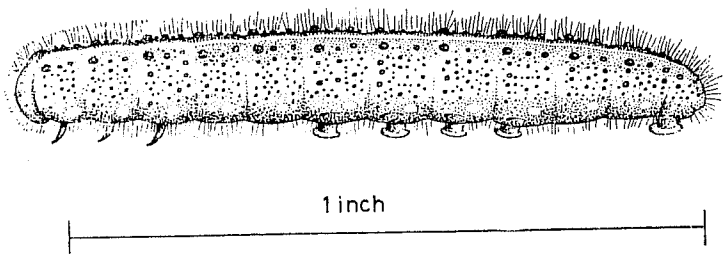
Fig. 2



Pieris krueperi Stgr
Mt. Hymettus, Attica, Greece.

Larva (Fig. 2)

Review

Collecting, preserving and studying insects **Harold Oldroyd**

Hutchinson Scientific and Technical, London. 2nd (Revised) Edition 15 plates, 135 figures. Hard Back, £2 10 0 (£2.50); Soft Back. £1 5 0 (£1.25).

While entomologists who start collecting a particular group of insects are usually catered for by keys or works concerning the group, the person who wants to collect insects generally needs to do a considerable amount of reading before they are acquainted with the various methods of collecting and preserving insects. Mr Oldroyd is to be congratulated on producing a book which contains all the information and instructions that a person coming into entomology or for that matter someone changing their interests within the field of entomology requires to know. Numerous figures go along with the text to show exactly what the author means when referring to a type of insect on the one hand or type of collecting net or setting board on the other. While the drawings are not always as clear and perfect as one might wish they fulfill the function for which they were intended. The inclusion of plates enhances the book and some of the plates at least show that one can start the study of insects at a fairly early age. A most useful chapter on photography will be most helpful to those people who prefer to take pictures and release the animals rather than preserve them. I have no hesitation in recommending this book to all those interested in insects. It is a neat, concise reference book which gives ample information on all those aspects of entomology which go to producing well-presented collections and at the same time educates the collector.

J. Kennaugh

On a New Genus and Species of Libellulid Dragonfly from the Ivory Coast

By Roger P. Lindley
(Barham Court, Barham, Canterbury)

In April 1968, the writer took a male and two females of a libellulid dragonfly beside the Bandama River, about 45 km. from Korhogo in the Guinea Savannah zone of the Ivory Coast, which not only appeared to be a new species, but could not even be attributed to any known genus. Their most conspicuous character was the length of the superior anal appendages in both sexes, which were elongated to a degree unparalleled anywhere in the Libellulidae, and more reminiscent of a female *Heliaeschna*. Although there were no obvious affinities with any known genus, they seemed closest to *Zygonyx* by the well-developed subapical tooth to the claw leaving a wide cleft between, and by the position of the nodus, which was considerably nearer to the apex of the wing than to the base. These characters might suggest affinities with Corduliidae, but the incomplete last antenodal crossvein, the absence of tibial keels in the male, and the rounded margins of the hindwing in both sexes, point definitely to their inclusion with the Libellulidae. The shape of the hamule is fairly similar to that of *Zygonyx* and its relatives, although the penis shows no very close resemblance to any of them. The sustained flight as opposed to the short "darting" flights of the Tritheminae and the more primitive subfamilies also suggests affinities with *Zygonyx*. They show little in common with the Trameinae apart from their manner of flight. A further male was found about 70 km. upstream on the same river in April 1969, and the four specimens are here described as *Zygonychidium gracile*, **gen. et sp. nov.**

Family *Libellulidae*, subfamily *Zygonychinae* (nom. emend. Gambles, for *Zygonictinae* Fraser 1957).

Zygonychidium **gen. nov.**

Moderately small libellulids, eye contact longish, frons rounded with a deep sulcus; abdomen narrow and of uniform width, apart from a slight deepening at the base, superior appendages very long and narrow, inferior very short, less than a quarter the length of the superiors; tibial spines slender, tarsal claws with a well-developed robust subapical tooth, set at an angle leaving a wide cleft; wings fairly narrow and pointed, hyaline faintly suffused with yellowish, venation fairly open, nodus further towards apex of forewing than in most *Zygonyx* (distance base to nodus is 0·56 of total length of wing), although not as far distal as in the Corduliidae; pterostigma short; last Ax incomplete, arculus between 1st and 2nd Ax, no additional

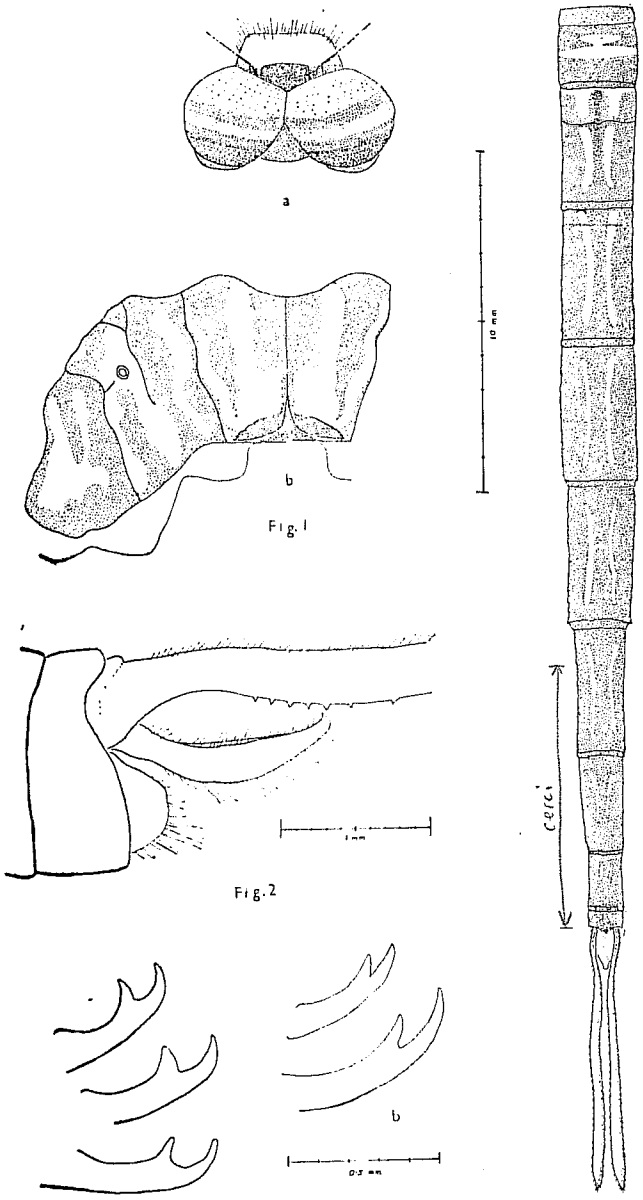


Fig. 1. *Zygonychidium gracile* (male holotype), pattern of a) head; b) pterothorax; c) abdomen.

Fig. 2. *Z. gracile* (holotype), base of appendages, from left.

Fig. 3. a) *Z. gracile*, tarsal claws of fore-, mid-, and hind-legs
b) *Trithemis dichroa*, tarsal claws of fore- and hind-legs, for comparison.

bsq or Cuq; forewing triangle crossed; discoidal field of forewing commencing with three rows, and widening towards its extremity; radial supplements well developed, and medial supplements moderately so, each containing a single row of cells.

Type-species, *Zygonychidium gracile*.

Zygonychidium gracile sp. nov.

Male (*holotype*). Head: labium ochreous; labrum ochreous yellow at border, greyish brown in centre; clypeus greyish brown; frons rounded, with a deep sulcus, and clothed with stout black hairs, pale blue anteriorly and dorsally, the blue bounded below with a narrow chocolate brown stripe, almost reaching clypeus in centre and curved slightly upwards at sides; space between stripe and clypeus ochreous yellow; a fine chocolate brown line separating frons from vertex, and continued along junction of frons with eyes; vertex metallic dark blue; eye contact longish, eyes pale brown above, crossed by two chocolate brown bands and greyish brown below; occipital triangle brown (Fig. 1a.)

Thorax: Prothorax with posterior lobe small. Pterothorax dark brown with two pairs of pale blue antehumeral stripes, the outer ones narrow and sinuous, the inner ones broader and abruptly dilated posteriorly in a medial direction, almost meeting each other but leaving a narrow central dark stripe like the stem of a wine-glass; the undilated portions enclose the body of the glass; ante-alar sinuses dark, forming the base of the glass; tergal sclerites bluish white; wing-base sclerites dark, except the most anterior which is pale in the centre; humeral stripe dark and sinuous; side of the thorax with alternating stripes of brown and pale bluish white as follows — mesepimeron with a pale stripe followed by a dark one extending to the first lateral suture; metepisternum with two pale stripes confluent below, separated by a dark half-stripe above, the pale area including the metastigma; a complete dark stripe along the second lateral suture; metepimeron with two pale stripes confluent above, separated by a dark half-stripe below (Fig. 1b).

Abdomen (fig. 1c) long and slender, very slightly dilated at base, mostly in a ventral direction, brown with the following pale bluish-white markings becoming paler and turning to cream colour by the posterior segments; segment 2 with two pale transverse bands, the anterior incomplete, the posterior complete, in contact with each other at their centres; 3-7 with a curved longitudinal streak on each side of the centre line for most of the length of the segment, closest at their centres; on segments 3 and 4 these pale stripes are interrupted by a dark line at the jugal suture and on 3 there is a narrow pale ring basally with which the stripes are confluent; 8 and 9 with similar stripes but shorter, covering just over half of 8 and much less than half of 9; 10 wholly dark; superior appendages very long and slender, 7·7 mm.,

pointed apically; inferior appendage much shorter, 1·45 mm.; superior appendages each with a row of seven small teeth ventrally near the base (fig. 2).

Legs blackish; fore-femora streaked with pale whitish on posterior aspect; tarsal claws on all legs with prominent subapical tooth of the *Zygonyx* type with cleft between claw and tooth widely open, and not narrow as in the *Trithemis* type (fig. 3).

Wings: hyaline, very faintly suffused with yellowish in all wings as far as the nodus (more distinctly marked in the paratype); hindwing with faint brownish fleck opposite membranule which is pale greyish (this fleck is also more distinct in the paratype); nodus in forewing closer to apex than to base, length from base to nodus being 0·56 of total wing length; nodal formula $\frac{7 \mid 12\frac{1}{2} \parallel 12\frac{1}{2} \mid 7}{9 \mid 8 \parallel 9 \mid 9}$; arculus between 1st and 2nd Ax; triangle crossed in forewings, free in hind; in hindwings, base of triangle infinitesimally proximal to arculus (slightly more so in paratype); subtriangle with 3 cells; 1 Cuq; bsq absent: R_3 bisinuous; single row of cells in both Rspl and Mspl; discoidal field commencing with 3 rows of cells, and widening considerably before the extremity; 4 rows of cells in anal field, both anal loops with 21 cells and extending by about two cells beyond distal angle of triangle; pterostigma 2·3 × 0·6 mm. in forewing, 2·0 × 0·6 in hind, dark brown.

Accessory genitalia (figs 4 and 5): anterior lamina hood-like, angled at the base, and covered with long silky hairs: genital lobes small and rounded; hamule with inner hook well developed, long and strongly curved, outer hook atrophied and no more than a right-angled bulge at the base of the inner; tip of penis rounded and flattened from side to side; when penis retracted, tip is not completely hidden and its ventral border is visible between the hamules, both in lateral and ventral view.

Abdomen (excluding appendages) 27 mm.; hindwing 32 mm.

Taken on the wing from an aggregation of about 20 individuals under a tall tree beside the Bandama River, near Ferkessedougou, Ivory Coast, 5.iv.1968.

Female (allotype). Pattern and colouring similar to that of male, with the following exceptions:—Frons without blue colour which is replaced by pale brown: pale marks on thorax varying from pale ochreous to cream coloured; pale areas on abdomen yellowish; pattern exactly as that of male; appendages 6·7 mm.; yellowish suffusion of wings more marked than in holotype, and in forewing extending as far as wing-tip; anal loops 23 cells left, 22 right; nodal formula $\frac{6 \mid 11\frac{1}{2} \parallel 11\frac{1}{2} \mid 7}{7 \mid 8 \parallel 8 \mid 8}$; pterostigma 2·3 × 0·6 mm. in all wings.

Genitalia etc.: a large bifid vulvar scale attached to hind-margin of 8th sternite; sternite proper with central longitudinal

ridge which is expanded posteriorly into a flattened diamond-shaped area; vulvar scale bifid for approximately half its length, but ventrally there is a cleft reaching to the point of the sternal "diamond" but not penetrating the full thickness of the scale; borders and internal surface of this cleft white, rest of scale deep ferruginous brown, with a tuberculated surface; 9th sternite wide and fan-shaped, whitish anteriorly, deep brown posteriorly, the hind margin fringed with 16 stout black hairs (fig. 6).

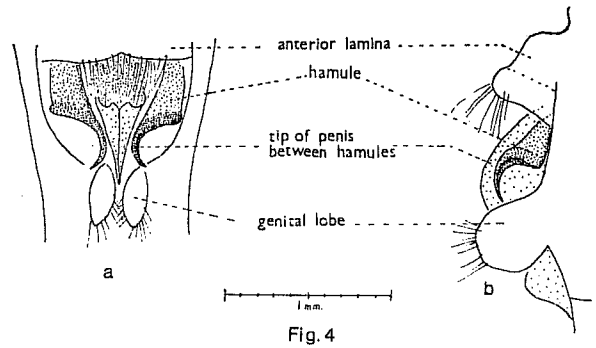


Fig. 4

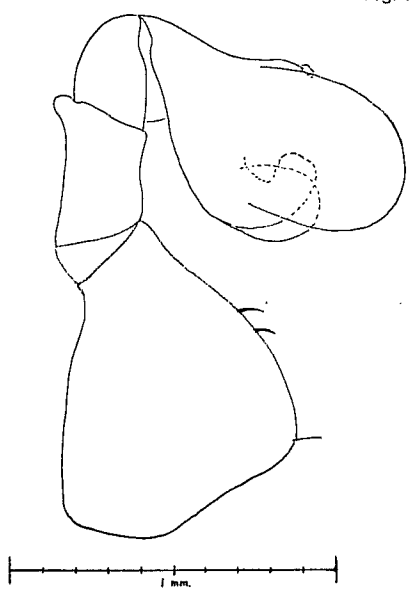


Fig. 5

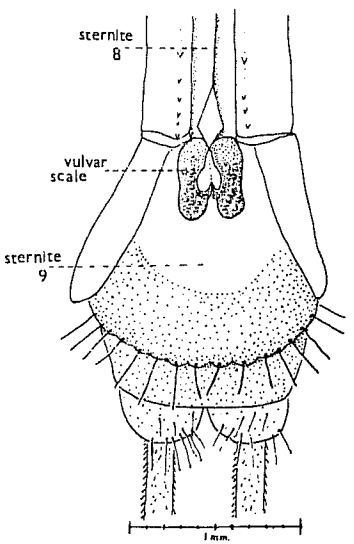


Fig. 6

Fig. 4. *Z. gracile* (holotype), accessory genitalia, a) ventral; b) from left.
Fig. 5. *Z. gracile* (holotype), penis from right.
Fig 6. Z. *gracile* (allotype), ventral view of segments 8-10, showing vulvar scale.

Abdomen (excl. appendages) 25·5 mm.; hindwing 30·5 mm.

Taken on the wing at the same time and place as the male.

Paratype male, found 17.iv.1969 settled on a bush by the Bandama River, 70 km. upstream of the type-locality, beyond Tauora, nodal formula $\frac{7 \mid 11\frac{1}{2} \parallel 12\frac{1}{2} \mid 7}{8 \mid 10 \parallel 9 \mid 8}$; anal loop 21 cells both sides; abdomen (excl. appendages) 27·5 mm., superior appendages 7·8 mm., inferior 1·5 mm., hindwing 31 mm.

Paratype female, taken with holotype and allotype, nodal formula $\frac{7 \mid 12\frac{1}{2} \parallel 11\frac{1}{2} \mid 7}{8 \mid 8 \parallel 9 \mid 8}$; anal loop with 26 cells left, 22 right; abdomen (excl. appendages) 24·5 mm., hindwing 31 mm.

Habitat. The species has been seen at various points on the Bandama River. Localities visited were all on a 100 km. stretch of the river curving round the town of Korhogo (9° N. 6° W.) roughly in a quarter-circle to the N.E. It was first observed due East of Korhogo near the town of Ferkessedougou. The river at this point is about 30 m. wide, with high steep banks thickly covered with tall trees with little underbrush. The trees extend along the bank in a belt 20-30 m. wide, and then give way to the usual grass and stunted trees. In the dry season the river is about 2 m. deep, with some sandbanks and midstream rocks. The banks enter the water almost vertically with many small tree-roots projecting below water-level. On 5.iv.1968 a small aggregation of about twenty individuals was observed flying about 4 m. high round the branches of a tall tree at the top of the bank shortly before dusk, and three specimens were captured. This was at the end of the dry season, when the first few rains had already fallen. This locality was visited again twice during the following December, in the middle of the dry season, but no specimens were seen. None were seen on 6.iv.1969 when the rains had scarcely started, but on 20.iv.1969, when there had been two or three further showers, three or four more specimens were observed flying 5-8 m. high around trees at a point 2 km. further upstream, between 1600 and 1730 hours. They were recognisable by the long appendages, but none could be taken. They disappeared towards dusk. A locality 70 km. upstream, where general conditions were similar but the river somewhat narrower, was visited on 17.iv.1969. A further male was found settled on the top of a bush about 2 m. high, and was captured. Another specimen was seen but could not be taken. At a further locality, 30 km. downstream from the first, near Badikaha, visited on 15.iv.1969, also between 1600 and 1730 hours, three or four were observed on the wing, 5-7 m. high around trees on the top of the bank. Pairing was observed, the *in copula* position being adopted from the start, with no preliminary flight in tandem. This was performed entirely on the wing while hovering, and lasted 20-30 seconds, after which the pair parted. They all disappeared before dusk.

The holotype and allotype will be given to the British Museum (Natural History) and the paratypes retained in the writer's collection.

Acknowledgements

The writer would like to thank Mr. D. E. Kimmins who allowed him to examine some of the specimens in the British Museum Collection; Miss C. E. Longfield who has kindly read and criticised the draft manuscript; and Mr. R. M. Gambles for guidance on the terms used in the description, for drawing the figures, and for allowing him to consult the typscript of an unpublished handbook on Nigerian dragonflies.

Review

The Pteromalidae of North-Western Europe (Hymenoptera: Chalcidoidea)
M. W. R. de V. Graham

Bulletin of the British Museum (Nat. Hist), Entomology, Suppl. 16. 1969. 908 pp. £19.

Species of Pteromalidae are encountered by nearly all entomologists, but their identification has hitherto been a major problem, necessitating at least the consultation of very scattered literature. Now at last between two covers, albeit nearly seven centimetres apart, are keys and figures for the identification of virtually all described Pteromalids of Britain and N.W. Europe. This monumental work is the outcome of many years meticulous and painstaking research in museum and field, and is of paramount importance to chalcidologists.

The keys are necessarily very detailed, being required to separate many groups of closely allied and sometimes variable species, and measured ratios are frequently employed. Identification of specimens will in many cases be slow, but this is unavoidable. The details in the keys are intended partly to replace detailed descriptions of each species.

Altogether over 800 species are included, 87 of which are described as new. Four new genera are also described. There is a key to families of Chalcidoidea, and all European genera of Pteromalidae are included in keys. The synonymy of each species is listed, together with notes on distribution, hosts, months during which the adults fly, and other biological data. There are 686 text figures, all very clear line drawings.

The largest British genera are *Gastrancistrus* (48 described species), *Habrocytus* (35 species), and *Mesopolobus* (30 species). The enormous number of 325 British species described by Francis Walker in the genus *Pteromalus* and listed there in Kloet and Hincks' *Check List* (1945) has been so reduced by synonymy and re-allocation to other genera that only six British species now remain in *Pteromalus,* and only one of these is a Walker species! This fact alone bears testimony to the amount of labour that has gone into this excellent production.

R. R. Askew.

Zygonychidium gracile

5-20 april