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AFRICAN GIANT BLACK MILLIPEDE

Archispirostreptus gigas (Peters, 1985)

MATING BEHAVIOR

Authors: N. Moresco(!); A. Minelli(+); E. Moretto(*)

(!) Student Dep. of Biol. Univ. of Padova - (+) Prof. Zool. Dep.of Biol. Univ. Padova - (*) Butterfly Arc Montegrotto T. Invertebrates Living Museum www.butterflyarc.it

INTRODUCTION AND AIMS

Studies focusing on analysis and understanding of the main but still little-known behavioral features of *Archispirostreptus gigas* (African Giant Black Millipede) during mating were carried out between October 2003 and June 2004 at the Butterfly Arc Museum of Montegrotto Terme (Italy). They also indicate interesting ideas for further future work on the biology and ecology of this species and, more in general, of all the diplopods. The most interesting points of the various experiments were filmed in order to facilitate study and analysis, and are presented here as photographic sequences.

MATERIALS AND METHODS

All tests and video films were made inside the tropical garden of Butterfly Arc, where optimal conditions of temperature and humidity were recreated, thus favoring spontaneous activity by *Archispirostreptus*. Digital video equipment and cameras were used for filming and photographing. Experiments were conducted inside a large open terrarium, formed of a five-sided tank with glass walls, the bottom of which was covered with organic soil carefully prepared and renewed for each new experiment, in order to avoid contamination by pherormones. Variously-sized fauna boxes were also used to isolate the males in advance for a period of at least three weeks, so that, once they were allowed to come into contact with females, there would be greater probabilities of being able to watch mating, and previously unknown partners would not be influenced by previous events or matings.

RESULTS

For the first time in the literature, the various phases involved in the mating of *Archispirostreptus* were filmed and analysed in detail. In particular, we report the probable mechanism of transferring sperm from the gonopore, behind the second pair of legs, to the gonopods, modified legs which are essential for mating, located on the seventh segment: these structures are typical of most of the class.

MATING SEQUENCE

MEETING →

COURTING →

INSEMINATION →

RELEASE

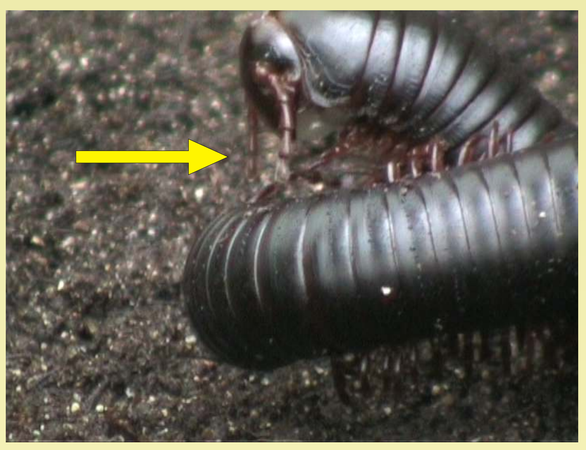
N.B.: The sequences of insemination and release may be repeated several times during the same mating event. In the cases observed here, mating took place about three times.

MEETING: We found that the movements of males and females do not overlap. Thus, we cannot state that particular traces are followed or perceived. The male only gives signs of having seen the female when he is a few centimetres away from her. When the two come into contact, the female coils up.

COURTING: the male mounts the female and begins to beat the ground with some groups of his legs for about 15 minutes (Mazer, 1996).

INSEMINATION: the female rolls aside, and puts the male's first pair of legs into her mouth (Krabbe, 1979). Insemination then begins.

RELEASE AND RECHARGE OF GONOPODS: After insemination, the male withdraws his gonopods and detaches the front part of his body, remaining attached to the female with his remaining legs, which continue to beat the ground. The gonopods are then recharged with sperm. This mechanism was unknown until now. A side view shows how, once his head is bent forward, the male unrolls a tube-like organ, which appears to be used to transfer sperm.This appendix is extended several times and inserted into the gonopods which, in this phase, fully protrude. In addition, fluid identical to sperm leaves the front part of the extended appendix. This phase lasts about 10 minutes.



RELEASE IN THE FEMALE: After being released, the female bends her head forward, expels from her gonopores some of the just deposited sperm, and swallows it. About 10 minutes later, insemination may begin again.

REFERENCES : Krabbe, E. (1979). The first pair of legs in male Spirostreptidae. In *Myriapod biology* 59-72. Academic Press, London.
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