

THE ODONATA OF THE IVORY COAST BASED ON THE
MISSION OF DR. R. PAULIAN AND P. LEPESME

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WITH 8 TEXT-FIGURES.

It is some five years since I reported on a collection of Odonata made by Dr. R. Paulian on the West Coast of Africa (1941, *Proc. R. ent. Soc. Lond.* (B) 10 : 85); although primarily from the Cameroons, the collection contained a few species from the Ivory Coast. Now I am again indebted to him for a further and larger collection made entirely on the littoral of the Ivory Coast. In addition to a few new species, the collection has resulted in more than doubling the number of species hitherto reported from that area.

Dr. Paulian has furnished me with the following notes. "The collection comes from the 'Réserve forestière du Banco,' which is a strip of rain forest at 12 km. west of Abidjan. I have not, however, the slightest idea as to how far our collection was exhaustive: we collected all (save two) of the species we saw from the middle of June to the end of September, and *we looked for them*. Collecting was done in clearings of the forest, also along the paths and on the banks of the river Banco; a few specimens were taken at the mouth of the Banco where it runs into the lagoon."

The Odonate fauna of the Ivory Coast is not peculiar to that region, but is common to an enormous area extending from the mouth of the Senegal in the west to that of the Congo in the south, and embracing inland the whole of the catchment area drained by the three great rivers Senegal, Niger and Congo. If a map of West Africa be consulted, it will be seen how these rivers interlock, the tributaries of the Niger dovetailing into those of the Senegal westwards, whilst those of the Congo form a less intimate association with the Niger through the interposition of rivers draining into Lake Tchad. Many years spent in similar tropical country has convinced me that the distribution of most Odonata is through the medium of water-courses, which are the great and natural highways of the jungle along and through which flows a steady and constant traffic of insect life: thus the area drained by any of these great rivers often coincides with the distributional area of a definite fauna. It is owing to this fact, together with the way in which the Senegal, Niger and Congo interlock and also on account of the comparative absence of great and high mountain barriers, that the majority of the West African Odonata are distributed evenly over so wide an area. A close parallel to this distribution is that of the Amazonian Odonate fauna.

Réne Martin's paper on the dragonflies of Grand Bassam is the only one which has been so far confined to the Odonata of the littoral of the Ivory Coast, but a number of species have been reported from this area from time to time in papers devoted to the West African fauna generally. I have been able to gather from literature a list of 26 species as coming from this area: I am now able to add to these a further 27, making a total of 53 in all. I have compared this number with that from a similar area on the West Coast of India and find that the numbers are approximately equal: thus I am of opinion that the number of 53 is not likely to be greatly exceeded in the future.

In the following list, those species marked with a dagger have been reported before, whilst those starred were included in Dr. Paulian's collection:—

LIST OF SPECIES FROM THE IVORY COAST.

Suborder ZYGOPTERA.

Superfamily AGRIOIDEA.

- † 1. *Umma cincta* (Selys).
 †* 2. *Sapho ciliata* (Fabricius).
 * 3. *Chlorocypha dispar* (Palisot de Beauvois).
 † 4. *Chlorocypha cyanifrons* (Selys).

Superfamily COENAGRIOIDEA.

- * 5. *Isomecconemis subnodalis* (Selys).
 * 6. *Elattonaura mutata* (Selys). = *gianta*
 * 7. *Agriocnemis macclachlani* Selys. = *gianta*
 * 8. *Agriocnemis ebneri* Ris. = *zerafica*
 † 9. *Agriocnemis exilis* Selys.
 †*10. *Ceriagrion glabrum* (Burmeister).
 *11. *Ceriagrion rubelloccinum* sp. n.
 †12. *Pseudagrion basicornu* Martin.
 †13. *Pseudagrion rubicornu* Selys.
 *14. *Pseudagrion angolense* Selys.
 *15. *Pseudagrion angelicum* sp. n.
 *16. *Pseudagrion conspicuum* sp. n. = *flavipes*
 †17. *Enallagma nigridorsum* Selys.

Suborder ANISOPTERA.

Family GOMPHIDAE.

- *18. *Neurogomphus fuscifrons* Karsch.
 *19. *Paragomphus atratus* (Selys). = *gerardi*
 †20. *Phyllogomphus aethiops* Selys.

Family AESHNIDAE.

- *21. *Gynacantha sextans* McLachlan.
 †22. *Gynacantha bullata* Karsch.

Family CORDULIDAE.

- †*23. *Neophya rutherfordi* Selys.
 †*24. *Phyllomacromia biflava* Martin. = *melania*
 †*25. *Phyllomacromia aequatorialis* Martin.
 †26. *Phyllomacromia melania* (Selys).

Family LIBELLULIDAE.

- †27. *Eothenis zygoptera* Ris.
 *28. *Allorhizucha klingi* Karsch.
 †29. *Micromacromia camerunica* Karsch.
 *30. *Lokia circe* (Ris).
 *31. *Hadrothemis versuta* Karsch.
 *32. *Hadrothemis camarensis* Karsch.
 *33. *Orthetrum africanum* (Selys).
 *34. *Orthetrum chryso stigma chryso stigma* (Burmeister).
 †*35. *Orthetrum guineense* Ris.
 †*36. *Orthetrum capense* Calvert. = *is abad*? → *julia*
 †37. *Orthetrum brachiale* (Beauvois).
 *38. *Orthetrum austeni* (Kirby).
 *39. *Orthetrum microstigma* Ris.
 *40. *Acisoma panorpoides ascalaphoides* Rambur.
 †*41. *Acisoma tridum* Kirby.
 †*42. *Chalcostephia coropata flavifrons* Kirby.
 *43. *Thermochoria equivocata* Kirby.
 *44. *Trithemis risi* Longfield.
 *45. *Trithemis stictica* (Burmeister).
 *46. *Trithemis violacea* Sjöstedt. = *annulata*
 *47. *Crocothemis erythraea* (Brulle).
 †*48. *Palpopleura lucia lucia* (Drury).
 †*49. *Palpopleura lucia portia* (Drury).
 †50. *Palpopleura lucia graeffi* Martin.
 †*51. *Brachythemis leucosticta* (Burmeister).
 †52. *Rhyothemis notata* (Fabricius).
 *53. *Urothemis edwardsi* Selys.

NOTES ON DR. PAULIAN'S COLLECTION.

Family AGRIIDAE.

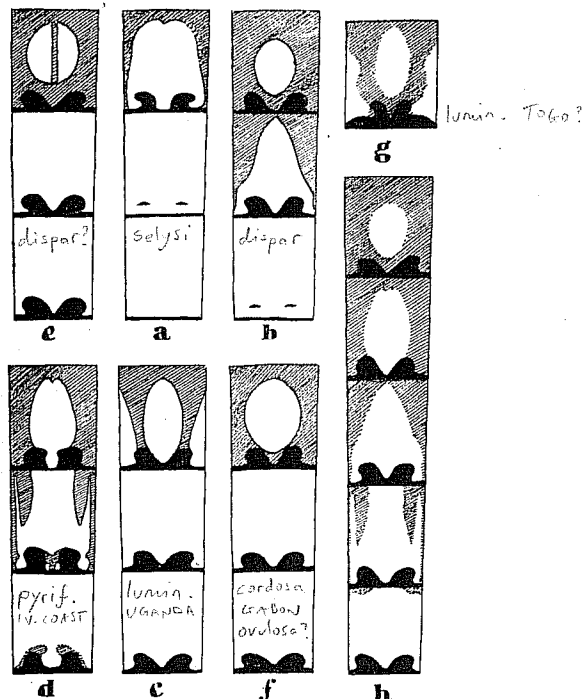
1. *Sapho ciliata* (Fabricius).

15 males, 10 females, from 3.vii to 20.vii. The majority are adult or nearly so and therefore more or less fully coloured. The most adult specimens have the wings deep coal black above and steely blue beneath, contrasting strongly with specimens in my own collection which are a beautiful metallic prussian-blue beneath. This colour may be lost in very adult age or it may have deteriorated in the present specimens. Teneral have the wings entirely hyaline or palely enfumated, iridescent but non-metallic.

2. *Chlorocypha dispar* (Palisot de Beauvois) (figs. 1 and 6c).

This species is characterised by the following complex: "1. Dorsal stripes of thorax confluent below, obsolete or interrupted above. 2. Ground-colour of abdomen blood-red throughout. 3. Segment 2 with a mid-dorsal spot of red. 4. Segment 3 broadly red on dorsum with the sides and apical borders of same irregularly black." There are 7 males and 11 females in the present collection and all, save one teneral uncoloured specimen, are almost typical but agree amongst themselves in possessing the same slight differences. In the type, in the British Museum, from Sierra Leone, the red dorsal spot on segment 2 occupies

the middle two-fourths of the segment and is oval in shape with its long axis in the same axis of the abdomen. In the present specimens, this spot is much larger, extending the whole length of the segment and bilobate in shape, one lobe occupying the basal three-fourths of the segment, the other, very much smaller and narrower, is a mere stalk connecting the larger lobe to the apical border of segment. The marking



1. Male abdominal markings of: a, *Chlorocypha selysi* Karsch, segments 2 to 4; b, *C. dispar* (Beauvois), segments 2 to 4; c, *C. d. luminosa* (Karsch), segments 2 to 4, subtypical race from Uganda; d, *C. dispar pyriformosa* (Beauvois) from the Ivory Coast, segments 2 to 4; e, *C. dispar* (Beauvois), race or var. in British Museum collection, segments 2 to 4; f, *C. dispar cordosa* from Gabon, McLachlan collection in British Museum, segments 2 to 4; g, *C. d. luminosa* (Karsch), segment 2, typical form; h, segments 2 to 6 of a hypothetical form to demonstrate the trend of evolution. (Pale areas are blood-red, cross-shading black. The black paired apical spots develop from the apical linear ones seen in figures a and b and are largely concealed later by the tertiary black markings which develop on segments 2 and 3).

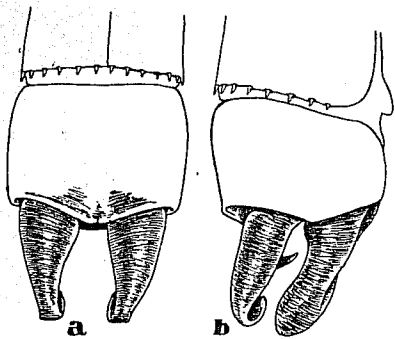
on segment 3 is very similar to that of the type: segments 4 and 5 have a pair of black apical spots confluent to the apical black ring, whilst segment 6 has a vestige of this marking. These black apical or subapical spots are basic for all the markings which arise afterwards on the segments and they can be traced as present whatever the nature of the marking may be, save where the segment is entirely black. I have demonstrated this in figure 1, where the cross-shading shows the actual extent of the black markings, whilst the black portions show their basic origins, these, of course, not being differentiated in the actual specimens. It is important to keep this fact in mind, because not only are the markings present in *dispar* but throughout the Ethiopian representatives of the genus, vestigial in some, highly developed and largely concealed in others. In the type of *dispar*, these spots on segments 4 and 5 are vestigial and represented by mere elongated subapical spots. The present specimens are best regarded as racial in character, differing from type only by various modifications of the markings on segments 2 to 6, but confined to a definite area. In the McLachlan collection, a male from Old Calabar is closely similar to these Ivory Coast specimens in possessing a red oval dorsal spot on segment 2, but it is unilobate and regularly oval in shape (fig. 1, f): another male in the same collection, from the Gaboon district, has a similar but more cordate shaped spot on segment 2, whilst segments 3 and 4 have paired apical spots confluent with a black apical ring. Thus this specimen resembles *luminosa* Karsch save that the mid-dorsal spot is broader and the sides of the dorsum are entirely black (red in *luminosa*). A third specimen also in the British Museum collection is similar to type except that the mid-dorsal spot on segment 2 is divided longitudinally by a black line into two small lunules (fig. 1e): this marking is so unorthodox that it may possibly be an artifact. The present specimens may be named race *pyriformosa* ssp. n.; the Old Calabar form *ovulosa* ssp. n., the Gaboon forms *cordosa* ssp. n., and Karsch's species becomes ssp. *luminosa*.

Family COENAGRIDAE.

3. *Isomecocoemis subnodalis* (Selys) (Text-figs. 2a and b; 8b).

Disparoneura subnodalis Selys, 1880, *Mem. Cour. Acad. R. Belg.* 38 : 162.
Disparoneura subnodalis Selys, Kirby, 1890, *Cat. Odonata* : 133.
Disparoneura subnodalis Selys, Karsch, 1893, *Berl. ent. Z.* 38 : 36.
Isomecocoemis subnodalis (Selys.) Cowley, 1936, *Ann. Mag. nat. Hist.* (10) 17 : 515, 526, fig. 4.

There are 10 males and 6 females collected from 10.vii to 19.viii. The males have the wings deeply tinted chlorine-green; the anal vein in all specimens ends on the cross-vein descending from the apical end of the discoidal cell, and in one specimen the anal vein lies so closely apposed to the posterior border of the wing throughout its length as to appear almost fused to it. The flexor surfaces of the femora and tibiae are conspicuously pale Cambridge blue and it is evident that the males employ this as a "recognition mark" in the same way as do many species of the CHLOROCYPHIDAE. The prothorax of the female (text-fig. 8b) is remarkably specialised, and Selys' description is quite inadequate; the anterior lobe is cleft deeply into two smaller lobes each deeply hollowed out



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2. Anal appendages of *Isomecocoememis subnodalis* (Selys), male, a, dorsal aspect; b, right lateral aspect.

internally; two slim digitate processes spring from the base of the middle lobe on its dorsum and slope so strongly forwards as almost to lie in contact with the two large mamillated processes which make up its dorsal surface. The posterior lobe is prolonged and very deeply cleft at its middle into two long thin spatulate processes which stand erect but with a slight backward inclination at the apices.

4. *Elatoneura mutata* (Selys).

1 subadult and 1 adult male, 1 very adult female, 14.vii, 20.vii, and 20.viii. An uncommon species in collections, but probably more common than it would appear to be on account of its inconspicuous coloration and the usual retiring habits of the genus. The anal appendages of the males agree very closely with Ris' good figure in the *Ann. S. Afr. Mus.* 18: 294, f. 21.

5. *Agriocnemis maclachlani* Selys.

2 males and 1 female, 1 to 8.viii. A widely distributed species throughout tropical east and west Africa. The male is characterised among other points by the black pterostigma of the hind-wing, whereas that of the fore-wing is pale, a reversal of the usual colouring met with in the group. One of the males has the abdomen gripped by the jaws of an ant, but the body of the latter is missing, so it is impossible to determine the species.

6. *Agriocnemis ebneri* Ris.

Male.—Abdomen 16 mm. Hind-wing 10 mm.

Head: labium white, labrum and postclypeus a beautiful brilliant metallic violet; anteclypeus, genae, bases of mandibles and beneath head pale green, rest of head above bronzed black with a pair of very small pale green round postocular spots situated very close to margin of eyes. Prothorax black on dorsum, the sides pale green, posterior lobe trilobate, the lateral lobes finely bordered with pale yellow. Thorax steely black on dorsum

to as far lateral as the antero-lateral suture, marked by complete narrow pale greenish antehumeral stripes. Laterally pale green, paling beneath thorax which is thinly pruinosed: small black spots at the upper ends of each lateral suture, that on the anterior confluent with the dorsal black in front. Legs pale green to creamy yellow with a poorly defined black stripe on outer sides of all tibiae but a well-defined black stripe on the extensor surface of hind femora, the spines and distal segment of tarsi black. Wings hyaline, 5 to 6 postnodals in fore-wing, 5 in the hind-wing, areolus very far distal to the distal antenodal, nearly as widely so as the length of the discoidal cell. Pterostigma pale yellow or bluish framed in black nervures, very long and narrow, at least four times as long as broad, outer border very oblique, the inner normally so. Abdomen green at base laterally and beneath changing to creamy yellow, then ochreous and finally ferruginous on the terminal segments. Black on dorsum from segment 1 to 7, each segment with the usual apical black ring, preapical dilatation followed by an apical constriction: segments 8 to 10 and anal appendages ochreous, probably darkening to ferruginous in full aduledge. Anal appendages very small, barely half the length of segment 10: superiors seen in profile triangular in outline with a deep apical recess, below which is a small black spine: subtriangular as seen from the dorsum, the black spine forming the apex, the whole dorsum coated with whitish curling hairs. Inferiors slightly shorter but very broad, foliate, appearing to be two laminae folded together, the inner with a fissure on its free margin.

Habitat: The type male, along with 3 females, came from the Soudan and are the only specimens known up to the present captures. The description was made from a teneral male with incomplete colouring so that a redescription is necessary; the descriptions of the females given by Ris, one from the adult stage, the other from an orange coloured teneral example, are good and need no repetition. A single pair from the Ivory Coast, 6.vii and 9.vii, the male almost fully adult, the female fully so, and both with the colours fully developed. The anal appendages of the male are very complicated and very small: I have not been able to improve on the figures given by Ris in 1924, *Denkschr. Akad. Wiss Wien* 99: 277, f. 3.

7. *Pseudagrion angolense* Selys.

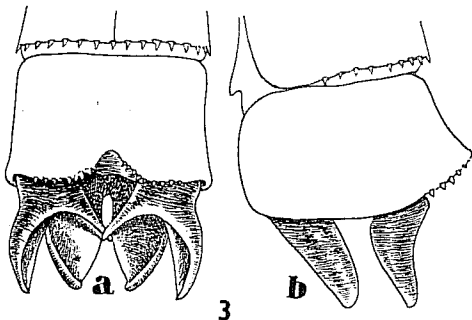
There are 2 very adult males of this moderately common and widely distributed species, 22.vii: it has been recorded from both the east and west coasts of Africa within tropical limits. The present examples belong to the old melanotic and partially pruinosed forms in which the markings are largely obscured.

8. *Pseudagrion angelleum* sp. n. (text-fig. 8).

Male.—Abdomen 30 mm. Hind-wing 18 mm.

Head: labium straw yellow; labrum, genae and frons to as far as the bases of antennae, including the pedicel of same bright chrome yellow or tangerine orange; rest of upper surface of head coal-black marked on occiput by a pair of very large olive green postocular spots between which run the vestiges of a yellow stripe, present as a few points only. (The postocular spots would probably change to bright chrome yellow or orange in adult males.) Prothorax black marked with chrome yellow as follows: a narrow anterior collar, a cuneiform spot on the posterior two-thirds of the dorsum of middle lobe, the two merely separated by a fine black mid-dorsal suture, a small round subdorsal spot on each side of middle lobe, two small triangular spots at middle of posterior lobe and finally the outer ends of this same lobe. Thorax black on dorsum, pale green, greenish blue or pale blue laterally, marked with bright chrome yellow antehumeral stripes, broad below, rather abruptly constricted above where the dorsal black invades the yellow locally. At this same level but to the

outer side of the humeral suture is a fine streak of yellow limited to the upper third of the shoulders. Laterally a fine black line maps out the upper part of the antero-lateral suture and expands lanceolately about midway down this suture: finally a small black spot at the upper part of the postero-lateral suture and a narrow lining of same to the inferior border of metepimeron. Beneath thorax pale, pruinosed white. Legs yellowish to ferruginous with the spines and a broad stripe along the outer side of femora black. Wings hyaline, 12 postnodals in fore-wing, 10 in the hind-wing: pterostigma very oblique, acute at both ends, olivaceous with darker centre and black framing veins: that of hind-wing one-third longer than broad, covering one cell: *ab* meeting the posterior border of wing



3. Anal appendages of *Pseudagrion angelicum* sp. n., male. a, Dorsal aspect; b, left lateral aspect.

well proximal to level of *Ac*. Abdomen bluish green at base laterally and beneath, marked with black on dorsum as follows: a quadrate spot extending from base to apical border of segment 1, a vase-shaped stripe on dorsum of segment 2 confluent apically with a narrow black ring and with a longitudinally rectangular spot of azure blue on its basal half, segments 3 to 6 with the conventional dorsal black stripes and apical rings, segment 7 similar but the stripe expanding at apical end to cover the entire dorsum and sides of segment, 8 and 9 azure blue on dorsum with narrow black apical rings covering from one-fifth to one-fourth of segment 8 and the apical third of segment 9: segment 10 entirely black as well as the anal appendages. Superior appendages about two-thirds the length of segment 10, triangular and tapering sinuously to a sharp point as seen in profile, deeply divided into two branches as seen from the dorsum, the outer branch convex outwardly, tapering to a fine point, not notched at apex, excavate within: inner branch a long robust spine directed obliquely inwards and backwards to meet and cross the apex of a similar spine from the opposite appendage. Inferior appendages of about the same length, sloping obliquely upwards as seen from the side, subconical, tapering but slightly to apex which is obtuse.

Female.—Abdomen 27 mm. Hind-wing 19 mm.

Head: labium pale brownish, almost white; labrum, clypeus, genae and frons ferruginous up to the level of lateral ocelli where a broad black band traverses the vertex broadening outwardly towards each eye, each of which is bordered narrowly with black. Posteriorly the band extends over the occiput to enclose large triangular orange or ferruginous post-ocular spots and a broken occipital stripe represented by two or three elongate small yellow spots. Prothorax ochreous marked with black but the latter colour much reduced so that the whole of the sides, most of the dorsum and the whole of the posterior lobe are pale, including the two small digitate sexual processes peculiar to this genus. Thorax golden-

green with similar black markings to the male but greatly reduced in character, thus the mid-dorsal carina is but finely black, the humeral black is incomplete and broadly interrupted below, where its continuation borders the outer side of the humeral suture. The lateral markings similarly reduced, only a small black point or elongate spot on the antero-lateral suture, which latter, above, is indicated only by the finest black line, the spot on the upper part of the postero-lateral suture vestigial. Legs as in male. Wings hyaline, 11 postnodals to fore-wing, 9 in the hind-wing: pterostigma paler, yellowish, of similar shape in all wings to that of the hind-wing of the male. Abdomen yellowish inclining to bluish green laterally and beneath especially on the basal segments, marked with black as follows: segment 1 as in the male, segment 2 with fine basal and apical black rings connected along the mid-dorsal line by an equally fine black line which expands subapically into a transverse oval dorsal spot, segments 3 to 7 similar to the male, segment 8 black on dorsum, yellowish laterally, 9 azure blue on dorsum but with a black basal ring which is confluent with a narrow mid-dorsal black stripe, segment 10 azure blue. Anal appendages black, very shortly conical.

Habitat: W. AFRICA; Ivory Coast, 2♂, 1♀. *Type* in Paris Museum.

This new species appears by the shape of its appendages to be nearly related to *P. basicornu* Martin, but in this latter the apex of the superior appendage as viewed in profile is distinctly notched, whereas it tapers to an acute point in *angelicum*. The colour and markings are entirely different, the latter, on the thorax of *basicornu*, being quite as much restricted as they are in the female of *angelicum*. The colour and markings are remarkably similar to those of *P. massaicum* Sjöstedt and *angolense* Selys, but the shape of the anal appendages is very different.

9. *Pseudagrion conspicuum* sp. n. (text-fig. 4).

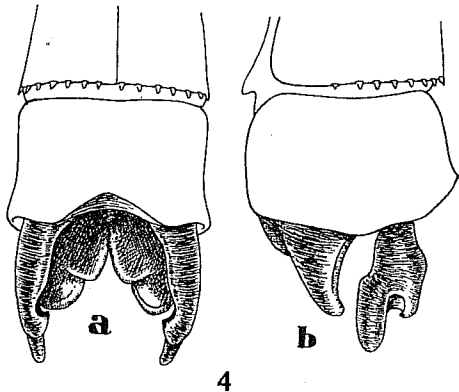
Male.—Abdomen 32 mm. Hind-wing 20 mm. Female unknown.

Head: labium straw yellow, labrum black rather broadly bordered with yellow, genae and anteclypeus pale yellow, postclypeus and frons black but the latter with a transverse rectangular chrome-yellow spot slightly notched at its middle anteriorly and sending a narrow prolongation outwards on each side to the base of antennae, the base and pedicel of which are also yellow. Rest of head black with large subrotund postocular spots of bright chrome yellow. Beneath head pale creamy yellow. Prothorax black, the anterior lobe a small subdorsal triangular spot on each side, as well as the lower parts on the middle lobe, and the outer ends of the posterior lobe all bright chrome-yellow. Thorax black on dorsum marked with chrome-yellow exactly as in the last described species (*angelicum*), the sides azure blue with a linear marking on the antero-lateral suture ending at the middle height of sides in a small black oval spot: finally a narrow and complete black stripe on the postero-lateral suture. Legs yellow with a trace of a black stripe on the distal ends of the outer sides of all femora. Wings hyaline, 13 postnodals in fore-wing, 11 in the hind-wing: *Ab* ending on the posterior border of wing distinctly distal to the level of *Ac*: pterostigma short, quadrate, rather oblique, olivaceous in colour, covering about three-quarters of a cell. Abdomen blue marked with black as follows: segment 1 with the whole of dorsum, segment 2 with a bilobate broad dorsal spot, the basal lobe about twice the length of the apical one which tapers apically to become confluent with a narrow apical black ring, the basal lobe enclosing a longitudinally oval spot of azure blue, segments 3 to 6 with the conventional black stripes and apical rings as in *angelicum*, segment 7 with the black broadening apically to cover the entire dorsum and sides, 8 azure blue, its sides black, this colour extending obliquely on to dorsum until it becomes confluent at apical border of segment with the black from the opposite side, segment 9 similar but the black still more extensive and leaving rather less than the basal half of segment blue, segment 10 black. Anal appendages black, resembling in shape those of *P. inconspicuum* Ris: the lower branch of

the superior appendages is, however, longer and pointed at its apex and the notch between the two branches very obtusely splayed: the inferior appendages are digitate in profile view and abruptly broadened at base.

Habitat: W. AFRICA; Ivory Coast, R. Banco. *Type* in Paris Museum.

This new species lies closest to *P. inconspicuum* Ris, from which, apart from differences in the shape of the anal appendages, it can be at once distinguished by the long petiolation of the wings and the quadrate pterostigma. The abdomen is exceedingly slender, reminding one of an *Aciagrion*. The origin of *Ab* is unique amongst the *Pseudagrions*, arising in all Oriental species at the exact level of *Ac* and in nearly all Ethiopian species proximal to that level: I know of no species resembling *conspicuum*, in which it arises distal to *Ac*.



4. Anal appendages of *Pseudagrion conspicuum* sp. n., male. a, Dorsal aspect; b, left lateral aspect.

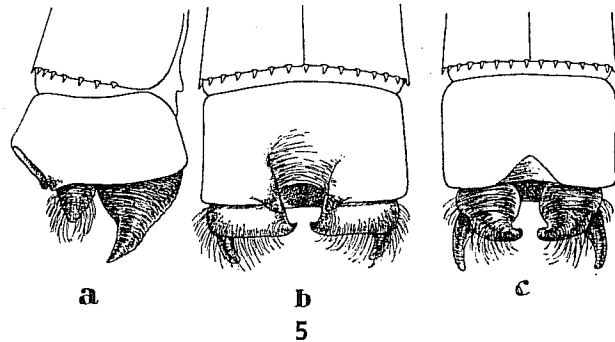
10. *Cerlagrion rubellocerinum* sp. n. (text-fig. 5a and b).

Male.—Abdomen 88 mm. Hind-wing 22.5 mm. Pterostigma 1.25 mm.

(General condition) Head: labium cinerous, labrum and rest of head uniform dull brown with a mere indication of rust-red developing at the site of the postocular spots: beneath head palest olivaceous. Prothorax brown, posterior lobe small, evenly rounded; thorax brown on dorsum, cinerous inclining to pale blue on the sides posterior to the humeral suture, with small oval black spots at the upper parts of the humeral and postero-lateral sutures. Beneath thorax whitish with a small black diffuse spot on each side of pectus posteriorly. Wings hyaline, uncoloured, 13-14 postnodals in fore-wings, 11-12 in the hind-wings; *Ab* prolonged proximal to *Ac* for a distance equal to the length of the latter in the fore-wing and for half that distance in the hind-wing. Pterostigma rather oblique, rectangular, only about one-quarter longer than broad, the costal side slightly shorter than the posterior, covering one cell, thus irregularly subquadrate: framed in thick black nervures which are themselves lined inwardly by clear yellow enclosing a greyish brown centre. Arculus slightly distal to the distal antenodal in all wings. Legs pale brown, knees and spines darker. Abdomen pale brown laterally, much darker on the dorsum, segment 1 with

its sides bluish, and with a black dorsal spot, segment 2 suffused with brick-red dorsally, this colour spreading on to the base of segment 3, the latter segment and 4 to 6 becoming black towards the distal ends to form conspicuous black rings; pale creamy white rings at the base of these same segments as well as subapical whitish rings basal to and bordering on the apical black rings: segment 7 similar at the base but the apical half of segment becoming brick-red: segments 8 to 10 in course of becoming red. Anal appendages pale, tipped with black.

(Adult condition) Differs from the teneral male by extreme melanism and by the thorax becoming white with pruinescence. Venation similar to the teneral example save that there are only 12 postnodals in the fore-wings and 10 in the hind. Head: labrum, bases of mandibles and genae turquoise blue, postocular spots a dull dark rust-red, rest of head dull black. Prothorax and thorax dull black on dorsum, clothed with dense white pruinescence on the sides and beneath, the black spots still, however, visible at the upper parts of the sutures. Legs reddish brown, knees and spines darker. Wings uniformly and palely clouded with brown: pterostigma black. Abdomen black on dorsum from segment 1 to the basal third of segment 7, the remainder bright rust-red. Sides of segments 3 to 6 with a diffuse ochreous stripe along the apical half. Anal appendages reddish tipped with black: superiors very short, less than one-third the length of segment 10: seen from above broad and flattened,



5. Anal appendages of *Cerlagrion rubellocerinum* sp. n., male. a, Right lateral aspect; b, dorsal aspect; c, the same of *Cerlagrion platystigma* Fraser.

rectangular with the postero-internal corner ending in a small black spine: seen in profile this appendage is triangular and has its apex crowned with thick curling hairs. Inferior appendages robust, very broad and conical at base, tapering rapidly to a short robust spine which is directed upwards and obliquely inwards. Segment 10 viewed from behind is deeply excavate, its apical border forming a horse-shoe shaped ridge, the ends of which are thickened and terminate in blackish robust spines.

Female.—Abdomen 87 mm. Hind-wing 23.5 mm.

(General condition) Closely similar to the teneral male, but the labium darker, the frons and vertex of head distinctly tinted with rust-red and the postocular spots definitely of this colour. A dark sooty-black area anterior to these spots runs obliquely outwards and forwards to the bases of antennae where its margin is sharply defined. Prothorax golden-brown with darker mid-dorsal line. Thorax golden-olivaceous on dorsum changing first to green and then pale blue laterally: thinly pruinose beneath and with the same small black spots on the sides as in the male. Legs as in male. Wings

hyaline, uncoloured: pterostigma similar to the male in the fore-wing but distinctly longer in the hind-wing where it is half as long again as broad; 14 postnodals in fore-wings, 12 in the hind-wings. Abdomen similar to the teneral male but the markings more strongly contrasted and segment 2 with similar basal and apical white and black rings which completely encircle the segments; segments 8 to 10 rust-red, segments 8 and 9 with a diffuse linear black stripe on the lower part of sides, whilst 8 has two small triangular subdorsal black spots extending along half the segment. Vulvar scale robust, reddish brown, extending slightly beyond end of abdomen.

(*Adult condition*) The specimen is slightly smaller than the teneral one, with abdomen 33-34 mm. and hind-wing 22 mm. All wings are palely enfolded with brown as in the adult male. Head as in adult male but labium blackish brown: pruinescence on prothorax and thorax confined to the lower parts of sides and beneath and bases of legs. The sides of thorax olivaceous green above, azure blue below. Legs dull reddish ochreous with black spines (4 to 5 spines on hind femora, spaced equal to their length). Abdomen entirely black on dorsum from base to apex, the only trace of paler colouring, on the sides of segments 3 to 6, which are obscurely reddish ochreous. Anal appendages and vulvar scale black, the former shortly conical.

Habitat: W. AFRICA; Ivory Coast, one adult pair and one teneral pair, 15-19.viii.

The colouring of this new species is almost a replica of *C. cerinorubellum* (Brulle) of the Oriental fauna and I actually mistook it at first for that species and only closer inspection showed it to be a most remarkable case of similarity through convergence. The new species is differentiated by the differently shaped pterostigma and anal appendages. The shape of the pterostigma is similar to that of *C. platystigma* Fraser, from Uganda, but the colouring of the insect and shape of anal appendages is quite different. As the figure I gave of this species in *Proc. R. ent. Soc. Lond.* (B) 10: 63 is not quite clear, I here show an improved figure for the sake of comparison with the new species (fig. 5c). *Type* and allotype in the Paris Museum, paratypes in my own collection.

11. *Ceriagrion glabrum* (Burmeister).

A single male of this common and widely distributed African species, 10.vii, borders of the Lagoon du Banco.

Family GOMPHIDÆ.

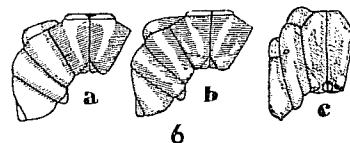
Neurogomphus fuscifrons Karsch.

- Neurogomphus fuscifrons* Karsch, 1800, *Ent. Nachr.* 16: 380.
Neurogomphus fuscifrons Karsch, 1801, *Ent. Nachr.* 17: 72.
Neurogomphus fuscifrons Karsch, Selys, 1892, *Ann. Soc. ent. Belg.* 36: 14 (sep.).
Neurogomphus fuscifrons Karsch, 1800, *Ent. Nachr.* 25: 171.
Neurogomphus fuscifrons Karsch, le Roi, 1915, *Zentr. Afr. Exp. Zool.*: 345.

There is a single female of this rare species in the present collection: only a single male and 2 females were known hitherto, so that this third female is described rather fully here, especially as it has the colours and markings preserved almost as in life. In respect to these latter, the original description is rather poor and probably the type was in poor condition.

Female.—Abdomen 48 mm. Hind-wing 42 mm. Pterostigma 4-5 mm.

Head relatively small, transversely wide as in *Merogomphus*: labium and genae yellowish, labrum dark brown, paler along anterior border, rest of face and head glossy black. Thorax and prothorax matt black marked with citron yellow as follows: a large spot on each side of prothorax, a complete mesothoracic collar, narrow straight ante-humeral stripes confluent with the mesothoracic collar at its outer ends, thus forming inverted figures of "7." Laterally entirely citron yellow traversed on the two sutures by narrow complete black stripes. Legs rather long, entirely black: hind femora extending to apical end of segment 1, with 5 or 6 rather short but robust spines on the distal half, and closely-set short spines on the basal half: mid-femora similarly armed but the distal spine longer. Abdomen slightly longer than the wings, rather tumid at base, cylindrical and parallel sided from apex of segment 2 to segment 6, segment 7 slightly broadened at distal end, segment 8 continuing this broadening, 9 narrowing again to 10 which is very narrow, cylindrical and with its apical half abruptly narrowed, the whole segment as long as segment 9. Anal appendages shortly conical, less than half the length of segment 10. Segment 1 yellow laterally, segment 2 with a mid-dorsal stripe extending whole length of segment, and a broad complete lateral stripe, segments 3 to 6 with narrow similar stripes but interrupted near the base on segments 4 to 6, the basal part triangular, the apical portions lessening in length from segment to segment, segment 7 with only a basolateral vestige, 8 with a broad basal ring expanding apically on mid-dorsum and again on each



6. Thoracic markings of: a, *Neurogomphus fuscifrons* Karsch; b, *Paragomphus atratus* (Selys); c, *Chlorocypha dispar* (Beauvois), male.

side so that its apical border is crenate or serrate. Segments 9 and 10 entirely black. Wings hyaline, venation black, some basal yellow tinting which extends also along the costal border: pterostigma elongate, longer in the hind-wing, narrow, strongly beaced, dark ochreous or reddish brown between thick black veins: costa black. Arculus at the 2nd antenodal vein, the primary antenodals, the 6th or 7th, nodus in fore-wing slightly proximal to mid point of wing, discoidal cell of fore-wing with costal and basal sides equal, the distal side slightly longer: discoidal cell in hind-wing with costal and distal sides slightly sub-equal, the basal about half the length of distal: a basal incomplete subcostal vein in both fore-wings (2 in one fore-wing) and in one hind-wing: anal-loop absent: 2 rows of cells in anal field of fore-wing, 3 rows in the hind-wing: all triangles entire: *Rs* forked symmetrically: only 2 cross-veins between the sectors of arculus in fore-wing, only 1 in the hind-wing: nodal index $\frac{16-20}{14-15} \mid \frac{19-25}{15-15}$ Vulvar scale vestigial, a mere trace of a transverse ridge, the lateral wings of the segments probably acting as substitutes.

Habitat: A single female from the Reserved Forest, Le Banco, near Abidjan, Ivory Coast, 12.vii. The type female and allotype male are in the Berlin Museum; the former differs only from the present specimen by a longer hind-wing (47 mm.).

Paragomphus atratus (Selys).

Onychogomphus atratus Selys, 1885, *C. R. Soc. ent. Belg.* 29 : cxlvi.
Lindenis atrata (Selys), Kirby, 1890, *Cat. Odon.* : 60.
Onychogomphus atratus Selys, 1892, *Ann. Soc. ent. Belg.* 36 : 5 (sup.).
Onychogomphus atratus Selys, Karsch, 1893, *Berl. ent. Z.* 38 : 81.
Onychogomphus atratus Selys, le Roi, 1915, *Zentr. Afr. Exp. Zool.* : 344, pl. 19. f. 2, text-figs. 9, 10.

Ris, in a note in his private catalogue, expressed the opinion that this species was identical with the next species.

Onychogomphus hageni Selys.

A single pair from a stream in the Le Banco Reserved Forest are of considerable interest in that they were taken *in copula*, thus establishing the two sexes without any doubt. The female was unknown and is now described for the first time : the male differs in a few points only from the type, these differences being accounted for perhaps by different habitats. Species of this genus are characterised by the incidence of xerophilous forms in desert areas and melanotic forms in heavily forested, wet areas : the present specimens are of the latter kind.

Male.—Abdomen 33 mm. with anal appendages. Hind-wing 25 mm.

The antehumeral stripes meet the mesothoracic collar at a point only to form inverted figures of "7." : the humeral stripe is reduced to an upper triangular spot followed after a brief interval by a very short linear one, the lower half of the stripe being entirely absent. The mediolateral stripe of the thorax is also broken into an upper triangular spot and a lower linear one. Beneath thorax is dark olivaceous with the sutures and borders black. There are no basal incomplete antenodal veins present ; these are not a character of the genus and the occurrence of one such in one of the wings of the type is no doubt a pure aberration.

Female.—Abdomen 35 mm. Hind-wing 29 mm. Pterostigma 4.5 mm.

Wings hyaline, uncoloured, nodal index $\frac{12-14}{12-11} | \frac{15-11}{12-16}$; pterostigma black, much longer than in the male, covering 6 cells ; 4 rows of cells in the anal field of hind-wing. The anterior border of labrum, labium and undersurface of head, the lower border of frons narrowly and a stripe across the upper surface of frons all citron yellow, rest of head and between these markings dark reddish brown. Behind occiput about 12 small spines in a right and left cluster of 6, yellow with black apices. Thorax dark reddish brown with a coppery reflex, marked with citron yellow as follows : antehumeral oblique stripes meeting the mesothoracic collar broadly to form inverted figures of "7" (much more broadly confluent than in the male), a narrow sinuous humeral stripe incomplete in its lower half and constricted but not interrupted above, 3 lateral yellow stripes, the first posthumeral with its upper end sharply angulated forwards, a narrower medial stripe interrupted as in the male, and lastly a posterior one which covers the greater part of the mesepimeron, curved strongly and with its concavity looking forwards. Beneath reddish brown. Legs : femora yellow, the anterior pair marked with black outwardly and anteriorly, all others black at distal ends and all coated on flexor surfaces with a dense field of small black spines. Tibiæ and tarsi black. Abdomen black marked as in the male with the yellow markings, however, more extensive : segments 2 to 4 with broad dorsal stripes which shorten from segment to segment and occupy only the middle two-fourths of segment 4. Segment 7 with its basal half yellow, 8 and 9 with large basal spots on the sides only, segment 10 and the anal appendages entirely black. The latter as long as segment 10, very acute : vulvar setæ as in *P. cognatus* (Rambur), very short and bifid.

Habitat : The type is from the Belgian Congo and is now in the Brussels Museum. Only 3 males and a single female are known. Karsch states that the occipital spines are absent in group *cognatus* of genus *Onychogomphus* (*Paragomphus*) to which this species belongs, but he is in error here as the female of *cognatus* has 6 well-developed spines behind its occiput, in two groups of 3, a right and a left ; to see these it is usually necessary to remove the head and to view it under a microscope.

FAMILY AESHNIDAE.

Gynacantha sextans McLachlan.

Gynacantha sextans McLachlan was described from a male from the Cameroons : the type, in the British Museum, is the only known specimen. There is an enormously robust female *Gynacantha* in Dr. Paulian's collection from the Reserved Forest, Le Banco, 18.viii., with a note on the packet to the effect that it is always crepuscular. I gather from this that a number of specimens were seen but only one captured : its size, venation and colouring all agree closely with *sextans*, and I do not think there is any doubt about the determination. Its abdomen measures 56 mm. without the anal appendages, the latter being shorter than is usual in the genus, and finely tapered, lanceolate and shorter than segment 9. The apices are intact and not fractured off as is so often the case in the female, this damage occurring during the act of ovipositing in dry soil. The venation is close, costa reddish brown, membrane white,

primary antenodals the 8th or 9th : nodal index $\frac{20-28}{25-22} | \frac{28-21}{22-23}$;

discoidal cells $\frac{6}{7} | \frac{6}{7}$; cubital cross veins $\frac{8}{7} | \frac{7}{6}$; anal loop 14/14. *Rs* is forked well before the pterostigma and there are 5 to 6 rows of cells between it and *R_{spl}* : pterostigma covers 4 cells, is rather long and reddish ochreous in colour. The general colouring is dark reddish brown, darkest on the dorsum of thorax ; the occiput yellow, and the frons bearing a thick black "T" on its upper surface. The legs are uniform bright reddish brown. Abdomen of the same colour but deepening dorsally to blackish brown ; segment 8 is short and very stout, segment 9 is at least half as long again as 8 and tapers analwards, thus differing from most other species of the genus.

[Whilst writing up these notes a second female was sent to me from the Paris Museum, taken at Libongo, W. AFRICA, viii.39, by Mr. Lepesme. This specimen is somewhat smaller—abdomen 53.2 mm. and hind-wing 50.4, contrasted with abdomen 59–60 mm. for type and 56 for the Ivory Coast specimen ; hind-wing 50–53 mm. for type and 53 for the Ivory Coast one. This Libongo specimen has a nodal index of $\frac{20-26}{22-20} | \frac{28-22}{21-24}$:

discoidal cells $\frac{7}{6} | \frac{6}{6}$: cubital cross veins $\frac{7}{6} | \frac{7}{7}$; anal-loop 12/14, which figures agree closely with the type and with the Ivory Coast female. The wings are irregularly infuscated more especially distal to the nodus, along the posterior border of wings and at the apices. The black "T" on

the frons is well defined. The Ivory Coast female has the wings clear but is probably a younger specimen; the type has the wings infuscated.]

Gynacantha bullata Karsch.

A single male, 12.viii, from Le Banco Forest, is entirely typical.

Family CORDULIDAE.

Phyllomacromia bislava Martin.

A single male differs only by the yellow markings which are more restricted than in the type. Border of lagoon du Banco, 10.viii.

Phyllomacromia aequatorialis Martin.

A single male with the same data as the last. Does not differ in any respects from Martin's description.

Neophya rutherfordi Selys.

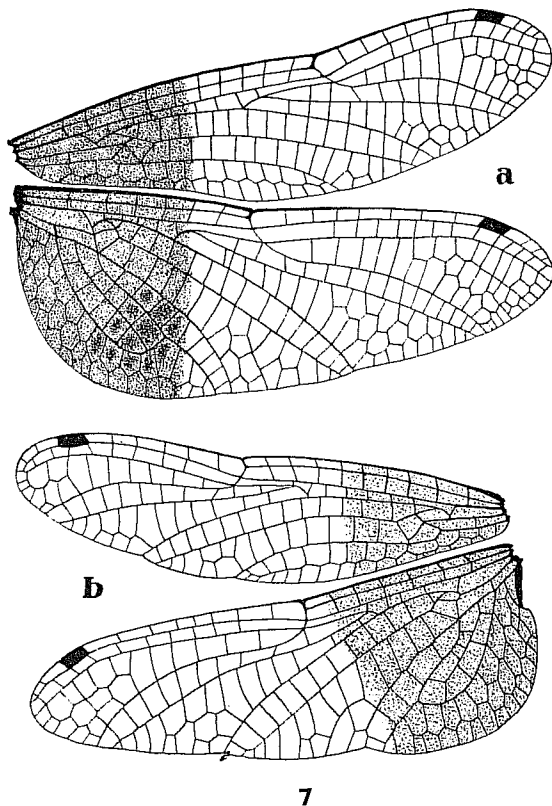
Neophya rutherfordi Selys, 1881, *C. R. Soc. ent. Belg.* 25 : 17.
Neophya rutherfordi Selys, Kirby, 1890, *Cat. Odon.* : 46.
Neophya rutherfordi Selys, Martin, 1906, *Cat. Coll. Selys, Cordulines* 17 : 8.
Neophya rutherfordi Selys, Martin, 1912, *Feuill. jeun. Nat.* (5) 42 : 60.
Neophya rutherfordi Selys, Morton, 1928, *Ent. mon. Mag.* 64 : 121.

Female.—Abdomen 19 mm. Hind-wing 25 mm. Pterostigma 1 mm.

Head: labium yellow, labrum steely blue black, anteclypeus pale, cinereous; post-clypeus, frons and vesicle glossy metallic blue black; occiput very small, steely blue black; eyes brown but probably dark emerald green during life. Prothorax black on dorsum changing to brown laterally. Thorax metallic bluish green (prussian blue) on dorsum as far lateral as the level of the spiracle, the sides pale creamy yellow traversed by a broad stripe of metallic dark blue which is centred over the postero-lateral suture and continued under the ventrum to become confluent with the stripe from the other side. A moderately broad creamy yellow stripe in the humeral region and occupying the lower two-thirds of the dorsum only. Legs blackish brown, coxae, trochanters and distal three-fourths of the two hind pairs of tibiae pale yellow: some fine hairs on the femora and very long, rather closely-set hair-like spines on the tibiae, decreasing rapidly in length distally. Claw-hooks long, equal to the ends of claws which thus appear to be bifid. Wings hyaline, palely and evenly enfumed throughout but deepening somewhat towards the apices and the cell middles paler, giving a mottled appearance to the wings: the bases of both pairs broadly tinted with deep amber yellow to as far distal as the level of the 5th antennal vein in both wings and with an outer border which runs straight back to the posterior border of wings. In full adults a dark infuscated irregular spot is present in the hind-wings occupying the centres of about 12 cells and centred over the apex of the anal-loop. This spot entirely absent in the general condition and occupying only the 3 terminal cells of the anal-loop in sub-adults. Venation closely similar to that of male and as shown in figure (fig. 7). Abdomen steely black marked with pale creamy yellow as follows: segment 2 with a large rounded subdorsal spot on each side, its ventral side pale and almost white, this colour being continued basad and dorsad and ending squarely on the sides. Segments 3 to 7 with broad lateral stripes, traversing the whole length of segment 3, three-fourths of segment 4, as far as the jugal suture on 5 and 6 and rather short of this level on 7. Rest of abdomen unmarked. Anal appendages very shortly conical. Vulvar scale short, buckled triangularly inwards at its apex, which is followed by a thin transverse ridge at the outer ends of which are short thin digitate processes.

Habitat: Two males and two females taken in forest clearings west of Abidjan, Ivory Coast. The male type now in the British Museum (Natural History) came from Old Calabar. I possess a second male from Sierra Leone, so that the species is distributed from the Gold Coast to

the Gaboon. The rediscovery of this interesting insect has permitted me to make a fuller description and to correct the former ones. The figure of the male wings given by Martin in the *Cat. Coll. Selys, Cordulines*, fig. 6, shows the base of the hind-wing too greatly expanded and



7. Wings of *Neophya rutherfordi* McLachlan: a, female; b, male.

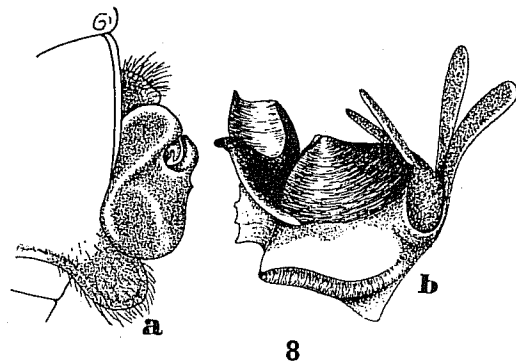
has not brought out the characteristic crenated hind borders of the wings: thus I have taken this opportunity to refigure the wings of both sexes (text-figure 7a and b). The position of the genus *Neophya* in the family CORDULIDAE is not clear: in the "Reclassification of the

Odonata," Tillyard and Fraser, I included it in a new subfamily, the NEOPHYINAE, but I am inclined now to revise that view in the light of the new evidence afforded by the female. The evolution of the nodal index is as high as that attained by the most recent LIBELLULIDAE and the arculus shows an equally high recession, yet we find these modern products associated with extremely archaic elements such as accessory veins to the bridge, four-sided discoidal cells, absent *Rspl* and so on. In the face of such anachronisms I can only think that this species is a highly specialised one and that the apparently vestigial elements found are due to a secondary reduction in the venation brought about by a lessening strain thrown on the wings. *Neophya* bears a remarkable resemblance to *Idionya* in the colouring, the poorly chitinized body and, I suspect, the habits. *Idionya* only flies in bright sunlight and soars and floats like gossamer on the ascending currents of warm air. Even the obscuring of sunlight by a passing cloud is sufficient to drive them from the air. Thus I think that *Neophya* has come from the same ancestral line as *Idionya* and the genus should now find a place in the subfamily IDIONYCHINAE. Dr. Paulian confirms that the flight of *N. rutherfordi* is similar to that of *Idionya*.

Family LIBELLULIDAE.

Allorhizucha klingi Karsch (fig. 8a).

There are 19 males and 7 females of this little known dragonfly, all taken during the months of June to August but more especially during July. Whilst I am satisfied in the correct identification of these specimens, I find that the genitalia are not in strict accord with the figure 49 shown in Ris, 1909, *Cat. Coll. Selys (Libellulines)* 9 : 81; the lobe is more rounded and the hamules distinctly overlap it, whilst the apices of the hamules are both visible in profile view as if interlocked. Of the 32 known examples, 27 are in the Selysian collection.



8. a, Male genitalia of *Allorhizucha klingi* Karsch; b, prothorax of *Isomecocenemis subnodatis* (Selys), female.

Lokia circe (Ris).

A single female, 20.vii.45, is with some doubt determined as such. It agrees closely with the Risian description made from a single juvenile male and female, the only specimens known.

Hadrothemis versuta (Karsch).

Only 11 males and a single female appear to have been collected heretofore of this fine species, so that it is surprising to find no less than 16 males and 9 females in the present collection. All males are of the red form and there is but slight evidence of pruinescence on segments 3 to 5 in any of the specimens. The basal markings of wings are less extensive than in the type; up to the 1st antenodal in the fore-wings and as far as the cubital vein, but extending to the 4th antenodal and middle of discoidal cell in the hind-wings. The abdomen varies from dark blood-red to black. The description of the allotype female in the British Museum given by Ris is incomplete and the following additional notes are now given:

Frons violet metallic, thoracic markings obsolete (or may have changed from decomposition), the whole an uniform brownish yellow, abdomen dark reddish-brown with the carinae mapped out in black. Wing apices only narrowly bordered with brown: dark streaks in the fore-wings extending up to the 1st antenodal and the cubital cross vein, but up to the 3rd antenodal and whole of cubital space in the hind-wings, where the coloured areas are very sharply (not diffusely) limited. Nodal index of female:

0-15	15-9
11-112	12-10

Hadrothemis camarensis (Kirby).

A single male, 11.viii, appears to belong to this species; it actually works out to *H. versuta* (Karsch) in the Risian key, but there are 2 rows of cells between *MA* and *Mspl* in the fore-wings, and the basal markings are so pale as to be almost obsolete. It agrees with *versuta* in possessing only a single cross-vein in the cubital space of the hind-wings. Its large size further suggests *camarensis*, of which it is perhaps an aberrant example.

Orthetrum africanum (Selys).

Four males all dated 28.vii. The species appears to be of local distribution and not at all common. The present specimens have been determined by their genitalia, which agree with figure 145 in Ris, 1c.

Orthetrum guineense Rfs, and *O. capense* Calvert.

There are 2 males of *O. guineense* and 15 males and 4 females of *capense* in the present collection. Both are common species and rather widely distributed. It seems best to treat these two as species rather than subspecies of *chrysostigma* and *stemmale* respectively as was done in 1909 by Ris, who, however, did raise the status of *guineense* to specific rank in 1916 (Ris, 1916, *Cat. Coll. Selys, Libellulines*, 16 : 1082).

Orthetrum austeni (Kirby).

One adult male and one teneral female of this magnificent *Orthetrum* are found in Dr. Paulian's collection, both taken in August. The base of the hind-wings of the male is colourless: there are as many as 8 cells in the subtrigone of fore-wings (6 shown in the wing figured by Ris (*loc. cit.*, fig. 139), but 7 given in the text.) It is quite the largest species of *Orthetrum* known, even exceeding the dimensions of *angustiventre* (Rambur) and *melania* Selys.

Orthetrum microstigma Ris.

One male, 22.vii. Determined by the genitalia which agree closely with the figure given by Ris (*loc. cit.*, fig. 626).

Acisoma panorpoides ascalaphoides Rambur and
Acisoma trifidum Kirby.

Numerous specimens belonging to both sexes of these two common species are represented in the present collection, all taken during July and August.

Chalcostephia coronata flavifrons Kirby.

A single male, 24.vii. A species widely distributed throughout tropical Africa but nowhere common. I possess specimens collected by Professor G. D. Hale Carpenter in Uganda, an area not mentioned in Ris, most of whose localities are in West Africa.

Thermochoria equivocata Kirby.

One pair, 30.viii, apparently taken in copula. The two specimens agree with the type rather than with var. *picta* Sjöstedt.

Trithemis violacea Sjöstedt.

A single male, 21.vii, determined by its colouring and markings with considerable doubt. I am of opinion that little separates this species from *annulata* (Beauvois) from the same area. The species is known from a single male and two females in the Stockholm Museum. The differences between it and *annulata* are well summed up by Ris (*loc. cit.*, 1912, 14: 772). The colouring and markings of the red forms belonging to the genus *Trithemis* undergo remarkable changes from the teneral to the adult condition, and in some species—e.g., *aurora* (Burmeister)—even the abdomen changes its shape as the insect passes from the juvenile to the adult state.

Urothemis edwardsi Selys.

There are 3 females of this fine species in the collection, all collected in the month of July. One of these is typical with the basal marking of the usual bright golden yellow with included black marking; the other two are remarkable as being andromorphs, with the basal marking of the hind-wings as in the male, a form which has not hitherto been described. Moreover, the basal marking is very extensive in the hind-

wing, where it reaches half-way between the 1st and 2nd antenodals, covers the proximal half of the discoidal cell and at that level runs straight back through the anal-loop to attain its inner border and then curves basad to reach the extreme ternal angle of the wing. Proximally it reaches the extreme basal border of the wing whilst outwards there is but the narrowest areola of golden brown. The whole area is steely black save for a fine horizontal hyaline line in the median space. In females from Uganda which I possess, the basal marking covers less than half this area although of the same dark blackish brown.

Habitat: Collected whilst ovipositing in the lagoon, 12.vii, near Abidjan, IVORY COAST.

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