

mal end of *Br* in the other two females); the nodal index corresponds to the two others, so that, on balance, I am of the opinion that this is the same species but with aberrant venation. This third female comes from Bambesa, VI.38, collected by J. VRIJDAGH, and I have labelled it as « Forma B, type » to distinguish it from the other two.

This genus appears to link up *Aethiothemis* with the *Trithemis* complex, the presence of the antenodal brace vein (incomplete distal antenodal) indicating a closer relation to the latter. All three females have been incorporated in the collections of the Musée Royal du Congo Belge.

New and rare species of Zygoptera from the Belgian Congo

By Lt. Col. F. C. FRASER, I. M. S., Reid.

This paper deals with some new species of the smaller Zygoptera which were found amongst unnamed undetermined material belonging to the Musée Royal du Congo Belge, Tervuren; two of the new species belong to the *Protoneturidae* and a third to the *Coenagrutidae*; the hitherto unknown female of *Chlorocnemis cyanura* FORSTER is also described. This latter species was transferred to the new genus *Isomeccocnemis* by COWLEY and is retained here with some doubt; as the female was unknown, COWLEY was unaware that this sex possessed specialized hooks on the prothorax, moreover he attributed the apparent absence of the anal vein in his figure of the wing of *cyanura*, due to buckling of the wings. This is not so but due to an actual rejoining of the vein with the posterior border of the wing, after which it separates again.

A new species of *Agrionemis* described has curious anal appendages shaped unlike any other species of the genus; as these organs constitute the only reliable method of separating the species, I have refigured (Fig. B, a - g) those belonging to the whole of the African species, save *ebneri* RIS. (= *A. zerafica* LE ROY) in which they are so small as to be invisible, and *A. angolense* LONGF., the appendages of which approximate to those of *forciputa*.

Elattoncura vrijdaghi n. sp. (Fig. A, 2, 5 and 7.)

A single male from Ucle : Bambesa, Belgian Congo, III. 39, collected by J. VRIJDAGH. Holotype in the Musée Royal du Congo Belge.

Male. Abdomen 41 mm. Hindwing 22 mm.

Head. Labium pale yellowish; labrum, epistome and frons bright brick-red, a vestigial interrupted black stripe running between the eyes separating the frons from the vertex; occiput black sharply marked

off from the vertex; prothorax and thorax brick-red, the former unmarked, its posterior lobe broad, erect and shallowly convex; thorax with the following black markings, a narrow stripe along the middorsal carina, a large irregular spot overriding the upper end of the humeral suture, an oval elongate spot at the middle of mesepimeron, a small

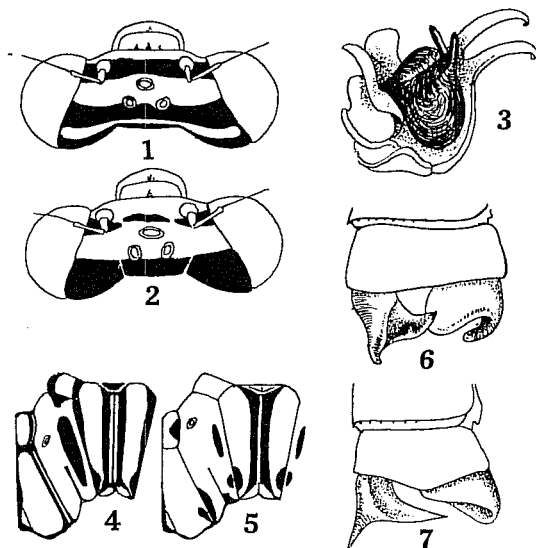


Fig. A. - 1. Head of *Elattonneura henrardi* n. sp., male. - 2. The same of *Elattonneura vrydaghi* n. sp., male. - 3. Prothorax of *Isomecoenemis cyanura* (FROBERG), female. Note the posterior lobe, as seen from the dorso-lateral view, is cleft to its base, whilst the middle lobe has a pair of unguulate processes. - 4. Thoracic markings (diagrammatic) of *Elattonneura henrardi*. - 5. The same of *Elattonneura vrydaghi*. - 6. Male anal appendages of *Elattonneura henrardi*. - 7. The same of *Elattonneura vrydaghi*.

spot just above the hind trochanter and an irregular spot at the upper end of the postero-lateral suture; the sides and beneath thorax paler and inclining to ochreous. Legs pale reddish, femora with apical, basal and subbasal blackish annules, spines pale carneous. Wings palely tinted with yellowish grey, the veins darker; pterostigma an oblique

quadrate rhomboid with the posterior and distal sides only slightly longer than the costal and proximal, pale reddish with dark grey centre, framed in an outer black and an inner pale bordering; 15 postnodals in forewings, 13 in the hind; *1A* ending on the vein descending from the distal side of the discoidal cell; *CuP* 4 cells long in forewings, 5 in the hind; *Riv + v* arising proximal to the subnodus, *IRIII* from that level.

The base of the right hindwing exhibits some extraordinary aberrations, - the subcostal portions of the two primary antenodals are absent but a subcostal antenodal is present well proximal to the basal antenodals; a strong and very oblique vein runs from *Cu* to the combined *R + M* across the median space, ending on *R + M* just below the level of the proximal antenodal. There is only one other record of a vein traversing the median space in any species of the Coenagrioidae, viz. an *Amphipteryx* in the British Museum Natural History collection.

Abdomen dull reddish clouded with blackish, segments 3 to 7 with broad black apical annules preceded by shorter pale whitish annules, and with narrow pale annules at the base; segment 7 nearly entirely black, segment 9 with its basal half black, the apical half and the whole of segment 10 bright ferruginous. Anal appendages red tipped with black, of the generic shape, superiors with short acuminate apex directed straight posteriorwards and with a robust ventral spine directed down and inwards and tapering to a needle-like point; inferiors more robust, longer, projecting distinctly beyond the superiors, broad at the base, bevelled and with the apex sharply curled upwards and inwards.

This new species, although morphologically similar to the others of the genus, is quite unlike any of these by its bright red colouring and very restricted black markings; its abdomen is of great length and remarkably attenuated in the middle segments. It is named after its collector M. J. VRIJDAGH.

Elattonneura henrardi n. sp. (Fig. A, 1, 4 and 6).

One female and seven males from Ucle : Bambesa, II-IX. 38, collected by M. P. HENRARD and J. VRIJDAGH. (Actual months, II, III and VI-IX.).

Male. Abdomen 30 mm. Hindwing 20 mm.

Head : labium dull reddish; labrum, epistome as well as the vertex and occiput blood-red traversed from eye to eye by three black bars, the anterior at the level of antennae traversing the frons, the second on the vertex passing between the ocelli, and a posterior traversing the occiput, enclosing thus two bright blood-red bars; eyes red but the black bars continued on to them above and laterally. Prothorax blood-

red marked by large black spots on each side of the middle lobe and two longitudinal ones on its upper surface; the posterior lobe erect, blood-red tipped with black on each side and with two black spots dorsally. Thorax blood-red paling to yellow on the lower parts of sides and beneath, marked with black as follows, - a moderately broad stripe along the middorsal carina which is split on each side of the carina by a fine red line; a narrow humeral stripe broadening below where it is confluent with a similar stripe on the mesepimeron incomplete above; a short linear stripe on the midlateral suture which may be confluent narrowly with the mesepimeral stripe; a narrow stripe on the posterolateral suture and finally a narrow bordering to the lower border of the metepimeron. Legs entirely blood-red, save the black tarsi. Wings hyaline or palely suffused with greyish; pterostigma caraceous framed in black veins and these again by caraceous, the central portion dark greyish, diamondshaped with the sides equal in length; 14 postnodals to the forewings, 12 in the hind; venation otherwise quite typical of the genus; abdomen dark reddish, the dorsum suffused with black which forms broad apical annules on segments 3 to 7, the annules preceded by shorter annules of pale yellow more or less distinct; segment 1 with its base black, but prolonged to a point on the dorsum, segment 2 with an indistinct subdorsal line deficient at base and apex of segment; in some specimens indications of a transverse subapical line joining the two ends of the lateral lines; segments 3 to 7 with narrow basal yellow annules; segment 7 otherwise entirely black; segment 9 black marked dorsally with two yellow spots, segment 10 pale yellow with base, apex and lower parts of sides bordered with black. Anal appendages of the usual generic shape, red or dark reddish brown approaching to black according to age of specimens; superiors of the same shape as in *glauca* SELYS, with short apical spine, a medial short spine on the triangular expansion of the appendage, and a more robust spine at the lower angle of the expansion; inferiors very broad at base, the apex below narrowing abruptly and curled upwards and a little outwards.

Female. Abdomen 29 mm. Hindwing 19 mm.

Head, prothorax and thorax marked similarly to the male but the ground-colour ochreous inclining to ferruginous on the head and olivaceous on the body (possibly olivaceous green during life?). Posterior lobe of prothorax projecting backwards and with two short unguulate processes directed forwards at an angle of 45 degrees over the dorsum of middle lobe; these processes yellow tipped with black. Legs bright yellow; the femora lined or stippled with black dots on the extensor surface; tibiae black at distal ends, as also the tarsi. Abdomen broader than in the

male, olivaceous yellow clouded and marked with black as in the male; segments 8 to 10 with the sides more or less broadly bright yellow; vulvar scale and anal appendages black. Wings hyaline, untinged; pterostigma golden yellow with dark centre, more elongate, about one third longer than broad; 13 postnodals to the forewings, 11 to 12 in the hind; arculus a little distal to the distal antenodal (this variable in the males); venation otherwise that of the genus.

This new species is remarkably similar to *Elattoneura atkinsoni* (SELYS) from Assam, both in its ground-colouring and shape and distribution of the dark markings; *atkinsoni* however lacks the parallel red lines on each side of the middorsal carina of thorax and its abdomen is generally darker. This species and *wijdaghi* are the first two red species of the genus to be reported from Africa. It is unfortunate that nearly all the specimens are either broken or deficient; the type male and allotype female are however in very fair condition, and are in the Musée Royal du Congo Belge, Tervuren.

Isomecocnemis cyanura (FÖRSTER). (Fig. A. 3.)

Chlorocnemis cyanura FÖRSTER, 1909, *Jahrb. Nassau*. 62 : 234.

Isomecocnemis cyanura COWLEY, 1936, *Ann. Mag. Nat. Hist.*, 10, 17 : 514.

This species was described from a single male from the hinterland of the Cameroons, W. Africa; there is a single female in the present collection, from Uele : Bambesa, III. 38, collected by M. P. HENRARD, which agrees so closely with FÖRSTER'S type that I feel there can be no doubt that it is the undescribed female of *cyanura*. COWLEY figured the wings of the type and in the legend beneath the figure pointed out that the Anal vein appeared to be absent owing to the buckling of the wing. In the female before me, it is seen that the Anal vein after leaving the wing-border at the level of the vein Ac, actually fuses again with it for nearly the whole of its length, and I have no doubt that this is the same state of the vein in the type male.

Female. Abdomen 39 mm. Hindwing 24 mm.

Differs as follows from the male, - frontal pale stripe a greenish yellow instead of blue (yellow or bright blue in the type), pale mesepimeral stripe complete but the subepimeral portion bright yellow; dorsal line on segment 2 of abdomen absent (perhaps faded?) and segment 9 with its basal half bright yellow, this colour extending apically along the middorsum. Prothorax with the posterior lobe greatly enlarged and cleft to its base into two elongated flaps; the middle lobe surmount-

tend by a robust tubercle from which arise two triangular divaricate lobes, which, in profile, are seen to be curled slightly backwards.

Wings iridescent, slightly enfumed, pterostigma and venation similar to that of the type male; 15 postnodals to forewings, 13 in the hind; the Anal vein meets Ac on the border of the wing, where the two form a minute chitinous triangle, and then leaves the posterior border of wing just before the level of the base of the quadrilateral in the forewings but beyond the middle of the quadrilateral in the hindwing, prior to which level it can be seen running parallel and confluent to the wing border. This specimen, which is the allotype, in the Musée Royal du Congo Belge, Tervuren.

Agriocnemis stygia sp. nov. (Fig. B, a, b and c.)

A single male from Eala, Belgian Congo, 1936, collected J. Ghesquière. Male. Abdomen 23 mm. Hindwing 15 mm.

Head : labium yellow; labrum, anteclypeus and genae pale green, postclypeus, frons and rest of head matt black, the occiput bearing very small round pale blue or greenish postocular spots. Beneath head black but a broad pale yellow fascia bordering the eyes which are also black. Prothorax black on dorsum, pale yellow on the sides; posterior lobe trilobate, the lateral lobes with a deep narrow notch. Thorax coal black on dorsum, this extending on to the sides to cover the anterior half of mesepimeron; rest of sides greenish yellow but a small black spot on the upper end of the postero-lateral suture; beneath pale yellow. Legs greenish yellow, the extensor surface of the femora and the outer sides of the tibiae black, tarsi black. Wings hyaline, pterostigma diamond-shaped, that of the hindwings rather longer, golden yellow with a darker centre, covering one cell; 9 to 10 postnodals in forewings, 7 in the hind; discoidal cells broader and shorter than is usual in the genus. Abdomen dark reddish brown on dorsum inclining to black at the apical ends of segments; fine pale rings at the bases of segments 3 to 6; segments 7 to 10 bright brick-red but the basal fourth of 7 black. Anal appendages highly specialised, the superiors glossy black, the inferiors ferruginous. Superiors shaped like the trigger of a revolver, the apical portion turned down at a right angle to the basal and hollowed out on its lower side; inferiors broad, expanded below and partially tribolate, the inner and medial lobes terminating in a black tooth; seen in profile, they are deeply emarginate on the upper surface and prolonged at the lower border to end in the medial tooth.

By its anal appendages, this species appears to lie nearest to *A. exilis* SELYS, especially as viewed from above, but the long fine ventral spine

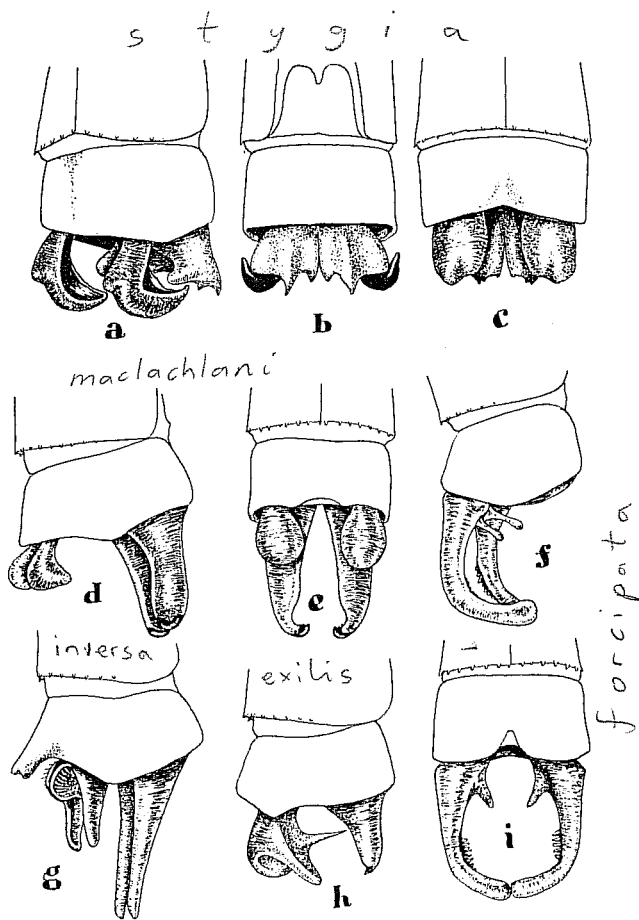


Fig. B. - a, b and c. Male anal appendages of *Agriocnemis stygia* n. sp., latero-dorsal, ventral and dorsal aspects; - d and e. The same of *Agriocnemis maclachlani* SELYS, right lateral and dorsal aspects; - f and i, *Agriocnemis forcipata* LE ROY, right lateral and dorsal aspects; - g, *Agriocnemis inversa* KANSCU; - h, *Agriocnemis exilis* SELYS.

of the superior appendages of *exilis* is absent and the broad hook-like process of the new species is replaced by a narrow unguulate one. The new species differs from all African ones by the dorsum of thorax without pale antehumeral stripes and by its relatively high nodal index and large size. These characters along with the unique shape of the anal appendages will serve to distinguish it from all others of the genus. Type in the Musée Royal du Congo Belge, Tervuren.

In the same collection are a number of specimens of *Agriocnemis forcipata* LÉ ROY from Uele : Bambesa. It may be pointed out here that *A. forcipata* SJÖSTEDT is the same species, which by a coincidence received the same name. CAMPION was unaware of this and thinking the name to be preoccupied, gave a new name to SJÖSTEDT's species - *flavilabris*, which name therefore becomes a synonym of *forcipata* LÉ ROY.

Notes on some African Bats, mainly from the Belgian Congo

by R. W. HAYMAN

Department of Zoology, British Museum (Natural History).

I am indebted to Dr. M. POLL of the Musée Royal du Congo Belge for the opportunity to examine in London a large number (466) of unidentified bats from the collection in his care. Nearly all are in alcohol. Although many belong to comparatively well-known forms, others represent species either now recorded for the first time from the Belgian Congo, or presenting other points of special interest.

The following are new to the Belgian Congo, so far as I have been able to determine from available collections and literature.

Micropteropus grandis SANBORN.

Epomophorus gambianus OGILBY.

Rhinolophus hildebrandti PETERS.

Tadarida (Chaerephon) spillmanni MONARD.

Tadarida (Chaerephon) pumila GRETZSCHMAR.

Nycticeius (Scotoceus) hirundo hindei THOMAS. Genus and species.

Glauconycteris beatrix THOMAS.

Pipistrellus crassulus THOMAS.

Pipistrellus culex THOMAS.

Miniopterus minor PETERS.

The identifications of all the Congo Museum bats examined are given in the following list. The Congo Museum numbers are followed by localities, dates of collection where known, and the collector's name in parentheses. The localities are to be found on the accompanying map. Specimens are all in alcohol except where noted otherwise. Of the specimens listed, a set of duplicates has been generously presented to the British Museum by the authorities of the Congo Museum, but all unique specimens remain in the collection of the latter institution.