

Playing in the skies: The White-rumped Monjita (*Xolmis velatus*) coordinates its flight with flights of other bird species

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Play is a behavior known for some groups of birds. This study aimed to report on play performed during flight by the White-rumped Monjita (*Xolmis velatus*) in central Brazil. On two occasions, one *X. velatus* was observed coordinating its movements with those of other bird species while flying over savanna vegetation. By pairing at their side, this tyrant coordinated its the flight trajectory with those of a Campo Flicker (*Colaptes campestris*) and a Peach-fronted Parakeet (*Aratinga aurea*). Several attributes of this behaviour characterise play. This is the first study to report on parallel locomotor play for a bird species.

Keywords: Birds. Locomotor play. Cerrado. Tyrannidae. Flight. *Xolmis*.

Brincando nos céus: a noivinha-branca (*Xolmis velatus*) coordena seu vôo com aqueles de outras espécies de aves. Brincadeira é um comportamento conhecido para alguns grupos de aves. Este estudo teve como objetivo reportar sobre brincadeira exibida durante voo por noivinha-branca (*Xolmis velatus*) no Brasil central. Em duas ocasiões, um *X. velatus* foi observado coordenando seus movimentos com aqueles de outras espécies de aves enquanto voava sobre vegetação savânica. Ao pairar aos seus lados, este tiranídeo coordenou sua trajetória de voo com aquela de um pica-pau-do-campo (*Colaptes campestris*) e de um periquito-estrela (*Aratinga aurea*). Vários atributos deste comportamento caracterizam brincadeira. Este é o primeiro estudo a registrar brincadeira locomotora paralela para espécies de aves.

Palavras-chave: Aves. Brincadeira locomotora. Cerrado. Tyrannidae. Vôo. *Xolmis*.

Play is a common behavior of vertebrates such as mammals and birds (Bekoff & Byers, 1998; Burghardt, 2005; Fagen, 1981; Millar, 1981). Play by vertebrates can be divided into three major types - object play, social play and locomotor play (Burghardt, 2005; Diamond & Bond, 2003; Ficken, 1977; Ortega & Bekoff, 1987).

Play has been recorded for several groups of birds. Among non-passerines are species of orders such as Struthioniformes, Galliformes, Anseriformes, Bucerotiformes, Falconiformes

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and Psittaciformes (Burghardt, 2005; Diamond & Bond, 2003; Ficken, 1977; Ortega & Bekoff, 1987). Detection of passerines' play has usually involved species of few families, such as Corvidae and Sylviidae (Diamond & Bond, 2003; Heinrich, 2006; Heinrich & Smolker, 1998).

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The scarce descriptions of bird play in the Neotropical region have involved mainly parrots, cormorants and herons (Sazima, 2008; Sick, 1997). This paucity of studies is also noted for the Cerrado, the savanna ecosystem that dominates central Brazil. Here we describe play behavior for the White-rumped Monjita (*Xolmis velatus*) while flying over the savanna vegetation in central Cerrado, Brazil.

Method

Field work was done at Parque Nacional da Chapada dos Veadeiros (14°04'S, 47°40'W), a nature reserve located in the state of Goiás, central Brazil. This park protects 60,000 ha of landscapes in the Cerrado – the savanna ecosystem that dominates central Brazil (Oliveira & Marquis, 2002). Among common vegetation physiognomies protected in this reserve are open savannas called *campo cerrado* (Silva, Silva, Munhoz, Silva Jr., & Medeiros, 2001). These woodlands occur on strongly drained sites with deep water table and high soil fertility (Oliveira Filho & Ratter, 2002). This vegetation has three vertical strata (Coutinho, 1978; Eiten, 1972). The herbaceous stratum of about 40 cm in height is almost continuous and mainly composed of grasses. The middle stratum is mostly formed by numerous shrubs highly variable in size and height. The higher stratum is composed of trees that range from 2 to 7 m high, with a canopy cover of 5 to 10% (Castro & Kauffman, 1998). Open savannas harbour a great richness of plant species (Filgueiras, 2002; Mendonça et al., 1998). Observations were done on a patch of open savanna embedded within a matrix of native shrubby grassland during three weeks in February 2008.

Results and Discussion

On 7 February 2008, a group of three Campo Flickers (*Colaptes campestris*; Picidae) was detected flying over a patch of open savanna vegetation. Flock members were flying 10-15 m after each other and making up and down movements while moving through the savanna. Thus, they were performing an undulated (wavy) trajectory, a characteristic flight of this

species. A few seconds later, we noted that this bird flock had a White-rumped Monjita (*Xolmis velatus*; Tyrannidae) as a fourth member. This tyrant was flying on the side (paired at about 1-2 m) of the last woodpecker. As consequence, this *X. velatus* executed the same flight trajectory of this *C. campestris* for about 100 m. They made quite similar movements during the crossing of the savanna patch. These four birds perched on the same tree. No aggressive interactions were observed and no calls or songs were emitted by this *X. velatus* during the flight or when they were perched. After a few seconds, the three *C. campestris* flew away while the *X. velatus* remained perched on this tree. Then, it moved to another direction.

During this afternoon, a similar behavior was observed at this same site. On this occasion, two Peach-fronted Parakeets (*Aratinga aurea*; Psittacidae) were detected flying in company of one *X. velatus*. This tyrant was flying paired beside one of the parakeets. It performed the same flight trajectory of the parakeet by keeping a distance between them of about 1 m. They flew paired for about 80 m. More specifically, they made several quick movements towards several directions while flying over the savanna patch. Then, the three birds landed on a tree branch. A few seconds later, one of the *A. aurea* approached the *X. velatus* and touched it with its shoulder. Then, both parakeets flew away and the tyrant remained perched on the tree. The tyrant made no calls or songs during or after the flight.

In both cases, no feeding activities occurred and the birds of different species flew to distinct directions after perching. Thus, these two flight movements did not represent participation in mixed-species flocks. Also, there were no aggressive interactions during the flight or in the tree canopies, suggesting that territory defense was not involved. As the *X. velatus* flew paired on the side of the other bird, no persecutions occurred. Therefore, the observed tyrants had the intention of coordinating its flight movements with those of these two birds for a certain period of time.

Several attributes of play behavior (Bekoff & Byers, 1998; Burghardt, 2005; Fagen, 1981; Ficken, 1977) can be identified in these flight movements shown by *X. velatus*. First, they had no apparent motivation relative to fundamental biological functions, such as feeding (final

consummatory act), courtship and territorial defense. Second, this pairing behavior involved the execution of repeated movements along the flight trajectory. Third, the observed behavior involved quick and energetically expensive movements. Fourth, there was no threat or submission. Also, this flight behavior by *X. velatus* has no obvious immediate function.

This flight behavior of *X. velatus* can be considered locomotor play. This is because this type of play involves the performance of intense or sustained locomotor movements, often without any apparent immediate reason or stimulus (Burghardt, 2005). These flight movements observed in *X. velatus* should not be viewed as play chasing, a flight behavior commonly observed in some bird species (Blumstein, 1990; Heinrich & Smolker, 1998; Kilham, 1974). This is because chasing occurs when one bird follows another in flight with role exchanges of pursuer and pursued (Diamond & Bond, 2003). On the other hand, the *X. velatus* flew paired with the other bird and these roles did not occur.

Xolmis velatus flying side by side with other bird species represents a specific pattern of play - the parallel locomotor play (Watson, 1998). This behavior involves two or more individuals performing motor patterns similar to those observed in solitary plays, but in a coordinated manner. Although rare, parallel locomotor play has been reported in several kangaroo species (Watson, 1998).

The flight play shown by the *X. velatus* might be related to its intra-specific interactions during the breeding season. During summers (January/February), mono-specific pairs are often seen performing numerous aerobatics in Cerrado reserves. This behavior was often observed by us over patches of open savannas in the study area and at Parque Nacional das Emas, and appears to be part of courtship. Pairs of this tyrant species usually fly up to 30 m and then start to perform a diverse range of aerobatics, side by side or not. Sometimes birds fly in pairs, performing the exact flight trajectory for a few seconds. Thus, it is likely that some *X. velatus* occasionally apply this experience achieved with intra-specifics to other bird species. Also, this flight play with other species might benefit the development of skills used during courtship flights.

As most recordings of play for passerines obtained worldwide involve the Corvidae and Sylviidae families (Diamond & Bond, 2003; Ortega & Bekoff, 1987), our study appears to be the first to report on play behavior for tyrant species. To the best of our knowledge, this is the only study to report on parallel locomotor play for birds.

References

- Bekoff, M., & Byers, J. A. (1998). *Animal play: Evolutionary, comparative, and ecological perspectives*. Cambridge: Cambridge University Press.
- Blumstein, D. T. (1990). An observation of play in bearded vultures. *Condor*, *92*, 779-781.
- Burghardt, G. M. (2005). *The genesis of animal play. Testing the limits*. Cambridge: The MIT Press.
- Castro, E. A., & Kauffman, J. B. (1998). Ecosystem structure in the Brazilian Cerrado: A vegetation gradient of aboveground biomass, root mass and consumption by fire. *Journal of Tropical Ecology*, *14*, 263-283.
- Coutinho, L. M. (1978). O conceito de Cerrado. *Revista Brasileira de Botânica*, *1*, 17-23.
- Diamond, J., & Bond, A. (2003). A comparative analysis of social play in birds. *Behaviour*, *140*, 1091-1115.
- Eiten, G. (1972). The cerrado vegetation of Brazil. *Botanical Review*, *38*, 205-341.
- Fagen, R. (1981). *Animal play behavior*. New York: Oxford University Press.
- Ficken, M. S. (1977). Avian play. *Auk*, *94*, 573-582.
- Filgueiras, T. S. (2002). Herbaceous plant communities. In P. S. Oliveira & R. J. Marquis (Eds.), *The Cerrados of Brazil. Ecology and natural history of a neotropical savanna* (pp. 121-139). New York: Columbia University Press.
- Heinrich, B. (2006). *Mind of the raven. Investigations and adventures with wolf-birds*. New York: Harper Perennial.

- Heinrich, B., & Smolker, R. (1998). Play in common ravens. In M. Bekoff & J. A. Byers (Eds.), *Animal play: Evolutionary, comparative, and ecological perspectives* (pp. 27-44). Cambridge: Cambridge University Press.
- Kilham, L. (1974). Play in hairy, downy and other woodpeckers. *Wilson Bulletin*, 86, 35-42.
- Mendonça, R. C., Felfili, J. M., Walter, B. M. T., Silva Junior, M. C., Rezende, A. V., Filgueiras, T. S., & Nogueira, P. E. (1998). Flora vascular do Cerrado. In S. M. Sano & S. P. Almeida (Orgs.), *Cerrado – ambiente e flora* (pp. 289-556). Planaltina, DF: Embrapa.
- Millar, S. (1981). Play. In D. McFarland (Ed.), *The Oxford companion to animal behaviour* (pp. 457-460). Oxford: Oxford University Press.
- Oliveira, P. S., & Marquis, R. J. (2002). *The Cerrados of Brazil. Ecology and natural history of a neotropical savanna*. New York: Columbia University Press.
- Oliveira Filho, A. T., & Ratter, J. A. (2002). Vegetation physiognomies and woody flora of the Cerrado biome. In P. S. Oliveira & R. J. Marquis (Eds.), *The Cerrados of Brazil. Ecology and natural history of a neotropical savanna* (pp. 91-120). New York: Columbia University Press.
- Ortega, J. C., & Bekoff, M. (1987). Avian play: Comparative evolutionary and development trends. *Auk*, 104, 338-341.
- Sazima, I. (2008). Playful birds: Cormorants and herons play with objects and practice their skills. *Biota Neotropica*, 8, 259-264.
- Sick, H. (1997). *Ornitologia brasileira*. Rio de Janeiro: Nova Fronteira.
- Silva, S. R., Silva, A. P., Munhoz, C. B., Silva Jr., M. C., & Medeiros, M. B. (2001). *Guia de plantas do Cerrado utilizadas na Chapada dos Veadeiros*. Brasília, DF: WWF.
- Watson, D. C. (1998). Kangaroos at play: Play behaviour in the Macropodoidea. In M. Bekoff & J. A. Byers (Eds.), *Animal play: Evolutionary, comparative, and ecological perspectives* (pp. 61-95). Cambridge: Cambridge University Press.

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