

SOME DRAGONFLIES OF EAST AND CENTRAL
AFRICA AND A RARITY FROM MAURITIUS

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This paper gives descriptions of one new genus and several new species of dragonflies:

<i>Pseudagrion whellani</i> n.sp.	<i>Lokithemis</i> n.g.
<i>P. rubroviridis</i> n.sp.	<i>L. leakeyi</i> n.sp.
<i>P. rufocinctum</i> n.sp.	<i>Trithemis parasticta</i> n.sp.
<i>Enallagma vansomereni</i> n.sp.	<i>T. anomala</i> n.sp.
<i>Orthetrum fitzgeraldi</i> n.sp.*	<i>Olpogastra fraseri</i> n.sp.

It also includes descriptions of a new form or race of *Pseudagrion pseudomassaicum* (mihi) and of the female of *Nepogomphoides pinheyi* Fraser; as well as notes on species of the *minuscula* group of *Aeshna*.

Some of these insects have been taken in East Africa, but others from Northern Rhodesia, during visits to the Victoria Falls and to Abercorn, have proved much more remarkable. In fact Lake Chila, at Abercorn, is perhaps the most interesting dragonfly habitat I have visited despite a number of extensive expeditions in tropical Africa. The lake is shallow, with a peat bottom, and extends into open swamp. It is fringed by *Brachystegia* woodland and two small areas of rather dense swamp forest. There is a rocky stream running out. All these varied habitats suit a large number of different dragonflies, some of them very peculiar species, two of them, at least, being real enigmas. One of these, with a blackish thorax, red and blue abdomen, seems to be a link between *Orthetrum*, *Hadrothemis* and *Oxythemis*, but nearer the first. The second appears to show characters involving *Oxythemis* and *Lokia*, but having genital hamules somewhat like (as Miss Longfield says) a *Nannophlebia*, the hooks of these hamules being scimitar-shaped as in the *donaldsoni* group of *Trithemis*.

What is the explanation for these 'misfits'? It might be said that certain small genera like *Hadrothemis*, *Oxythemis* and *Lokia* are not concisely defined, or that they are of sub-generic rank. Perhaps a better conception of the problem is that genera obviously must not be accepted too literally in their characters as they are really only artificial groups employed for convenience. Insects in many families or subfamilies are sometimes difficult to place generically, probably quite often because they are evolutionary transition species. A similar problem sometimes seems to occur within a genus. For instance, in *Pseudagrion* there are certain complex subgroups, like the *massaicum* section, where the difficulty of separating them may be due to the fact that they have changed little from

* See footnote on p. 30.

some common ancestry, and that some forms may be in a transitional stage. Females, particularly, are often very hard to distinguish.

I should like to acknowledge the assistance I have had from Miss Longfield and from Col. Fraser over some of the puzzles in this dragonfly fauna. My gratitude is also due to Mr L. D. E. F. Vesey-Fitzgerald who has helped considerably with material, and through his hospitality I was enabled to see the Chila habitat and its insect life.

***Pseudagrion whellani* n.sp. (Text-figs. 1, 2)**

Pseudagrion ? *sjöstedti* Pinhey 1951, 'The dragonflies of southern Africa', *Transv. Mus. Mem.* no. 5, pl. 6b, figs. 161-2 (genitalia).

DESCRIPTION

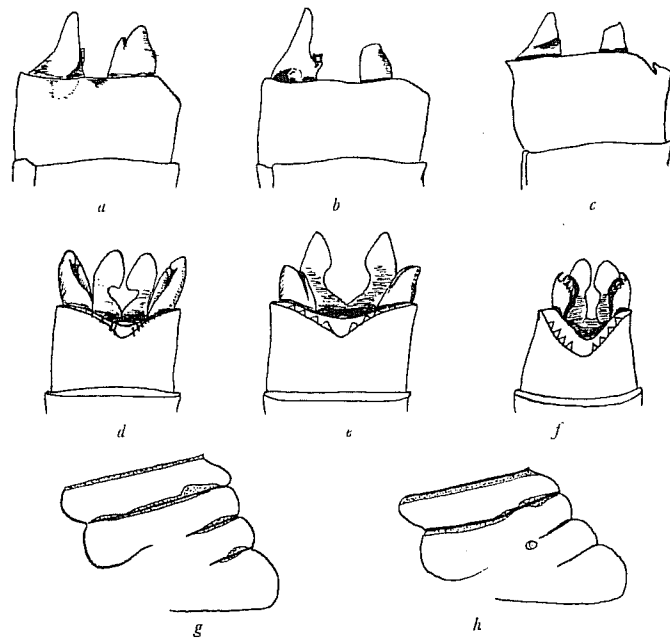
Holotype male. Labium orange ochreous; face in front orange red; frons above and vertex to post-antennal level dark red brown; back of head black; with large greenish postocular spots linked by narrow line on occipital plate. Antennae with red basal joints. Eye red in ventral half in life. Prothorax black. Synthoracic dorsum dark red with black median and humeral bands. Sides greenish ochreous with short black streaks on first and second lateral sutures. Femora mainly black with yellow interior line; tibiae and tarsi light reddish. Venation black; Ab. as long as Ac. Arculus at second Ax. Pterostigma a brown quadrilateral with black veins, costal edge the longest. Abdomen yellowish laterally, with broad greenish black dorsal band; constricted just before distal end of 2; constricted on 3-6 at basal ends, at about one-fifth from distal ends and just before distal ends; constricted on basal and distal ends of 7. Segments 8-10 pale blue pruinose (obscured in type male), with greenish black marking; narrow distal annulus on 8; a distal patch covering half the dorsum of 9, and the whole dorsum of 10.

Appendages short, the inferiors slightly the longer; superiors broad, provided with a blunt, ventral, subapical tooth. The related *P. nigerrimum* (mihi) is easily distinguished in having the blunt superior appendages considerably shorter than the inferiors. In *P. sjöstedti** Förster, the appendages are still shorter, the superiors provided dorsally with a row of apical hooks.

Paratype males. Practically all the examples are fully adult males, many of them coated in patches with white pruinosity: at ventrum and sides of thorax; antealar sinus, interalar spaces; coxae and femora; abdominal segments 1 and 2. In all such specimens the head and thorax dorsally are very dark, appearing superficially black. In some specimens, particularly from Karamoja (Uganda), there is a thin blackish streak along the tibiae.

One of the males from Victoria Falls is mature, yet still in juvenile pattern; face and vertex of head as far back as the front edge of the posterior ocelli distinctly rufous; back of head black, but the postocular spots so large as to be bordered by only a moderately narrow black zone. Thoracic dorsum light reddish. Despite such immaturity the specimen shows pruinosity as in older examples and bluish white pruinosity on the terminal three segments of the abdomen.

Allotype female (Madi Opei). Labium whitish; face in front pale ochreous yellow; postclypeus, frons above and vertex to ocellar region reddish brown; rest of vertex black with large postoculars as in male. Prothorax light brown, with narrow black transverse anterior and posterior line. Stylets as in the *massaicum* group, slightly more prominent than in *nigerrimum*. Synthorax pale ochreous brown with very sparse black marking;



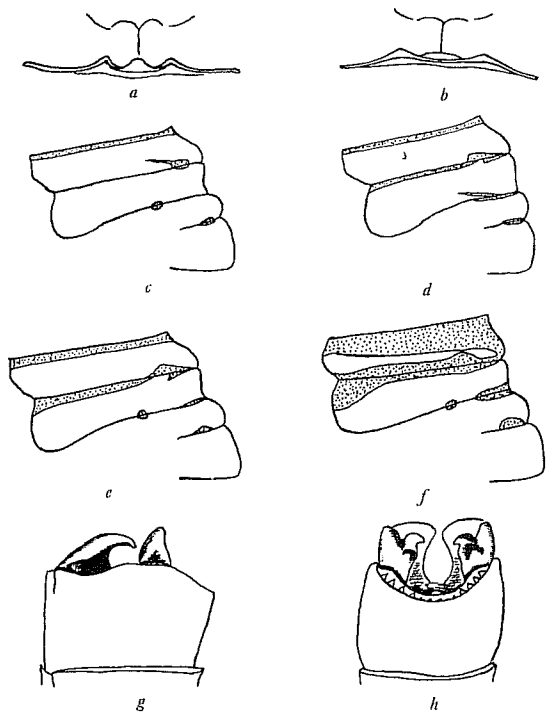
Text-fig. 1. *Pseudagrion*. Upper row, male appendages, right side: a, *P. whellani*; b, *P. nigerrimum*; c, *P. sjöstedti*. Middle row, male appendages, dorsally: d, *P. whellani*; e, *P. nigerrimum*; f, *P. sjöstedti*. Bottom row, synthorax from left: g, *P. whellani* (immature); h, *P. sjöstedti*.

narrow band on median suture; short streak at upper end of humeral suture; small spots only on first and second lateral sutures. Legs pale ochreous, the femora with black exterior streak. Abdominal markings very similar to male, but 8 black; 9 bluish with broad black dorso-basal triangle tapering to distal end; 10 blue.

Paratype females. One from Aremo (Labwor Hills) has more extensive dark markings particularly on the prothorax; humeral stripe of the synthorax broader and continuous

like *P. nigerrimum*. Others from Madi Opei, Kacheleba, Karamoja (Uganda) and Ibadan (Nigeria) have these markings intermediate to the allotype, the humeral stripe continuous but narrower, or discontinuous.

Abdomen: male (without appendages) 24–31 mm.; female 23–27 mm. Hindwing: male 17.5–22.5 mm.; female 17–21 mm. Abd./hw. ratio (male) 1.37.



Text-fig. 2. *Pseudagrion*. Top row, prothorax: a, *P. whellani*, female; b, *P. nigerrimum*, female. Second and third rows, synthorax from left: c, *P. whellani* female (Madi Opei); d, *P. nigerrimum*, female; e, *P. whellani*, female (Labwor Hills); f, *P. rubroviridis*, male. Fourth row, male appendages from right and from above: g, h, *P. rubroviridis*.

REMARKS

The mature males of this blackish species are, in the field, very like *P. nigerrimum*. Both occur in Rhodesia and in East Africa, but generally do not seem to overlap, for

whellani appears to be a more western insect. Only at the Victoria Falls have I seen and taken both species together. The distribution of *P. whellani*, according to my records is:

Rhodesia. Chirundu Bridge, Zambezi (where Mr J. A. Whellan took the first examples on the hot spring pools); Maramba River (Northern Rhodesia) which runs into the Zambezi a few miles north of the Victoria Falls (coll. E. Pinhey).

Kenya. 20 miles west of Lake Magadi (which is 70 miles south-west of Nairobi) (coll. J. Nagle).

Uganda. Kacheleba, Suk (Pinhey and Jackson); Kotido, Mount Kadam and Aremo (Labwor Hills) in the Karamoja District; Rom, Madi Opei and Aswa River Bridge, in Acholi district (Jackson); Kampala (Pinhey); Bwamba Forest (Pinhey) (below Ruwenzori).

Southern Sudan. Yambio (coll. C. E. Wilson).

Nigeria. Ibadan (coll. H. J. Sutton).

The Uganda material from Karamoja and Acholi Districts were collected by Dr V. G. L. van Someren and Mr T. H. E. Jackson.

The known distribution of *P. nigerrimum* (material collected by Pinhey):

Rhodesia. Maramba River, Victoria Falls; near Shawanoya River (about 45 miles north-east of Salisbury); Odzi River; Umtali.

Portuguese East Africa: Mavita.

Kenya: Diani and Shimba Hills, near Mombasa; Mzima Springs (Tsavo National Park); Kibwezi.

Tanganyika: Kimboza Forest, Uluguru Mountains; Amani, East Usambara Mountains.

It would appear that *P. nigerrimum* is mainly a coastal insect but travels up the rivers and tributaries well inland; while *P. whellani* scatters over tropical low country, westwards.

The holotype and allotype of *P. whellani*, taken in copula by Jackson at Madi Opei, will be presented to the British Museum, together with thirteen male paratypes from various localities: Madi Opei (6), Kacheleba (1), Mount Kadam (Karamoja) (1); Bwamba Forest (1); Yambio (2); Magadi (1); Victoria Falls (1).

In Dr van Someren's collection there are eight male paratypes: from Aswa River Bridge (5), Madi Opei (2), Kotado (Karamoja) (1); and five female paratypes: from Madi Opei (4), Kotido (1). In the Coryndon Museum there are twenty-eight male paratypes from the Victoria Falls, the Karamoja and Acholi localities, Bwamba Forest, Kampala, Yambio, Ibadan and Magadi; and six female paratypes (five from Uganda, one from Ibadan).

RELATIONSHIP

The mature male of *P. whellani* can be distinguished readily from *P. nigerrimum* in its red face, vertex, tibiae and tarsi, which are black in the latter. Mature *sjöstedti** is red

* In this paper it is assumed that the *P. sjöstedti* mentioned is the same as Förster's species from the Cameroons, although, as Miss Longfield considers, there is no certainty about this identification at present. The male and female from which the details were drawn for this paper were taken in copula at Turiani, north of Morogoro, in east central Tanganyika. They appear to agree with Ris's description of specimens from Uelle, Belgian Congo (Ris, 1936, *Abh. senckenb. nat. Ges.* 433: 57).

on the thorax. The superior appendage is longer than in either of the others and has the ventro-apical tooth. The prothoracic stylet of the female is well developed. *P. massaicum* Sjöst. and *P. pseudomassaicum* (mihi) are quite distinct from *whellani* in having the hatchet-shaped inferior appendage. Females of *P. whellani*, however, are very much more difficult to determine unless taken in copula as they fit into the *massaicum* group with abbreviated prothoracic stylets and red thoracic dorsum. A detailed revision is necessary of the females of this section of the *Pseudagrion* using long series taken in copula and perhaps studying bursae. While the Coryndon Museum has 'in copula' material of most of these, we as yet have no 'in copula' females of *P. acaciae* Forst. (South and East Africa) and *P. punctum* (Ramb.) (Madagascar).

***Pseudagrion pseudomassaicum* Pinhey**

Pseudagrion pseudomassaicum Pinhey 1951, 'The dragonflies of southern Africa', *Transv. Mus. Mem.* no. 5, p. 83, figs. 150, 151, 178, 223.

***F. rusingae* n.forma (Text-fig. 5)**

DESCRIPTION

At the northern end of Lake Victoria there is a common form of *P. pseudomassaicum* which, in the long series I have taken, is nearly always smaller (with the measurements of *P. massaicum* Sjöst.) and with a strong tendency to melanism in the male. Collecting this insect in large numbers on the shores of Rusinga Island I was at first inclined to think it might be a new species. However, at Jinja, where it was also numerous, occasional specimens of a larger size, obviously very close to normal *pseudomassaicum*, were captured. There seems to be no difference in genitalia, this form also having longer superior appendages than *massaicum*.

In *rusingae* the black markings on vertex and occiput are more extensive than in typical *pseudomassaicum*, this darkening sometimes spreading round the back of the occiput. On the synthorax the black at median and humeral sutures is normally much broader, as in the figure here; occasionally broader still, almost linking these two dark zones.

Living colours: face and eyes in front orange-red, eyes below green, post-dorsally dark red-brown. Postocular spots, mesepisterna, pale areas at base of abdomen green to blue green. Sides of thorax and the whole of abdomen 8-10 sky blue. In the less mature specimens the mesepisterna are bright red; but this soon becomes coated with thin pruinosity which eventually changes the appearance from bluish green to almost purplish, as in typical *pseudomassaicum*.

The females are like small editions of *pseudomassaicum*; with vestigial stylets. In life the thorax and postocular spots are velvety green; eye below yellow; other pale areas are more yellowish green.

Abdomen: male 27-28 mm.; female 25-26 mm. Hindwing: male 18-19 mm.; female 20 mm. Abd./hw. ratio (male) 1.5 (as in *pseudomassaicum*).

The occasional larger male may have abdomen 31 mm., hindwing 21 mm.

REMARKS

A very common species at Rusinga Island, taken both by Dr Leakey and his family and by myself; also found on Karungu Island and on the lake shore at Jinja and Entebbe in some numbers, and on streams near the lake in the latter locality. One damaged male from Musoma on Lake Victoria, farther southwards in Tanganyika, may also be this insect. It is possible that this form could be considered a Lake Victoria race. The nomino-typical form or race of south-east Africa extends northwards also, through Tanganyika, Kenya and northern Uganda. Some cotypes will be sent to the British Museum.

DESCRIPTION ***Pseudagrion rubroviridis* n.sp. (Text-figs. 2, 3)**

Holotype male. Labium and occiput below whitish ochreous. Face and frons in front reddish, postclypeus with a pair of lateral black dots and a central black basal triangle which continues on to the frons as an inverted triangle to form a joint square. Frons above, vertex and basal joint of antenna greenish black, second joint of antenna red; green, pyriform postocular spots; a yellow line on occipital plate. Prothorax greenish black; yellowish anterior transverse collar; two small central yellow spots, a larger green lateral spot. Synthorax metallic green on dorsum, extending over more than half of the mesepimeron; a narrow reddish yellow incomplete antehumeral stripe, severed at upper two-thirds. A short black line at upper end, a central dark spot, on first lateral suture; a short dark line on second lateral suture. Sides of thorax bluish white. Femora blackish; tibiae and tarsi reddish. Arculus in forewing just beyond second Ax.; at this point in hindwing. Ab. almost equal to Ac. in forewing but much shorter in hindwing. Pterostigma elongate, almost a parallelogram, with costal edge slightly the longest; red, edged with paler, between black veins.

Abdomen 1 sky blue with black basal spot; 2 blackish with elongate pale blue mid-dorsal spot at base; 3-7 greenish black with thin yellowish annuli at bases; 8-9 blue with narrow black annulus at distal end; 10 blue with black dorsal band. Appendages short; in side view the inferiors hooked and curved upwards; in dorsal view the superiors with an inner hooked branch.

Pale colours in life; postocular spots, sides of thorax, abdomen 1, 8 and 9 bright cobalt blue; eye red-brown above, greenish white ventrally.

Paratype males. In one of these the upper end of the antehumeral stripe is completely separated off as an isolated spot.

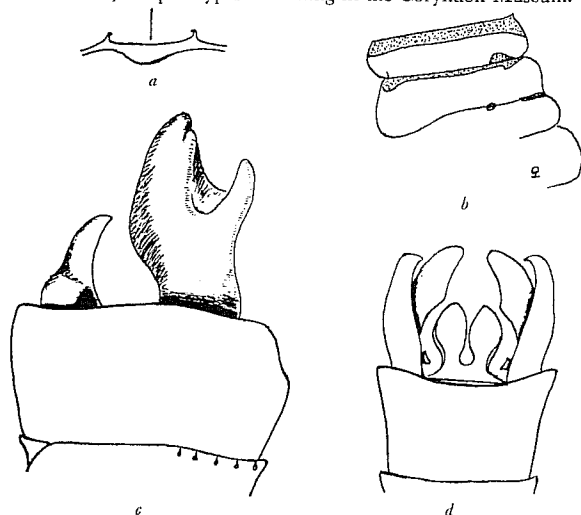
Allotype female. Face and head above as far back as anterior edge of posterior ocelli red; postclypeus marked as in male; frons above with dark basal line; a dark spot on either side of anterior ocellus; postocular spots red, almost joined across occipital plate. Prothorax with red areas much larger than the pale spots in male; stylets very short, pointed, slightly upturned. Synthorax pale reddish; a broad metallic greenish median band; narrow dark humeral line expanded to a spot at both ends; short lines on first and second lateral sutures. Legs reddish with slender dark exterior streak on femora. Pterostigma paler than in male.

Abdomen 1 reddish with blackish green dorso-basal patch; rest of abdomen reddish laterally with broad metallic greenish dorsal band, constricted at each end on 2-5. Terminal three segments lost in this specimen.

Paratype female. Similar. Abdomen 8-9 with large bluish post-lateral spot; 10 bluish.

REMARKS

One pair in copula (holotype and allotype) with two other males and one female (paratypes) were taken by the author on the Maramba River near the Victoria Falls (amongst *P. whellani*) at the beginning of October 1953. Holotype and allotype will go to the British Museum, the paratypes remaining in the Coryndon Museum.



Text-fig. 3. *Pseudagrion*. Upper row, prothorax and synthorax: a, b, *P. rubroviridis*, female. Lower row, appendages from right and from above: c, d, *P. rufocinctum*, male.

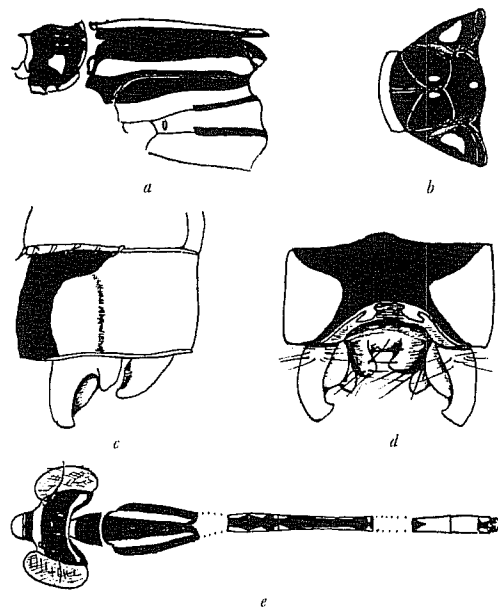
DESCRIPTION

***Pseudagrion rufocinctum* n.sp.** (Text-figs. 3, 4)

Holotype male. Labium pale ochreous. Face and frons orange-ochreous; three black basal dots on labrum, broad black basal band on postclypeus. Occipital lobes ochreous below. Vertex black; pyriform reddish postocular spots almost linked to red line on occipital plate.

Prothorax and dorsum of synthorax greenish black with reddish ochreous markings as in the diagram; the reddish antehumeral band complete. Sides of thorax greenish ochreous; with broad black band below humeral suture and short stripes on first and

second lateral sutures. Legs pale inwardly, femora and basal half of tibiae broadly black externally. Pterostigma red, edged with black veins; rhomboidal on forewing; a parallelogram on hindwing, the interior edge of each case shorter than the cell below it. Ac. meets the anal veins at its commencement.



Text-fig. 4. *Pseudagrion* and *Enallagma*. Upper row, thorax of male from left, prothorax of female from above: a, *P. rufocinctum*, male; b, *P. rufocinctum*, female. Middle row, appendages from right and from above: c, d, *Enallagma vansomereni*, male. e, *E. vansomereni*, male, from above.

Abdominal segments 1-7 covered dorsally by broad dark green band; 8 and 9 bluish; 10 and appendages black. Superior appendage broad, deeply excised, the ventral branch being the larger; a small basal tooth on inner edge. Inferiors short and slightly curved.

Living colours: pale colours on face, vertex and dorsum of thorax bright orange red; sides of thorax and of abdomen 1-3 green; abdominal segments 8 and 9 violet blue.

Paratype males. Similar.

Allotype female. Differs in markings from male in following respects; labium and antclypeus greenish ochreous, the former with dark basal line; postclypeus entirely black.

Prothorax with two medial pale spots instead of four dots; stylets brownish, reaching nearly half the length of the prothorax. Antehumeral stripes broader than in male. The black streak on first lateral suture linear only and very short. Femora with narrow black external line. Pterostigma brown with black veins, rhomboidal in both wings. Abdominal segments 1-8 broadly greenish black above; 9 with basal two-thirds blackish, its distal third and whole of 10 pale blue.

The pale colours of the female are postmortem only, as a record of the living colours was not kept in the field.

Abdomen: male 34-37 mm. (without appendages); female 33 mm. Hindwing: male 23.5-26 mm.; female 25 mm. Abd./hw. ratio (male) 1.44.

REMARKS

This species is nearest to *P. risi* Schmidt from Cameroons. The latter has similarities in colour and markings, size and the abdomen-hindwing ratio. The pterostigma is more trapezoidal in shape. The superior appendage in *risi* has (according to the figure) a broader ventral branch (in lateral view) and the inferior is evidently blunter. Four males of *P. rufocinctum* were collected by the author (one of them being sent to Colonel Fraser) in Kamengo Forest near Kampala, May 1951 and May 1952. A solitary female, evidently conspecific, was collected in the same place near one of the males in May 1952. The insect was very sparse in this haunt on a stream edged with swamp and required much concentration to collect under difficult conditions.

The holotype will be sent to the British Museum. The paratypes and allotype will at present remain in the Coryndon Museum until more can be collected.

DESCRIPTION

***Enallagma vansomereni* n.sp. (Text-fig. 4)**

Holotype male. Labium whitish, back and ventrum of occiput light blue. Face and frons pale blue, postclypeus black. Head above black, with narrow blue postocular spots linked across occipital plate. Prothorax black above, edged blue anteriorly and blue at sides. Synthorax black above, with complete blue antehumeral stripe; at sides pale blue, with black stripe along and below humeral suture; an elongate black spot at dorsal end of second lateral suture. Blue interalar spots. Legs pale, with black stripe on outer surface of each femur, slightly continued at proximal end of tibia. Pterostigma pale brown, bordered with black veins; nearly a parallelogram but with costal edge the longest. Arculus at second Ax. in forewing, just beyond it in hindwing; Ac. midway between antenodals; Ab. longer than Ac.

Abdomen mainly greenish black above, pale blue at sides, except end segments. Segment 2 with dorsal black strongly constricted in middle and again just before distal end; 3-6 with the black constricted at basal end and distally less so than segment 2; 7 mainly black at sides and dorsum; 8 with black basal triangle; 9 wholly blue; 10 blue with black dorsal band constricted in middle. Appendages black; superiors directed horizontally; with an interior lobe and a ventral swelling. Inferiors broad and blunt.

Paratype males. The black may be less constricted on abdominal segment 2 and there may be a larger basal triangle on 8. In *variety A*, the basal triangle on 8 is small, while the dark mark on 10 is reduced to a thin transverse basal line.

Allotype female. Very similar to the holotype male. Labium yellowish with brown basal line. Thoracic markings as in male. Prothoracic posterior lobe only narrowly developed. Abdominal segments 1-7 as in male; 8 black, 9 black in basal half, 10 blue. Femora with narrow black external streak.

Paratype female. With black on abdomen 9 extending distad in a mid-dorsal triangle. Abdomen: male, female 18-18.5 mm. Hindwing: male, female 12-13 mm.

REMARKS

This small species seems to be nearest to *E. glaucum* (Burm) of the known Ethiopian species. A series was taken by Dr V. G. L. van Someren and Mr T. H. E. Jackson on Pachua dam at Paimal in the Acholi Region of northern Uganda. The holotype and allotype will be sent to the British Museum. Paratypes (8 male, 1 female) are in the Coryndon Museum and in Dr van Someren's collection there are six male, one female paratype, as well as twelve other males.

***Nepogomphoides pinheyi* Fraser (Text-fig. 5)**

Nepogomphoides pinheyi Fraser 1952, *Occ. Pap. Coryndon Mus.* 3, pp. 3-6, figs. 1, 2 (♂).

DESCRIPTION

Allotype female (mature). Similar to males but abdomen stouter. Base of wings faintly yellowish to distal edge of discoidal triangles and along costal-subcostal area nearly to nodus. Pterostigma longer than in male. Vulvar scale broad, black. Living colours: eye dark blue, whitish ventrally. Body markings pale green. Cerci whitish.

Abdomen 29 mm. Hindwing 26.5 mm. Pterostigma 3.5 mm.

Teneral female (in life). Eye brown above, grey-blue below. Markings on face, thorax and base of abdomen pale yellow-green, on rest of abdomen more pale yellowish. Pterostigma yellowish, between brown veins.

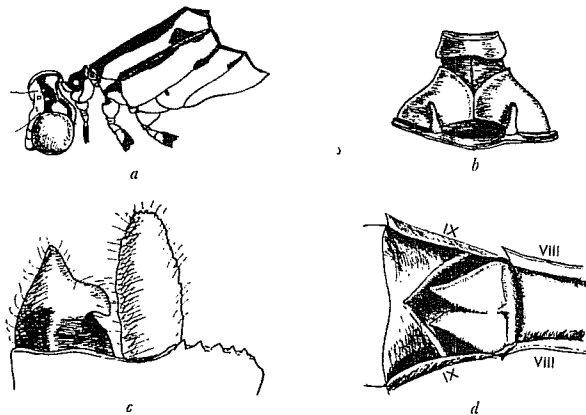
Males. Living colours. Eye blue-green, whitish ventrally. Markings on head, thorax and base of abdomen usually pale green and on rest of abdomen pale yellow. In a few mature examples the antehumerals are whitish in life.

REMARKS

The type series of males were taken in Kimboza Forest, Uluguru Mountains, Tanganyika, in October 1951. A longer series of males, a pair in copula (of which the female is the allotype above) and a second, very teneral female, were taken in the same locality in April 1954. I also found the empty larval shuck as the teneral female rose from a twig on the water of the forest stream. Other larvae were dredged up in different instars. Later, nearer Morogoro, a teneral male and its empty shuck were taken at a rockpool near a mountain forest stream.

The first male of all, in this species, was secured in November 1950 by Mr J. G. Williams in Kimboza Forest; and it was partly on this account that I visited the locality a year later. In February 1953, I found one male on the Sigi River below Amani, East Usambara Mountains; thus again linking the fauna of the East Usambaras and the Ulugurus.

The allotype female and the male with which it was caught will be presented to the British Museum.



Text-fig. 5. *a*, head and thorax of *Pseudagrion pseudomassaicum rusingae*, male. *b*, prothorax of *P. sjöstedti*, female. *c*, appendages of *P. p. rusingae*, male. *d*, end segments of *Nejoagomphoides pinheyi* from below, female.

Aeshna F.

Remarks on the minuscula group

A. ellioti Kirby, 1895, *Ann. Mag. nat. Hist.* (6), 17, 124 (Ruwenzori).

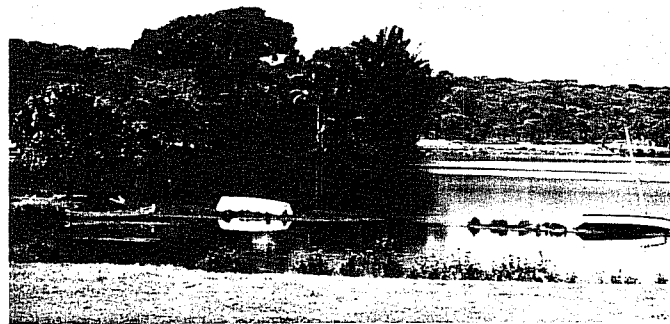
A. minuscula McL. 1895, *Ann. Mag. nat. Hist.* (6), 17, 421 (Cape of Good Hope and Knysna).

A. usambarica Först. 1906, *Mannh. Jb. Ver. Naturk.* 71-72, p. 48 (Usambara Mountains).

MATERIAL EXAMINED

In the *Coryndon Museum* there are specimens of both sexes of *A. minuscula* from Natal; of what is evidently *A. usambarica* from Southern Rhodesia (both sexes) and one female from Lushoto, Usambara Mountains, Tanganyika; and a long series of both sexes of *A. ellioti* from East Africa, collected in the following localities:

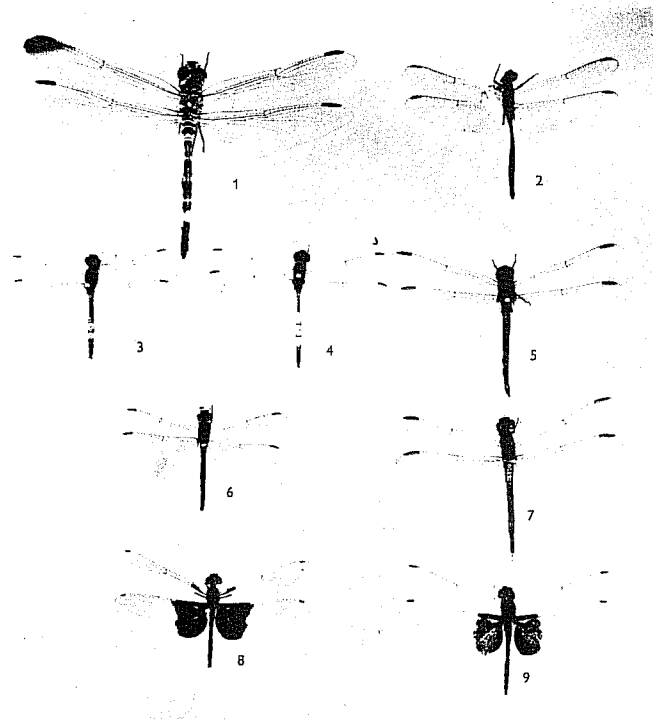
Kenya. Nairobi and Limuru; Burguret River and Sagana River (Mount Kenya); Thomson's Falls (Aberdare Mountains); Mount Marsabit (Northern Frontier District); Kitale and Mount Elgon; Kakamega district.



Lake Chita, Abercorn, Northern Rhodesia

This is the habitat of a surprisingly large number of species of dragonflies, including some remarkable ones of which a few are described in this paper. The upper picture shows a patch of swamp forest standing out from the fringing *Brachystegia* woodland. In the lower photograph the mountains just discernible in the distance are in the southern extremity of Tanganyika Territory

(Photographs by L. D. Vesey-Fitzgerald)



1. *Oligoneura fasseri* n.sp., male paratype (the dark apical patch on left forewing of no. 1 is a blemish on the photograph).
2. *Thalassothemis marchali* (Ramb.), male.
- 3, 4, 6. *Lokithemis lakeyi*, n.g. and n.sp. (two paratype males and the allotype).
- 5, 7. *Orthetrum fitzgeraldi* n.sp. (paratypes, male and female).*
8. *Rhyothemis semihyalina semihyalina* (Desj.) (Mauritius, male).
9. *Rhyothemis semihyalina separata* Selys (a specimen from Uganda, male).

(All $\frac{2}{3}$ nat. size)

* See footnote p. 30.

Tanganyika. Ngorongoro Crater.

Uganda. Kibale Forest (Fort Portal); Kalinzu Forest (Lutoto); Katera (Sango Bay); Mafuga Forest (Kigezi).

I have also examined the following material:

In the Transvaal Museum, Pretoria. *A. usambarica* (recorded by me as *A. ellioti* in 'The dragonflies of southern Africa', 1951, p. 163) from Marieps Mountain, northern Transvaal. *A. minuscula* from Jonkersberg (Cape) and Pretoria (Transvaal).

In Dr Van Someren's collection, Nairobi. *A. usambarica* from Sagala Hills (near Mount Kilimanjaro), Lake Jipe, Teita Hills and Mount Mbololo (in south-east Kenya).

Dr Van Someren also has a long series of *A. ellioti* from Kenya and Uganda.

Some differences between these Aeshna

A. minuscula. Mark on frons a large black disc, joined by a short neck to a black crescent on anterior edge (fig. 398, Pinhey, 1951). Antehumeral stripes parallel-sided, very slender, continuous and yellowish to greenish yellow in colour. Lateral bands on thorax broad, also yellowish. Pterostigma in male about 3.5 mm., almost 4.0 mm. in female. Membranule more than half white. Superior appendages with sub-basal, ventral tooth (fig. 410, Pinhey, 1951). Wings of female with a continuous, broad amber band from base to level of pterostigma.

A. ellioti. Mark on frons a large black pentagon (fig. 339, Pinhey, 1951), sometimes extended laterally on frons as a stripe along anterior edge. Thoracic markings bright green; antehumeral as in *minuscula* but very slightly broader, the lateral bands narrower. Pterostigma in male generally less, but not more than 3 mm., in female 3-3.5 mm. Membranule less than half (occasionally just half) white. Superior appendages without distinct tooth at the base. Wings of female amber at base and at apical half beyond nodus.

A. usambarica. Similar in all respects to *A. ellioti* but the antehumeral stripes are wedge-shaped, tapering downwards from antealar sinus; the lateral bands broader, like *A. minuscula*, but distinctly green.

INFERENCES

Förster (1906), in his description of *A. usambarica*, suggested that in reality his species might be the same as *A. ellioti* or a race of it. Sjöstedt considered them synonymous. However, the little difference mentioned above is distinct enough to consider it a subspecies of *A. ellioti*, occurring in the Northern Transvaal, Rhodesia, Usambara Mountains and the Teita Hills of Kenya, where it perhaps meets the nominotypical subspecies. It would appear to be the easterly race. *A. ellioti* itself, as far as our records are concerned, occurs from the Ngorongoro Crater (north central Tanganyika) to the Kenya highlands, northwards to Marsabit, westwards commonly in the higher forest of Uganda (above 5000 ft.). It must certainly occur in the Congo forests.

A. minuscula, as far as my records and observations are concerned, is South African. Martin, however (1915, *Voy. Alhauud*, p. 40), records this from Kijabe, Burguret and Naro Moru in Kenya. I have seen no Kenya examples of *A. minuscula* at all, whereas

A. ellioti is common. If the former does occur here it is surprising that it is not represented in the Coryndon Museum or Dr van Someren's collection from East Africa. Kijabe, for instance, is only about 30 miles from Nairobi. Among the points of difference Martin gives is that of size; but our series of *A. ellioti* shows some variation in this respect, the abdomen in the male (without appendages), for instance, varying from 39 to 45 mm. I cannot rule out entirely the possibility that *A. minuscula* does occur in Kenya and Abyssinia, as Martin states. But it does seem most unlikely, and from my own experience I would say that it would surprise me if a Kenya specimen was captured. My own opinion is that Martin's East African records were really *A. ellioti*.

***Orthetrum* ? *fitzgeraldi* n.sp.* (Text-fig. 6; Pl. III)**

Genus. This is a difficult insect to place generically, but it lies near *Oxythemis* and *Orthetrum*; Miss Longfield examined the original male and, I think, considered it nearer *Oxythemis*, but with strong affinities to *Orthetrum farinosum*. In genitalia it appears to be nearer *Hadrothemis*. It seems probable that it requires a new genus, but that might virtually entail linking these genera and this I would hesitate to do. There are, however, several complexes in the more primitive African *Libellulid* genera as well as in other families. These particular groups are so compact that it is by no means easy to place some of the African species in established genera.

DESCRIPTION

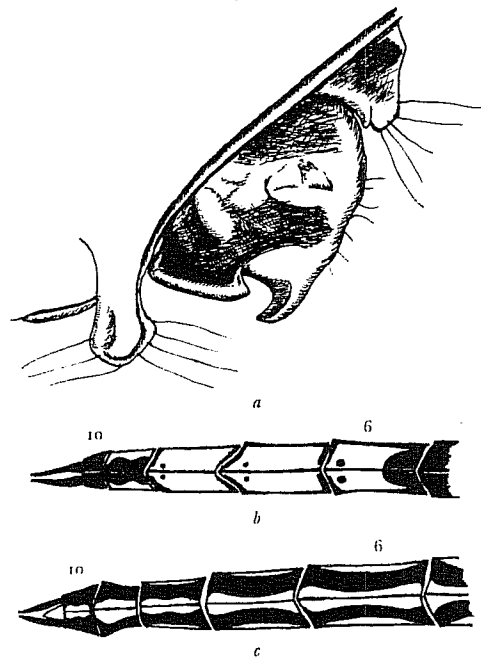
Structural features. The new species, like *Orthetrum*, has discoidal field in forewing starting and continuing as three rows, almost to nodal level; postnodally increasing. The arculus is at second Ax. in some examples, but others have the arculus proximal to this point, unlike *Oxythemis* and like some of the less primitive *Orthetrum*. R_3 is only slightly undulate and some specimens have this vein rather flat, like *Hadrothemis*. Cu_2 in the forewing is less strongly curved than typical *Orthetrum*; in hindwing this vein originates at a point well separated from lower (posterior) angle of discoidal cell. There are two rows between IR_3 and R_{spl} in both wings.

Cross-veins. Each vein in all specimens has one Ac. Discoidal triangles always crossed in forewing; in hindwing sometimes crossed near distal angle, but more often free. Hyper-triangles only occasionally crossed near distal end in forewing, but normally free in both wings. Antenodal cross veins in forewing (the last always complete): 12-13, occasionally 11. One bridge cross vein. Postnodals in forewing 7-8. The anal loop is similar to *Orthetrum* in form, 18-19 cells.

Body features. Head and thorax of the build of *Orthetrum farinosum* group with vertex larger and frons more rounded than typical *Orthetrum*; posterior lobe of prothorax well developed, with fringe of long hair; narrower than *O. caffrum*. Abdomen triquetral, not

* Since this paper went to press the types, which were sent prematurely from Nairobi to the British Museum, have been described by Miss Longfield in 'The Odonata of N. Angola', pt. 1 (1955), *Museu do Dundo*, p. 61, under the new genus *Nesciothemis*, intermediate between *Orthetrum*, *Hadrothemis* and *Oxythemis*. The above species thus becomes *Nesciothemis fitzgeraldi* Longf.

so markedly swollen at base dorso-ventrally; in dorsal view rather parallel-sided to fourth segment (not constricted in third) gradually tapering posteriorly. Unguis with short subapical hook nearer the tip than in *O. caffrum*. Accessory genitalia more like *Hadrothemis*. Vulvar scales not well developed.



Text-fig. 6. *Orthetrum fitzgeraldi*. Accessory genitalia and the end segments of the abdomen from above. a, male; b, male; c, female.

Holotype male (mature). Labium, frons, vesicle and occipital triangle glossy black; labrum dark brown, clypeus pale greenish ochreous. Entire thorax and legs jet black, with faint whitish pruinosity on ventrum of thorax and inner surface of femora. Venation mainly black, but subcostals yellow; a mere trace of dark amber across extreme base of both wings; membranule brown, with the antero-distal angle white; pterostigma reddish brown, between black veins, the costal and posterior veins being very strongly thickened at the pterostigma.

Abdomen 1-5 black with thin bluish white pruinosity; 6-9 bright red with black

dorsal and lateral carinae and distal edging, and with other black marks; 6 with large basal spot extending more than one-third length of segment, 6-8 with a pair of small black distal dots, 9 black laterally, 10 and appendages black.

Accessory genitalia: anterior lamina small, excavate posteriorly with the lateral edges thickened. Hamules very large and broad, with well-developed hooks; posterior lobe small.

Paratype males. Similar, but variable in size. In life the clypeus is more whitish; compound eye grey-blue; brown on top. Teneral examples of both sexes are somewhat like *Orthetrum farinosum* in markings; the synthorax chocolate in front to below humeral suture, with yellow median stripe and carina; sides of thorax and abdomen pale greenish yellow.

Allotype female (mature). Labium pale greenish ochreous, darker in centre, posterior lobe dark brown; face and frons in front pale greenish ochreous, frons above light brown, vesicle darker, occipital triangle reddish brown. Prothorax and front of synthorax blackish brown, ochreous along median dorsal line; faint trace of reddish brown antehumeral band. Sides of synthorax reddish but much obscured by blackening, particularly over first lateral suture; slight white pruinosity, denser on ventrum. Interlaral sinus greenish. Legs mainly black; coxae and trochanters, outer surfaces of fore-femora brown. Wings as in male, but the deep amber basal colouring extending beyond first Ax. and the Ac. in each wing.

Abdomen slightly broader than in male, lightly pruinosed with white so that the markings are a little obscured. Dorsal and lateral longitudinal carinae black; a continuous broad black lateral band, evidently extending full length of abdomen; a broad reddish dorsal band and a lateral yellowish band, distinctly yellow on 4-8. Ventrums of 4-7 with discontinuous yellow lateral band.

Paratype female. Very similar, but more heavily pruinosed. In life the clypeus was pale ochreous; eye grey-blue, capped with brown.

Abdomen: male (without appendages) 24-28 mm.; female 25-26 mm. Hindwing: male 29-32 mm., female 31 mm. Abd./hw. ratio (male) 0.84-0.87. Dwarf male abd. 19 mm., hw. 21 mm.; abd./hw. ratio 0.9.

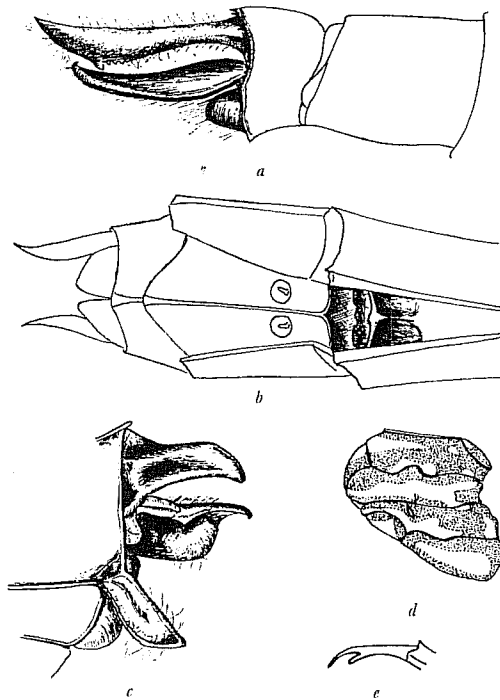
REMARKS

The original four males and one female of this strikingly coloured and peculiar species were collected by Mr L. D. E. F. Vesey-Fitzgerald at Lake Chila, Abercorn, Northern Rhodesia; the first male (paratype) on 20 March 1951; the holotype, two male paratypes and the allotype on 31 January 1954. A long series of mature males (paratypes), a mature female (paratype) and some teneral examples were collected by myself at Lake Chila in April 1954. The holotype and a paratype male, and the female allotype have been sent to the British Museum; other paratypes remaining in the Coryndon Museum.

One male taken was the prey of *O. trinacria* Selys, and this voracious creature was also captured feeding on the rare *Aethiothemis? mediofasciata* Ris; a discovery which induced me to search for and collect a fine series of this as well as examples of *A. bequaerti* Ris.

Lokithemis n.g.

A peculiar species, unstable in many characters, was found at Abercorn. It has close affinities to *Oxythemis* and to *Lokia*, but does not fit either. In build it is like an *Oxythemis*. Colonel Fraser is inclined to think it is nearer *Diplacodes* in some respects.



Text-fig. 7. *Lokithemis leakeyi*. a, appendages of male; b, terminal segments of female, from below; c, genitalia of male; d, synthorax of female; e, tarsal claw.

CHARACTERS

Rather slenderly built, the thorax small, prothoracic hindlobe poorly developed. Labium large. Abdomen rather slender, expanded dorso-ventrally at base, constricted at 3-4, then fusiform. Superior appendages with a small subapical, ventral tooth and tarsal claws also with well-developed subapical tooth.

Wings in most specimens short and (the hindwing especially) rather broad. Arculus

tending to be almost at second Ax., or slightly before it (well before it in one male). In *Lokia* the arculus is normally beyond second Ax. The last Ax. in forewing is, on the average, incomplete (as in *Lokia*); but it may differ on opposite wings and in one example it is complete on both forewings (like *Oxythemis*). Antenodals vary from 8 to $10\frac{1}{2}$ in forewing (average $9\frac{1}{2}$); 5-8 in hindwing (average 6-7); postnodals 6-8 in forewing. Bridge veins not developed. R_3 and Cu_2 in forewing tending to be rather straight, not markedly sinuous or curved, as the case may be. Discoidal triangle crossed in forewing, free in hindwing; hypertriangles normally free (but crossed on one side in one male). The triangle is moderately narrow; post-discoidal field parallel or convergent (unlike *Oxythemis*) composed of two rows of cells (in one male starting with three cells at the triangle). The venation is much more open than in *Lokia*.

The discoidal triangle on forewing is complete on costal edge except in one male where it is slightly broken. Each wing has 1 Ac. Forewing with one row in IR_3 -Rspl. In hindwing Cu_2 starts at the anal angle of the discoidal cell, which is itself situated approximately at the arculus. Anal loop long, composed of from 16-18 cells in male (average 17), 14 cells in female.

In the *accessory genitalia* the hook of the hamules is rather scimitar-shaped like the *donaldsoni* group of *Trithemis* and quite unlike *Lokia*. Type species of the genus: *Lokithemis leakeyi* n.sp.

***Lokithemis leakeyi* n.sp.** (Text-fig. 7; Pl. III, figs. 3, 4 and 6)

DESCRIPTION

Holotype male. The large labium yellow, broadly black down the middle; labrum and central portion of postclypeus black, anteclypeus brownish ochreous; rest of face and frons greenish ochreous. Vertex and a broad basal band on frons dark steely blue. Occipital triangle brown; back of occiput yellow and black.

Prothorax small, mainly black. Synthorax half black and half pale green, the pale marking as follows: broad antehumeral, constricted to a spot at upper end; spot on antecular sinus; irregular lateral stripes, incomplete (these greenish markings more extensive than in the female shown in the figure). Ventrally mainly pale greenish.

Legs black, forefemora greenish postero-laterally. Wings hyaline; trace of amber at base of hindwing; membranule pale brown, to whitish at base. Pterostigma and venation black. Last Ax. complete on left forewing, incomplete on right. Forewing with $10-10\frac{1}{2}$ Ax., 7-8 Px.

Abdomen black with pale greenish markings; 5-7 thickly whitish blue pruinose above, with traces of this on 1-4 and 8. The green markings: sides of 1, a discontinuous and irregular posterior annulus on 2, and a median incomplete annulus on 3. Slender, discontinuous dorsal yellow line on 4-7; 8-10 and appendages black.

Genitalia. Lamina and hamules well developed, the hooks long and only gently curved. Anterior lamina very broadly grooved on exterior (antero-central) surface. Posterior lobe tending to have two outer angles.

Abdomen 23 mm. Hindwing 25 mm. Pt. 2.5 mm. Abd./hw. ratio 0.9.

Paratype males. These show greater or lesser pruinosity and variations in size. Fully mature examples have a thin dusting of darker blue pruinosity on front of synthorax, and on the abdomen the whitish powder extends uniformly on dorsum from 2-8. The labium bright yellow; sides of thorax and of base of abdomen, sides of forefemora may also be this colour. Eye in life pale grey-blue, capped with brown.

Two damaged and incomplete males, dated 1st June 1943, are larger than the average, and not pruinosed (although this may possibly have been due to post-mortem treatment). The wings are comparatively slightly narrower than in the type.

Smaller examples: abd. 19-20 mm.; hw. 22 mm.; pt. 2-2.3 mm. Abd./hw. ratio 0.9. Larger (June 1943): abd. 23 mm.; hw. 26 mm.; pt. 2.5 mm.

Allotype female. Pale colours bright yellow on head, greenish yellow on thorax and abdomen; eye grey-blue, capped with brown. Differs from male as follows: black band on labium narrower; the black labrum relieved by a pair of yellow spots. Synthorax darker, with the pale markings reduced (see figure). Pterostigma brown, between black veins.

Abdomen a little broader and not so markedly constricted. Pale markings: lateral and dorsal spots on 1-3; discontinuous dorsal line on 4-7, dorso-lateral line on 4-6. 8-10 and cerci black.

Abdomen 19 mm. Hindwing 23 mm. Pt. 2.5 mm.

REMARKS

The two damaged males are dated 'Abercorn, 1-6 43'. Mr Vesey-Fitzgerald collected an example at Lake Chila in December 1952 and another in January 1954 (the holotype). During my brief visit in April 1954 males were seen settling on reeds at the open swamp end of the lake, but they were very shy and difficult to approach. The females, of which only the allotype was taken, seem to settle on the upper branches of *Brachystegia* trees in the fringing woodland.

I have pleasure in naming this species after Dr L. S. B. Leakey. Types will go to the British Museum, paratypes remaining in the Coryndon Museum.

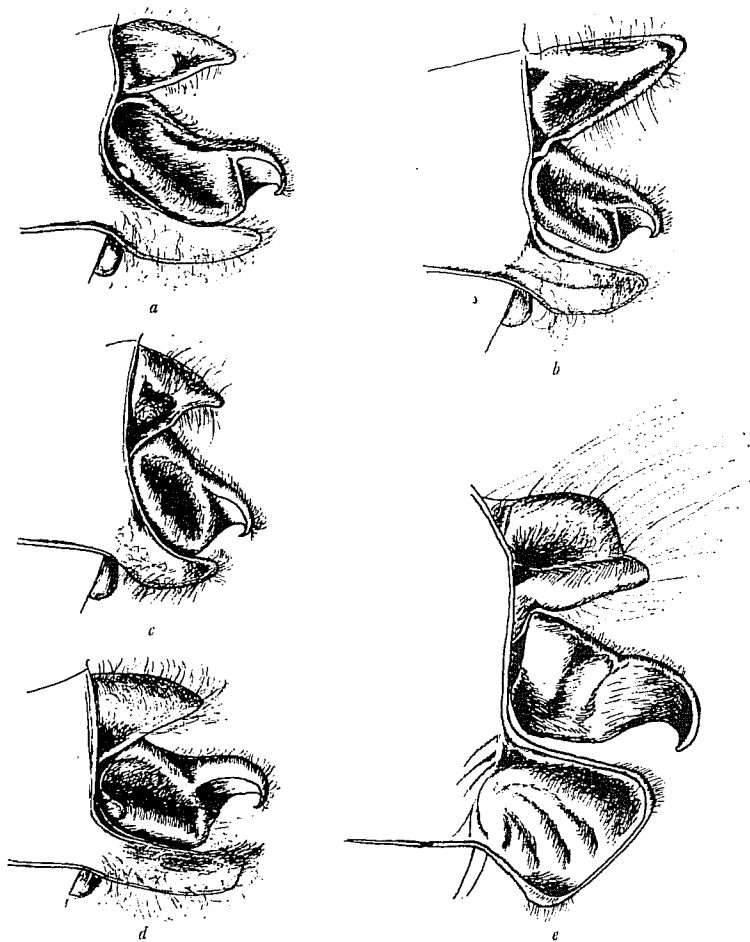
Col. Fraser informs me that there is a solitary female in the British Museum of a species, taken in Gaboon, French West Africa, which is probably closely allied to the present one. It was captured many years ago.*

DESCRIPTION

***Trithemis parasticta* n.sp.** (Text-fig. 8)

Holotype male. Very closely allied to *T. stictica* (Burm.). Markings on head and face similar; perhaps a little more heavily marked with black on the yellow labrum. Pruinosity on thorax slightly darker blue and not (in specimens seen) spreading entirely over the yellow sides; whereas in *stictica* the paler pruinosity starts on the front of the thorax and spreads right across the sides. Sides of thorax and base of abdomen yellow with blackish sutural markings. Rest of abdomen black, marked with longitudinal yellow streaks as in *stictica*.

* This West African species is now published as *Porpacithemis dubia* Fraser (1954), ♀ type from Gaboon.



Text-fig. 8. Accessory genitalia of males, from right. a, *Trithemis parastictica*; b, *T. anomala*; c, *T. stictica*; d, *T. nuptialis*; e, *Oligogastra fraseri*.

Legs (like *stictica*) black. Wings completely hyaline, with the merest speck of basal amber but *without* the yellow suffusion on hindwing which is a marked feature of *stictica*. Pterostigma brown, between black veins. Forewing with 9½ Ax., 8 Px. Discoidal triangles crossed in forewing.

Genitalia. Hamules very similar to *stictica* but more robust.

Abdomen 25 mm. Hindwing 30 mm. Pt. 4 mm. Abd./hw. ratio 0.83.

Paratype male. Similar in size and all essentials.

Allotype female. Labium with broader median black, and with metallic blue on frons reaching less far forward; otherwise head markings as in *stictica*. Synthorax yellow with less black than *stictica*: the yellow antehumeral marking is not separated from the lateral yellow, and the black lateral stripe is less pronounced. Abdominal markings similar. Wings with speck of amber at bases. Forewing with 10 Ax., 8 Px.

Abdomen 25 mm. Hindwing 30.5 mm. Pt. 3.5 mm.

REMARKS

This insect, found at Lake Chila, Abercorn, is so similar to *stictica* that I at first mistook it for that species. However, apart from the larger size, the absence of the yellow patch on the hindwing made me investigate further and look for genitalial differences.

The first impression was that it might be a race of *stictica*, but this was shown to be unlikely when I took genuine *stictica* on a stream about 25 miles from Lake Chila—a distance that can generally be ignored in the distribution of African dragonflies that are found flying in the open. It might be argued, on the other hand, that it is an ecological race showing a preference for waters of low pH value. But I think myself that the very widespread and common *stictica* could be as tolerant of the waters favoured by *parasticta* as are so many other species which breed in this lake. The fact that I did not see the former on Lake Chila is by no means conclusive in a stay of merely four days. Col. Fraser tells me he has specimens from the Belgian Congo which may be this species.

T. nuptialis Karsch is another close relative of *T. stictica*, but the darker blue colour of the male spread, as it is, all over the body makes this species appear in the field like a slender form of the ubiquitous *T. risi* Longfield. Other thin-bodied *Trithemis* of the *donaldsoni* group have quite distinct hamules; while the dark blue *T. hecate* Ris (*T. aureola*) is at once recognized by the reduced venation.

Types of *T. parasticta* will go to the British Museum, a paratype male remaining in the Coryndon Museum. Other examples are in the collection of the International Red Locust Survey at Abercorn, Northern Rhodesia.

Flying with *T. parasticta* in the swamp at the end of Lake Chila were certain *Trithemis* which were devoid of pruinosity, but evidently mature. In the field, however, I at first assumed these to be examples of *T. parasticta* prior to their development of pruinosity. For although they were active and pairing, it is often observed that dragonflies will mate in a somewhat juvenile condition. On examination of the genitalia of these examples it was evident that they were actually distinct from *parasticta* and it was apparent that they belonged to another new species:

DESCRIPTION

Trithemis anomala n.sp. (Text-fig. 8)

Holotype male (in copula). This species is in the *stictica* group, but appears to reach maturity without developing any marked pruinosity. Labium yellow with narrow median black line; face and frons brownish yellow, labrum with black distal margin and median band. Frons above with deep groove and with only a narrow transverse basal blackish band (even teneral examples of *stictica* have the frons above entirely metallic blue). Vertex and occipital plate brown.

Prothorax brownish yellow, edged with darker. Synthorax whitish yellow marked with bronze-brown: broad median band on mesepisternum, incomplete at upper end where it is narrowly linked to an antehumeral band; laterally with the usual irregular stripe, spreading along the sutures and this brown becoming darker ventrally, to almost black on the sternites; tinged slightly with white dusting; this faint pruinosity continuing on to femora and ventral surface of abdomen.

Abdomen above black, with yellow spots and streaks in two rows, dorsal and lateral (unlike *stictica* in which, after segment 3, there is only one row on either side); ventrally black with yellow streaks.

Superior appendages yellow at base, the rest black (entirely black in *stictica* and *parasticta*); inferiors yellow, edged with black.

Forefemora yellow latero-posteriorly, rest of leg surfaces black. Wings slightly tinged with yellowish all over; amber streaks in bases of subcostal and cubito-anal spaces. Pterostigma light brown between black veins. Forewing with $9\frac{1}{2}$ – $10\frac{1}{2}$ Ax., 8 Px.

Genitalia. Hamules somewhat like *stictica*, but the anterior lamina much longer and more conical in lateral view.

Abdomen 25 mm. Hindwing 30 mm. Pt. 3 mm. Abd./hw. ratio 0.8.

Paratype males. Median black on labium may be broader. Wings more heavily fumosed or slightly less so. Size very constant.

Allotype female (in copula but not quite fully mature). Similar to male but black on labrum only faintly developed. Brown markings on body less extensive, the abdomen with nearly complete yellow longitudinal stripes. Cerci yellow at base, the rest black (like the superiors of the male). Legs as in male, but yellowish at bases of femora. Wings strongly tinted yellow all over, particularly along costal zone and cubito-anal space. Pterostigma as in male.

Forewing with $9\frac{1}{2}$ – 10 Ax., 8 Px. In life the eye was grey-blue, capped with brown. Abdomen 22 mm. Hindwing 30 mm. Pt. 3 mm.

REMARKS

A few males, as well as the pair in copula, were taken at Abercorn in April 1954. Mr Vesey-Fitzgerald had previously caught examples in January. The species flies with *T. parasticta* at the swamp end of Lake Chila, where they rest on reeds over the pools, in the same surroundings as *Lokithemis leakeyi*, *Aethiothemis*? *mediofasciata* Ris and *Aethriamanta rezia* Kirby.

T. anomala is recognizable by its darker general colouring than immature examples of other *Trithemis*. The lack of pruinosity and the smoky wings differentiate it from mature *Trithemis* of other species. The very restricted marking on the frons is also characteristic.

DESCRIPTION

Olpogastra fraseri n.sp. (Text-fig. 8; Pl. III, fig. 1)

Holotype male. Lips yellow, with greenish tinge to centre of labrum. Rest of face pale greenish yellow, the frons with a metallic blue triangle from base along the groove. Vertex and occiput yellowish. Thorax greenish yellow with steely blue metallic stripes on synthorax: two on mesepisternum linked at upper end, one at and below humeral suture, and one below each lateral suture. Antealar sinus yellow. Legs mainly black, bases of femora, and the trochanters yellow, forefemora yellow on outer edge. Wings hyaline with small amber patch at base of anal area of hindwing. Pterostigma black; costa, antenodals and sectors of arculus yellow. $14\frac{1}{2}$ antenodals in forewing.

Abdomen shaped as in *Olpogastra fuelleborni*, dilated dorsoventrally on 2–3, strongly constricted on 3–4, then triquetral. 1–2 yellow with blackish annulus; 3 yellow with black distal annulus excavate dorsally; 4–10 with dorsal carina narrowly yellow; 4 black with latero-basal yellow spot and median yellow annulus; 5–6 black with median yellow annulus; 7 yellow with narrower black basal and distal annuli; 8–10 black, 8 with yellow spot on lateral carina, 10 with trace of distal yellow. Appendages black, slightly yellowish at base of superiors. Accessory genitalia somewhat like *O. fuelleborni*.

Abdomen 37 mm. Hindwing 44 mm. Pt. 5.5 mm.

Paratype males. Essentially similar.

Abdomen 36–37 mm. Hindwing 43–44 mm. Abd./hw. ratio 0.8.

Allotype female. Differs only slightly from the males. The metallic area on frons spreading in a T-shape across frontal crest. Yellow on femora spreading further distad. Abdomen only slightly stouter, but the blackish areas reduced, so that the ground colour of 1–7 is yellow; 10 with distal yellow annulus. Cerci yellowish, black at tips.

Abdomen 40 mm. Hindwing 45 mm. Pt. 5.5 mm.

REMARKS

This large golden banded species is near Grünberg's *fuelleborni*, but it is larger, with the yellow body markings much more extensive and evidently lacking pruinosity. There is also the yellow patch on the hindwing. Fraser says it differs from *occidentis* Ris (considered a race of *fuelleborni*) in the yellow veins: costa, arculus and sectors of the arculus; the yellow at the bases of the appendages; and the yellow labrum (glossy black in *occidentis*).

I have not seen *occidentis* which, by its description, is evidently close to *fraseri*, with its body larger and yellower than *fuelleborni* and also lacking the pruinosity. The forewing in *occidentis* has $15\frac{1}{2}$ – $16\frac{1}{2}$ antenodals. It was described from the Belgian Congo.

The present species was collected in the semi-desertic areas of Northern Uganda, the type series by T. H. E. Jackson and further examples by Dr V. G. L. van Someren. The

holotype and two paratype males are from the Aswa River, Acholi (March 1952), with one paratype male and the allotype from West Madi in the West Nile District (June 1954). Holotype, allotype and one paratype will be sent to the British Museum, the other paratypes remaining in the Coryndon Museum.

Rhyothemis semihyalina (Desj.) (Pl. III, figs. 8, 9)

Libellula semihyalina Desj. 1835, *Ann. Soc. Ent. Fr.* 4 (1), 4 (Mauritius).

Libellula separata Selys 1849, in Lucas, *Expér. Algérie*, 3, 115, pl. 1, fig. 1 (Algeria).

Through the kindness of Col. J. W. Rawlins I have been able to examine a number of species of *Odonata* collected by him within the last few years in Mauritius. Among these there is a series of both sexes of topotypical examples of *Rhyothemis semihyalina*. These all differ in two constant features from all of the specimens I have seen from southern, eastern, central and western Africa; from Socotra and Seychelles. I understand from Col. Fraser that Madagascar examples are also like the continental form, while those from Réunion resemble the Mauritian ones. Although both these forms vary quite appreciably, all the specimens from Mauritius have the dark area on the hindwing extending to, or very slightly beyond, the nodus as well as covering the anal area right round the tornus. Whereas in the continental form this area terminates one or even two cells before the nodus and quite often barely touches the tornus. In the second respect, the Mauritian form has distinct dark basal streaks on the forewing, one in costal-subcostal area to about the third Ax., and a second in the cubital space reaching to beyond the arculus.

It would therefore seem advisable to resurrect racial names to distinguish these forms. It has been described from Mauritius as *semihyalina* (Desj.), *hemihyalina* (Selys-Hagen) 1850, and *disparata* (Ramb.) 1842. Selys described *separata* from Algeria and at a later date Kirby used *ducalis* (1898) for a Nyasaland example. Other forms have been named from the Mediterranean region, of which *syriaca* (Latr.) is recorded also from Algeria: but we have no specimens from North Africa. It appears that there are at least two races: *R. semihyalina semihyalina* (Desj.) from Mauritius and Réunion; *R. semihyalina separata* (Selys) from most of the rest of the Ethiopian region, including Sokotra, Madagascar and also Seychelles and part of North Africa. I believe Rambur's *disparata* was a variation towards Latreille's *syriaca*. Nevertheless the apparent constancy of pattern-difference in the Mauritian and continental examples seems to justify racial discrimination here.

Thalassothemis marchali (Ramb.) (Text-fig. 9; Pl. III, fig. 2)

A little-known dragonfly from Mauritius

Libellula marchali Rambur 1842, *Névropt.* p. 62.

This peculiar Mauritian dragonfly had not been found again since its original capture well over a hundred years ago, until Col. J. W. Rawlins caught one male in February 1954 which he sent to me with a number of other dragonflies. It was redescribed by Ris in 1909 as the genotype of his *Thalassothemis* (*Cat. Coll. Zool. Selys*, 9, 32, and 1912, loc.

cit. 14, 752) but as this excellent monograph of the Libellulidae is not available to many dragonfly collectors it does not seem out of place to include some notes on Col. Rawlin's specimen. Col. Fraser tells me that the type is in the Hope Museum at Oxford.



Text-fig. 9. *Thalassothemis marchali*. a, thorax and abdomen; b, genitalia.

DESCRIPTION OF MALE

In appearance it is at first sight rather like a small *Atoconeura*, but the wings are narrower and the abdomen, although similar in shape, is more slender. The venation is much closer. On the right forewing 14 Ax., but only 11 Ax. on left; last Ax. complete. Arculus before second Ax. 1 Ac. in forewing, 2 in hindwing. Discoidal triangle crossed in forewing and hindwing. Postdiscoidal field parallel, starting with three cells at the triangle followed to nodal level by two rows (three rows in Rambur's type). Anal loop as well developed as in *Atoconeura*. In forewing IR₃ is only slightly sinuous, Cu₂ scarcely curved; costa almost straight. Wings a little fumose, a trace of amber near the brown membranule. Venation and pterostigma dark brown. Labium black with yellow latero-anterior spot; labrum and postclypeus black, anteclypeus brown, rest of face pale yellow; frons and vertex bright metallic blue. Body black marked with pale yellow spots as in the figure. In the fully mature adult (type), however, Fraser tells me these spots are azure blue, although our specimen does not seem to be juvenile. Legs black. Accessory genitalia as in the figure.

Abdomen 25 mm. Hindwing 30 mm. Pt. nearly 3 mm. Abd./hw. ratio 0.8.*

* In this paper measurements of the abdomen exclude anal appendages.