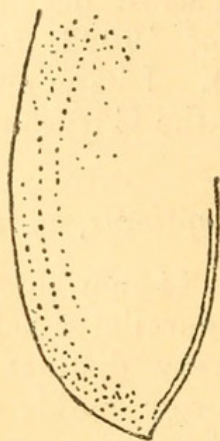


Bartonian, Lower Bagshot, Corfe Clay, Creech, between Corfe and Wareham, Dorset (*W. R. Brodie*, 14). British Museum, 19047. Purchased from the executors of H. S. Beckles in 1891.

Fig. 10.

*Erotylites wallacei*, sp. n.

The shape of the elytron is like that of *Cypherotylus aspersus*, Gorham (Erotylidæ). The general form is rather suggestive of Tenebrionidæ, but the apex is different.

Named after Dr. A. R. Wallace, in memory of a visit to Corfe in his company many years ago.

#### IV.—*New Species of African Simuliidæ.*

By A. W. J. POMEROY, M.B.E.

[Plates III. & IV.]

IN a previous paper\* the writer pointed out the importance of the respiratory filaments of the pupa of *Simulium* as specific characters in distinguishing closely allied species, and an extended series of observations on African species confirms this opinion. In addition to the differences of the formation of the branching of the filaments, what may prove to be a very important clue to generic character has been observed, namely, the composition of the chitinous membrane of the filaments themselves. In some species the chitin is in the form of "scalloped" plates welded together,

\* Pomeroy, Bull. U.S. Dep. Agric. no. 329, Professional Paper, March 6, 1916, p. 24.



in others on hexagonal plates. In one species—*S. gilvipes*, Pomeroy—the membrane is covered with crescent-shaped nodules arranged in rows. In three species which have pupæ with four-branched filaments the resemblance in the arrangement of the chitin is remarkable, since one species (*S. bracteatum*, Coq.) is found in N. America, another (*S. aureum*, Fries) is a British species, and a third (*S. aureo-simile*, Pomeroy) is found in the Kamerun, W. Africa. The writer has not made any histological investigation into the subject, and some considerable work needs to be done before any definite conclusion can be reached ; but from superficial observation under a low power the characters seem to be too important to be overlooked.

In the following descriptions of new species the pupæ have been correlated with the adults, by dissecting adult males which were almost ready to emerge from the pupal skin and comparing their genitalia with those of specimens bred in the streams at the same time and place.

*Simulium cervicornutum*, sp. n.

(Pl. III. fig. 3 ; Pl. IV. fig. 3.)

*Male*.—Length 1.5 mm.

*Antennæ* black, covered with a short greyish pubescence. *Thorax* velvet-black, covered with thick golden pubescence, in freshly emerged specimens entirely so. *Pleuræ* brown, lacking the patch of soft hairs. *Wings* hyaline, veins brown, radius unforked. *Abdomen* velvet-black, first segment with a fringe of dark purple-brown hairs ; a diagonal perlaceous stripe on each side of the abdomen across the fifth, sixth, and seventh segments, rather more iridescent blue in some lights. *Legs* : front legs, coxæ dark brown ; femora, apical ends dark purple-brown, remainder covered with shining light yellow hairs ; tibiæ, apical third dark purple-brown, remainder covered with light yellow hairs ; tarsi almost black. Hind legs : coxæ dark purple-brown ; femora dark purple-brown ; tibiæ, basal third covered with light shining yellow hair ; tarsi purple-black, second tarsal joint with excision near base. *Genitalia* : basal pieces large ; claspers about one-third the length of basal piece, having one finger-like process at the apex ; anal plates, the lateral plates very long, exceeding the length of the claspers, with a few short bristles at the apex, the centre plate large ; adminiculum rather broad, with a fringe of short hairs and some very irregular short spines at the apex of the trough ; arms, the arms end mesally with a pair of spines, the outer one very long, the inner very short.



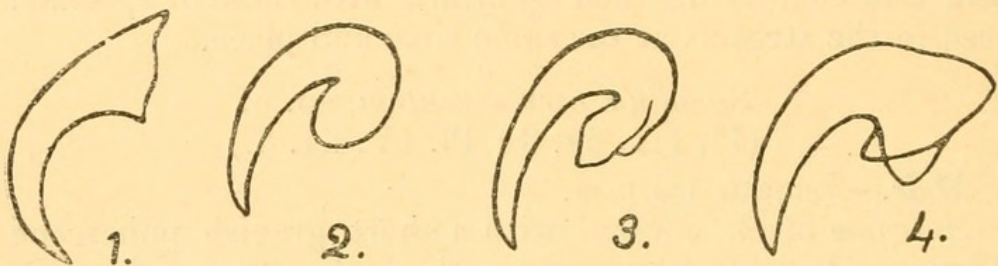
*Hab.* Quick-flowing mountain-streams, obtained by rearing from pupa.

*Loc.* Bangan, Kamerun, W. Africa, 14. 2. 1916. Altitude 2200 metres.

Type in the British Museum.

*Female*.—Length 1·7 mm.

*Frons* silver-grey. *Antennæ* brown with grey dusting, the two basal joints yellow. *Thorax* lustrous black, covered with strong golden pubescence. *Pleurae* fuscous and lacking the patch of soft hairs. *Wings* hyaline, radius unforked. *Abdomen*: basal segment with fringe of long yellow hairs; second, third, and fourth segments with long golden hairs dorsally and laterally, the last four segments shining purple-black, with sparse black hairs and bristles. *Legs*: front legs, coxæ dark brown, with shiny masses of yellow hair; femora dark, with thick shining pale yellow hair on the



Hind claws of *Simulium*, ♀.

Fig. 1.—*Simulium medusæformis*, sp. n. Hind claw of female.

Fig. 2.—*Simulium cervicornutum*, sp. n.

Fig. 3.—*Simulium aureosimile*, sp. n.

Fig. 4.—*Simulium gilvipes*, sp. n.

apical half, silvery in some lights; tibiae yellow, dark brown on apical fourth; tarsi very dark brown, almost black. Hind legs: coxæ dark brown; femora dark brown; tibiae hairy, basal half shining yellow, apical half dark purple-brown; first tarsal joint yellow, but black at apex; second tarsal joint with marked excision near base; second, third, fourth, and fifth tarsal joints all purple-black. Claws with a large blunt tooth projecting from the base similar to *S. latipes*, Meig.

*Hab.* Not found biting. Bred from pupa in swift mountain-stream.

*Loc.* Bangan, Kamerun, W. Africa, 14. 2. 1916. Altitude 2200 metres.

Paratype in British Museum.

*Pupa*.—Pupal filaments shaped like the antlers of an elk. The filaments arise from the base in three main branches;



the first branch divides dorsad into three short branches progressively longer; the second main branch divides dorsad into four, the first very short, the remainder progressively longer; the third main branch divides into two.

The pupa was determined from the genitalia and legs of the adult male, dissected from the pupa and compared with the type.

*Simulium gilvipes*, sp. n.  
(Pl. III. fig. 5; Pl. IV. fig. 1.)

*Male*.—Length 2.4 mm.

*Antennæ* entirely dark brown, with greyish pubescence, the two basal joints somewhat paler. *Thorax* velvet-black, covered with thick light golden pubescence. *Pleuræ* light grey-brown, with patch of soft hairs near spiracle. *Wings*: hyaline veins brownish yellow, radius unforked. *Abdomen* velvet-black, covered with golden pubescence; first segment with fringe of long yellow hair, golden at base, pale at apex. *Legs*: front legs, coxæ very dark brown; femora dark brown at base, middle light yellow, brown at apex; tibiæ brown at apex, middle yellow covered with light golden pubescence, apex dark brown; tarsi, all tarsal joints very dark brown, last three almost black. Hind legs: coxæ brown; femora very yellow, with golden pubescence, apex dark brown; tibiæ, basal third yellow, apical two-thirds dark brown; tarsi almost black, the second tarsal joint with excision near base. *Genitalia*: basal pieces large; claspers less than the length of the basal pieces, blunt at apex, with single finger-like process; the ends usually turned over mesally; anal plates, side-pieces very small and very constricted inwardly at apices, bearing five to six stout bristles arising from very distinct nodules, centre plate small and denude of bristles; adminiculum very broad, with a fringe of weak hairs along the lower portion of pouch; arms very chitinous, ending mesially in two groups of strong black spines, the main spinal process very serrated outwardly.

*Hab.* Quick-flowing mountain-streams: obtained from pupa attached to rocks.

*Loc.* Bangan, Kamerun, W. Africa, 14. 2. 1916. Altitude 2200 metres.

Type in British Museum.

*Female*.—Length 2.6–7 mm.

*Head*: frons covered with silver pubescence; face silver-grey; antennæ dark brown with grey pubescence, first two joints pale yellow, third joint pale yellow at base. *Thorax* dull purple-black, covered with golden pubescence. *Pleuræ*



brown-grey with patch of soft silky hair near spiracle. *Wings* hyaline, veins yellowish, radius unforked. *Abdomen* dull purple-black, covered with rather brassy pubescence, the seventh and eighth tergites rather bare and shiny, the fringe of hair on the first segment distinctly short, almost absent dorsally. *Legs*: front legs, coxæ brown; femora yellow, apex brown; tibiæ, basal two-thirds yellow, remainder dark brown; tarsi very dark, almost black. Hind legs: coxæ light brown; femora golden yellow, covered with brassy pubescence, apex black; tibiæ, basal two-thirds yellow, remainder dark brown; tarsi, first tarsal joint—basal third yellow, two-thirds covered with yellow pubescence, remainder of tarsal joints black. The second tarsal joint with excision near base; hind claws with tooth at base as in *S. ornatum*.

*Hab.* Not found biting; bred from pupæ in quick-flowing mountain stream.

*Loc.* Bangan, Kamerun, W. Africa, 14.2.1916. Alt. 2200 metres.

Paratype in British Museum.

*Pupa*.—The pupal filaments consist of fourteen branches arising from seven main stems and branching dichotomously a short distance from the base. The filaments are very strong in appearance, very dark and quite black at the apices, which are sharp-pointed and very chitinous. Under a high power the outer wall is seen to be covered with crescent-shaped nodules, which are arranged in rows over the entire surface. The pupa is described from specimens containing adult males dissected out and compared with type. They were also collected from the same locality on the same date.

*Simulium medusæformis*, sp. n.  
(Pl. III. fig. 6; Pl. IV. fig. 2.)

*Male*.—Length 2 mm.

*Antennæ* black, covered with fine short grey pubescence, the two basal segments dirty yellow. *Thorax* velvet-black covered with thick light golden pubescence (in the type-specimen some of the pubescence has been rubbed off), especially thick at the sides. *Pleuræ* brown with silver sheen, lacking the patch of soft hairs near the spiracle. *Wings* hyaline, radius unforked. *Abdomen* velvet-black, first segment with long fringe of golden-brown hairs, a diagonal broad patch of iridescent silver-grey on the sides about the fifth and sixth segments; a fringe of long shining pale yellow hairs arises from the margins of the ventral sclerites, covering the sides of the abdomen on the first five



segments; the ventral surface of the abdomen brown, with blue-grey iridescence. *Legs*: front legs, coxæ dark purple-brown; femora dark purple-brown just at apex covered with light yellow pubescence; tibiæ, dark brown front, basal two-thirds covered with shining silver pubescence; tarsi all black. Hind legs: coxæ black; femora purple-black; tibiæ, basal third covered with shining golden-yellow hair, remainder purple-black; tarsi, black first tarsal joint paler in middle, second joint with excision near base. *Genitalia*: basal pieces large; claspers large, rather tapering, with two finger-like processes at apex; anal plates, side-pieces small, with very few strong bristles; centre plate small with no bristles; adminiculum rather oblong with peculiar rows of stout spines running diagonally mesad across the lower end of pouch; arms strongly chitinous, ending mesally in two groups of very strong black spines, surrounded by a spiny membrane.

*Female*.—Length 2.3 mm.

*Head*: frons and face silver-grey; antennæ black with fine short silver pubescence, the two basal segments pale yellow. *Thorax* dark greenish black covered with golden pubescence, silver pubescence laterad on the shoulders. *Pleuræ* brown-grey pollinose, lacking the patch of soft hair on the membranous patch near spiracle. *Abdomen* black, heavily covered with long thick matted golden pubescence, which turns silver at the sides, first segment with a fringe of long pale hairs. *Legs*: front legs, coxæ black, femora black, front covered slightly with silver pubescence; tibiæ, basal two-thirds silver, apical third black; tarsi entirely black; hind legs, coxæ black, femora and tibiæ purple-black with silver pubescence; tarsi, first tarsal joint black at point of base, following two-thirds yellow, devoid of pubescence, black at point of apex, remainder of tarsi black; second tarsal joint with excision at base; claws simple.

*Type-locality*. Bangan, Kamerun, W. Africa, 2. 14. 1916. Alt. 2200 metres.

*Hab.* Bred from pupæ in swift-flowing mountain streams. Not found biting.

Paratypes in British Museum.

*Loc.* Top of Table Bay, Capetown, S. Africa. Specimens of pupæ obtained Dec. 7, 1912, by K. H. Barnard in Brit. Museum.

One male dissected from pupa shows the same male genitalia as type.

*Pupa*.—Pupal filaments with unique secondary filaments arising from main trunks. The main branches are as



follows :—first main branch rather weak, consisting of four long filaments arising dorsally from the stem at intervals ; the remaining branches consist of four very stout finger-like processes, very dark in colour, with secondary filaments of a pale colour arising from them as follows :—from first finger two long filaments arise together from the base, about half-way up towards the apex a single long filament arises, and near the apex another long filament, making four secondary filaments in all ; from the second finger two filaments arise from the base, a third about halfway up, a fourth two-thirds and a fifth a short distance from the apex ; from the third finger only two filaments arise, one about two-thirds up and the other a short distance from the apex ; the last finger is not so thick as the preceding and is devoid of secondary filaments. Pupa described from specimens containing male adults dissected out and compared with type. The pupæ were also collected from the same locality and on the same date as adult type.

*Simulium aureosimile*, sp. n.

(Pl. III. fig. 1 ; Pl. IV. fig. 4.)

*Male*.—*Antennæ* brown. *Thorax* thickly covered with rich red-golden pubescence. *Pleuræ* brown, lacking patch of soft hair. *Wings*: radius unforked. *Legs*: front legs, coxæ pale yellow ; femora pale yellow covered with light golden hair ; tibiæ, basal two-thirds yellow, apical third brown ; tarsi all black. Hind legs : coxæ black ; femora, basal two-thirds yellow, apex black ; tibiæ, basal two-thirds yellow, apex black ; tarsi black, second tarsal joint with excision at base. *Genitalia*: basal pieces large ; claspers less than length of basal pieces with single finger-like process at apex of clasper ; anal plates not as large as claspers, with 18–20 strong bristles at apex ; centre plate rather small, devoid of bristles ; adminiculum very broad ; the pouch very narrow, constricted, with many small bristles ; arms end mesially in a single very prominent spine divided and thickened at base.

*Hab.* Bred from pupæ found in slow-moving stream. The pupæ were attached to grass-blades and vegetation.

*Loc.* Baliben, Kamerun, W. Africa, 10. 1. 1916.

Type in British Museum. Described from a single adult and some specimens dissected from pupa.

*Female*.—*Thorax* dull black, sparsely covered with light golden pubescence. *Pleuræ* brown, lacking the patch of soft hairs. *Wings*: radius unforked. *Abdomen* dull brown.



*Legs*: front legs black with traces of pubescence, coxæ and femora yellow; tibiæ, basal two-thirds yellow, apical third black; tarsi all black. Hind legs: coxæ black; femora pale yellow, black at apex; tibiæ, basal third yellow, remainder black; tarsi all black; second tarsal joint with excision at base; claws with very large projecting tooth at base.

Described from a single specimen reared from pupa and others dissected from pupa. The very conspicuous feature of the species is the yellowness of the upper part of the legs and the tooth-like process at the base of the claw.

*Hab.* Bred from pupa in slow-moving stream. Alt. 1000 metres. Not found biting.

*Loc.* Baliben, Kamerun, W. Africa, 10. 1. 1916.

*Pupa*.—The pupal filaments are four in number. The first two branches arise from the main stem near the base. The third branch divides dichotomously a short distance from the base. The filaments are very similar to those of *S. aureum*, Fries, and to *S. bracteatum*, Coq., but differ in the way they arise from the main stem. The pupa were determined from specimens containing male adults dissected out and compared with type.

*Simulium unicornutum*, sp. n. (Pl. III. fig. 2.)

*Pupa*.—Length 2–2.3 mm.

The pupal filaments are of a very unique character, consisting of a single horseshoe-shaped tube, rather more prominent cephalically, situated either side of the thorax. The filament, the cephalic portion of which is about 1 mm. in length, is attached at the usual position on the thorax and the tubular extension leading from the base is present. One of the specimens contained a male imago, but not sufficiently well developed to permit of an accurate description. The writer is of the opinion, however, that the very remarkable formation of the pupal filaments is sufficient to warrant its description as a new species.

Described from six specimens. Type in the British Museum.

*Hab.* Slow-moving mountain stream, attached to grass-blades.

*Loc.* Balibo, Kamerun, W. Africa, 12. 12. 1916. Altitude about 2000 metres.

*Simulium damnosum*, ♂, Theobald.

(Pl. III. fig. 4; Pl. IV. fig. 5.)

*Male*.—Length 2 mm.

*Antennæ* dark brown with grey pubescence. *Thorax*:



general colour lustrous slate-blue, with a broad black median stripe and a broad black stripe on either side concave outwardly, abbreviated toward basal margin. *Pleuræ* slate-grey, lacking patch of soft hair near prothoracic spiracle. *Abdomen* velvet-black, first segment with fringe of dark golden-brown hair, sides of abdomen with diagonal stripe of perlaceous blue. *Legs*: front legs, coxæ black; femora and tibiæ dark brown, with front of shining silver; tarsi very broad and black. Hind legs: coxæ and femora black; tibiæ black, basal third shining silver; tarsi, first tarsal joint shining silver, black at apex, remainder of tarsal joints black; second tarsal joint with excision near base. *Genitalia*: basal pieces about the same length as the claspers, having the apex of the outer lateral margin projecting very strongly, covered with very stout black bristles; claspers the same length as the basal pieces, with a single finger-like process at apex and rather pointed; anal plates—lateral pieces prominent, with several strong bristles, centre piece broad; adminiculum V-shaped, covered with very stout small triangular spines and a fringe of short hair at the apex of the pouch; arms—the arms end mesially in two masses of very black chitinous spines, the general appearance rather like a brush.

*Pupa*.—The filaments are rather pale and translucent in structure. They are composed of eight main lobes, bulbous and finger-like. The cephalic and caudal lobes very broad in the middle, pointed toward the apex. These two lobes are very often found split up the centre. The remaining six arise from the base of the main stem in pairs, and in some specimens a short broad secondary finger-like filament is present attached to one of the middle filaments, usually the first cephalic pair, about halfway up.

Described from specimens containing male imagos dissected out and compared with emerged adults, bred from the same locality and at the same time.

*Hab.* Swift-flowing mountain stream, attached to rocks in large masses.

*Loc.* Morogoro, Conquered Territory, E. Africa, 24. 11. 1917.

No previous description of the male or pupa has been published. The females bred from the same pupæ were compared with the type in the British Museum. The larva will be described in a later paper.

Specimens placed in the British Museum Collection.



## EXPLANATION OF THE PLATES.

## PLATE III.

Pupæ of *Simulium*.

- Fig. 1. Respiratory filaments of the pupa of *Simulium aureosimile*, sp. n.  
 Fig. 2. Respiratory filaments and upper portion of the pupa of *Simulium unicornutum*, sp. n.  
 Fig. 3. *Simulium cervicornutum*, sp. n.  
 Fig. 4. *Simulium damnosum*, Theobald.  
 Fig. 5. *Simulium gilvipes*, sp. n.  
 Fig. 6. *Simulium medusæformis*, sp. n.

## PLATE IV.

Genitalia of *Simulium*.

- Fig. 1. *Simulium gilvipes*, sp. n.  
 Fig. 2. *Simulium medusæformis*, sp. n.  
 Fig. 3. *Simulium cervicornutum*, sp. n.  
 Fig. 4. *Simulium aureosimile*, sp. n.  
 Fig. 5. *Simulium damnosum*, Theobald.

V.—*British Oligocene Ants.* By HORACE ST. J. K.  
 DONISTHORPE, F.Z.S., F.E.S.

[Plate V.]

IN my book on British ants (1915) I pointed out that two wing-impressions from the Lower Purbecks of Durdlestone Bay, considered by Westwood to belong to ants, and described by him in 1854 as *Formicium brodiei* and *Myrmicium heeri*, had been shown by Handlirsch to belong to saw-flies. I also stated that the remains of three genera—*Myrmica*, *Formica*, and *Camponotus*—were found in the Bembridge Limestone. The latter statement was made on the strength of a short note by P. B. Brodie on Tertiary fossil ants (1875) and a list of genera given in a paper by Dr. Henry Woodward (1879) on the authority of Mr. Frederick Smith of the British Museum.

At the time I was not aware that there were in the British Museum large collections of insects made by Brodie and E. J. A'Court Smith from the Oligocene of the Isle of Wight. At the request of the officers of the Geological Department I have since overhauled this collection, as well as a number of British fossil insects belonging to Mr. R. W. Hooley from the same source, and have arranged the specimens, as far as I am able, into their different families. Of the numbers





Pomeroy, A W J. 1920. "New species of African Simuliidae." *The Annals and magazine of natural history; zoology, botany, and geology* 6, 72–81.

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