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SCIENTIFIC NOTE

A CASE OF GYNANDROMORPHY IN *GOLOFA TERSANDER* BURMEISTER (COLEOPTERA: SCARABAEIDAE)

Through the kindness of Terry Taylor of Combined Scientific Supplies in Ft. Davis, Texas, I was recently sent a pair of *Golofa tersander* Burmeister (Dynastini). The two specimens, apparently both males with fully developed horns, were taken *in copula* and were received by me still thoroughly locked together. They were collected at Fortin, Veracruz, Mexico, on 15 June 1987 by Taylor and are now in my collection.

Golofa tersander is a sexually dimorphic species with males possessing a long, slender horn arising from the frons, a distinct pronotal tubercle anteriorly, a strongly convex pygidium, and an apically emarginate last sternite. Females, on the other hand, have only a tubercle on the frons, lack a pronotal tubercle, possess a relatively flat pygidium, and the last sternite is entire apically. Both of the specimens described here exhibit all of these external male character states just mentioned.

Most of us who study live insects have observed instances where two individuals of the same species and sex attempt to mate with one another. These are, no doubt, cases of confusing or inadequate recognition signals (visual, tactile, olfactory) between them. In these instances, mounting may occur, but actual copulation does not. The pair of *G. tersander* under consideration here must have really had their sexual recognition signals go awry, or else something different was going on. As it turned out, something different was going on.

Careful dissection of both specimens showed that the larger specimen (Fig. 1, 31.7 mm long) was indeed a male because it had entirely functional male genitalia; it was also positioned dorsal to the other specimen. The smaller individual (Fig. 2, 29.2 mm long), positioned beneath the larger, was actually a female with fully developed female genitalia . . . but with the external male characters. In other words, a gynandromorph, or individual displaying characters of both sexes. Stern (1968) regarded this condition as a special type of genetic mosaicism.

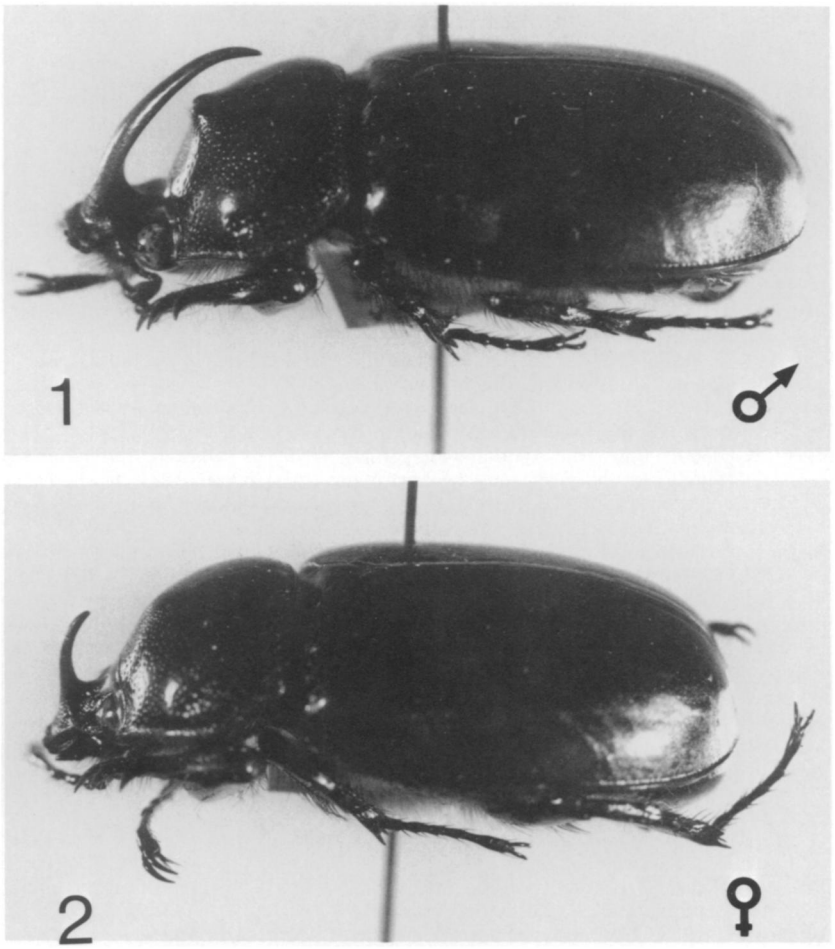
In most Coleoptera, the structural differences between the sexes appear to be directly determined by the genetic make-up of the tissues involved (Crowson 1981). Hormonal activity is not believed to determine the formation of sexual structures in beetles except possibly in the Cantharidodea (Naisse 1966). One possible result of direct genetic determination of sexual characters is gynandromorphism resulting from somatic mutation or genetic miscombinations.

Gynandromorphs have been rarely reported in Coleoptera (Balazuc 1948; Lengerken 1928; Sokoloff 1972). Within the Scarabaeidae, a few cases are also known: Dechambre (1987) described an example of *Megasoma elephas* (Fabr.) (Dynastinae) and Lachaume (1983) did the same for *Goliathus goliatus* (L.) (Cetoniinae).

In many of the above cited instances of gynandromorphy, the adult beetles showed a "left–right" gynandromorphism whereby one side of the body had male characters while the other side had female characters. In this instance with *G. tersander,* all the external features are male while the genitalia are female. There is no left–right division of the body into male and female sides.

Had these two specimens not been taken *in copula,* they would have both been considered males without a second thought. I do have recollections of a couple of dissections of dynastines of what were clearly males externally, but the specimens lacked any male genitalia . . . no phallobase, no parameres. I am now wondering if these might not have been gynandromorphs also, and that the shriveled remains of female genitalia were overlooked by me.

Gyandromorphism in insects is still not well understood, and examples of it are rare in the literature. Reports of such examples in Scarabaeidae are even more rare. Perhaps if we look more carefully, *i.e.,* past the obvious secondary sex characters of armature, sculpturing, body proportions, or color, we may encounter other examples of this interesting phenomenon.



Figs. 1, 2. *Golofa tersander.* 1, male. 2, female exhibiting male external characters.

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