

(c) *Pontania apicifrons* Malaise 1931 (= *P. carminifrons* Benson 1940 syn. n.) and (*P. apicifrons* var. *punctifrons* Malaise 1931) = *P. anglica* (Cameron 1877) syn. n.

In a recent paper (Benson 1940 (2)) I separated two unrecognised British species related to *P. leucopsis* Fribben. One of these, living as a larva in rolled leaf-margins of *Salix pentandra* L., I described as a new species—*P. carminifrons* Benson. In comparing specimens of this with a paratype of *P. apicifrons* Malaise 1931 (from Kamohetka, East Siberia) I find that the two are synonymous, but that *P. apicifrons* var. *punctifrons* Malaise 1931 (also from Kamohetka) is certainly not the same species but a synonym for *P. anglica* Cameron 1877 (on *Salix viminalis* L.).

(d) *Pontania harrisoni* Benson on *Salix nigricans* Smith.

Among the galls collected on the crags above Lochan à Lairige, Perthshire, in August 1932 by my colleague Dr. G. Taylor were some subspherical galls of the *viminalis* group of *Pontania* on the undersides of leaves of *Salix nigricans* Smith and *S. nigricans borealis* Fries (det. Fiederus). From these I bred one female of *P. harrisoni* Benson (1940 (1) : 91-94, and fig. 8). On the banks of the Liddell near Newcastleton, Roxburghshire, in August 1940 my wife gathered some galls, almost certainly of the same species, on *Salix nigricans* Smith and *nigricans* Smith x *aurita* L. (det. A. J. Wilmoth). Malaise (1920 : 114) records that "*P. viminalis* L." in the mountains of northern Sweden such as in Jemtland and Lappland, including a series he bred from galls on *Salix nigricans* Smith, can be distinguished from specimens of the same species from southern Sweden by their clearly bicoloured stigma, white at the base and clearly dark brown at the apex. As this stigma colouring is typical of *P. harrisoni* Benson and distinguishes it superficially from *P. viminalis* L., it seems extremely likely that Malaise's northern specimens really belong to *P. harrisoni* Benson.

The types of all the new species described above are in the British Museum (Natural History).

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NOTES ON THE GENUS *TETRASTEMIS* BRAUER WITH DESCRIPTIONS OF THREE NEW AFRICAN SPECIES (ODONATA)

By Lt.-Col. F. C. FRASER, I.M.S. Retd., F.R.E.S.

AMONG the extensive collections of Odonata made in Uganda during the years 1927-28 by Professor G. Hale Carpenter, to whom I am greatly indebted for the opportunity of studying them, are no fewer than four species belonging to the genus *Tetrestemis* Brauer, only one of which was previously known to science. This is remarkable when one considers that the genus is but small and has always been regarded as almost purely oriental in distribution.

The genus was founded by Brauer in 1868 with *irregularis*, an oriental species, as the genotype. In the previous year, Selys had described a species *poliensis* from Madagascar, under the new generic name of *Neophlebia* but owing to delay in the publication of this description, Brauer's name secured priority. Kirby, in 1890, in his Catalogue of Odonata, listed both names *Tetrestemis* and *Neophlebia*, but without giving his reasons for retaining the latter. In so far as I have been able to compare the oriental with the ethiopian fauna, I am quite unable to find any generic differences between the species, so that the name *Neophlebia* must be regarded as a pure synonym of *Tetrestemis*.

Subsequent to the description of the above two species, *T. irregularis leptoletus* Selys was described in 1869, *T. platyptera* Selys in 1878, *T. irregularis hyalina* Kirby in 1889, *T. flavescens* Kirby in 1889 and *T. gerburyi* Kirby in 1893, all these being oriental in distribution. Thus the genus justly came to be regarded as of oriental origin, and the single species from Madagascar as a recent extension into the ethiopian fauna. In the year 1899, however, Sjostedt described a second African species, and in the year 1899, however, Sjostedt's anomalous fact that its venation was more archaic in character than that of any of the oriental forms from which the ethiopian species had been considered to have originated! This new species, *cameroensis* Sjostedt, unlike *poliensis* from Madagascar, and all the oriental species of the genus, had its arculus occupying a very distal position between the 2nd and 3rd antenodal nervures instead of between the 1st and 2nd, the recent position which the arculus has attained to almost throughout the whole family LIBELLULIDAE.

Further species since added to the genus have served to strengthen this anomaly in one direction, whilst the ultimate preponderance attained by the ethiopian fauna has, of course, abolished it. *T. cladophila* Tillyard, 1906, from Australia, has the arculus in the recent position, *T. corduliformis* Longfield, 1936, from Africa, has it in the archaic position, and finally, of three new species from Africa described below, two have the arculus in the archaic, whilst the third has it in the recent position. The present position of the genus then is that the ethiopian forms preponderate over the oriental, and whilst all the latter are recent, the former, save for two transitional forms, are archaic in regard to the position of the arculus. In regard to the two transitional forms, it is perhaps more than a coincidence that they both possess anal appendages conforming to the recent conventional Libellulina type, whereas all the others have these abnormal or specialised, and, in one species, the inferior appendage has the apex markedly bifid, an archaic character only to be explained by a persistence of the ancestral zygoterous type. This interesting zygoterous character is found extremely rarely in the family LIBELLULIDAE and then only in the most archaic forms such as *Nemophlebia alexia* Lieftinck and a few

species of *Diplacius*; it does, however, crop up more commonly in some of the older Anisopterous families and more especially in the case of the GOMPHIDAE. To sum up the present evidence, I think that it is quite clear that the genus *Tetrathemis* had its origin in Africa and spread eastwards via Madagascar, S. India and Ceylon to Malaysia, the Sondaic Archipelago, Australia and the Philippines. The most archaic forms are found in Africa, transitional forms in East Africa and Madagascar, and recent in S. Asia and Australia. Such a distribution lends support to Wegener's theory of floating continents but the invasion of N. Australia by the genus must have occurred within very recent times.

Key to African species of genus *Tetrathemis* Selys.

1. Arculus situated at the level of the 2nd or between the 2nd and 3rd antenodal nervures. (Arehate group) 2.
2. Arculus situated at a level between the 1st and 2nd antenodal nervures. (Recent group) 5.
3. Superior anal appendages of great length, about three times as long as segment 10, cylindrical and parallel, apices reflected outwards more or less 3.
4. Superior anal appendages short or moderately short, only as long as or a little longer than segment 10, subcylindrical, apices obtuse and not reflected outwards 4.
5. Inferior anal appendage deeply bifid at apex *bifida* sp. n.
6. Inferior anal appendage obtuse and not bifid at apex *camerunensis* Selys.
7. Superior anal appendages markedly longer than the inferior *contuliformis* Long.
8. Superior anal appendages shorter than the inferior *ruesorsoriensis* sp. n.
9. Wings of male, save for base and extreme apex, blackish-brown in colour; no yellow spots behind eyes *nolani* Selys.
10. Wings of male hyaline, uncoloured; 2 sharply defined yellow spots behind the eyes *carpentieri* sp. n.

Tetrathemis bifida sp. n.

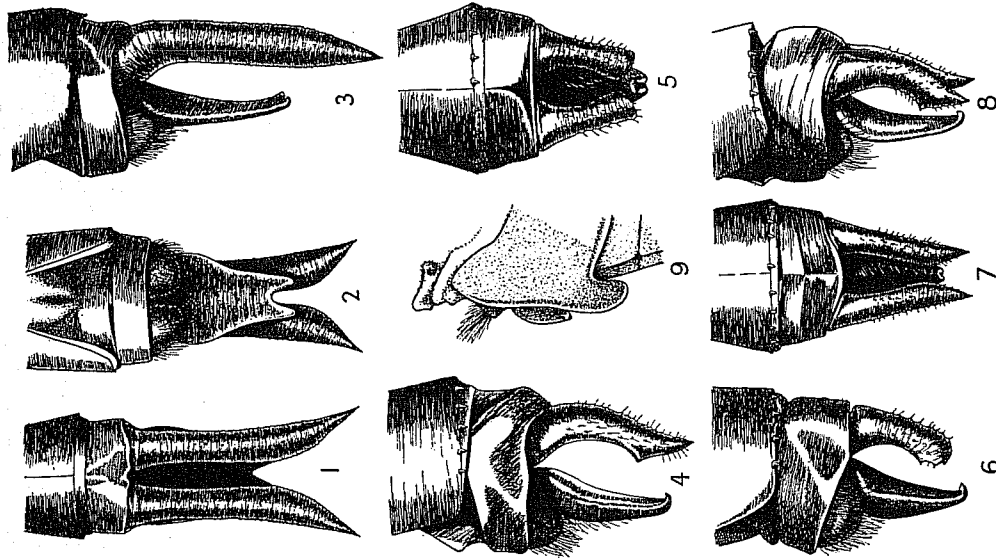
Male. Abdomen 21 mm. Hind-wing 21 mm. :-

Head. Labium bright chrome yellow with the centre of middle lobe and the apposed borders of lateral lobes narrowly black; labrum glossy black, ante- and post-clypeus and the lower outer corners of frons pale creamy yellow, rest of frons ochraceous broadly capped with metallic blue-black; vesicle metallic blue-black; occiput ochraceous to reddish-brown and bright chrome yellow behind. Eyes probably greenish during life (as in oriental species which I have taken alive), glossy black behind and without any yellow markings.

Prothorax warm reddish-brown, anterior lobe pale apple green bordered anteriorly with bright yellow; posterior lobe large, emarginate at centre, bordered with a ruff of long white hairs, bright apple green in colour. Thorax dark reddish-brown to dull black on dorsum with a fine line of apple green on each side of the middorsal cartina which extends neither entirely above nor below. The centre of the alar sinus, the sides and a very irregular humeral scribe are also apple green in colour, the latter expanded below and with its upper end turned abruptly inwards towards the alar sinus. On the lower part of thorax the apple green changes to bright citron yellow, and on the sides, this is traversed by three oblique black stripes, the anterior and posterior of which are moderately broad, the

middle narrow.

Figs. 1-9.—1-3. Anal appendages of *Tetrathemis bifida* sp. n., seen in dorsal, ventral and left profile views respectively. 4. Anal appendages of *T. nolani* Selys, seen in left profile view. 5 and 6. Anal appendages of *T. ruesorsoriensis* sp. n., seen in dorsal and left lateral views. 7 and 8. Anal appendages of *T. carpentieri* sp. n., seen in dorsal and left lateral views. 9. Genitalia of *T. carpentieri*, seen from the left side.



medial one narrow and incomplete below. Beneath thorax citron yellow traversed by three black stripes continuous with the lateral ones. Legs black, trochanters, coxae and inner sides of anterior femora yellow. Wings hyaline tinted palely with yellow or palely enured in old specimens. Pterostigma dark reddish-brown between black nervures, covering about 2 cells, 2.0 to 2.5 mm. long. Nodal index—8-8 | 8-8 | 7-9 | 9-7 | hyper-tigones traversed ones in all wings, 4 to 6 cells in the anal loop, arculus lying between the 2nd and 3rd antenodals, less rarely opposite the 2nd.

Abdomen black marked with citron yellow as follows: segment 1 with a triangular spot on each side, segment 2 with the whole of sides and base, traversed obliquely by a narrow brown stripe on each side, segments 3 to 6 with reduced but similar lateral markings, which are reduced to a mere point on segment 6 and split up into apical and basal spots on segment 5; segment 7 with its basal two-thirds yellow but its middorsal carina and base finely black; remaining segments unmarked but the intersegmental joints yellow. Anal appendages black, superiors very long and straight, cylindrical, very acuminate at apex which turns slightly outwards but not to the extent seen in *T. camerunensis*. These appendages about three times as long as segment 10; the inferior appendage about three-fourths the length of superiors, deeply bifid at apex, the prongs of the bifurcation slightly divergent. Genitalia similar to that of *T. camerunensis*.

Female. Abdomen 20 mm. Hind-wing 27 mm. 1—

A more robust insect than the male and with a correspondingly greater wing expanse. Venation of wings and colour and markings of body similar to the male but the markings of abdomen more extensive and those on segments 4 to 6 not differing markedly from those on segment 3. Anal appendages very shortly conical, black. Vulvar scale well developed, projecting backwards almost to apical border of segment 9.

Type in my collection.

Habitat:—BYAMBIA VALLEY, near Kitongo, c. 2500 ft., 5 ♂♂ and 1 ♀ (*G. Hale Carpenter*), 7.1.28. This species closely resembles *T. camerunensis* Sjöstedt from West Africa, and is clearly closely related to it by the distal position of the arculus and the elongated cylindrical superior anal appendages. It is at once distinguished from this species by the bifid apex of the inferior appendage and the apices of the superiors only slightly turned outwards. It is a rare and interesting occurrence to find a bifid inferior appendage in a Libelluline; parallel cases are not uncommon in the archaic GOMPHIDAE and less so in the AESHIDAE and CORUDUCASTRIDAE. The genus *Tetralthemis* stands right at the foot of the family LIBELLULINAE and it is in just such a genus, possessing other archaic features in its venation, that one would expect such a feature as a bifid inferior appendage to crop up.

Tetralthemis carpenteri sp. n.

Male. Abdomen 10 mm. Hind-wing 25 mm. 1—

Head: labium glossy yellow, middle lobe and borders of lateral lobes narrowly black; labrum glossy black, ante- and post-glypeus, as well as the lower part of frons, palest yellow, frons above and vesicle metallic blue-black; occiput reddish-brown above, bright chrome yellow behind; behind eyes glossy black marked with two small sharply defined bright yellow spots, one of which borders the eyes laterally. Prothorax reddish-brown, dorsum of anterior lobe, a transverse diffuse stripe on middle lobe and the whole of posterior lobe save its centre, apple green. The latter lobe large, rounded and with its border fringed with long white hairs. Thorax dull black on dorsum, the middorsal carina bordered on each side by a fine line of apple green which extends neither above nor below. The centre of the alar sinus and a very irregular humeral stripe, which expands below and is strongly angulated inwards above, are also apple green, changing below, however, to bright citron

the genus *Tetralthemis*.

yellow. Laterally apple green above changing to bright yellow below and marked by three oblique blackish-brown stripes, the medial one of which is incomplete in its lower third. Beneath thorax greenish-yellow traversed by two purplish-black stripes, the most posterior of which curls posteriorwards at each end to meet and enclose a spot of the ground-colour. Legs black, all coxae, trochanters and the inner sides of anterior femora, bright yellow. Wings hyaline. Pterostigma blackish-brown between black nervures, 2.75 to 3.0 mm. in length; nodal index—7-9 | 9-7 | hypertrigones traversed ones in the fore-wings only;

4 cells in anal loop; arculus lying between the 1st and 2nd antenodal nervures. Abdomen black marked with bright greenish-yellow as follows: a small triangular spot on each side of segment 1; 2 spots on each side of segment 2 narrowly separated by the black jugal suture; similar spots, but larger, on segments 3 and 4, small baso-lateral spots on segments 5 and 6 and a large basal spot on segment 7 which is bordered basally and bisected narrowly by black; remaining segments unmarked. Anal appendages black, very simple and of typical Libelluline shape. Superiors about twice the length of segment 10, cylindrical, curving gently downwards and ending in a finely tapered point. In profile a small ventral subapical spine is present. Inferior appendage triangular, of the same length as superiors, its apex curved evenly upwards and minutely emarginate. Genitalia very similar to that of *T. camerunensis* but the lobe smaller and bent at right angles to the posterior border of the segment.

Habitat:—BRITISH EAST AFRICA: Uganda, Entebbe, 1 ♂ (*G. Hale Carpenter*), vii.1927, the type, now in my collection. This species is distinguished by the conventional Libelluline type of its anal appendages, which are closely similar to those of *T. palleni* Selys in this respect, but the latter has the wings broadly coloured blackish-brown. The genitalia of this new species also offer specific characters by the shape and angulation of the lobe. Lastly the isolated, sharply defined yellow spots behind the eyes are extremely characteristic of this species.

Tetralthemis ruwensoniensis sp. n.

Male. Abdomen 18 mm. Hind-wing 23 mm. 1—

Head: labium chrome yellow with middle lobe and the borders of lateral lobes narrowly black; labium glossy black; ante- and post-glypeus and lower part of frons pale citron yellow; frons and vesicle metallic blue-black; eyes probably green during life, glossy black behind and without any yellow spots as in the last described species; occiput reddish-brown. Prothorax dark blackish-brown, the posterior lobe apple green with a quadrate spot of dark reddish-brown at its centre, large, rounded, minutely emarginate at its centre, fringed with long whitish hairs. Thorax velvety black on dorsum, bright apple green laterally changing to citron yellow low down on the sides. A fine line on each side of the middorsal carina, extending whole length of thorax, apple green; the centre of alar sinus and a very irregularly shaped humeral stripe also apple green. The sides traversed by three steeply black stripes, the medial one of which is incomplete below. Beneath citron yellow traversed by two narrow black stripes. Legs black, coxae, trochanters and the anterior femora on the inner side yellow. Wings hyaline; pterostigma blackish-brown between thick black nervures, 2.0 to 2.25 mm. in length; nodal index—8-8 | 9-7 | hyper-

trigones traversed once in all wings; anal loop with 4 cells; arculus situated between the 2nd and 3rd antenodal nervures or opposite the 2nd. Abdomen black marked with citron yellow as follows: segment 1 with a small ventro-lateral spot on each side; segment 2 with its sides broadly and its base narrowly yellow, this colour laterally traversed by an oblique black stripe from ventro-apical border to dorso-basal; segments 3 to 6 with oblique lateral stripes converging basally, these stripes becoming more and more restricted from

segment to segment; segment 7 with rather more than its basal half yellow but the mid-dorsal carina finely black; remaining segments unmarked. Anal appendages black, superiorly nearly twice the length of segment 10, broad, subcylindrical, very obtuse at apex which is furnished apically with several robust small teeth along the outer ventral border. Inferior appendage markedly longer than superior, triangular, tapered to apex which ends in an upturned point minutely and narrowly emarginate. Genitalia closely similar to that of *T. corduliformis* Longfield but the lamina not emarginate and the humales but very slightly turned outwards. Female unknown.

Habitat.—UGANDA: Ruwenzori Mts. (*G. Hale Carpenter*), 1 ♂, the type, now in my collection, 1927. This species is closely similar to *T. corduliformis*, especially in regard to its clubbed-shaped abdomen and genitalia. It differs in the following respects: the superior anal appendages markedly shorter than the inferior, the reverse being the case in *corduliformis*. The author has failed to describe the appendages of this latter species but Mr. Kimmins' figure may be relied upon to demonstrate this character. The apex of the inferior appendage is acuminate and minutely emarginate, but very obtuse in *corduliformis*. This latter species is pruinose in part, but there is no sign of this in *ruwenzoriensis* although the type is fully adult. The ratio of the length of abdomen to wing is about 6 to 8 in *ruwenzoriensis*, but more nearly equal in *corduliformis*; lastly the nodal index of fore-wing in *ruwenzoriensis* is higher than in *corduliformis*. Of all these differences, that of the shape of the anal appendages will at once suffice to distinguish the two species.

DESCRIPTION OF NEW STAPHYLINIDAE (COLEOPT.)—3

By Malcolm CAMERON, M.B., R.N., F.R.E.S.

Olophrum kashmiricum sp. n.

Shining, head black; thorax dark brown; the margins narrowly reddish-yellow; elytra blackish-brown, the shoulders, lateral and posterior margins reddish-yellow. Abdomen pitchy, the sides and apex brownish-yellow. Antennae black, the first five segments and legs reddish-yellow. Length 3.75 mm.

In build somewhat like *punctatella* Epp. but more depressed, smaller and narrower with the sides of the thorax straighter behind. Head impunctate in front, elsewhere with some moderate scattered punctures; ground-sculpture absent. Antennae with the 3rd segment a little longer than the 2nd, 4th to 7th a little longer than broad, decreasing in length, 8th to 10th about as long as broad. Thorax transverse (3.3:2), convex, the sides rounded in front, retracted and straighter behind, moderately coarsely and moderately closely punctured; ground-sculpture absent. Elytra fully twice as long as the thorax, a little widened behind, a little more coarsely punctured; ground-sculpture absent. Abdomen feebly coriaceous, the 1st visible tergite very finely and moderately closely punctured, almost impunctate elsewhere.

KASHMIR: Gulmarg. Type in my collection.

Olophrum kashmiricum parvum subsp. n.

Differs in the smaller size (3 mm.), narrower build and brighter colour, the thorax is bright reddish-yellow, the elytra yellow, sometimes with the disc extensively infusate, the abdomen brownish-yellow with lighter sides and apex.

KASHMIR: Gulmarg. Types in my collection.
PROC. R. ENT. SOC. LOND. (B) 10, PT. 8, (AUG. 1941.)

Amphichroon altivagans sp. n.

Moderately shining, fore parts reddish-yellow, abdomen black. Antennae black, the first three segments and legs reddish-yellow. Palpi reddish-yellow, the last segment infusate. Length 2.5 mm. Build of *mositcola* Cam. but smaller and more brightly coloured, the antennae similarly constructed; the head is more strongly coriaceous, less shining and with fewer and more obsolete punctures, the punctures of the thorax are a little larger, not quite so close and more superficial and a fine ground-sculpture is also present, the elytra are a little less coarsely punctured. Abdomen very finely and sparingly punctured, feebly coriaceous.

♂. Middle tibiae thickened and excavated internally for the apical two-thirds, the excavated margin closely and finely denticulate.

KASHMIR: Kheilanmarg, altitude 10,000 feet. Type in my collection.

Lesteva brevipennis sp. n.

Moderately shining; head and abdomen black, the rest pitchy black to pitchy brown. Antennae blackish, the first two segments and sometimes the last, yellowish-red. Legs reddish or reddish-yellow, the tibiae sometimes infusate. Length 3.5-3.75 mm. Resembles *fuviata* Champ. in the build of the head and thorax but the puncturation of both is a little coarser, the antennae stouter, the penultimate segments a little shorter and at once distinguished by the much shorter elytra which are widened behind and only twice as long as the thorax and more finely and rather less closely punctured.

KASHMIR: Gulmarg, altitude 8000 feet. Type in my collection.

Geodromicus ruficornis sp. n.

Rather shining, black. Antennae yellowish-red. Legs yellowish-red, the femora sometimes infusate. Length 5 mm.

Except for the shorter elytra and smaller eyes scarcely differing from *nigrita* Müll. in build, colour and lustre but the head is a little narrower, the ocelli nearer to each other than to the eye, the impressions and sculpture scarcely differing and the antennae similarly constructed. Thorax transverse (3:2.75), formed as in *nigrita*, narrowly impressed along the middle, the impression not extending to the anterior or posterior borders, before the scutellum with a fovea, the puncturation scarcely as close and distinctly less coarse than in that species. Elytra longer than the thorax (5.75:2.75), widened behind, more coarsely and deeply punctured than in *nigrita*, the abdomen as in that species.

KASHMIR: Gulmarg, Lianmarg, altitude 8000-10,000 feet. Type in my collection.

Geodromicus depressus sp. n.

Moderately shining, black. Antennae black, the first segment pitchy. Legs pitchy-black, the tarsi reddish-yellow. Length 6.75 mm.

A broad depressed species widest a little behind the middle, much resembling in build *Hygrocybus spinipennis* Cam. Head narrower than the thorax, the eye about as long as the temple, deeply triangularly impressed between the antennal tubercles, more superficially on the vertex, closely, moderately finely punctured, coriaceous. Ocelli absent. Antennae very long and slender. Thorax transverse (5.75:4.3), the sides rounded and rather strongly dilated in front, feebly acutely retracted behind, before the scutellum