

An interesting case of camouflage in African dung-beetles of the genus *Drepanocerus* (Coleoptera: Scarabaeidae)

by

J. KRIKKEN

Rijksmuseum van Natuurlijke Historie, Leiden

ABSTRACT. — An unusual type of camouflage is reported: African dung-beetles of the genus *Drepanocerus* Kirby resembling coarse elephant-dung particles. This resemblance is produced by a general dung colour, by a body shaped like a twig fragment, and by remaining motionless when disturbed.

During field work in Kenya I repeatedly encountered scarabs in elephant dung looking like the coarse particles that make up the greater part of the dung mass, especially the poorly digested, fragmented twigs and other woody material. The resemblance of these scarabs to dung particles is due to both the colour and the contours of the body, as well as to their behaviour. They do not move when disturbed, keep their legs folded against their body, and are consequently extremely difficult to detect in the dung mass when one attempts to collect them by hand. Most of the specimens were obtained by sifting large quantities of dung by means of modified Winkler sieves. The scarabs seem to be active during the daytime and move around on and under the dung surface. As such they are vulnerable to avian predators, e.g. francolins (Phasianidae), which can be seen flying off from the dung heaps in large numbers as one drives by car over elephant-inhabited country in Kenya (cf. also Davis, 1977). This elephant-dung camouflage seems to have escaped the attention of scarabeologists, presumably because few of



Fig. 1. A specimen of *Drepanocerus trogiformis* (centre) among elephant dung debris and specimens of *Onthophagus* and *Aphodius*.



Fig. 2. General appearance of *Drepanocerus trogiformis*; dirt-covered male from Tsavo East, Kenya.

them have actually seen the scarabs in their dung microhabitat. They are not common and their distribution might be confined to that of the large pachyderm herbivores.

The scarab species concerned belongs to *Drepanocerus* Kirby, a genus of Oniticellini (Janssens, 1953). The species I saw in Kenya appears to be *D. trogiformis* (Roth). Recently Simonis & Zunino (1980) revived for this and three other species the name *Cyptochirus* Lesne. For the time being I keep these four species in *Drepanocerus*, waiting for a detailed phylogeny of the Oniticellini to show the status of both *Drepanocerus* and *Cyptochirus*. Specimens of *D. trogiformis* were collected in Tsavo National Park (both East and West) and in the Masai Mara Game Reserve. They are nearly the largest among *Drepanocerus*, their length ranging from 9 to 12 mm. The typical "dung colour" of these scarabs is produced by the dirty brownish colour of a dense cover of scales and by the more or less brownish derm. Other species of *Drepanocerus*, usually much smaller, also have scales, but to a lesser extent. Moreover, much dirt and dust may adhere to both the scales and the scabrous microsculpture of the derm, thus sometimes adjusting the cryptic coloration to local circumstances. The body shape of the large *Drepanocerus* species mentioned is elongate, with sinuous to zigzag contours, making them look like a piece of twig. All these camouflage factors may have contributed to the reputed rarity of most *Drepanocerus* species (cf., for instance, Balthasar, 1963). My own experience in Kenya shows that this reputation is not generally true: sifting methods (like the one mentioned above) have yielded large numbers of ca. 12 species near Voi in Tsavo East National Park alone (ca. 20 species are known from the whole of Africa, Ferreira, 1972). Formerly most species may frequently have been overlooked due to their more or less perfected camouflage, their small size, or a combination of these.

Apart from the rather different case of arthropods resembling inedible bird droppings, I have

found one other substantiated record somewhat comparable to the type of camouflage just described. According to Matthews (1974) members of the Australian scarab genus *Amphistomus* Lansberge are invariably coated with soil and dung and frequently exhibit thanatosis, this rendering them very inconspicuous. Some other scarabs (e.g. *Sisyphus*) may look and behave similarly, but all the possible cases of camouflage among dung-beetles seem to be less "perfect" compared to our case of the African *Drepanocerus*. Heikertinger (1954) vaguely suggests some further possible examples of dung mimicry, and there is, of course, the more widespread, well-known general dung coloration of dung-associated insects. All in all, our elephant dung camouflage case seemed interesting enough to be reported upon.

ACKNOWLEDGEMENTS

For discussing the matter described in this paper I am indebted to my colleagues P. J. Kuijten and L. van der Hammen.

REFERENCES

- Balthasar, V., 1963. *Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region (Coleoptera: Lamellicornia)*. 2, 1-627, 226 figs., 16 pls. — Czechoslov. Academy of Science, Prague.
- Davis, A. L. V., 1977. *The endocoprid dung beetles of Southern Africa (Coleoptera: Scarabaeidae)*: (3), 1-140, 37 figs. — M. Sc. thesis, Rhodes Univ., Grahamstown.
- Ferreira, M. C., 1972. Os escarabídeos de África (Sul do Saara). I. — *Revta Ent. Moçamb.* 10 (1968-69): 1-1088, 507 figs., 288 pls., 44 tables.
- Heikertinger, F., 1954. *Das Rätsel der Mimikry und seine Lösung*: I-VIII, 1-208. 114 figs., 9 pls. — Gustav Fischer, Jena.
- Janssens, A., 1953. Oniticellini. — *Explor. Parc natn. Upemba, Miss. G. F. Witte*, 11, 1-118, 135 figs.
- Matthews, E. G., 1974. A revision of the scarabaeine dung beetles of Australia II. Tribe Scarabaeini. — *Austr. J. Zool. Suppl.* 24, 1-211, 364 figs.
- Simonis, A. & Zunino, M., 1980. Il genere *Cytochirus* Lesne (Coleoptera, Oniticellini). — *Boll. Mus. Zool. Univ. Torino*, 4: 21-40, figs.

Postbus 9517, 2300 RA Leiden, the Netherlands.

PLUTELLA XYLOSTELLA (LINNAEUS) EN DE HEIDE (LEP.: YPONOMEUTIDAE). Naar aanleiding van de korte mededeling van de heer Lempke in *Ent. Ber.*, Amst. 42: 155, 1982, vermeld ik, dat ik op 1 en 2 oktober van dat jaar op de Sprengenberg bij Haarle deze vlindertjes eveneens uit heide opjoeg. Toen ik daar met het net voorzichtig over de jonge, dus nog lage heide streek, vlogen deze geregeld op. Veel waren het echter niet, naar ruwe schatting 2 à 3 per 100 m². Maar of dat een maatstaf is voor de aansluitende velden over de heuvelrug durf ik niet aan te nemen.

Op 22.X maakte ik in diezelfde streek een wandeling van een paar uren. Hoewel ik voortdurend met een stok over de heide streek, kwam geen enkele exemplaar meer te voorschijn. Waren de vlindertjes die ik op 1 en 2.X aantrof, nu verdwenen of dood?

Tegenover mijn huis liggen uitgestrekte weiden langs de IJssel, maar hier heb ik nog nooit een exemplaar gezien. Als het dan een kwestie van rustplaats mocht zijn, dan vraag je je wel af: waarom wel op heiden en niet op weiden?

W. Oord, Rembrandtkade 44, 7412 HC Deventer.