

VI.—NOTES ON A COLLECTION OF WEST AFRICAN MYRMECOPHILES

BY WM. M. MANN

Prof. Wheeler has kindly given me for study an interesting collection of West African myrmecophiles, most of them collected by the Rev. G. Schwab from nests of several species of *Dorylus* subgenus *Anomma*, some larvæ of *Microdon* taken by Messrs. Lang and Chapin, and two Paussidæ, not found with their host ant, collected by Dr. J. Bequaert and Messrs. Lang and Chapin.

Rev. G. Schwab had before sent quantities of material to Father E. Wasmann, who has recently written much on the guests of the doryline ants, increasing their number from fourteen species in 1900¹ to an extensive fauna, rich in highly specialized genera and species. Most of the species before me have been described by him. There is in the collection, however, an additional species of the interesting genus *Dorylophila* and a new variety of *Ocyplanus kohli* which I venture to describe.

Four specimens (one adult and three larvæ) of an aradid bug and the curious *Microdon* pupæ hereafter described were taken with *Pheidole megacephala* (Fabricius). The other species in the following list are guests of driver ants.

COLEOPTERA

Paussidæ

***Pleuropterus lujæ* (Wasmann)**

Text Figure 101

Pleuropterus dohrni Wasmann, 1907, Deutsch. Ent. Zeitschr., p. 152, Pl. I, fig. 3 (♀) (nec fig. 4; nec Ritsema).

Pleuropterus dohrni subspecies *lujæ* Wasmann, 1907, Deutsch. Ent. Zeitschr., p. 152; 1910, Ann. Soc. Ent. Belgique, LIV, pp. 394 and 396.

Pleuropterus lujæ Wasmann, 1918, Tijdschr. v. Ent., LXI, p. 81.

Belgian Congo: Med'è (Lang and Chapin).

The one specimen is without host ant. Originally described from Kondué, Kasai, also without indication of the host.

***Paussus æthiops* Westwood**

Text Figure 102

Paussus æthiops Westwood, 1845, Arcana Ent., II, p. 186, Pl. xciii, fig. 6. Blanchard, in Cuvier, Règne Animal, 3d Ed., Ins., Pl. lxi, fig. 8 (before 1845, but without description).

¹Wasmann, E. 1900. 'Neue Dorylinengäste aus dem neotropischen und dem äthiopischen Faunengebiet.' Zool. Jahrb. Abt. Syst., XIV, pp. 215-289, Pls. xiii-xiv.

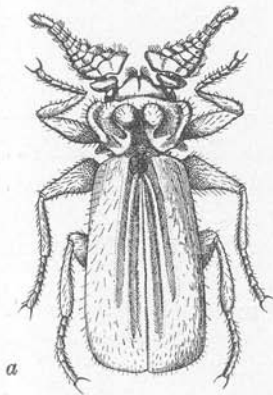
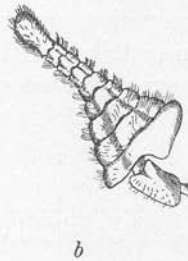


Fig. 101

Fig. 101. *Pleuropterus lujæ* (Wasmann): a, insect from above; b, antenna enlarged.



b

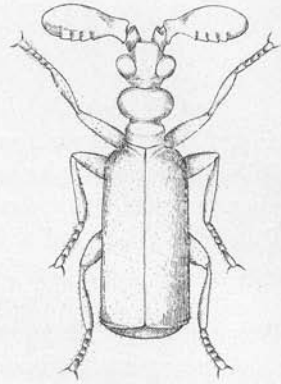


Fig. 102

Fig. 102. *Paussus æthiops* Westwood: insect from above.

Belgian Congo: Between Beni and Kasindi (J. Bequaert).

“At Lisasa, a village in the Savannah of the Semliki Valley, about midway between Beni and Kasindi, a great many specimens of this *Paussus* were attracted by lights in the evening (August 12, 1914). When taken between the fingers these beetles would ‘explode’ in the same manner as bombardier-beetles (*Brachinus*, *Pheropsophus*, etc.). They emit at the same time a volatile substance with a strong odor of bromine which stains the skin brown.” (J. Bequaert).

Staphylinidæ

Sympolemon anommatis Wasmann

Sympolemon anommatis WASMANN, 1900, Zool. Jahrb. Abt. Syst., XIV, p. 258; 1917, Zeitschr. Wiss. Zool., CXVII, p. 311, Pl. ix, fig. 30.

Cameroon: Akono-Linga (Schwab).

Host: *Dorylus* (*Anomma*) *nigricans sjæstedti* Emery.

Three specimens which agree closely with a cotype received from Father Wasmann. The species has been found with various *Doryli* in the Belgian Congo (Sankuru; St. Gabriel) and Cameroon (Grand Batanga; Yukaduma).

Mimanomma spectrum Wasmann

Mimanomma spectrum WASMANN, 1912, Zool. Anzeiger, XXXIX, p. 480, figs. 1-8; 1917, Zeitschr. Wiss. Zool., CXVII, p. 302, Pl. ix, fig. 27.

Cameroon: Akono-Linga (Schwab).

Host: *Dorylus* (*Anomma*) *nigricans sjæstedti* Emery.

Prof. Wheeler sends me the following notes in regard to this extraordinary dorylophile: "In conversation with Mr. Geo. Schwab I learned that, although he investigated as many as 1000 to 1200 marching armies of *Dorylus* and *Anomma* during his sojourn of many years in the Cameroon, he succeeded in finding *Mimanomma* only on two occasions. The first lot, comprising the types, was sent to Father Wasmann in two vials which led him to cite them erroneously as from two armies (Zool. Anzeiger, XXXIX, 1912, p. 473). The second lot, which Mr. Schwab sent to me, was taken with the same host (*Anomma nigricans* subspecies *sjaestedti*) about 60 miles farther inland and 30 miles north of Akono-Linga, August 19, 1916. The beetles walk in the *Anomma* files but more slowly than the ants. Mr. Schwab says he has never seen the ants either touching or paying the slightest attention to the *Mimanomma*. The same is true of the other staphylinids which are often very numerous in the processions or bring up the rear after the ants have passed. He states that the dorylophiles are most abundant in August and may be very scarce in the processions during the rainy season. He captured only such beetles as voluntarily and persistently returned to the ant-trail after they had been removed from it.

"Wasmann, in dealing with the ecitophiles of the Neotropical and the dorylophiles of the Ethiopian Region, has elaborated hypotheses of mimicry, hypertely, etc., to account for the ant-like appearance of some of these insects. *Mimanomma* he regards as a case of hypertely—one in which the insect has become an example of greatly and uselessly exaggerated mimicry of its host ('über das Ziel hinauschiessende Mimicry'). As it is rather important that such speculations, which are easily excogitated in laboratories and museums, should not be left in undisputed possession of the field of theoretical biology, I advance another hypothesis which seems to me worthy of consideration. It is well known that bivouacking dorylines, and especially the species of *Anomma*, form great masses, like swarming bees, with their long legs, antennæ and bodies interlaced and enveloping the brood, booty, and guests. Long, slender insects like *Mimanomma* and even those of Wasmann's 'Trutztypus,' which have the very opposite shape, being short and broadly rounded anteriorly, with rapidly tapering posterior end, would be beautifully adapted for forcing their way through and moving about in the forest of legs, antennæ and bodies of the bivouacking ants, much as both very thin, long, insinuating and small, rotund, pushing people seem to be better adapted for shouldering their way through a crowd than people of average stature. Hence, the peculiarities of form referred by Was-

mann to mimicry, hypertely, etc. may be really direct and useful adaptations to the very peculiar nest environment created by the densely agglomerated bodies of their hosts. I have seen such conditions in ecitophile-containing artificial nests of our North American *Eciton* (*Acamatus*) *schmitti* Emery and *opacithorax* Emery, and have no doubt that future observers will be able to make similar observations on *Anomma* and its guests. Of course, *M. spectrum* is really 'phasmoid,' rather than 'ant-like.'

***Dorylomimus brevicornis* Wasmann**

Dorylomimus brevicornis Wasmann, 1917, Zeitschr. Wiss. Zool., CXVII, p. 293.

Cameroon: Batanga (Schwab).

Host: *Dorylus* (*Anomma*) *nigricans burmeisteri* variety *rubellus* (Savage).

Originally taken from the columns of the same ant at St. Gabriel near Stanleyville. A single specimen before me agrees closely with the description of the type. It is very distinct from a cotype of *D. kohli* Wasmann in having the head shorter and broader and the antennæ shorter.

***Dorylophila rotundicollis* Wasmann**

Dorylophila rotundicollis Wasmann, 1904, Zool. Jahrb. Abt. Syst., Suppl. VII, p. 633, Pl. xxxi, fig. 7.

Cameroon: Akono-Linga (Schwab).

Host: *Dorylus* (*Anomma*) *nigricans sjæstedti* Emery.

Several specimens in the collection agree closely with Wasmann's description and figure of this species, which was described from specimens taken with *Dorylus wilverthi* Emery in the Congo.

***Dorylophila schwabi*, new species**

Length 2 mm.

Dark reddish brown, antennæ yellowish brown; very feebly shining; head, thorax, and elytra finely granulose-punctate and with a dense covering of short hairs; abdomen with fine, silky, semirecumbant hairs which are longest on the margins and apex.

Head broader than long, wider behind than in front, sides in back of eyes feebly convex and rounding into the feebly convex posterior border. Eyes a little more than half as long as sides of head, the surface a little convex. Antennæ stout, first joint as long as the second and third together, second and third joints elongate-cylindrical, the third shorter than the second, fourth joint slightly longer than broad, remaining joints transverse, becoming strongly so apically, terminal joint a little longer than the two preceding. Pronotum broader than long, with a strong semi-circular impression at the posterior portion and the posterior two-thirds of sides;

middle of posterior border slightly produced and rounded; surface in front of semi-circular impression convex, with a broad, shallow impression behind middle. Elytra at base a little broader than prothorax, broader behind than in front, sides and posterior border nearly straight, sides elevated into blunt margins, surface flat behind, elevated and feebly convex in front of middle. Abdomen narrow, about as long as remainder of body, at base a little narrower than the elytra, first five segments margined at sides.

Cameroon: Efulen to Elat (Schwab).

Host: *Dorylus (Anomma) nigricans burmeisteri* variety *rubellus* (Savage).

This is the second species in the genus and differs from *D. rotundicollis* Wasmann in its smaller size, more delicate punctation, in the broader and thicker antennal joints, and in not having the posterior corners of the elytra angulately projecting.

***Enictonia (Anommatoria) arommatophila* Wasmann**

Enictonia arommatophila Wasmann, 1904, Zool. Jahrb. Abt. Syst., Suppl. VII, p. 636.

Enictonia (Anommatoria) arommatophila Wasmann, 1915, Ent. Mitt. Deutsch. Ent. Mus. Berlin, IV, p. 31, Pl. II, figs. 2, 2a-b.

Cameroon: Akono-Linga; Mful Aja (Schwab).

Host: *Dorylus (Anomma) nigricans sjæstedti* Emery.

***Enictonia (Anommatochara) rubella* Wasmann**

Enictonia (Anommatochara) rubella Wasmann, 1915, Ent. Mitt. Deutsch. Ent. Mus. Berlin, IV, p. 33, Pl. II, figs. 4, 5, and 5a.

Cameroon: Akono-Linga (Schwab).

Host: *Dorylus (Anomma) nigricans sjæstedti* Emery.

***Ocyplanus kohli* Wasmann¹ variety *niger*, new variety**

Differing from the typical form (from nest of *Dorylus wilverthi* Emery) in color, being black, with the appendages brown and the apical portions of femora dark brown to black. The difference is constant in a series of thirty specimens before me, which apparently belong to a distinct variety.

Cameroon: Mful Aja (Schwab).

Host: *Dorylus (Anomma) nigricans sjæstedti* Emery.

***Demera kohli* Wasmann**

Demera kohli Wasmann, 1904, Zool. Jahrb. Abt. Syst., Suppl. VII, p. 630.

Cameroon: Metit (Schwab).

Host: *Dorylus (Anomma) kohli* variety *congolensis* Santschi.

Several specimens, one of which has been compared with the type, are in the collection.

¹*Ocyplanus kohli* Wasmann, 1916, Ent. Mitt. Deutsch. Ent. Mus. Berlin, V, pp. 137 and 139, Pl. III, fig. 5.

Pygostenus bicolor Wasmann

Pygostenus bicolor Wasmann, 1904, Zool. Jahrb. Abt. Syst., Suppl. VII, p. 647.

Cameroon: Batanga (Schwab).

Host: *Dorylus* (*Anomma*) *nigricans burmeisteri* variety *rubellus* (Savage).

One specimen.

Pygostenus lujæ Wasmann

Pygostenus lujæ Wasmann, 1904, Zool. Jahrb. Abt. Syst., Suppl. VII, p. 648.

Cameroon: Batanga (Schwab).

Host: *Dorylus* (*Anomma*) *nigricans burmeisteri* variety *rubellus* (Savage).

Four specimens.

Pygostenus alutaceus Wasmann

Pygostenus alutaceus Wasmann, 1904, Zool. Jahrb. Abt. Syst., Suppl. VII, p. 649.

Cameroon: Batanga (Schwab).

Host: *Dorylus* (*Anomma*) *nigricans burmeisteri* variety *rubellus* (Savage).

The single specimen in the collection runs in Wasmann's key and answers to the short description of this species, which was first taken with *D. wilverthi* Emery in Congo.

Phyllodinarda xenocephala Wasmann

Phyllodinarda xenocephala Wasmann, 1917, Zeitschr. Wiss. Zool., CXVII, p. 330, Pl. ix, figs. 35 and 36.

Cameroon: Akono-Linga (Schwab).

Host: *Dorylus* (*Anomma*) *nigricans sjæstedti* Emery.

Originally found with the same ant in Cameroon (Grand Batanga; Lolodorf).

DIPTERA**Syrphidæ****Microdon** species

Text Figure 103

Larva. Length 6 to 7.5 mm.

Dark brown, opaque (except stigmal plates), granulose-punctate. Form broadly oval, convex above, concave beneath. Dorsum with a strong median longitudinal ridge extending from the posterior spiracle to anterior end and a series of seven similar transverse ridges which are interrupted at middle; these ridges thickly covered with coarse, conical spines, some of which appear to be composed of elongate flattened hairs; surface between ridges reticulate, the reticulæ made up of rows of clusters o

3 to 5 crystalline-like particles. Lateral margins with an interrupted, moderately coarse longitudinal ridge beneath which is a series of four fine parallel ridges and a membranous margin. Posterior spiracle elongate, tubercular, dull grayish in color, stigmal plates shining, amber-colored, each divided into four stubby finger-like projections, two above and two below, above with two very large pores.

Congo: Zambi (Lang and Chapin).

Host: *Pheidole megacephala* (Fabricius).

Several specimens.

These pupæ are remarkable on account of the pronounced ridges on the upper surface and the structure of their bristles. The latter vary, those at the sides of the ridges being elongate, whitish flat hairs arranged in groups of 2 to 6; the others thick, conical, brown structures, seemingly composed of masses of hairs coalesced. Most of the conical spines are subequal in size but among them are a few much larger than the others. All have at the tips whitish particles which are somewhat glistening and may possibly be exudations.

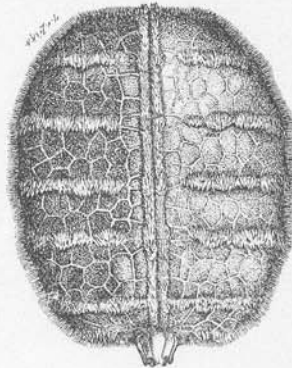


Fig. 103. *Microdon* species: larva living with *Pheidole megacephala* (Fabricius) at Zambi; from above.

HOMOPTERA

Coccidæ

The following scale insects were found in the domatia of various ant-plants collected by Lang, Chapin, and Bequaert in the Belgian Congo. They have been identified by Prof. R. Newstead, of the Liverpool School of Tropical Medicine. The three forms first enumerated are apparently still undescribed.

Pseudococcus citri (Risso) variety *congoënsis* Newstead

Taken from myrmecodomatia of *Barteria fistulosa* inhabited by *Pachysima æthiops* (F. Smith) at Medje (Lang and Chapin). Also from domatia of *Cuviera angolensis* inhabited by *Crematogaster africana* subspecies *laurenti* variety *zeta* (Forel) near Stanleyville (Lang and Chapin).

Pseudococcus crassipes Newstead

Taken from myrmecodomatia of *Sarcocephalus* species inhabited by *Crematogaster africana* subspecies *winkleri* variety *fickendeyi* (Forel) at Masongo, between Walikale and Lubutu (J. Bequaert).

Lecanium (Saissetia) barteriæ Newstead

Taken from hollow stems of *Barteria Dewevrei* inhabited by *Crematogaster africana* variety *schumanni* (Mayr) at Leopoldville (J. Bequaert).

Stictococcus formicarius Newstead

Stictococcus formicarius NEWSTEAD, 1910, Journ. Econ. Biol., V, p. 19, fig.

Larvæ of this species were recognized in the pellets taken from the trophothylax of larvæ of *Pachysima æthiops* (F. Smith) living in *Barteria fistulosa* at Medje (Lang and Chapin). This scale insect was described from specimens found in the hollow stems of *Barteria fistulosa* and *Cuviera angolensis*.