grey; and there is the black band on abdomen ten.

The specimens were found on grassy banks around Lake Chila, Abercorn, in the months of December and April, by Mr Vesey Fitzgerald and myself. The type male and female will be sent to the British Museum (Nat. Hist.). Paratypes of male and female in the National Museum, Bulawayo.

Platycypha Fraser

Fraser, 1949, *Bull. Inst. Sci. nat. Belg.* xxv, 10; 1950, xxvi, 2.

For some time now I have felt uncertain about Fraser's determination of Mount Kenya specimens I sent him. In his 1950 paper (p. 3) he describes them under the name *auripes* Foerster. Foerster's specimens came from the East Usambara Mountains close to where I took my series of *greenwayi*. On my visits to the Amani district in this East Usambara Range, where the latter insect occurs, I have seen no signs of the Mount Kenya species.

This led me to suspect that Foerster's *auripes* and my *greenwayi* might be the same insect. In fact, in the original description the more important features agree entirely, and Fraser is now of the opinion that the two are synonymous.

This leaves the Mount Kenya species without a definite name, as it is certainly a very different species from the Amani one. On the other hand, I think Martin's rather inadequately described *amboniensis*, from the Fort Hall district, on the approach hills to Mount Kenya, agrees with this insect as far as one can make out. The mountain species is a distinctly high altitude insect for a dragonfly, and in East Africa I met with no other Chlorocyphids as high as this. There were no other species seen in the Fort Hall district. Furthermore, the legs of *amboniensis* are

described as being slender in the type male. Since no *Chlorocypha* sensu stricto are known from that area, I think it reasonable to assume that the yellow tibial expansions is the same as the yellow-legged *ambionensis*.

The species of *Platycypha* and their synonymy would now be as follows:

- Platycypha* ? *amboniensis* (Martin). *Libellago amboniensis* Martin, 1915, *Voy. Alluaud, Pseudon.* XLII (♂, Fort Hall).
P. auripes Fraser, nec Foerster, 1950, loc. cit. xxvi, 3 ff.
P. auripes (Foerster). *Libellago auripes* Foerster, 1906, *Mannh. Jb. Nat.* LXXI-LXXII; 54 (Nguelo, East Usambara Mountains).
P. greenwayi Pinhey, in Fraser, 1950, loc. cit. xxvi, 18 (Amani, East Usambara Mountains).
P. caligata (Selys). *Libellago caligata* Selys, 1853, *Bull. Acad. Belg.* (2) 1, 57 (Durban).
Libellago ambigua Gerst., 1869, *Arch. Naturgesch.* xxxv, 222 (Mbaramu, Zanzibar).
Libellago hartmanni Foerster 1897, *Ent. Nachr.* xxiii, 216 (Transvaal).
? *Libellago sulphuripes* Martin, ined. (Transvaal).
P. fitzsimonsi (Pinhey). *Chlorocypha fitzsimonsi* Pinhey, 1950, *Ann. Transv. Mus.* xxi, 270 (Natal).
P. lacustris (Foerster). *Libellago caligata lacustris* Foerster, 1914, *Arch. Naturgesch.* LXXX, 2, 61 (Entebbe).
Chlorocypha armageddoni Fraser, 1940, *Ann. Ent. Soc. Amer.* xxxiii, 551 (Buganda).
P. pinheyi Fraser, 1950, loc. cit. xxvi, 6 (Mwangongo, Kigoma). The colours of this last species were incorrectly described. I have referred to this in a forthcoming monograph on the East African Odonata.

A key to the males of *Platycypha*

- | | |
|---|--|
| 1. Abdomen 3-6 dorsally mainly red or orange. | 2 |
| — Abdomen not reddish on dorsum; at most reddish on sides of segments 2-3. | 4 |
| 2. Abdomen above reddish orange. Tibial expansions yellow | |
| — Abdomen above red on 1-6, pale blue on 7-10. Tibiae red | 3 |
| 3. Hindwing under 19 mm. | <i>pinheyi</i> Fraser |
| — Hindwing over 20 mm. | <i>fitzsimonsi</i> (Pinhey) |
| 4. Abdomen on basal half above dull greenish or ochreous. | 5 |
| — Abdomen above pale blue on all segments. | 6 |
| 5. Tibiae red, distinctly expanded. | <i>fitzsimonsi inyangae</i> n.subsp. |
| — Tibiae orange yellow, scarcely expanded. | <i>amboniensis</i> (Martin) |
| 6. The two larger pale central spots on abdomen 2 elongate. | |
| — The two larger pale spots on 2 broad equilateral triangles or spreading outwards to join the lateral pale area. | <i>caligata</i> (Selys)
<i>lacustris</i> (Foerster) |

I consider the last two distinct species, since I have taken both on the same stream in tropical Africa. In *lacustris* the broader black bands on the abdomen will distinguish it in the field.

Platycypha fitzsimonsi subsp. **inyangae** n.subsp. (Fig. 3, 5)

In recent years this Natal species has been collected in the Chimanimani range of Melsetter District, Southern Rhodesia, by Mr K. M. Pennington and Mr R. H. Carcasson.

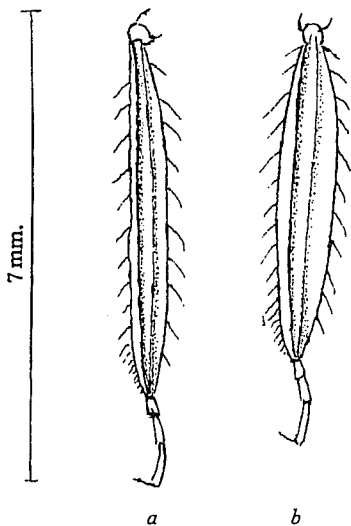


Fig. 3. Posterior tibia in *Platycypha*: a, *Fitzsimonsi inyangae* n.subsp.; b, *caligata*.

Mr J. A. Whelan has taken examples of a *Platycypha* at 7000 ft. on Inyanga, near the Portuguese Border. These are not quite typical of the species.

♂. At first sight the male looks like an immature *caligata*, but on closer examination the tibial expansions are found to be more elongate and parallel-sided; in fact they are just like those of *fitzsimonsi*. Furthermore, these expansions are externally red, as in mature *caligata* and *fitzsimonsi*, whereas in juvenile *caligata* they are yellow or orange; internally salmon pink, instead of white, as in the latter. I have not seen general examples of *fitzsimonsi* males, but Whellan considered his Inyanga specimens fairly mature when he captured them. Segments 1-6 of the abdomen are yellowish to ochreous, rather greenish dorsally; 7-10 pale sky blue, as in *fitzsimonsi*. The dorsal black markings on the abdomen are rather more distinct than in typical *fitzsimonsi*. Forewing with 11 Ax. Abdomen 19.5-20 mm., hindwing 22-24 mm., pterostigma 2 mm.

The female from Inyanga seems very like *fitzsimonsi* but rather small. Abdomen 18.5 mm., hindwing 25.5 mm., pterostigma 2.3 mm.

In the Natal and Chimanimani males I have seen the basal segments of the abdomen are reddish or orange red. It seems probable that the Inyanga examples represent a high altitude race of this species, and so far the most northerly extent of its range. They were taken by Whellan at

the 'Nyangombie Falls and on the Nyererwe River. The Chimanimani examples tend, in the male, to be more melanic on the thorax than the Natal ones, with narrower antehumerals.

The type male and female will be sent to the British Museum (Nat. Hist.).

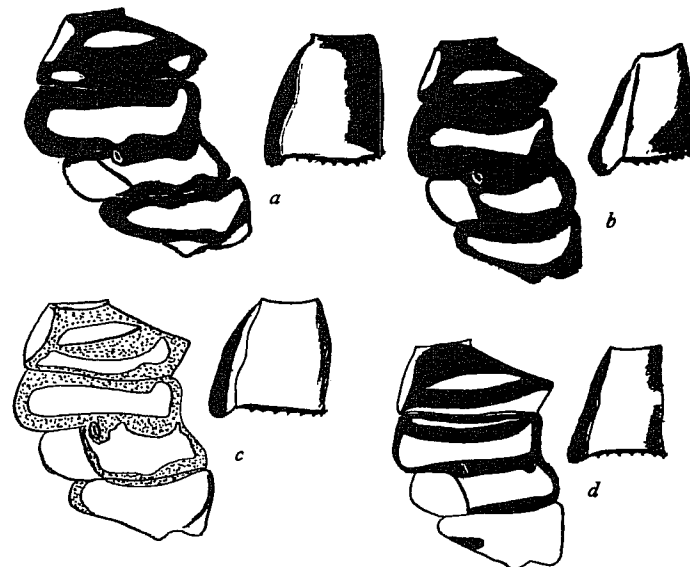


Fig. 4. *Onychogomphus*. Thoracic pattern and segment 8 in male, both from left side, in: a, *O. supinus*, melanic, from Port East Africa; b, *O. nigriscens* Pinhey (nec Laidlaw), from western Uganda; c, *O. supinus nigrotibialis*, from Kenya; d, *O. supinus*, from South Africa.

ANISOPTERA

Gomphidia quarrei (Schouteden)

Diastatomma quarrei Schouteden, 1934, *Ann. Mus. Congo Belge, Zool.* III (1), 57 (Belgian Congo).

A long series taken at the Victoria Falls agree, in the male, with Schouteden's description, except in the number of cross-veins on the anterior margins, and the appendages are paler. In the type the forewing had 19 Ax, 10 Px; primaries, 1st and 6th Ax. The abdomen (without appendage) 44 mm., hindwing 34 mm.

In the Falls specimens, these details are as follows:

♂. Forewing with 17-18 Ax, 9 Px; also 1st and 6th primary antenodals. Abdomen (without appendage) 43-44 mm., hindwing 32-33 mm., pterostigma 4.5 mm. (as in the type). The wings have traces of dark basal brown spots. Superior appendages yellow, black at base and apex. In life: eye grey; face, thorax and base of abdomen yellowish green; antehumerals light green to greyish green; abdomen 5-10 and appendages light yellowish.

♀. Forewing with 19-21 Ax, 10-11 Px, 1st and 6th or 7th Ax primaries.

Abdomen 40–43 mm., hindwing 35–36 mm., pterostigma 5 mm. In life: eye blue-grey; body greenish yellow, greener on thorax, yellower on abdomen. In a juvenile female the face, frons and vertex pinkish buff; pale areas on body bright yellow.

In a male from Inyamadzi River, Portuguese East Africa, near Spungabera (leg. Whellan, December 1948), the markings are more pronounced. The frontal black protrudes more anteriorly down the groove; vesicle black, greenish apically (all green in the above specimens), occiput more broadly black at sides. Thorax blacker, with shorter antehumerals; less green on antear anal sinus. Forewing with 16–17 Ax, 8–9 Px, 1st and 6th Ax primary. Pale markings on abdomen 7–10 somewhat reduced. Superior appendages more broadly blackish at base and apex, and ventrally largely blackish.

It would appear to me that the type is intermediate between the two forms from the Falls and the Inyamadzi River; nearer to the latter in the colour of the appendages; but paler in other respects.

Neurogomphus ? fuscifrons Karsch

Neurogomphus fuscifrons Karsch, 1890, *Ent. Nachr.* xvi, 380.

Females of what appear to be this species and of *uelensis* Schout. (1934, *Ann. Mus. Congo Belge, Zool.* III (1), 65) were taken at the Katembora, about 40 miles up the Zambezi from the Falls. Both are very shy insects and appear quite suddenly, settling on twigs. The larger species, *fuscifrons*, was particularly alert. One female flew rapidly back and forth over a patch of grass, only a few inches above the ground. In the female which I consider to be *fuscifrons* there is no subbasal subcostal vein. Forewing with 16 or more Ax. Discoidal field expanding before nodus. Face strongly sloping, with the crest consequently not well defined. In life the eye varies from pale olive above, yellow ventrally to green above, pale orange below. Face yellow. Body maroon, with greenish yellow markings on thorax and abdomen. Abdomen 50 mm., hindwing 41 mm., pterostigma 4.5 mm.

In the female *uelensis*, which is very similar to one I took in central Tanganyika, the eye, in life, was darkish green; face light reddish brown; frons and marks on thorax and abdomen pale yellowish green, yellower on metepisternum and on 8th abdominal segment. Abdomen 45 mm., hindwing 38 mm., pterostigma 4 mm. In September 1957 I saw *fuscifrons* near the Falls as well as at Katimbora.

Lestinogomphus africanus (Fraser)

Echinoptergomphus africanus Fraser 1926, *Trans. Ent. Soc., Lond.*, LXXIV, 355 (female, Sierra Leone).

I recorded this from the Victoria Falls in my monograph, 1951, p. 142. Dr Van Son said he took those specimens in the 'Rain Forest'. I have not seen it in this small fringe of bush but have found it in some numbers in bush along the northern bank and near the Maramba River. In the

latter area it was very numerous on the further edge of thick bush, away from the river. It would have been possible to capture two or three in one sweep of the net. Colours in life, both sexes, were: eye dark green above to light grey below, or bluish green above, paler below. Thorax, abdominal segments 1–2, and 7, dull pale green; rest of abdomen pale greyish green. Male: abdomen 31 mm., hindwing 21 mm.; female: abdomen 31–33 mm., hindwing 23–24.5 mm.

I have also taken one male on the Hunyani River near Salisbury, October 1956.

Crenigomphus Selys

Crenigomphus Selys, 1892, *Ann. Soc. ent. Belg.* xxxvi, 12, 97.

Two species have been found in Rhodesia: the rather widespread *hartmanni* (Foerster) and, at the Victoria Falls, as well as Katimbora, my *cornutus* (1956, *Occ. Papers Nat. Mus. Bulawayo*, p. 83 f.). The latter species has affinities with the East African *renei* Fraser and the Abyssinian *denticulatus* Selys. It resembles the former in lacking foliations on segment 8 and in the length of segment 9, as well as the short anal appendages which are not as long as the 10th segment. The formation of the appendages in *cornutus* is much nearer *denticulatus*, which also has these structures shorter than 10; but the latter has quite distinct foliations on 8, while segment 9 is much shorter than 10. In September 1957 only females of *cornutus* were taken and it was noticeable that the eyes in life were largely pink.

A key to males of Crenigomphus

1. Abdomen 8–9 without foliations. 2
- Abdomen 8–9 with foliations. Segment 9 shorter than 10. 3
2. Segment 9 slightly shorter than 10. Inferior appendage in side-view slender, ending in a long thin spine; a stout dorsal tooth at halfway. 3
Abdomen about 30 mm. renei Fraser
- Segment 9 as long as 10. Inferior in sideview very robust to apex where there are short tumours carrying teeth. Abdomen 34–35 mm. cornutus Pinhey
3. 10th segment with distinct apical tumour on posterior margin. 4
Inferior appendage with broad apices, the bifurcation separate at base; each apex with small points close together. abyssinicus (Selys)
- 10 without apical tumour. Branches of inferior closely applied; each apex deeply separated into two points. 4
4. Superior appendage much longer than 10; gently curved. 4
hartmanni (Foerster)
- Superior much shorter than 10; sharply down-turned apically. 4
denticulatus Selys

This key omits Martin's *occidentalis*, a small, dark insect that may not correctly belong here.

Paragomphus Cowley (Figs. 5, 6)

Paragomphus Cowley 1934, *Entomologist*, LXVII, 201.

Six species have so far been taken in Rhodesia. By far the commonest is the ubiquitous and very variable *hageni* (Selys), which may itself, perhaps, be only a form of the Mediterranean *genei* (Selys). More local in the

territory is the type species, *cognatus* (Rambur), also widely distributed in east and southern Africa. On bushes near the Maramba River, the species, *sabicus*, which I described from the Sabi Valley, is fairly plentiful. It is one of the largest species I have seen, but not as large as *magnus* Fraser, still only known by the type female from Mombasa. The species

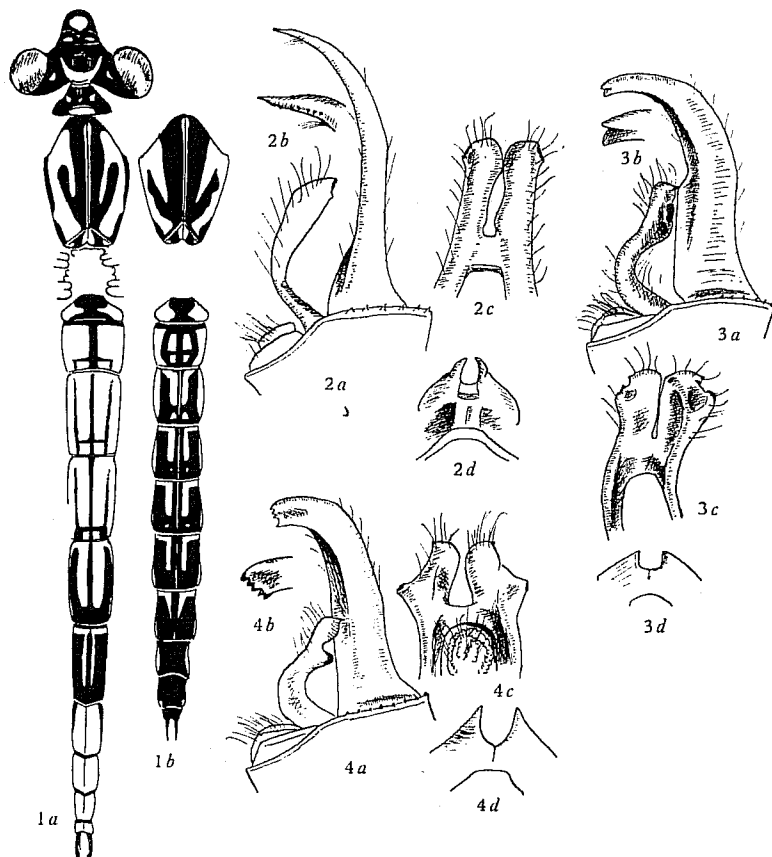


Fig. 5. (1) *Platycypha fitzsimonsi inyangae* n. subsp. Body markings. *a*, male; *b*, female. (2) *Paragomphus sabicus*: *a*, anal appendages of male from right; *b*, tip of superior appendage from inside; *c*, inferior appendage from below; *d*, vulvar scale of female. (3) *P. hageni*: *a*, anal appendages from right; *b*, tip of superior appendage from outside; *c*, inferior appendage from below (but slightly to right side); *d*, vulvar scale of female. (4) *P. cognatus*: *a*, anal appendages of male from right; *b*, tip of superior from outside; *c*, inferior appendage from below; *d*, vulvar scale of female.

lacustris (Karsch) and *elpidius* Ris are discussed below. Lastly, there is *nyassicus* Kimmins, described from Nyasaland. I have only taken one small male at the Victoria Falls, in the dry season: abdomen 27 mm., hindwing 24 mm. The appendages of all species six are shown here.

In *hageni*, *sabicus*, *elpidius* and what I believe to be *lacustris*, the superiors are closely applied in terminal half. In *sabicus* they taper to a

long, fine single point, with a few minute teeth on inner edge before apex; inferior about half as long, in sideview like a blade, ending in a thickened edge. The superior in *elpidius* is more robust, ending in a broader, single point; inferior only a third as long, each branch having two widely separated points. The superior in *hageni* is broader laterally

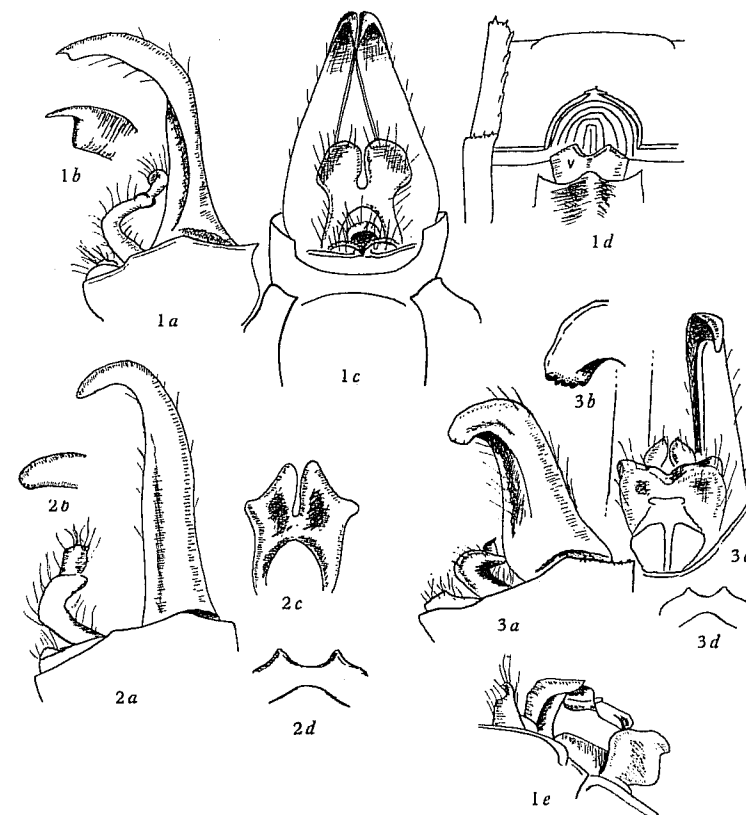


Fig. 6. *Paragomphus*. (1): *a*, *lacustris*, anal appendages of male from right; *b*, the same, tip of superior appendage from outside; *c*, the same, appendages from below; *d*, the same, segments 8-9 from female from below, showing vulvar scale; *e*, the same; accessory genitalia of male, laterally. (2): *a*, *elpidius*, large race from Zambezi, appendages of male from right; *b*, the same, tip of superior from outside; *c*, the same, inferior appendage from below; *d*, the same, vulvar scale of female (taken in copula with the male figured here). (3): *a*, *nyassicus*, from the Zambezi, appendages of male from right; *b*, the same, tip of superior from inside; *c*, the same, appendages of male from below (left superior not completed); *d*, the same, vulvar scale of female.

in the basal half and finishes in two blunt points; inferior half as long, the branches closely applied and each provided with a lateral hard surface and a post-lateral thickened point. In *lacustris* the upper appendage ends in a small shelf and a long acute point; inferior about a third as

long, each branch somewhat rounded. In the other two the superiors diverge apically. In *cognatus* the very robust superior terminates in a row of teeth; inferior about half as long; each branch far apart at junction, provided with a lateral thickened pad and, well posteriad, a small point. In *nyassicus* the short upper appendage is still more robust, with apical teeth on inner edge. Inferiors scarcely a third as long, the branches widely splayed out and carrying a post-dorsal point.

A small *hageni* as taken recently by Corbet at Tabora in Tanganyika, had an abdominal length of 27 mm., but hindwing very short, only 21 mm., tending to the dimensions of *pumilio* (Ramb.).

Paragomphus ? lacustris (Karsch) (Fig. 6)

Onychogomphus lacustris Karsch, 1890, *Ent. Nachr.* xvi, 377 (Tanganyika).

Among the species found at the Victoria Falls, Christmas 1956, were examples of a very bright green *Paragomphus*, related by its markings and appendages to the *hageni* group. It agrees fairly closely with Karsch's description of *lacustris*, but I have not had an opportunity of seeing the type. If it should prove to be different in any important details the present insect is probably new. Consequently, it will be described here in some detail. Corbet has taken a specimen of a male more recently at Kigoma in Tanganyika.

♂. In life, the eye darkish grey-blue, paler below; face, thorax and abdomen 1-2 bright green; rest of abdomen marked with yellow and brown.

Lips and entire face, frons and occipital plate pale green, unmarked with brown; vertex brown. Prothorax green with light brown dorsal saddle. Synthorax with only the faintest light brown markings: trace of a band near median carina and collar, traces of outer oblique antehumeral and a humeral stripe. Femora green, tibiae and tarsi blackish brown; claw-tooth very small and remote from apex. Venation dark brown, pterostigma yellowish brown between black veins. Forewing with 11-12 Ax, first and fifth primaries. Anal triangle of 3 large and 1 small cellule. Abdomen 1-2 green with dull orange transverse bands. 3-7 yellowish green with diffuse reddish brown marking and black transverse carinae; 8-10 more or less ferruginous, with narrow blackish foliations on 8-9, only about a quarter as wide as the segment. Appendages ochreous, blackish apically. Superiors curved down, parallel; at apices an abrupt shelf and a tooth (like tip of an elephant's trunk). Inferiors reaching slightly more than a third. Abdomen (without appendage) 28 mm., hindwing 24 mm., pterostigma 2.5 mm.

♀. Similar, but with broader abdomen. The frons is liable to darken after death sometimes. Pterostigma paler yellow. Very narrow black foliations on 8-9. Stylets slender, acute. Vulvar scales small, separated by broad V-shaped gap. Abdomen 33 mm., hindwing 26-27 mm., pterostigma 2.8-3 mm.

This species differs from *hageni* (Selys) in the following respects: it is

brighter green; there is no marking on the frons (normally a brownish basal band in *hageni*); costa brown (yellow in *hageni*). The superior appendages of *hageni* end in two or more small points; and the inferiors are about half as long as the superiors. The latter species is of very much wider distribution, extending across Africa in various forms to the Mediterranean shores.

Paragomphus elpidius (Ris) (Fig. 6)

Mesogomphus elpidius Ris, 1921, *Ann. S. Afr. Mus.* xviii, 346 ff. (Zululand).

A long series from the Victoria Falls and elsewhere along the Zambezi River, as well as a female (leg. Whellan) from Tanganda River in the south-east of Southern Rhodesia, are all much larger than Ris's Zululand specimen, but they are, I consider, no more than a larger race of this species. The thoracic markings are either distinct or very distinct.

Living colours. In one male the eye was green above, bluish at sides; frons and thorax emerald; face and base of abdomen pale green; rest of abdomen greenish yellow to yellow. In another male I recorded the eye as being green above, grey-blue medially, whitish below; abdomen 1-2 greenish yellow, 3-7 yellow. Female: labrum pale greenish ochreous; face, frons, thorax and base of abdomen bright grass green; rest of abdomen yellow with tinge of green.

Onychogomphus supinus Selys (Fig. 4) (Melanic variety)

[*Onychogomphus supinus* Selys-Hagen, 1854, *Bull. Acad. Belg.* xxi (2), 34 (p. 93 sep.).] Pinhey, 1951, *Transv. Mus. Mem.* v, 155 (variety).

The insect which I mentioned in 1951 (without describing) as a variety of the South African *supinus supinus* is much blacker than either true *supinus* or the insect, so common in parts of East Africa, which I have considered to be Sjoestedt's *nigrotibialis* (Sjoestedt, 1909, ex Kilimanjaro). It is not so dark as the western Uganda species which I named *nigrescens* (this latter name is, I understand, from Miss Longfield, pre-occupied by a species of this name from East Asia. The necessary change will be made in a forthcoming paper).

For the present I will continue to consider the variety mentioned above as a melanic form of *supinus*. A description of the male follows.

♂. Labrum black with greenish lateral spots. Rest of face and frons in front greenish yellow, with curved black stripe across postclypeus, joined above to a black band along lower border of frons. Base of frons above broadly black, vertex black; occipital plate brown, marked with black, posterior edge almost straight, fringed with black hair. Prothorax black, with narrow yellow spots on anterior margin, small green lateral spots on median lobe, minute pair of median dots on posterior lobe. Synthorax jet black with green markings: trace on anteorar sinus, and on median carina; incomplete mesothoracic collar; short, fusiform antehumerals, a

small spot dorsally and short streak ventrally, these two just above humeral suture; three broad green lateral stripes; two separate spots on posterior edge of metepimeron. Ventrally, mainly greenish yellow.

Legs black, like *nigrotibialis*, with pale stripe on femur 1 and trace on femur 2. Wings hyaline, mere trace of brownish at base; venation dark brown to black. Pterostigma brown, between black veins. Forewing with 12-14 Ax, first and fifth primary. Abdomen 1-7 black with greenish or yellowish marking: on 1 a posterior triangle and lateral spot; on 2 a mid-dorsal fusiform stripe, and a lateral patch incorporating the auricle but almost divided by a black ray just behind this organ; 3 with basal triangle at side and mid-dorsal spot; 4-6 with basal annulus and middorsal spot; 7 with basal half yellow, this continuing distad, latero-ventrally. 8-9 ferruginous with very narrow black foliations (scarcely a tenth as wide as the segment in dorsal view); with diffuse dorsal black band, leaving a reddish basal spot on 8. 10 ferruginous with diffuse black dorso-basal triangle. Superior appendages ferruginous, inferior black. The appendages are shaped very like *supinus*. Abdomen, without appendages, 32.5 mm., hindwing 28.3 mm., pterostigma 3.3 mm.

This species was captured by Whellan on the Inyamadzi River, in Portuguese East Africa, below Mount Selinda; February 1948. I am inclined to think it is probably a distinct race of *supinus*, rather than just a melanic aberration. More than one male was captured at the time.

The comparative figures of thorax and 8th segment of abdomen in related African species or races indicate certain of the differences. Thus, *nigrotibialis* has very reduced dark areas on the thorax and these zones are light reddish brown, even in mature examples; the foliation on 8 is fairly broad. The next darkest is typical *supinus*, these thoracic areas being black; but the foliation on 8 narrow. In the melanic insect described above the dark areas are all jet black and extensive; foliation again narrow. In my *nigrescens* the dark areas are still greater but they are partly dark ferruginous and partly black; foliation very broad. The inferior appendage in this last insect has a broader mid-dorsal spine, but otherwise the appendages are very like *supinus*. It is possible that these four represent races of the same species, inhabiting very different terrain. This is a disputable point. Another close relative is Fraser's *7-flavum* (1955), from the Belgian Congo.

A single teneral male *Onychogomphus* which I took in the Honderingwe Gorge, on the Ringwe River November 1956, was broadly yellow on the thorax, much more like the condition in *nigrotibialis*.

The only Corduliids of special note were a male *Macromia congolica* Fraser collected at Siachelaba, Zambezi River, May 1956; and a species I took near the Victoria Falls which is near *M. subtropicalis* Fraser, but differs slightly in markings.

A few Libellulids call for special mention. Whellan took a dwarf male *Tetrathemis pollenii* (hyaline stage, *carpenteri* Fraser) on the lower Hunyani River, Lomagundi District, some years ago. The abdomen measured 16.5 mm., hindwing 22 mm. An unnamed race of *Porpax asperipes* occurs in Rhodesia:

***Porpax asperipes risi* n.subsp.**

P. asperipes (?) Ris, 1919 (? part), *Coll. Zool. Selys*, xvi (2), 1129 (female, Busi Valley); 1921, *Ann. S. Afr. Mus.* xviii, 406.

Porpax sp. innom., Pinhey, 1951, *Transv. Mus. Mem.* v, 228-9, Pls. 16a, 25.

Ris was not sure if this southern female he described was conspecific with *asperipes* or a distinct species. Having obtained a little more material, a comparison of males of the Rhodesian and Mozambique insects with an example from West Africa of the typical *asperipes* indicates differences which I feel are subspecific, rather than specific, since the genitalia and anal appendages are similar.

This race differs from the nominotypical one in the following particulars:

♂. Labrum yellow with trace of black at base and black anterior border (all black in *asperipes*). Sides of thorax between humeral and second lateral sutures mainly yellow with black sutural bands (instead of mainly black with greenish yellow stripes). Pterostigma slightly longer. Arculus at or proximal to second Ax in forewing (instead of being distal to this cross-vein). Triangle of forewing free or crossed (more often free, but sometimes crossed in *asperipes*). Cu_2 a little more strongly curved; but this may be proportionate to its smaller size. Otherwise similar to the typical male. Both show a discontinuous yellow lateral stripe on segments 1-3 of the abdomen. Abdomen 17-20 mm., hindwing 23-24 mm., pterostigma 2-2.5 mm.

The type male is mature, and it is pruinose blue on the abdomen and the antehumerals are also pale blue, in striking contrast to the surrounding black. Abdomen 17 mm., hindwing 23 mm.

♀. Abdomen broader than in the male and not pruinose. Vulvar scale with broad U-shaped depression. Abdomen 19 mm., hindwing 25 mm., pterostigma 2.5 mm.

This race occurs on the Busi River, near Mount Selinda, the Chibudzana River in the same area (Whellan) and on the Vumba Mountains (Pinhey, November 1953). The type specimens were collected by J. A. Whellan, the male in February 1948, the female in November the same year. Holotype and allotype will be sent to the British Museum.

From Salisbury material I have separated off what I believe to be *Diplacodes exilis* Ris, from the larger and more abundant *D. lefebvrei*. Apart from its consistently smaller size the fully mature males of this *exilis* are black, coated with a thin white pruinosity on thorax and most of the abdomen (more extensively than in *lefebvrei*), giving it a faintly grey-blue tint. In the immature male and female the front of the thorax is distinctly reddish brown, instead of ochreous; the black stripes at humeral and lateral sutures more emphasized; a broader continuous black dorsal band the length of the abdomen (confluent in both species at the distal end with the black latero-ventral band). This smaller insect occurs sparingly in a number of localities, such as Salisbury, Rusape