

FIELD NOTE

Mating behavior of the six-banded armadillo *Euphractus sexcinctus* in the Pantanal wetland, Brazil

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Abstract Little is known about the reproductive behavior of *Euphractus sexcinctus*, but the chasing behavior of several individuals behind one another has been reported. We describe two observations of chasing behavior in the Pantanal, Brazil, which included a clear mating event. On these two occasions, a presumed adult male mounted another individual, presumed to be an adult female, during and after the chase, clearly indicating reproductive behavior. Our occasional records of chasing behavior, eventually including mounting, suggest a fairly defined mating period from the mid-dry season to the onset of the raining season in the Pantanal wetland.

Keywords: behavior, *Euphractus sexcinctus*, mating, Pantanal, yellow armadillo

Comportamento reprodutivo em tatu-peba *Euphractus sexcinctus* no Pantanal, Brasil

Resumo O comportamento reprodutivo de *Euphractus sexcinctus* ainda é pouco conhecido, mas a perseguição de um indivíduo por vários outros já foi reportada. Nós relatamos a observação, em duas ocasiões, de comportamento de perseguição que incluiu evento de cópula. Nas duas ocasiões, um indivíduo presumidamente macho montou em outro indivíduo, presumidamente fêmea, durante e após a perseguição, no Pantanal, Brasil, indicando claramente um comportamento reprodutivo. Nossos registros ocasionais sugerem um período de reprodução relativamente bem definido, que vai de meados da estação seca ao início da estação de chuvas no Pantanal.

Palavras-chave: acasalamento, comportamento, *Euphractus sexcinctus*, Pantanal, tatu-peba

The ecology and natural history of the six-banded or yellow armadillo (*Euphractus sexcinctus* Linnaeus, 1758) is still largely unknown (Medri, 2008). This includes a lack of understanding of mating and pre-mating behavior. Published reports on the chasing behavior among armadillos have been considered as an indication of reproductive competition among male six-banded armadillos (Desbiez *et al.*, 2006), or as an aggressive display of adult male nine-banded armadillos (*Dasypus novemcinctus*) towards juveniles (Breece & Dusi, 1985) and one- to two-year-old males

(McDonough, 1994). These chasing events have also been reported for the Brazilian three-banded armadillo (*Tolypeutes tricinctus*) (Marinho-Filho *apud* Guimarães, 1997).

On two occasions we recorded in digital video a group of adult six-banded armadillos, presumably males ('males'), chasing another adult presumed as female ('female') in the southern Pantanal wetland, Brazil. The first observation occurred in July 2006 (19°02'06"S, 56°46'04"W) at approximately 17:00 hr,



FIGURE 1. A presumably female six-banded armadillo (*Euphractus sexcinctus*) mounted by a presumed male during a collective race, chased by another presumed male, in the Pantanal wetland, Brazil, July 2006. Photo: Walfrido Tomas.

when we witnessed a successful attempt of one of the 'males' in mounting the 'female'. Five 'males' were in a line running after one 'female', and one of the 'males' mounted the 'female' in a quick movement when it briefly stopped during the chase. After being mounted successfully the 'female' quickly resumed running, with the 'male' still attached (**FIG. 1**). The remaining 'males' started chasing the couple. The mounted running was as fast as when individuals were running alone and occurred for nearly 20 m, without release by the 'male'.

The mounted run finished when the 'female' entered a burrow, with the 'male' being left outside. While mounting, both 'male' and 'female' were running coordinately in a wandering line until the 'female' found the burrow hidden in a bunch grass bush (the video is available at http://www.cpap.embrapa.br/imagens_documentais/euphractus_mating_walfrido_tomas_jul_2006.avi).

The second observation occurred on 16 October 2012 around 17:00 hr (19°08'36"S, 56°50'50"W). A pair of armadillos (presumably a female mounted by a male) crossed in front of our vehicle, chased by three other adults, presumably males. Again, the 'female' entered a burrow, with the 'male' being detached from the 'female's' back, and started digging and filling the entrance with sand. The 'male' that had mounted the 'female', as well as the other 'males' involved in the chasing event, started to dig vigorously at the burrow entrance and the surrounding substrate in an attempt to reach the 'female'. The shoot was stopped around 18:00 hr due to the lack of light conditions to continue.

These two observations indicate that the chasing behavior reported by Desbiez *et al.* (2006) is a pre-mating behavior, or at least one of the mating repertoires of six-banded armadillos. The unusually long penis of six-banded armadillo males, which can reach about 33% of its body length (McDonough & Loughry, 2001), may represent an adaptation to ensure fertilization during these mounted runs, if the reported events represent a pre-mating or even mating behavior. However, it is unclear if complete copulation is achieved during the mounted run or if *E. sexcinctus* females would accept another male afterwards. While a published description of a male mounting a female *T. tricinctus* while moving slowly

(Marini-Filho & Guimarães, 2010) may be similar, it contrasts with the fast locomotion we witnessed.

The behavior we witnessed during the mounted runs differs substantially from the agonistic interaction between individuals reported for *D. novemcinctus* (Breece & Dusi, 1985; McDonough, 1994). Additionally, we found the observed behavior of *E. sexcinctus* to be different from the described attempt to prevent the access of a male competitor to a female in *T. tricinctus* (Marinho-Filho *apud* Guimarães, 1997; Marini-Filho & Guimarães, 2010). In both occasions the *E. sexcinctus* 'males' involved in the chase did not interact directly with one another. Several additional, anecdotal observations in the Pantanal involving two to six males also did not include any type of direct interactions among the males. Therefore, the competition for mating in *E. sexcinctus* seems to be based on the ability to be the first to reach and mount the female rather than any aggressive behaviors between males.

The frantic excavation by several males when a female is inside a burrow, such as described here, may explain the concentration of burrows in certain areas, often observed in the Pantanal. It has also been observed that the males may continue the chase inside the burrows, emerging at other openings in search of the female.

Our records help to clarify at least one of the questions raised by Desbiez *et al.* (2006). These authors were not certain whether the chasing behavior they reported had a reproductive function or rather represented a strategy to defend territories or food resources. Although no specimen was captured or sex-discriminated, some of the photos we have taken showed the erect penis of the mounting armadillo (**FIG. 2**), indicating that the chasing and mounting behaviors represent a reproductive event.



FIGURE 2. A male six-banded armadillo (*Euphractus sexcinctus*) mounting a female during a chase event in the Pantanal wetland, Brazil. Photo: The Pantanal Giant Armadillo Project.

Finally, we recorded 11 events of chasing behavior by *E. sexcinctus* from 2006 to 2013 in the Pantanal (three in July, two in August, one in September, three in October, and two in November), and no records in other periods of the year. Mountings were observed three times, always associated with runs or chasings. These occasional records of chasing behavior from July to November in the Pantanal suggest a slightly defined mating period lasting from the mid-dry season to the onset of the raining season, which is in agreement with the records of pregnant females found in Central Brazil (September and October) and in Uruguay (January) (Barlow, 1965), as gestation lasts 60 to 64 days (Redford, 1985).

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