



ABNORMALITIES IN ANTS.

On some Abnormalities in Ants.

(With Plate II.)

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In 1917 the late H. Viehmeyer published a short paper on abnormalities in the skeleton of ants, embracing certain cases of malformation, variability, intermediate forms, and gynandromorphism, which had come under his observation in the course of time [*Entom. Mitt.*, **6**, 66-72 (1917)].

The first category included a *Camponotus (Dinomyrmex) gigas*, Latr., ♂, with a projection proceeding from the inner side of the left fore tibia, which he regarded as a second half tibia; an *Orebeckia subelata*, Viehm., ♂, with a deformed thorax; specimens of *Camponotus ragens*, Scop., ♀, and *Formica pratensis*, Retz., ♀, with deformed scales, etc.

The second category included certain variations in the scales of *Camponotus (Myrmoturba) maculatus-chloroticus*, Emery, ♀, *Formica rufa*, L., ♀, and *F. pratensis*, Retz., ♀; and of the petiole in *Myrmica (Neomyrma) rubida*, Latr., ♂♂.

The third category consisted of *Myrmica bergi*, Ruzsky, var. *barchanica*, Ruzsky ♀, and *Myrmica ruginodis*, Nyl., var. *ruginodolacrinodis*, Forel. This from the description is evidently a Pterergate. The fourth an ergatandromorph of *Myrmica ruginodis*, Nyl.

I have for some time past been collecting similar cases to those recorded by Viehmeyer; and am here describing and figuring a certain number which come into the first two categories.

As the third and fourth belong to phenomena of quite a different nature, I do not propose to deal with them in this paper.

No. 1. (Fig. 1.) *Myrmica ruginodis*, Nyl., ♀, taken at Weybridge, July 28th, 1919. This ant was walking about on the heath, and although to the naked eye it appears to be normal, yet there was something about its movements which caused me to bottle it. Under the microscope there can be seen a short growth projecting from the basal third of the inner side of the scape of the left antenna; a tiny point occurring at the end of the projection. It may possibly be a portion of a half-formed second scape; the point at the end being the spot whence the funiculus would arise. This growth may be due to an injury, caused by pressure or otherwise, in an earlier instar; the wound being the starting point of a super-regeneration of a second scape. As pointed out by the late Dr. Chapinan in a paper on some experiments on the regeneration of the legs of *Liparis dispar*, L.—“Where crushing takes place and possibly, therefore, division of the group of embryonal cells that provides for regeneration, there may take place various supplementary portions, branches, and duplication of limbs.” [*Trans. Int. Ent. Cong. Oxford*, **2**, 305 (1912).]

No. 2. (Fig. 2.) *Myrmecina graminicola*, Latr., ♀. Both antennæ are deformed, being bent and curled round like a ram's horns; otherwise it is perfectly formed. This may be the result of some injury, but I am more inclined to think that the pupal skin had not been properly removed from its antennæ by its fellow workers when it was a callow. The result being that they had become stiff and fixed in one position.

MAY 15TH, 1922.

This individual was bred in my observation nest of *M. graminicola*; the colony of which I obtained at Box Hill on May 1st, 1910, and have still under observation. It pupated in May, 1911, emerged in July, and died on December 15th. It was a pugnacious little ant and would attack a paint-brush when presented to it. It was generally to be found wandering about the nest, or sitting by itself, away from the other ants.

No. 3. (Fig. 3.) *Formica sanguinea*, Latr., partly winged ♀. Dug up in a *F. sanguinea* nest at Woking, on June 12th, 1914. The right posterior leg is short, and deformed, the femur being short and abruptly bent, the tibia short, and the tarsus twisted and deformed. The tarsal claws are short and blunt, being almost absent. The right forewing, though broken, was still present, which would appear to show that this female dated from, not less than, the year previous to that of capture. The formation of the leg may be due to injury received during an earlier instar; or possibly to neglect, as in the case of the antennæ of *M. graminicola* recorded above. This latter supposition, however, is not so likely to occur in a nest in nature as in one in captivity; moreover, the shortness of the femur and tibia, etc., are against this.

No. 4. (Fig. 4.) *Formica rufibarbis*, F., ♀. Both the antennæ, the labial palpi, and all six legs are deformed, being twisted in all directions. This ant (and a similar specimen) was reared in an observation nest of *F. rufibarbis*, the colony of which was taken at Weybridge, on July 10th, 1912. These two cripples, though quite unable to walk, lived for some time in the nest. I am inclined to consider their condition to be due entirely to neglect; their pupal skins not having been properly removed. Although I had the nest in question under observation for six years, and the queen laid eggs regularly, very few ants were reared. The workers appeared to resent captivity, and I eventually liberated them.

No. 5. (Fig. 5.) *Formica fusca*, L., ♂. Taken at Cratloe, Co. Clare, Ireland, in 1895, and presented to me recently by Mr. Stelfox of the Dublin Museum. The left antenna is deformed; the scape being shorter than that of the right one, which is of normal length, and the joints of the funiculus are soldered together into a sort of spiked club (see figure). Although most of the joints of the funiculus are so mixed up, yet it is almost possible to recognise 12, which is the normal number of joints (not counting the scape, which makes it 13) in the ♂ of *Formica*.

This ant is otherwise quite normal; excepting that the mandibles possess 4 or 5 well-developed teeth. This latter character, though remarkable* in itself, has nothing to do with the deformity of the

* This struck me as being remarkable as, though I have examined hundreds of male specimens of *F. fusca*, I have never seen a specimen with toothed mandibles before; moreover, in the following works, both in the tables and under the descriptions of the species, the ♂ of *F. fusca* is stated to possess mandibles without teeth—André, *Spec. Hym. Europe* (1881); Donisthorpe, *British Ants* (1915); Emery, *Palæarktische Formiciden* (1909); *Formicidae Italianæ* (1916); Forel, *Fourmis de la Suisse* (1874). Nevertheless Wheeler, in his *Revision of the Ants of the Genus Formica* [*Bull. Mus. Compar. Zool.*, 53, 495 (1913)], when describing the ♂ of *F. fusca*, L., states that the mandibles are "often, if not always, denticulate"; so the fact was evidently well known to him.

antenna; as Mr. Stelfox has shown me a number of other *F. fusca* ♂ ♂ (taken in Ireland by Mr. Phillips) with toothed mandibles, which are in every other respect normal and perfect.

No. 6. (Fig. 6.) *Leptothorax acervorum*, F., deal. ♀. Taken in a mixed nest of *L. acervorum* and *M. ruginodis*, at Mauley Bog, Keighley, by Mr. Butterfield, on April 26th, 1918, who kindly presented the specimen to me. It is a small dealated female, rather dark in colour, and is *exceedingly* remarkable in that it possesses no trace of either a petiole or a post-petiole! The gaster is joined directly on to the epinotum by the small neck which joins the post-petiole to the gaster in normal ♀ ♀. It measures 3.3mm. in length. The gaster shows the usual four segments (though this is not apparent in the figure) to be seen in ants which possess a two-jointed pedicel. The peculiar construction of this specimen would appear to represent a reversion to an ancestral form. One of the chief characters by which ants can be distinguished from all the other members of the order Hymenoptera is the construction of the abdomen, which is divided into two very distinct regions, a slender very movable pedicel of one or two joints, and a larger posterior portion, the gaster; though in certain low forms in the *Ponerinae* the construction of the abdomen comes nearer to that of some of the *Fossores*.

No. 7. (Fig. 7.) *Acanthomyops (Donisthorpea) niger*, L., del. ♀. Bloxworth, Dorset, from the collection of the late Rev. O. Pickard-Cambridge, and kindly given to me by his son, Mr. A. W. Pickard-Cambridge.

The scale is very emarginate, otherwise the insect is quite normal. This is a simple case of variation; the scale in the female of *A. (D.) niger* usually being somewhat emarginate, but not to the extent shown in this specimen. In the genus *Formica* the scales in the females and workers of *F. rufa*, L., *F. pratensis*, Retz., and *F. exsecta*, Nyl., are known to vary in this way. The scales in the workers of *F. rufa* are usually not emarginate, though I have found colonies in which all the ants possess emarginate scales. In *F. exsecta* the scales are usually considerably emarginate, though less so in some cases.

This paper is No. 111 of a series of notes and papers, etc., on Myrmecology which I have published up to date. As the last list published [*British Ants, Bibliography*, p. 357 (1915)] only gives such papers up to No. 74, it has been suggested to me that I should publish a list of the rest:—

No. 75. "Genital Armature of the Male Ant," *Proc. Ent. Soc. Lond.*, 1915, l.-liii. (with a Historical Chart).

No. 76. "Marriage-flights of *Donisthorpea* species on August 8th, etc.," *Ent. Record*, 27, 206-207 (1915).

No. 77. "British Ants, their Life History and Classification," Brendon and Son, Plymouth (1915). (pp. xv. + 379, with 18 plates and 92 text figures).

No. 78. "The Type of *Camponotus (Myrmoturba) maculatus*, F.," *Ent. Record*, 27, 221-22 (1915).

No. 79. "Descriptions of a Pterergate and two Gynandromorphs of *Myrmica scabrinodis*, Nyl., with a list of all the known cases of the latter," *Ent. Record*, 27, 258-60 (1915).

- No. 80. "*Myrmica schencki*, Emery, an ant new to Britain," *Ent. Record*, **27**, 265-66 (1915).
- No. 81. "Myrmecophilous Notes for 1915," *Ent. Record*, **28**, 1-4, 33-37 (1916).
- No. 82. "The eggs of *Clythra 4-punctata*," *Ent. Record*, **12**, 238 (1900). (= 8a, missed out of all previous lists.)
- No. 83. "Probable Myrmecophilous Habits of the genus *Astilbus*," *Ent. Record*, **12**, 335 (1900). (= 9a, missed out of all previous lists.)
- No. 84. "Note on *Leptothorax nylanderii*, Först.," *Ent. Record*, **14**, 130 (1902). (= 12a, missed out of all previous lists.)
- No. 85. "*Epitritus wheeleri*, n.sp., an Ant new to Science; with Notes on the Genus *Epitritus*, Emery," *Ent. Record*, **28**, 121-22 (1916).
- No. 86. "The Ants of the Netherlands and their Guests," *Ent. Record*, **28**, 228-29 (1916). (Review of Father H. Schmitz's book.)
- No. 87. "Synonymy of Some Genera of Ants," *Ent. Record*, **28**, 241-44, 275-77 (1916).
- No. 88. "Myrmecophilous Notes for 1916," *Ent. Record*, **29**, 30-33, 48-52 (1917).
- No. 89. "The Ants of the Baltic Amber," *Ent. Record*, **29**, 112-16 (1917). (Review of Prof. W. M. Wheeler's paper.)
- No. 90. "*Dolichoderus (Hypoclinea) crawleyi*, n.sp., a species of Ant new to Science; with a few notes on the Genus," *Ent. Record*, **29**, 201-202 (1917).
- No. 91. "Some Notes on a Paper by Dr. Leach on Ants and Gnats in 1825," *Ent. Record*, **30**, 8-9 (1918).
- No. 92. "Myrmecophilous Notes for 1917," *Ent. Record*, **30**, 21-24 (1918).
- No. 93. "A List of Ants from Mesopotamia; with a description of a new species and a new variety," *Ent. Record*, **30**, 165-68 (1918).
- No. 94. "Myrmecophilous Notes for 1918," *Ent. Record*, **31**, 21-26 (1919).
- No. 95. "*Coccinella distincta*, Fald., and its association with *Formica rufa*, L.," *Proc. Ent. Soc. Lond.*, **1919**, xix.-xxii. (1920).
- No. 96. "Ova of *Coccinella distincta*," *Proc. Ent. Soc. Lond.*, **1919**, xix.-xxx. (1920).
- No. 97. "*Coccinella distincta*," *Proc. Ent. Soc. Lond.*, **1919**, xlvii.-xlviii. (1920).
- No. 98. "The Myrmecophilous Lady-Bird *Coccinella distincta*, Fald., its Life History and Association with Ants," *Ent. Record*, **31**, 214-222 (1919); **32**, 1-3 (1920). (With two plates.)
- No. 99. "The Ants of France and Belgium," *Ent. Record*, **32**, 71-76 (1920). (Review of Mons. J. Bondroit's book.)
- No. 100. "British Oligocene Ants," *Ann. Mag. Nat. Hist. (S. 9)*, **6**, 81-94 (1920). (With one plate.)
- No. 101. "Colonizing of a nest of *Acanthomyops (Dendrolasius) fuliginosus* by Myrmecophiles," read February 2nd, 1921, *Proc. Ent. Soc. Lond.*, **1921**, vii.-ix. (1921).
- No. 102. "Myrmecophilous Notes for 1920," *Ent. Record*, **33**, 21-25 (1911).
- No. 103. "Le Monde Social des Fourmis du Globe comparé à celui de l'Homme," *Ent. Record*, **33**, 59-60 (1921). (Review of Dr. A. Forel's book.)

- No. 104. "The Subfamilies of *Formicidae*," *Proc. Ent. Soc. Lond.*, 1921, xl.-xlvi. (With 4 text figures and 1 diagram.)
- No. 105. "*Nabis lativentris*, Boh., a Myrmecophilous Insect," *Ent. Mo. Mag.*, 57, 136-38 (1921).
- No. 106. "The Colony Founding of *Acanthomyops* (*Dendrolasius fuliginosus*, Latr.," *Biol. Bull.*, 24 (1922). Boston, U.S.A.
- No. 107. "Mimicry of Ants by other Arthropods," *Trans. Ent. Soc. Lond.*, 1921, 307-11 (1922).
- No. 108. "*Ripersia europaea*, Newst., as a British species," *Ent. Mo. Mag.*, 57, 234-5 (1921).
- No. 109. "Myrmecophilous Notes for 1921," *Ent. Record*, 34, 1-5, 21-23 (1922).
- No. 110. "*Ponera punctatissima*, Roger," *Ent. Mo. Mag.*, 58 (1922).

Formicidae.—A new species and variety,

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Anochetus evansi, sp. nov. ♀ L., 5.2mm. (with mandibles.) Entirely castaneous. Pilosity as in *ghiliani*, Spin., from which it differs in its small size, shorter body, and in having the posterior part of the corselet smooth and shining.

All joints of funiculus except the three apical ones, considerably shorter than in *ghiliani*, the second in particular being hardly longer than broad. Thorax rather shorter proportionately than in *ghiliani*, and the incision between the mesonotum and epinotum is hardly marked. The scale is lower and thicker, especially at the top, where it is more rounded.

Head similarly sculptured to that of *ghiliani*, but the scattered punctures on the back half are much more numerous and distinct, and larger. Thorax and epinotum almost entirely smooth and shining, with only a few small points on the base of the epinotum, and a few fine transverse striae on the declivity. Otherwise like *ghiliani*.

1 ♂, Sar-i-Pal, Persia, 1919. (Evans, no. 46.) Recorded in *Ent. Rec.*, 32, 163 (1920), as *A. ghiliani*, Spin., though at the time I considered it a variety. Emery, however, is of opinion that it is a distinct species.

Type presented by Mr. Evans to the British Museum.

Crematogaster auberti, Em., var. *sorokini*, Ruzsky., ♀ N.E. Baghdad, 1918 (Evans). Recorded in *Ent. Rec.*, l.c., as *C. scutellaris*? var. Emery has now identified it with Ruzsky's variety, which I have not seen.

Leptothorax sculptiventris, Mayr., var. **distincta**, var. nov. ♀ L., a little over 5.0mm. (type 4.0mm.). Differs only in the colours, which are more sharply defined. Thorax and petiole pale yellow; head, mandibles and basal third of gaster slightly deeper in colour. Funiculus and apical third of scape dark chocolate-brown; tip of apical segment of funiculus and remainder of scape yellow-brown. Apical joints of tarsus, the basal fifth of femur, the apex of coxa, and apical half of tibia pale yellow; the remainder and apical two-thirds of gaster dark chocolate-brown.