Gomphidae from the Belgian Congo
(Order Odonata)


The exact position of the family Gomphidae in the Order Odonata is extremely doubtful; whilst many species show evidence of high specialization, the widely separated eyes and the incomplete fusion of the inferior anal appendages of the males, align them with the Zygoptera. The widely broken character of the distribution of species belonging to many genera again serves to emphasize the archaic nature of the family and this is strikingly illustrated in the distribution of the Gomphidae of the Belgian Congo.

Dr. H. SCHONLEB has dealt adequately with this family in the Cat. Faune Ext. Congo Belge (Annuaire Congo Belge, 1934, Zool. Sex. III, II), but only as part of the whole Odonate fauna of the region. In this work he lists 18 genera and 50 species but, in the light of further material, I believe that some of these are synonyms. The present paper is concerned purely with the Gomphidae and is limited to descriptions and notes made on some 145 specimens sent to me for study by Dr. SCHONLEB to whom my best thanks are due. The material is the property of the Musée du Congo Belge and types and allotypes will be found in that Institution.

The affinities of the Ethiopian Gomphidae with the Oriental had been previously limited to the two genera Letiangomphus CLOWLEY and Probomphus CLOWLEY but this relationship is now broadened by the discovery of species among the new material before me, belonging to the genera Megagomphus Schütz and Gomphaea Stål, genera which had always been regarded as purely Oriental in character and distribution. The present writer has collected species belonging to both genera for over a decade and has always found them to be remarkably local and restricted in their distribution, so that to find species as far...
removed as Central Africa comes as a great surprise. How such a connection was made and for how long it has endured it is impossible to say, but must have been long before the formation of the arid desert regions now stretching across Northern Africa and Central Asia, these offering impossible barriers for the spread of insects accustomed only to a habitat of moist hot jungles. The nearest Oriental species of these two genera to the African coast are to be found in the Western Ghats of India, a distance of over 2000 miles of ocean intervening and forming a barrier to migration as impossible as the desert regions of the north. It is necessary to say that Wegener’s theory of floating continents might serve to explain the distribution of these ethiopic-oriental genera if we postulate that their main characters have remained largely unchanged since cosmic times, for the distance then separating the shores of India from Africa would have been negligible as regards the possibility of migration from one continent to the other.

I have great pleasure in dedicating the first African Microgomphe to Dr. H. Schenck.

SYSTEMATIC.

FAMILY GOMPHEIDAE FRASER.

Subfamily 1. ICTINOGOMPHEINAE COWLE.

Numerous cross-veins between the sectors of arculus in forewings proximal to the forkling of the superior sector; more than 2 cross-veins in the hindwings; all triangles crossed, the subuligrade of forewing 2 or, more often, 3-celled.

Genus ICTINOGOMPHEUS COWLEY.

Ictinogomphe ferox (RAMBUR).


Material examined: 1 male and 2 females, Irama (Laic Albert), 1-13, X.J.; 1 male, Maketi, X.I.; 1 male, Liwala (Laic Albert), VI.I; 2 males and 2 females, Kageni (Laic Albert), VI.I; 6, all coll. (H. J. BAHR); 3 males, Tang. Tete, X.39 (A. P. CAMROUX); 1 male, Lusula, 1934 (Dr. TAMANE); 1 female, Entebbe, Uganda, 21.IX.37.

(H. J. BAHR): 1 female, Kiota: Kere-Kere, without date (Dr. TAMANE); 1 male, Bumuna, 28.IV.37 (H. J. BAHR) and 1 female, Kajweji, VIII.31 (J. LEKOU).

None of the specimens differ to any extent from the type. My own specimens exhibit transitional forms between ferox and pinguex SELYS, so that I am of opinion that the latter is synonymous with the first. Cambrox (loc. cit.) appears to have thought that the type of ferox was in the Selvias collection as he states that M. SELYS had informed him that the type could not be found in the Brussels Museum collection; actually the type is in the Paris Museum where SELYS himself stated it to be. The type of pinguex is in the Hope collection, Oxford University, and it differs only from ferox by the black at base of frons above confluent with that on the crest, a condition which is however not uncommon in ferox, especially in the females.

Ictinogompheus Regis-Alberti (Schmutz). (Figs. 1 and 19. 5).

Material examined: 5 males, Ebuka, 1.IX.35; 2 males, Bumbuna, 2-29.IX.35 and 1 male, Bumuna, VI.I; coll. E. BAHR and J. BAHR.

This species was hitherto known from a single incomplete female and is, as its author claimed, an insect of magnificent size and colouring. It is easily distinguished from ferox by its darker colouring, more graceful build and the six yellow stripes on each side alternating with black ones. The male has not been described.

Male. Abdomen 58-60 mm, Hindwing 48-50 mm. Pterostigma 6 mm. Head: labium bright crimson yellow; labrum black with a rectangular yellow spot on each side; anteclypeus citron yellow, postclypeus black on its lower half, bright citron yellow for the upper half; frons broadly black in front and again at base above, a median narrow prolongation from the latter meeting the black on front so as to cut the greenish yellow above into two transversely elongate spots; bases of mandibles yellow, the free and inner border aseparably black.

Vertex black, occiput black; antenna yellow narrowly bordered with black along its strongly arched free border. Behind head glossy black bordered broadly with crimson yellow against the eyes and with a minute round isolated yellow spot at the middle height.

Prothorax black with a large oval yellow spot on each side: pterothorax black marked with citron yellow or green as follows: 6 yellow stripes on each side, and a very slightly interrupted mesothoracic collar in front: antehumeral stripes short, oblique and strongly divergent below where they narrow and are widely separated from the collar.
a small spot on the anterior part of the antecalar sinus, narrow juxta-
humeral stripes clubbed above, then narrowing and again widening
where they are continued on to the meso-episternum: 2 narrow stripes
on the mesepimeron, the posterior of which is incomplete above the
level of the spiracle, a broad oblique stripe over the centre of the
metepimeron and finally a narrow bordering of the posterior edge of
the same part. Black beneath thorax marked with two large triangular
yellow spots posteriorly which just meet at a point medially.

Wings similar to the female. In venational details save that the dis-
oculal field of forewings has only 2 rows of cells at the beginning

Fig. 1. — Anal appendages of male Ichthiognathus Rapis Alberti Schneiderian,
lateral and dorsal aspects.

instead of 3 (This is however subject to variation in the female). Legs
black, the bases and fihor surfaces of femura yellow. Abdomen black
marked with citron yellow as follows: - segment 1 with a narrow apical
band confluent with an oblique band which passes towards the base:
segment 2 with a narrow apical band interrupted laterally posterior
to the cerci, and a longitudinal longitudinal stripe on middorsum:
segments 3 to 6 with paired basal triangular spots occupying about one
fourth the length of segments and matched on middorsum: that an
segment 3 confluent laterally with a creamy white, conspicuous spot on
each side; 7 with about the basal half yellow but the marking produced
slightly along the middorsum and also laterally towards the apex of
segment; 8 with a narrow basal ring. 9 with basal and apical spots,
10 immaculate. Anal appendages black but the superiors citron yellow
for the apical four fifths: superiors cylindrical, tapering to a point
especially as viewed in profile, where the apex is seen to be slightly
upturned: laterally a short nipple-shaped spine is seen just basal to
the midpoint of appendages directed ventrally and slightly laterally but
not visible from the dorsum. Inferior appendage about half the length
of superiors, broadly and shallowly emarginate, the two branches widely
spayed and curving up to meet the superiors. Penis shaped closely
similar to that of I. ferox but without the ventral spine to the glans.

Habitat: West and Central Africa. In addition to the specimens
mentioned at the head of this description, I have examined a second
female in the British museum collection bearing a label "West
Africa + without further data and undetermined at the time of my
examination."

The shape of the penis, closely resembling that of ferox, separates this species from the Oriental section of the genus and
indicates a long separation of the African species from the parent stock.
It is a much darker, more elegantly built insect than ferox and is espe-
cially to be distinguished by the 6 yellow stripes on each side of the
thorax alternating with 6 black ones. The type is a female in the Musee
du Congo Belge.

Genus GOMPHIDIA Silvax (Fig. 8).

Dr. SCHUMACHER, when describing his new species Diastatotoma braehoi
and quassoi, and probably also quassoi, noted that they differed from
the genotype bodei Silvax by the subapertural cells being of the
same size as those immediately posterior to themselves, and that the
superior anal appendages were simple and unbranched. It may also
be said that the inferior appendage was well formed, although almost
obscure in the genotype. On account of these differences, he split the
genus Diastatotoma into two sections. There are examples of braehoi
in the present collection, and I possess a single female of quassoi in
my own collection. When examining these I was struck by their close
resemblance to the oriental Gomphidias: I therefore removed and
examined the pene when it at once became evident that these species
were actually Quassoides, the highly specialised water-spring apex of
the phallic organ being unmistakable and quite unlike the blunt simple
form found in genus Diastatotoma.
The genus *Gomphidia* is much more closely related to *Tringa* than to *Dipteronyx* and differs from the former by the absence of lateral fissions to segments 8 and 9 of the abdomen and by the superior anal appendages compressed instead of cylindrical. It differs from the latter by the presence of a well-developed inferior anal appendage, by the superior anal appendages unbranched and by the character of the cells beneath the pterostigma, which are not smaller and more numerous than the row immediately posterior to themselves. The genus differs from both by the highly characteristic shape of the penis (fig. 8) which has two long flagellae like curled watch-springs at its apex. All the African species differ from the oriental ones by a greater number of yellow stripes to the thorax. Genotype: *Gomphidia Tatinorum Selys*. Distribution: Oriental and ethiopian.

**Gomphidia bali** n. sp. (Figs. 2, 8 and 19, 12).

Male. Abdomen 50 mm. Hindwing 34 mm. Pterostigma 5 mm.

Head: lobium bright citron yellow. Labrum black with a small rounded spot of yellow on each side: anteclypeus bright yellow, postclypeus black with a large bright yellow spot on each side: from broadly citron yellow above and in front, its base black up to halfway to crest: vertex and occiput black but the latter with a large central yellow spot. Prothorax black, unmarked, Pterothorax black marked with citron-yellow at follows: a complete rather broad mesothoracic collar, elongate rectangular antehumeral spots converging above, diverging below and well separated from the collar: jugal-antehumeral interrupted stripes consisting of a small upper triangular spot and a short stripe below which may also be broken up into two isolated spots: laterally 3 yellow stripes, one on the mesepimeron closely parallel to the humeral suture, a medial slightly anterior to the postero-lateral suture and a third much broader centred on the mesepimeron. Legs black, femora dark reddish at base. Wings hyaline with dark brown rays at base projecting into the subcostal and cubital spaces and confluent at base, extending outwardly as far as the 1s antenodal and the Cu2: membrane brown: base of wings deeply incised, with projecting tornus: pterostigma black: narrow: sternal index 19-19-19: anal triangle 17-17-17-17: clavate cells 2-cellul: subclavate cells 2-5-cellul. 2 Cells in all wings: hyaline segments crossed 5 times in forewings, twice in the hind: 5 rows of cells in anal field. Only 6 cells beneath pterostigma. Abdomen black, segment 1 with a small mordorl and a very large lateral yellow spot, segment 2 with the orelle yellow, as well as a narrow mordorl stripe tapering posteriorly and usually slightly interrupted, segments 3 and 3 with small lateral basal spots, 6 without yellow markings, 7 with its basal half yellow, 8 and 9 black, 10 black with a conspicuous bright yellow spot situated on the sloping apical portion of dorsal. Anal appendages: superior twice as long as segment 10, cylindrical, a little twisted at base, nearly parallel-sided thereafter but tapering subapically as far as apex which is very slightly upturned, black. Inferiors very short and vestigial, small oval nipple-like processes about one-sixth the length of superiors. Female unknown. Genitalia, including penis, hardly distinguishable from that of *Gomphidia Tatinorum Selys*.

Habitat: 3 males, Gile, Belgian Congo, 9.11.35, 9.11.35 and 19.11.35, and 1 male, Linganola, Belgian Congo, 25.11.35, all collected by A. Bat. This new species closely resembles *Gomphidia ferox* (Schouteden) and *Gomphidia gomphoid (Schouteden)* and is distinguished from both by the interrupted juxtahumeral stripes and presence of blackish brown rays at bases of wings, the latter enabling them to be distinguished at a glance. I have examined the penes of all three species and find that all closely resemble the highly characteristic one of *G. Tatinorum Selys* (fig. 8). Type in the Congo Belge Museum, Tervuren.
**Gomphidia bredoi** (Schouteden) (Fig. 3).


Material examined: 1 female (without abdomen), Bambarwa, 18.X.37, (J. Verheyen); 1 male, Bondjoma, 13.IX.35 (A. Bal); 1 male, Lingunda, 25.IV.35 (A. Bal); 1 female, Bambwa, VII-VIII.34 (H. J. Beaufard); 1 male, Ekoaka, 1.IX.35 (A. Bal).

Fig. 3 — Anal appendages of male *Gomphidia Bredoi* (Schouteden), dorsal and left lateral aspects.

These specimens agree well with the original description by Dr. Schouteden but also include his *D. aberrans*, some males having the aberrant *ti* in the hindwings made up of 3 cells and some possessing a single-celled *ti* on one side, whilst that on the other is 3-celled. It is thus evident that *D. aberrans* is not more than a simple venational variation of *D. bredoi*. The penis resembles that of *G. Tigmoid Stens*.

**Gomphidia quevri** (Schouteden) (Fig. 4).

*Diastatommia quevri* Schouteden, 1934, loc. cit. 57.


Fig. 4 — Anal appendages of male *Gomphidia Quevri* (Schouteden), left lateral and dorsal aspects.

The female is rather terrestrial but agrees in markings and venational details with the type male in the Museum Congo Belge, which was hitherto the only known specimen. The formation of the penis leaves no doubt as to its correct place in the genus *Gomphidia*.

**Genus Diastatommia** Burmeister (Fig. 9).

The authorship of the genus belongs to Burmeister although this author included several other genera under the name. With the subsequent re-evaluation of the latter, the name was finally reserved for *Aedma tricolor* Beauc. *Beauc.* mentioned as the author of the genus by Dr. Schouteden is an obvious lapsus calami for *Burmeister*.

The genus is here reserved for those species in which the superior anal appendages possess a long intersegmental brace, the inferior anal appendage is obsolete, the cells beneath the pterostigma are smaller and more numerous than in the adjacent space and, finally, the penis has a simple, hooded, non-flagellated apex. I have seen only two species, both of which are included in the present collection, *D. selyi* Schouteden and *D. multilinata* n. sp. Both of these differ from *tricolor* (Beauc.) by the antehumeral stripes widely separated from each other and from the mesothoracic collar, and from *bicolor* Stens by the presence of a narrow juxtahumeral stripe. *D. selyi* and *multilinata* are very closely
related, but the former has the inner branch coming off obliquely from the main stem and thus forms more than a right angle with it, whilst *multilimina* has the branch coming off at a right angle as in *triangular*. These points will serve easily to differentiate the four species.

**Diastatoma Selysi** Schouteden (Figs 6 and 9).

Material examined: 7 males and 5 females as follows: 4 males and 2 females, Bambeba, VII.34 (J. Leary); 2 females (var. *aberrans*), Eela XII.34 (J. Gheerbrant); 1 male, Bambeba, VIII.33, 1 female, VI.37 and 1 male, Bambeba, VIII.35 (J. Vlček); 1 male, Luobo: Kapunga X.23 (G. F. Overlaert).

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**Diastatoma soro** Schouteden (Figs 5 and 19, 13).

Material examined: 3 females, Tshilakala, Luobo, IV.X.33 (G. F.

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**Diastatoma Selysi** Schouteden, dorsal view.

**Fig. 6.** — The scale of *Diastatoma Selysi* Schouteden.

**Fig. 7.** — The scale of *Diastatoma multilimina* n. sp.

As stated above, some of these specimens exhibit different venation in the opposite wings; one being typical, the other as in the aberrant form *aberrans* Schouteden. All have been determined by the character of the branch of the superior anal appendages which continues obliquely inward the direction of the stem of the appendages instead of coming off at a right angle.

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**Diastatoma soro** Schouteden, 1934, loc. cit. 50.

**Fig. 8.** — Pens of *Graphidea Balli* n. sp. (Resembles also *G. Turyngiaensis*).

**Fig. 9.** — Pens of *Diastatoma Selysi* Schouteden.

Female. Abdomen 12 mm., hindwing 35 mm.

Differ from the male in the following particulars. Lateral lobe of labium entirely citron yellow, only the middle lobe narrowly bordered with black. All bright markings are vivid citron yellow or pea-green. Behind the head is bright citron yellow with the eyes narrowly and irregularly bordered with black, this enclosing an oval yellow spot behind the occiput: the latter strongly arched and narrowly emarginate at its centre. Prothorax dull black. Thorax entirely similar to the male, with the triangular area enclosed between the antehumeral stripes and the metathoracic collar black, and the latter bordered anteriorly...
with the same colour as also the antehumeral stripes posteriorly. The lateral green stripes are also bordered anteriorly and posteriorly with black, the remaining areas being chestnut or mahogany red. The femora are of a similar castaneous colouring save the distal ends and a row of short robust spines which are black. Wings: costa bright citron yellow to as far as the pterostigma which latter is dark reddish brown between stout black nervures; venation otherwise reddish brown. Nodal index rather variable. 

11-18 | 19-12 | 10-17 | 11-10 | 10-12 | 11-10 | hts 1 1 2

In one specimen 2-celled in left forewing, 3-celled in the right, but 2-celled in all other wings. Abdomen greenish yellow marked with black as follows: - segment 1 similar to the male, segment 2 with narrow irregular subdorsal black stripes deficient apically, narrower than in the male and extending an irregular lanceolate middorsal yellow stripe: segment 3 with a broad middorsal black stripe, diffuse and poorly marked basal to jugal suture but well defined thereafter and formed as a long triangle with its base resting on the apical border of segment: segments 4 to 6 with thick dorsad black stripes not quite extending to base of segments and expanding triangularly at apices of segments: segment 7 with its apical half black, this tapering basally to as far as the jugal suture, leaving the sides broadly yellow: 8 and 9 broadly black, marked on each side with a 7-shaped yellow spot, broadest on segment 8: segment 10 entirely greenish yellow save for a very narrow basal border of black. Anal appendages black, emerald, as long as the segment, separated by a yellow emerald protuberance. 

This very beautiful species resembles Heterogomphus superbus Brain in its unusual colouring of green, black and reddish. The female from Kupole Kere becomes the allotype. 

Diastatomma multilineata n. sp. (Figs. 7 and 19, 14). 

Male. Abdomen 16 mm. Hindwing 37 mm. Pterostigma 5 mm. Head: labium greenish yellow, middle lobe finely bordered with black: labrum black with two oval yellow spots converging anteriorly: anteclypeus yellow, postclypeus black with a large triangular yellow spot on each side: from greenish yellow, its lower part in front black and confluent with the black of postclypeus: faces of mandibles citron yellow: vertex black, occiput green, its posterior border raised and bordered finely with black: behind head dark reddish brown with a large diffuse yellow spot outwardly which is centred by a small black spot. Prothorax black: pterothorax black marked with greenish yellow 

as follows: - a complete broad mesothoracic collar, rather narrow antehumeral stripes squared above, pointed below but well separated from the mesothoracic collar: narrow and rather sinuous humeral stripes broadened above and below, a medial spot in the anteclypeus, 3 narrow lateral stripes, an anterior on the mesepimeron, a medial bordering the postero-lateral suture and curving forwards below the thoracic suture and a third centred on the metepimeron, making a total of 5 stripes on each half of the thorax. Abdomen black (Colours largely lost from postmortem decomposition), segment 1 yellow laterally, segment 2 with the ventral border yellow, 3 with a basal yellow ring, very narrow on thorax but broadening laterally and below to extend to about half the length of segment, 7 with the basal half yellow but this extending laterally nearly to apical end of segment, 8-10 apparently black. Anal appendages black: superior slightly longer than segment 10, elongately triangular with the apex tapered rather abruptly and acutely: from the inner side of the appendage subapically a long flattened branch projects at right angles to the stem of the appendage and overlaps the similar branch of the opposite appendage, ending in a bevelled point. In profile these appendages are also elongately triangular with the apical end turned slightly upward in a gentle curl and with the inner branch just showing as a fine spine. Inferior appendage vestigial, a mere transverse ridge which is hardly discernible. Wings hyaline, evenly enfolded but the colour gradually deepening towards the apices and posterior border: pterostigma black to blackish brown, covering 10 cells and the latter followed by a row of 7-8 cells: in the hindwing covering about 9 cells and the latter covering some 7 cells. Nodal index 12:21 | 21:14 | 15:14 | 16:15; the 1st and 8th the primary antenodals: Gnt 5 4 | 3 3; hts 2 in all wings, triangles 1-celled, st 2 1 1; anal triangles 6-celled, anal loop 4-celled, 5 rows of anal field cells, anal vein pectinate. 

Female. Abdomen 48 mm. Hindwing 41 mm. Much more robust than the male and differing in a few respects. Yellow markings generally more extensive: two small basal spots to labrum situated medially to the lateral oblique spots, lateral spots of postclypeus much larger. Occiput with central part of border raised and minutely emarginate. Segment 2 with a middorsal yellow stripe. (This is probably present in the male also but obliterated in the present specimen). Legs reddish brown but distal ends of femora, the tibial and tarsi black. Anal appendages subapically, with pointed apices, black. Valvar scale as long as segment 9, narrow, deeply cleft.
into 2 narrow prong-like branches which lie closely parallel. Veination of wings differs in only minute particulars and not exceeding the variations normally met with in the males themselves.

Habitat: 2 males, Butu Litt., 22-28.VIII.19 (A. R.); 1 male, Butu Bombora, 16.VIII.35 (A. R.); 1 male, Linghamal, 8.IV.35 (Cm.); 1 female, Bombora, 22.IV.35 (Cm.); 1 male, Cie, 9.XI.35 (Cm.). This species closely resembles *D. selbyi Schouteden* in its markings but differs by the branch of the superior anal appendages coming off at an acute angle as in *D. triecula* (Beaup.).

Subfamily 2. EPICOMPHINAE Williams.

Numerous cross-veins between the sectors of areolae in forewings proximal to the fork of the superior sector; more than 2 cross-veins in the hindwings in this same space: all triangles free of cross-veins. (Only one African genus, viz, *Microgomphe* Selys.)

Genus MICROGOMPHE Selys.


— Fraser, 1933, Fauna Brit. Ind. (Odonata), 2 : 351.

Small slender Compilines coloured black marked with green or citron yellow: arboreal by nature. Wings with all triangles entire and without basal subcostal antenodals. Superior anal appendages with a long slender inner branch converging on and meeting the branch from the opposite appendage: inferior appendage rectangular with apex more or less indented. Genotype: *Microgomphe choldee* Selys.

**Distribution:** Hitherto restricted to the Indo-Malayan region and Sundaic Archipelago but now extended to Africa.

*Microgomphe Schoutedeni* n. sp. (Figs. 18 and 19, 1).

Male. abdomen 37 mm. Hindwing 22 mm. Pterostigma 2.25 mm. Head: labium yellowish at base changing to blackish brown at apical border: labrum glossy black with an obscure greenish yellow spot on each side: antenyyseus pale green, postclypeus and lower part of frons in front glossy black, the crest of front pale green: rest of head black, occiput deeply concave, fringed with short black hairs. Prothorax uniform dark purplish brown. Pterothorax dark reddish or purplish brown marked with green or citron yellow as follows: — a complete or slightly interrupted mesothoracic collar: short antecoxal stripes broadly divergent below where they are widely separated from the collar, converging above but not meeting the antennal scapes, which latter bear a small oval spot in its floor: two moderately broad lateral stripes, an anterior a little posterior to the humeral suture, broadening inferiorly to as far as the coxae and covering most of the mesepimeron, and a posterior covering the posterior three fourths of the metepimeron. Legs black, rather long, the hind femora extending in the middle of segment 2 and bordered with a row of closely-set, gradually lengthening spines. Wings hyaline: nodal index variable 11-14 14-9 8-14 14-9 11-10 11-10 | 9-10 11-10 10-10 no basal incomplete antenodals; the 1st and 4th or 5th the primary antenodals; 1 CuA to all wings: anal-loop obsolete; anal-triangle 3-rel-

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**Fig. 16.** Anal appendages of male *Microgomphe Schoutedeni* n. sp., seen from the left side and dorsum.
but increasing to about one third on segment 2. Superior anal appendages pale green, as long as segment 10, broad at base, conical, divergent, keeled above from base to pointed apex; within, a long narrow branch springs, arising well away from base of appendage and directed obliquely medially so as to converge on the branch from the other appendage: the apices of these branches spoon-shaped, hollowed out on the outer side and with the points of apex curved strongly over and outward (Fig. 10). Inferior appendage glossy black, cleft for about its apical half into two short branches which are slightly divergent and obtuse at apex.

Female. Abdomen 26 mm. Hindwing 24 mm. Pterostigma 2.5-3.75 mm. Closely similar to the male in colour and markings (but rather obscure in the female due to postmortem changes): metathoracic collar complete: basal yellow annule of segment 7 less than one third the length of segment. Occiput of similar shape to the male; hind femora rather longer and the spines coarser, less numerous and therefore more widely set. Wings distinctly tinted with yellow at base; nodal index — 9:14 15:11 9:10 11:10.

2 Cops in forewings, 1 in the hind. Anal appendages black, short and conical. Vulvar scale short, about half the length of segment 8, deeply cleft for quite half its length, the two branches narrowly and parallel.

Habitat: 1 male from Kapango, Belgian Congo, X.L.192, coll. G. F. Overlaet; 1 male and 1 female, Bangesc, V.56, coll. J. Vierianni. This is the only representative of the genus known from African limits, so that its small size and conspicuously branched appendages should easily distinguish it. The anal appendages are rather similar to those of M. lusae Frasger from Burma, but in this latter, the antehumeral stripes are broadly confluent with the metathoracic collar and the inferior anal appendage is only shallowly lobed. (In my description of M. lusae (Fauv. Brit. Ind. Odonata 2: 360) I stated that the inferior anal appendage was triangular but this is correct only as the appendage is viewed from the side: viewed dorsally, it is as in Schmetipennis rectangular but with the apical border only shallowly concave.)

Subfamily 3. GOMPHINAE WILLIAMSON.

Only 3 cross-veins between the sectors of areolus in forewings proximal to the forking of the superior sector: only a single cross-vein (rarely 2) in this same space in the hindwings; usually all the triangles free of veins (always in the case of the celtidini genera).

Genus PARAGOMPHUS COWLEY.

Oxychogomphus Selas (p.154), Bull. Acad. Belg., (2), XXI, 50.
Liudorenis Krzy, 1883, (p.151), Cat. Odon., 57.
M. typus Gomphus coccinellus RAMBUR.

Paragomphus coccinellus (Rambur).

Material examined: 1 male, Kasangl, 1953 (J. Lenoir); 1 male, Bangesc, X.L.31 (J. Lenoir); 1 female, Lulumbasibi, 2 X.31 (G. F. Overlaet); 1 female, Bangesc, V.56 (J. Vierianni); 1 female, Roe, Albert, Iowa, 1953 (W. J. Bedne); 1 female, Thapsiu, H.81 (G. F. Overlaet).

A widely spread and common species but which I have found is much more common further south in the continent, large numbers having reached me from Limbe. It differs broadly from other species by the irregular nature of the lateral markings of thorax.

Paragomphus elpidius Run.

Material examined: 1 male, Kaponga, X.L.32 (G. F. Overlaet); 1 male, Kaponga, Meerve Diem, V.33 (G. F. Overlaet).

The characteristic broad pale markings on the dorsal of thorax leave no doubt about the identity of these two specimens. The antehumeral stripes are confluent medially for their upper halves which curve outwards and are nearly confluent with a narrow posthumeral stripe on each side. Laterally the markings are of a much reduced type of the markings in coccinellus.

Paragomphus sp.

There is a very similar male from Luluma Kaponga, V.133, collected by G. F. Overlaet, which bears some resemblance to P. modus Longfield, but which I hesitate to identify with certainty on account of the poorly developed markings and the somewhat distorted anal appendages.

Paragomphus sp.

This specimen is a female from Bangesc, collected by M. Heikala, V.30. The general colouring is sandy with dark brown markings: the antehumeral stripes are definite in the upper third, the humeral stripes in their lower half, whereas the only markings visible.
are dark points on the spiracle. The prothorax is sandy yellow laterally, dark reddish brown dorsally and with the posterior lobe broadly crenate. The legs are sandy yellow but all tibiae and tarsi conspicuously black. The wings are hyaline and unlined, pterostigma ochreous between black nervures and covering about 5 cells: there are 13 antenodals and 10 postnodals in the forewings, and 10-11 antenodals and postnodals in hindwings. The abdomen is sandy yellow marked with dark brown but is much discoloured from decomposition. - segment 2 has 4 short dark lines, the basal pair horizontal, the apical oblique: segments 3-7 appear to be yellow with the middorsal carina, jugal suture and apical rings black: segments 8-10 dark reddish brown on dorsum paling to yellow laterally but with the falcinations on 8 and 9 black. The valvar scale is minutely triangular and deeply notched at apex. The specimen is much like exclusus Pramer but it has a higher nodal index and the tibiae are black.

**Paragomphus hageni** Selva

A female from Kilo Kero-Kere, collected by Dr. Tesch, without date, however, may belong to *P. hageni* but the abdominal markings do not quite agree with that species. Segment 2 reddish brown with middorsal and lateral yellow stripes, the latter bordered below with blackish brown: segments 3-6 with a black lateral stripe broadening basally where it encloses a bright yellow spot, and confluent apically with a black ring, a second bright yellow spot being enclosed here at the point of concurrence: segment 7 with the basal half citron yellow but this traversed longitudinally by fine middorsal and subdorsal black lines. Segments 8 and 9 dark reddish brown, 10 and the short acuminatum appendages sandy yellow.

**Paragomphus atratus** Selva (Figs 11 and 19, 9).

Material examined: 5 males and 2 females all from Bambena, collected by MM. J. Vrijdag and Hennard on 14th July 1938 and 1.v. 39.

All specimens are typical, with slightly interrupted mesothoracic collar, antenomeral and humeral stripes and three pale stripes on each side of thorax. There are three dark species of *Paragomphus* found in the Belgian Congo, viz. *atra* Selva, *abnormis* Kaszab and a new species *acuminatus*, which latter is confused with *atra*. *P. atra* Selva has a complete humeral stripe, the others, without a trace of this in the case of *acuminatus* and with only a small upper spot in the case of *abnormis*, which latter is easily distinguished from all other species by the presence of a basal subcostal antenodal vein in all wings.

The anal appendages of *atratus* are pointed at the apices but are not tapered to a fine point as in the case of *acuminatus*.

**Paragomphus abnormis** (Kaszab) (Figs. 12 and 19, 11).


Material examined: 1 male, Bambena, 1X.38 (Hennard): 1 male, Bambena, 1939 (J. Vrijdag): 1 male, Uele (Bambena), without date (J. Vrijdag).

Fig. 11. -- Anal appendages of *Paragomphus atratus* (Selva), left lateral aspect. (Apex of inferior anal appendage intact).

Fig. 12. -- The same of *Paragomphus abnormis* (Kaszab), left lateral aspect. (Apex of inferior appendage intact).

It is more than half a century since Kaszab described his *Oxyclonomphalus abnormis* from a single male, and I have been unable to find any further records of this rare and interesting insect, so that the inclusion of 3 more males in the present collection is of more than usual interest. A few details are given as follows.
Male. Abdomen 32 mm. Hindwing 25 mm.
Head: labrum black narrowly bordered with yellow; Clypeus black with the antennae and a triangular spot on each side of the clypeus; bright citron yellow; frons broadly greenish, base above narrowly black; vertex and occiput black, the latter simply concave and without the usual spines behind. Pterothorax with a rather broadly interrupted mesothoracic collar, oblique anterolateral stripes confluent below with the collar to form inverted figures of 7, a vestigial humeral stripe represented by a small superior triangular spot, and lastly, 3 lateral stripes, all citron yellow. Wings with costa and pterostigma black: antennae in forewings varying from 15 to 15, postnodals from 9 to 10; hindwing with 8 to 10 antennods and 9 to 10 postnodals. All wings of all three specimens bear a subcostal antennod (This is the only species in the genus which possesses such cross-veins although they do occur as an aberration in one or more wings of other species. In the present collection, a female of P. atritis has one in the right forewing, and another female possesses one in the left hindwing. It seems obvious that the possession of a subcostal vein in atritis is both constant and of a specific nature. Segments 3 to 5 and the base of 7 are narrowly cylindrical, the dilatations of 8 and 9, by comparison, much broader than in other species of the genus.

Paragomphus acuminatus n. sp. (= P. atritis (L. Reis) nuc. SIAY). (Figs. 13 and 19, 8).

Male. Abdomen 37 mm. Hindwing 25 mm. Pterostigma 3.75 mm.
Head: labium brown: labrum and whole of face below frons save the postclypeus, which is pale, dark reddish brown; frons olivaceous green above with the base narrowly blackish brown; bases of mandibles yellow; vertex and occiput dark reddish brown, the former simple with a slightly concave border. Pronotum and prothorax dark purplish brown marked with greenish yellow as follows: - a rather broadly interrupted but narrow mesothoracic collar: hemicrural anterolateral stripes converging closely on the anterior wings but strongly divergent below where they are tapered and are arrested just short of the mesothoracic collar. Laterally a narrow oblique stripe on the anterior half of mesospirometer, a second stripe rather broader on the middle of metespirometer, and a third vestigial stripe between these, extending for only a short distance above spine. Legs reddish brown darkening to black on the tibial and tarsal head; extrorse surface of anterior femora greenish yellow. Wings hyaline: pterostigma brown, narrow, slightly swollen, covering 4+5 cells, very dark reddish brown; nodal index.

11.11.14.10
10.10.10.10.8

no basal subcostal antennod: anal-triangular 4-celled: base of hindwing squarely and deeply excavate; anal vein rectiline. Abdomen black, the sides of segments 1 and 2 and base of 3, as also a basal-lateral spot on segments 4-6 greenish yellow; segment 2 has a mildridal lunular stripe continued on to dorsum of segment 3; segment 7 with its basal half yellow but bicolored by the black mildridal carina; segments 8-10 blackish brown, dark ocelli laterally, the lateral foliages on segments 8 and 9 very broad and dark reddish brown. Anal appendages of the same color: superior about as long as segments 9 and 10 together, broad at bases which are well separated, then tapering to a thin acuminate point, the ends curved sharply downwards and very hairy beneath. Seen from above they first incline towards each other meeting at their middles, and then gradually divergent: the dorsum is strongly keeled. Inferior appendages less than half as long, directed downwards and posteriorly at first and then almost horizontally posteriorly, the outer border presenting two small subapical teeth: seen from above, the appendage is deeply bifid, each branch shortly fusiform in shape so as to enucleate a small furrow.

Female. Abdomen 35 mm. Hindwing 29 mm.
Colour and markings entirely similar to those of the male. The lateral foliages on segments 8 and 9 well developed but smaller than in the male. Anal appendages twice as long as segment 10, very acute at apex which is black. The wings strongly tinted with yellowish to as far as the proximal end of pterostigma: nodal index: 10.14.10.10.10.10.10
Vulvar scale small, two triangular lobes not quite extending to apical border of segment 8 and with inner borders strongly divergent.

Habitat: 1 male, Eda, Belgian Congo, L.55, coll. J. Gromot; 1 female, X.11.31, also from Eda. This new species is easily distinguished from all other Paragomphus by its long tapering, almost filiform superior anal appendages which are clothed with hair beneath.

Genus CRENIGOMPHUS Staw.

Two species belonging to this genus are represented in the present collection, viz., C. hastifrons (Forster) and reini Faxon, the latter by both sexes, that of the female being hitherto unknown. In the Proc. R. Ent. Soc. Lond., 1896, (2) 5 : 197, I have shown that Denisonius Martin (nom. nud.) is a synonym of Crenigomphus. No genotype was cited for this genus but in the Paris Museum collection, I found a spe-
cimen labelled *Dentigomphus robustus* Martin, which the latter evidently intended to be the genotype of his genus. This specimen, which I found to be a new species, was a bright ferruginous marked by a banded abdomen, the effects of postmoult changes. Thus Martin had named his species from artificial characters, so that I renamed it as *renelli*, in honour of my late colleague. A second male, collected by G. H. Carpenter, in Uganda, is in my collection and is the type of *renelli*. One of the two females in the present collection, becomes the **holotype**.

**Crenigomphus hartmanni** (Fortster).

Material examined: 1 female, Isawa, IX.31 (J. Hukro); 1 female, Bomboomi, 1929 (A. Ball); 1 female, Ukimarama, 4.5.31 (La Forêt). I have also examined 2 males from Uganda (G. H. Carpenter and Capt. Pitman, and 1 female from Limbe, Central Africa (Mrs. Wise). The species has already been reported from the Belgian Congo by Dr. Schouteden, viz. 2 males and 1 female from Bunia, 1929.

The specimens are rather paler than usual and the markings are brown and often ill-defined. A dark lateral, very oblique stripe on each side of segment 2, appears to be a specific character for *hartmanni* as it is present in all specimens. This stripe is continued along segment 3 to 7 but is interrupted basad to the jugal suture on all. The oriptal is distinctly curved up and is furnished along its free border by about 12 small black spines. The crest of spines, as usual in this genus, shows an irregular row of small black spines or points, the nature of which is by no means clear. The long black pterostigma conspicuously contrasted with the bright yellow costal margin is unique and enables species of *Crenigomphus* to be recognised at a glance.

**Crenigomphus renei** Frasé.

*Dentigomphus robustus* Martin, (nom. nud.) (Type labelled as such in the Paris Museum).


Material examined: 1 female (Holotype). Isawa (Lac Albert). 35 (H. J. Breith); 5 males and 1 female, Tang. Terr. Ukerewe, 1959 (R. P. Comarr). (In addition I have seen the type male from Uganda and Martin’s male in the Paris Museum).

Female, Abdamen 82-85 mm. Hindwing 28-30 mm.

Ground colour a dull pale ferruginous marked with pale greenish yellow. Resembles the male in all but sexual characters. In my original description, I gave the ground colour as that of the markings, but, in the case of the thorax, it would be better to reverse this as now given.

- a narrow complete mesothoracic collar; oblique, very slightly sinuous narrow antehumeral stripes tapering below to a point which is well separated from the collar, bevelled above and falling short of the antehumeral sinua; narrow humeral stripes chiefly above, very slightly sinuous. The humeral, both lateral sutures and a short stripe near the posterior border of metepimeron dark reddish brown, that on the first lateral suture darkening to blackish brown below and most conspicuous against the sandy yellow surrounding it. Both sexes have the occipital border spined, these numbering from 12-14 in the male; behind the head is pale yellow scale for an oval, glossy black tubercule at upper border of eyes. The nodal indices of the two females are:

- 8-13 [14-8] 7-13 [14-8]

- pterostigma covering nearly 5 cells in the Lake Albert specimen but nearly 9 in the other which has a slightly denser venation. Male, Abdomen 35, hindwing 28 mm.

**Genus Podogomphus** Karsch.


It is more for the sake of convenience that I keep *Podogomphus* apart from *Notoagomphus* although I feel that they are synonymous. The latter name appears to have priority although the name was only suggested by Selys in 1859, but the name was validated by Karsch when he gave a short definition in his key to the African Gomphines, and cited two species as belonging to it. Thus I am inclined to agree with Miss Lowenfield and if the name *Podogomphus* *Selys* should be finally adopted in the future, *Gomphus spinell* Selys will become the genotype. Two species of *Podogomphus* are represented in the present collection.

**Podogomphus lupi** Schouteden (Figs. 14 and 19, 10).

Material examined: 8 males, Lulua Kapanga, 11IV.54, 2 males, Lulua Zhipanza, 11IV.31, 1 female, Lulua Kapanga, IV.54 and 1 female, Lulua...
This species is very closely related and rather similar to the new species leroi Schouteden, from which it is best separated by the shape of the anal appendages, the superiors having the ventral spine nearer the middle of appendage and with the apex more abbreviated and with a blunt tubercle beneath it.

Podagymphus leroi Schouteden (Fig. 15).

Material examined: 1 male, Bambusa, X1341 (F. Lefroy); 1 male, Bambusa, 10.1.38 (J. Vijuwan).

![Fig. 15. — Anal appendages of Podagymphus leroi Schouteden, male. From left and dorsal aspect.](image)

I place these two specimens as leroi Schouteden because of the unusual colouring of the basal abdominal segments which are all largely pale green. It is necessary to add to the primary description, some further particulars lost in the type male from postmortem changes. The labium has the middle lobe brown, the lateral bright citron yellow, the bases of mandibles and also two small rounded spots on the labrum citron yellow. The occiput is green, with its free, slightly arched and slightly notched border, loosely black. Lastly the prosternum has two blackish brown stripes on each side. Anal appendages as in figure 15.

Genus NOTOGOMPUS STANK.

Only a single species of this genus is represented in the present collection, viz. N. dorsalis (STANK). It should be noted that the hind femora of the female of this species are quite typical for those of Podagymphus.
Notogomphus dorsalis (Selva).

Material examined: A single female from 7, Bandiria, IX.31 (F. Bulloch). The specimen does not differ from one I have from Uganda: it is a widely distributed but not a common species, which has not hitherto been reported from the Belgian Congo.

Genus LESTINOGOMPHUS Martin.

Echinopterygogomphus Fraser, 1926, Travaux Ent. Soc. Lond., 1925 : 335.
Fraser, 1928, Ibid. 1928 : 130.

I described this remarkable genus of Gomphidae as new under the name of Echinopterygogomphus on account of Martin's faulty description of his genus Leistinogomphus. Although I have not seen the type, the points of resemblance far outweigh those dissimilar, and the characters of the abdomen and anal appendages are so remarkable that it is unlikely that different insects are concerned here. The apical end of segment 1 is thickened and cylindrical but there is no telescoping of segments involved here: segment 8 is not more slender than the adjacent ones and the probability is that the segment concerned was compressed artificially in the genotype. The comparative length of the end segments is as described by Martin, viz, segment 8 half as long again as segment 10, which latter is only half the length of the elongated segment 10. The anal appendages are as described by Martin and as figured by myself (loc. cit. 1926).

Genotype. — Leistinogomphus angustus Martin.

Leistinogomphus angustus Martin.


The venational details of these specimens and the markings of the abdomen agree more closely with angustus Martin than with advenus (Fraenh.) thus segments 3 to 5 have well marked apical black rings and basal yellow ones; there are paired subdorsal oval yellow spots on 4 and 5, these being broadly confluent over dorsum on segment 5. None of the specimens that I have examined, including the present 7 specimens, possess an anal loop as described by Martin and I am sure this is an error for the normal cells of the anal field, the wing being far too narrow here (as mentioned by Martin himself) to contain an anal-loop. Martin does not mention also the prominent spines adorning the terminus of the hindwings.

The exact position of this curious genus and the species is obscure: apart from the fact that they belong to the subfamily Gomphinae, their relationship to other African genera and, in fact, to all other Gomphinae, is by no means clear.

Genus PHYLOGOMPHUS Steen (Figs. 16 and 17).

Four species belonging to this genus have been described, viz. orthognathus Steen (genotype), heleneus Lackner, coloratus Kühn and selva Schuheldris, the latter only being represented in the present collection. I possess a single female from Sierra Leone which agrees with heleneus in most respects but differs by the costa conspicuously citron yellow (black in heleneus). This may be a new species but unfor-
Phylogomphus selysi SCHOUTEDEN (Figs. 16, 17, 19, 3).


All specimens are true to type but the majority show but few of the paler markings owing to postmortem changes. This species differs from both *nethispa* and *calanus* by the shape of the posterior hamules.
of 7: segment 8 twice as broad as the apex of 7: and with rather broad lateral foliations which are pointed along the border: segment 9 much narrower than 8 and only about two thirds of its length, also with lateral foliations but very much narrower than on segment 8: segment 10 as narrow as 9, its basal half cylindrical, its apical half abruptly swollen, especially as seen in profile. Anal appendages: superior conical, tapering evenly to a fine point, widely divericate: inferior with its branches of about the same length as superior and even more divericate. Genitalia: penis shaped as in Gomphus (sens strict) but the apex split into two flagellae resembling the tongue of an adder: anterior hamules small curved hooks broadly hidden by the enormously enlarged posterior hamules which are sinuata-shaped and directed strongly forwards so as to slightly overlap the apical margin of segment 1 (in profile, these hamules resemble an erect penis).

Genotype. — Neurogymnopus fusciformis Karsch. Distribution: Tropical East, Central and West Africa.

Only thirteen specimens are known which have been included under seven specific names, but how far these are to synonymy is by no means clear, and will remain so until all the types can be examined vis-à-vis. Unfortunately the type of one, notarius Lachaux, has been lost, and the types of fusciformis in the Berlin Museum, are not available for examination. Karsch's description of the latter is lamentably inadequate, the thoracic markings being barely mentioned and the genitalia not at all. Le Rot, who added to the description of fusciformis, failed to supply the necessary details of the thorax but gave good figures of the end of the abdomen and so showed for the first time, the highly characteristic features of this organ. Karsch, in 1889, expressed the view that Neurogymnopus was doubtfully distinct from Phylogymnopus Str., an opinion which no specialist in the Order will share with him. The hamules in Phylogymnopus slope posteriorly just as muchly as do those of Neurogymnopus slope forward: the foliations on the sides of segments 8 and 9 of Phylogymnopus are enormous, and in no species do we find a subcostal basal antenodal: other characters separating the two genera are not hard to find and all we can say is that they belong to the same subfamily Gymnephinae. The general resemblance of the end segments of the abdomen in the two genera is solely due to convergence and not to any close relationship.

Until more material becomes available, it seems best to retain the present names but my present opinion is that notarius and Ghesquiere are synonymous and that, most probably, both are synonyms of fusciformis. Ueleensis is probably a synonym of agilis although this is by no means certain: ueleus is a synonym of ueleensis as shown by an analysis of the variation given below, and, lastly, Witteri is a good species. A specimen in the Mauris collection, which I determined as agilis (Martin) some years ago, is either a new species or a variety of Witteri, probably the last.

Notes on the 13 known specimens.

Specimens examined by myself are the type of Ghesquierei Semon- terain, under the generic name of Karschogymnopus: the two types of agilis Martin, under the generic names of Neurogymnopus and Orygym- nopus: a male in the Mauris collection determined as agilis: a female in the Congo Belge Museum determined as Witteri Scudderiana and a male, in the same collection, determined as ueleensis Scudderiana.

1. N. fusciformis Karsch. A female, the genotype and type, in the Berlin Museum. Dorson of thorax with a broad antenodal stripe on each side: pterostigma: 1 mm.: primary antenodals, the first and seventh: nodal index 14-15, 14-14 total for hindwing 65. Abdomen 19 mm., hindwing 47 mm.

Habitat: Cameroon.

2. N. fusciformis Karsch. Allotype male, in the Berlin Museum. Dorson of thorax as for female: pterostigma: 4 mm.: primary antenodals, the first and seventh: nodal index 17-20, 16 total for hindwing 61. Abdomen 51 mm., hindwing 35 mm.

Habitat: Upper Cameroon.

3. N. fusciformis Karsch. Paratype female described by Le Rot, believed to be in the Konigstein Museum. Specimen in a bad state, preserved in alcohol, with markings of thorax as for fusciformis type. Pterostigma: 4.5 mm.: primary antenodals the first and seventh: nodal index 17-20, 18-7 total (stipules of 3 wings missing). Abdomen 47 mm., hindwing 44 mm. (ca).

Habitat: Oela Dist., Belgian Congo, between Aong and Yakona.

4. N. notarius (Lachaux). A female, the type, described as an Orygymnopus. (Type was loaned to R. Martin who took it to Chile, where it was lost sight of after Martin's death. Lachaux in litt.). Pie-
rostigma 3.8 mm.: primary antennalals the first and seventh; nodal index, 12-19 | 20-14, total for hindwings 54. Abdomen 51 mm., hindwing 48.5 mm.

Habitat: Bangui, Congo.

5. **N. Ghezziarei** (Schouteden). Type a male in the Congo Belge Museum, described under the new genus *Korchiogonius*. *Pterostigma* 3.5 to 4 mm. Dorsal markings of thorax similar to those of *morinifurus*, viz. oblique antehumeral stripes, diverging strongly in front where they are confluent with a stout mesothoracic collar interrupted at its middle; above confluent with a vestigial humeral spot and strongly angulate at this level, so that the whole marking is Z-shaped: primary antennalals the first and seventh; nodal index, 12-19 | 18-15, total for hindwings 54. Abdomen 51 mm., hindwing 39 mm. (This specimen exhibits the remarkable aberration of a cross-vein in the median space of each forewing).

Habitat: Stanleyville, Belgian Congo.

6. **N. Witteli** Schouteden. Type a male in the Congo Belge Museum. *Pterostigma* 3 mm.: dorsal markings of thorax similar to the last but the humeral stripe is partially or entirely complete, extending halfway down the dorsum: primary antennalals the first and fourth or fifth; nodal index, 10-11 | 11-10, total for hindwings 54. Abdomen 36 mm., hindwing 30 mm.

Habitat: Mbaa, Belgian Congo. The species differs from all the foregoing by the low nodal index and by the presence of a humeral stripe (Fig. 19, 6).

7. **N. Witteli** Schouteden. A female in the Congo Belge Museum, which I have determined as the allotype. *Pterostigma* 3 mm.: dorsal markings of thorax similar to the male: primary antennalals the first and fifth or sixth; nodal index, 11-14 | 17-12, total for hindwings 54. Abdomen 40 mm., hindwing 51 mm.

Habitat: Kilo-Kere, Belgian Congo, 1931, coll. Dr. Treuro. This specimen is determined as *Witteli* mainly on account of the similar thoracic markings: its size is slightly larger and the venation rather closer than in the male. The face is pale yellowish brown, the vertex blackish brown and the frons pale green. The occiput is hollowed out above and the free border strongly convex and produced, the centre being slightly emarginate. The lateral markings of thorax and the colour and markings of the abdomen are obscure but a black stripe appears to be developing on the posterolateral suture whilst segment 2 has an obscure midlateral lunulate spot bordered on each side by a broad dark line (a similar marking is found in *ngilii*): the midlateral carina of segments 3 to 5 is finely yellow and there are basolateral yellow spots on these same segments as well as on 6 and 7; 8 and 9 have diffuse lateral yellow spots, whilst 10 has the basal half black and the apical half yellow. The anal appendages shortly conical, dark, about half the length of segment 10.

8. **N. Witteli** A male formerly in the Museum collection but now in the Royal Scottish Museum, Edinburgh. *Pterostigma* 3-4 mm.: nodal index, 11-14 | 17-12, total for hindwings 41; primary antennalals the first and fifth; markings of thorax similar to *Witteli* but the antehumeralas are distinctly broader, especially at their confluence with the mesothoracic collar, and the humeral stripe is complete, extending on to the mesinfra-episternum. Laterally the sides are broadly greenish yellow with narrow black stripes on the two lateral sutures. Abdomen 15 mm., hindwing 36 mm.

Habitat: Kenya, Mt. Gari, Natta, Kavonita.

9. **N. wulcanus** Schouteden. The type is a male in the Congo Belge Museum with *pterostigma* 3-4 mm.: nodal index, 9-12 | 15-10, total for hindwings 41: primary antennalals the first and fifth; dorsal thoracic markings - broad antehumeral stripes tapering posteriorly, confluent broadly anteriorly with an interrupted mesothoracic collar and posteriorly with an upper triangular spot. Abdomen 35 mm., hindwing 33 mm. Segment 2 and the greater part of 3 are pale, probably green during life, the former with sublateral blackish brown stripes incomplete basally.

Habitat: Bambea, Belgian Congo. The sides of this species are broadly greenish or yellow posterior to the first lateral suture.

10. **N. wulcanus** Schouteden. A male in the present collection which I place as *wulcanus* on account of the colour and markings of the sides of thorax and segments 2 and 3 of the abdomen. *Pterostigma* 3-4 mm.: nodal index, 13-10 | 14-10, primary antennalals the first and fifth.
Dorsal and lateral markings of thorax similar to those of the type. Abdomen 42 mm., hindwing 33 mm.

Habitat: Liketu, Belgian Congo, 12.VI.36, (J. Goulard). The total of antenodals and postnodals in hindwing is 48 as compared with 43 in the type but all other characters agree (Figs. 10, 7).

11. *N. vicinus* SCHOUTEDEN. A terminal male in the Congo Belgian Museum, the type, which I have not examined but which was separated from *aelfa* on account of its apparent closer venation. This however is more apparent than real as the total number of nodal cross-veins in the hindwing is only 41 compared to 45 in the type of *aelfa*.

![Fig. 18. — *Neurogastrina agilis* (Martini), from the type male, showing the extrasyllable genalia in profile. End of abdomen (segment 7) is inset to show the highly characteristic shape of segment 10.](image)

so that I am inclined to think that it is only a venational variety of that species.

Habitat: Kibumba, Belgian Congo.

12 and 13. *N. agilis* (Martini). The type is a male in the Genoa Museum under the genus *Neurogastrina*; there is a second male in the Paris Museum under the old name of *Ozygonus spinosus*. An examination of these two shows that they are identical save for the nodal indices which may however be expected to show the usual irregular venation peculiar to the genus. Nodal indices of the two specimens:

13-15 | 16-13
17-11 | 11-11

(44) : 12-17 | 12-26

Pterostigma 3-1 mm.; primary

**Fig. 19. — Markings of thorax, diagrammatic; dorsal and right side only shown.**

antennals the first and fifth. Dorsal markings of thorax: antehumeral stripes very broad below, tapered very abruptly in the upper half and angleate on the outer border. Separated above from a triangular humeral spot. Laterally two broad black stripes, an anterior on the first lateral surstome and a posterior on the anterior half of the metepimeron.

Habitat: Portuguese Guinea, W. Africa. The 2nd segment of abdomen has a middorsal lanceolate stripe and this is continued as a fine stripe on the following segments (Figs. 18 and 19, 19).

APPENDIX

Shortly after this paper was completed I received a further 29 specimens of Geomphinae from Dr. Schouteden which call for no remarks except for the additional data on localities. There are, however, two females of Paragomphus abnormis (Karsch), of which only the male was so far known: the description of this female is given below.

Diastatotomma selysi SCHOUTEDEN, 5 males, all from Bambesa, 2.XII.37 and 1.III.38, collected by J. Verjus.

Diastatotomma multilineta FRASER, 1 male, Bonabana, 1.I.35, coll. A. Bal.

Gomphus aureus (SCHOUTEDENE). 1 male, Bonabana, 18.VIII.38, J. Verjus.

Hedileptomma leviyi SCHOUTEDENE, 1 male, Kifumbeu, 9.V.38, J. Verjus.

Hydrogomphus selysi SCHOUTEDENE, 3 males and 2 females, Bambesa, 8-10, VII.37 and 18.VIII.38, J. Verjus.

Paragomphus nitens (Stål), 5 males and 1 female, all from Bambesa, J. Verjus, 1933; 20.VIII.38 and 21.III.37. One pair are decidedly smaller and the yellow colouring is more extensive. One male shows an incomplete basal antennal in the left forewing.

Paragomphus elpidius (Ris), 2 females, Bambesa, 2.II.38 and 9.V.39, J. Verjus.

Paragomphus abnormis (Karsch), 1 male and 2 females, all from Bambesa, 10-15, III.38 and 1.V.38, J. Verjus. All agree in the possession of an incomplete basal antennal in all wings. The description of the female follows.

Abdomen: 31 mm. Hindwing 26 mm. Protocormyla 5.5 mm.

Head: Dark reddish brown with green markings as follows: a transverse stripe on labrum, the whole of prostheca, a triangular spot on each side above latus and a broad stripe overlapping crest of front. Occiput black with a row of small spines behind each side to the number of 7 or 8. Behind head blackish brown obscurely marked with yellow. Thorax as in the male, the antennal ring yellow stripes narrow and confluent with a slightly interrupted inconspicuous collar below to form inverted figures of 7. Wings slightly and evenly enframed, nodal index: 1-14 antennals in forewings and 9 to 10 in the hind: 10-11 antennals in all wings: all wings with an incomplete antennal at the base of subcostal space. Abdomen dark reddish brown marked with citron yellow as follows, segment 1 with a small basal triangular dorsal spot and a very large lateral one on each side: segment 2 with a fine middorsal stripe extending from end to end of segment, and a moderately broad stripe on each side slightly interrupted at the site of the cercus; segment 3 with a basal lateral triangular spot on each side and a rather broad dorsal stripe which is bordered by the black middorsal carina and the jugal suture: segments 4 to 6 with the same dorsal marking as on 3 but not extending to the apical ends of segments: segment 7 with rather more than the basal half of dorsum and subdorsum yellow: segments 8 and 9 with large lateral rounded spots: segment 10 and a conical process separating the anal appendages largely yellow, the appendages nearly twice the length of segment 10. Very slender and finely acuminate, blackish brown. Vulvar scale very small and inconspicuous, formed of two small slightly separated triangular processes.

Cremogomphus bartramii FORSTER, 2 males and 1 female, Bambesa, H. and III.37, J. Verjus collected.

Leistogomphus australis (Ris), 2 males and 2 females, Bambesa, J. Verjus.

It is possible that L. angustus MARTIN may be a sphenorbic form of australis in which the markings are strongly contrasted against a black background. One of the present females differs from any others which I have seen by possessing a very short stout pterostigma, measuring only 2 mm. In the other specimens, this organ is 3.5 mm. for the males, 3.5 mm. for the females. It is of smaller stature than the other female. Abdomen 27.5 mm. and hindwing 21 mm., to 32.5, 25 mm. respectively. Beyond these two characters, I can see no other differences. The smaller size does not entirely account for the wide differences in the sizes of the pterostigma.
Un Carabique microphthalme nouveau du Katanga

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*Limnastis Leleupi* nov. sp.

Long. 2,5 mm. — Allé, entièrement dépigmenté, d’un ferrugineux testacé. Téguments alvéolés, à microsculpture biodiamétrique peu visible, entièrement pubescents.

Tête grosse et robuste, sa largeur au niveau des yeux dépassant de loin la moitié de celle du pronotum; yeux très petits et malencontreux, deux fois plus courts que les tempes. Cou très épais, sans aucune constriction dans la région post-oculaire. Front peu prononcé, pourvu de deux sillons obliques bien marqués. Mandibules courtes mais acérées, peu saillantes. Avant-dernier article des palpes maxillaires fortement renflé, le dernier très petit. Antennes moyennes, dépassant la base du pronotum de près de trois articles, moniliformes, le premier très brisé, les autres dernièrement pubescents.

Pronotum très grand, sub-caréné, un peu plus large que long, faiblement convexe, la base un peu plus érode que le bord antérieur; ce dernier assez fortement concave, les angles antérieurs saillants mais arrondis, appliqués contre le cou; côtés assez largement arrondis en avant, nettement situés en arrière, les angles postérieurs vifs, légèrement aigus au sommet: base faiblement concave. Silon longitudinal médian à peine distinct; dépressions basitarsales très superficielles; gouttière marginale assez étroite en avant, très fortement élargie en arrière. Largeur maximale assez nettement dépassée en avant du milieu. Toute la surface est couverte d’une punctation faible et d’une pubescence jaune couchée.

Élytres érodés, allongés et aplatis, subobovales, plus larges que le pronotum, la largeur maximale située près du milieu. Repli basilaire