

ON THE OCCURRENCE OF DEĀLATED ♂♂ IN THE
GENUS *DORYLUS* FAB. (HYM. FORMICIDAE)

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ON 19 November, 1938, Dr. V. G. L. van Someren of Nairobi wrote to Sir Edward Poulton as follows ". . . I now send specimens of *Dorylus* which may be of interest. In the tube are larva and pupa of the male; and the pinned insects are wingless males which I took out of a 'trail' over a period of two weeks while the ants were on the move, November, 1937. I can find no record of wingless males, but of course it may be well known. It was the only occasion in twenty odd years in which I noted males taking part in a 'safari.'

"It would be of interest to know whether these males have *shed* their wings; or did they ever have them? I have dug out hundreds of male pupae as the specimens sent and all have wing cases, but of course, here again, the wings of some may never develop, though the case is present in the pupa."

Sir Edward handed the material to me and asked me to go into the matter. This I have done and the following short paper is the result. I have dissected out the genitalia and I found they are normal males in every way, except that they are deĀlated, the wings having been shed. Their correct name is *Dorylus* (*Anomma*) *nigricans* Ill. var. *molesta* Gerstacker. I quote from two letters written to me by Dr. van Someren which give a little more information on his discovery. 17 December, 1938. ". . . When I referred to the males as 'wingless,' I presumed that they had shed the wings, and were, as you say, deĀlated. I had looked up such literature as we have and could find no reference to males taking part in a 'safari' or trek. On the other hand these ants are supposed to be nomadic, are they not?, and if this is correct both males and the female must surely, at some time, move above ground.

"I had the particular trail under observation during the daytime while the trek was on, but no female was noted; she may have travelled by night. In my garden of some 15 acres there are two *Dorylus* 'nests,' some 200 yards apart, and the movement seems to be from one to the other, at intervals (not checked), and when one is occupied, the other becomes vacant after a few days. Both are situated amongst the root system of large trees. It was from one of these 'nests' that I obtained the pupae of the various grades and the queen. The ants were *not* engaged in a raid, but in one of their periodical treks." Again on 18 January, 1939, he wrote: "I have examined the trails of *Dorylus* on several occasions lately . . . and there were no wingless males on the move. . . . One point I cannot make out is, why at odd times pupae of the soldier and worker grades are moved from one nest to the other. I have never seen male larvae or pupae being moved. Are there two queens, one in each 'nest'?" It is believed that there is never more than one queen in a nest, and when the ants move to a new nest the workers carry their large wingless queen with them. This probably accounts for the fact that some of the queens which have been found are minus some of their tarsi. The queens of *Dorylus* species are called "Dichthadiigynes" because Gerstacker [*Stettin. ent. Ztg* 24: 93, pl. 1, f. 2 (1863)] erected a new genus *Dichthadia* for the reception of a large female and which he named *Dichthadia glaberrima*. This is the female of the

worker which Smith [*Journ. Linn. Soc. Lond.* 2:70 (1857)] had named *Typhlopone laevigata*. It is now placed in the subgenus *Dichthadia*. The males of the different *Dorylus* species are very well-known insects, often being taken at lights when flying by night. They are not entirely nocturnal, as their workers have been observed driving them out of the nests in large numbers in the daytime.

Linnaeus [*Mus. Ludov. Ulr.* : 412 (1764)] named the male of *Dorylus helvolus* "*Vespa helvola*" in 1764, and in 1767 [*Syst. Nat.* (ed. 12) 1:968 (1767)] "*Mutilla helvola*."

It was not till later that the males of the different species of *Dorylus* (and also females) were recognised as such. In searching through the voluminous literature on *Dorylus* to try and find any mention of deälated ♂♂ I came across the following in *Proc. Acad. nat. Sci. Philad.* 1846-1849:200-201:—

"In the letter transmitting his paper on Driver Ants to the Academy, Dr. Savage says, 'In the small vial you will find some specimens of *rubella*, with three very large individuals, which I consider the perfect insect. Now here is presented an interesting point of investigation, viz., the true relation of these larger individuals of the Driver Ants.' These specimens afford a solution to a problem which has engaged the attention of entomologists; namely, the relation of the Dorylides to the FORMICIDAE, since the large ones alluded to belong to the genus *Dorylus*. They are 13 lines long and seem to be referable to *D. nigricans*, and they have cast their wings.

"The circumstances attending the capture of these insects are thus stated by Dr. Savage.

"In the month of April, 1847, I visited the mission of the Am. Board Com. For. Miss., at Gaboon, 15' north of the equator. Walking out at 7 o'clock on a cloudy morning, I saw a column of red drivers crossing the path. They consisted of two lines, as is always the case, one going, the other returning to their domicil. I stopped some time to compare them with the black species which abounds at Cape Palmas and that part of the West Coast generally. They were not as numerous or as large as *arcens*, but equally ferocious and offensive. Their arrangement and movements were the same. I soon discovered in the lines the large insects in question. I was here taken by surprise as I had observed nothing like them in the economy of the Black drivers. The first idea presented to my mind was, that they were captives, but on observing further they seemed to be no unimportant members of the community. Within a distance of about two rods I discovered ten of this class. I was soon convinced that they belonged to the Drivers, and proceeded to test the truth of the conclusion. I took one or two from the lines to a distance of six to ten feet. They seemed at once to miss their companions, and manifested great trepidation, and made continuous efforts to find a way of return. At last they reached the lines and at once resumed their places, displaying at the same time decided gratification. Nor were the lines thrown into any confusion by their entrance, as they would most surely have been in the case of a foreign insect or body. On further watching their motions I perceived that they did not continue on with the drivers, but after going a certain distance returned. This they repeated, going and returning. What office they performed I could not discover. My time was limited, not permitting me to trace them to their domicil. It was with regret that I left them, but from the observations made, it is evident that they were members of the driver community. I cannot doubt that they were the perfect state of insect. Several natives recognised them as insects that flew about, and into their

houses at night. This is altogether probable when they first attain their winged state. Similar insects, closely allied to the *Dorylus*, it is known, fly at night into the houses at Cape Palmas, undoubtedly bearing the same relation to *arcens*, the Black Driver."

It will thus be seen that Dr. van Someren has made a similar observation to that of Dr. Savage. The only reference to this phenomenon that I can find in the literature is a short note by Wheeler, who wrote [*Ants* : 252 (1910)] : "The large males and females have been rarely observed in the nests. Savage saw a number of deälated males of *Anomma nigricans* marching in file with the workers. He endeavoured to divert some of them from their companions but they kept returning. This observation is of considerable interest because the males of all other ants show no ability to return to the colony or the nest, nor do they voluntarily accompany the workers on their foraging expeditions or migrations." It will be observed that Wheeler does not go into the question of the males being deälated, but only as to their behaviour towards the workers. Smith in "Observations on Ants of Equatorial Africa" [*Trans. ent. Soc. Lond.* (3) 1 : 470-73 (1863)] gives a number of extracts from Savage's paper but omits all mention of these deälated males. I will here make a digression on a small point of interest in Smith's paper. He states that he has had the opportunity to examine some specimens of an *Anomma* which were found in the skin of a large Gorilla lately imported into this country. I have found the ants in question : they are in the collection at the Museum, and are labelled "62.77." In looking up this number in the register I found that the skin of the Gorilla was sent to the Crystal Palace, and the ants were presented to the British Museum in 1862. Their correct name is *Dorylus (Anomma) emeryi* Mayr. subsp. *opacus* Forel. To return to the deälated males, in the collection at the Museum, there are seven deälated males of *Dorylus (Anomma) nigricans* Ill., three of *Dorylus (Dorylus) affinis* Shuck., and one of *Dorylus (Alaopone) atriceps* Shuck. I have little doubt now that these specimens were found by their collector in their present condition ; but it seems curious that no note should have been made about them. I wrote to my colleague Dr. F. Santschi of Kairouan, Tunis, on the subject of the deälated males and he replied as follows :—

"Your letter of 12.xii.38 is very interesting on the subject of apterous males of *Dorylus*. It would be necessary to examine if the anatomy of the sexual organs is normal. I think that it is a question of individuals in which there is a predominance of the female hormones exciting the psychology whilst the soma remains under the influence of the male hormones, at first predominant and then neutralised later by the female hormones. I put forward this hypothesis by simple analogy with that which one sometimes sees in *Homo sapiens* L. This explains the worker-like behaviour (marching in file with the workers and returning to the nests) of these apterous males. The loss of the wings is also characteristic of a psychological female act, as the fertilised female loses her wings."

The most interesting questions appear to me to be—why are certain males deälated?, only a few out of the vast numbers reared. Do they shed their wings themselves?, and when? The courtship between *Dorylus* males and the heavy blind wingless female must take place in the nest. Are the deälated males the successful suitors? ; as, of course, all those males which have flown away, or have been driven out by the workers, cannot have encountered the female.

These questions seem to offer a large field for future investigations.