

Mating display of the Yellow-chevroned Parakeet (*Brotogeris chiriri* Vieillot, 1818) (Psittaciformes: Psittacidae)

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The Yellow-chevroned Parakeet (*Brotogeris chiriri*) is naturally found in South America. It feeds on fruits, flowers and seeds, and can be found in arboreal landscapes and inside cities. Its breeding season extends from May to September. On the morning of 09 September of 2017 a couple was visualized while mating in Puerto Iguazú, Argentina. This work describes the sequence and the duration of this species mating behaviors. Similar behaviors can be visualized for other parrots, but differ on duration and sequence. As parrots are trade victims, it is important to know the mating aspects of this species for its future conservancy in case it becomes threatened of extinction in the future.

Key words: breeding behavior, courtship, copulation, mating behavior, parrot, reproduction.

Exibição de acasalamento de periquito-de-encontro-amarelo (*Brotogeris chiriri* Vieillot, 1818) (Psittaciformes: Psittacidae)

O periquito-de-encontro-amarelo (*Brotogeris chiriri*) é naturalmente encontrado na América do Sul. Alimenta-se de frutos, flores e sementes, e pode ser encontrado em ambientes arbóreos e interiores de cidades. Sua temporada reprodutiva se estende de maio a setembro. Na manhã do dia 09 de setembro de 2017 um casal foi visualizado enquanto acasalava em Puerto Iguazú, Argentina. Esse trabalho descreve a sequência e duração dos comportamentos de acasalamento da espécie. Comportamentos similares podem ser visualizados em outros psitacídeos, porém diferem na sua duração e sequência. Como os papagaios são vítimas do tráfico de animais silvestres, é importante conhecer os aspectos reprodutivos da espécie para sua futura conservação, caso torne-se ameaçado de extinção no futuro.

Palavras-chave: acasalamento, comportamento reprodutivo, cortejo, cópula, papagaio, reprodução.

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INTRODUCTION

The Yellow-chevroned Parakeet (*Broto-geris chiriri* Vieillot, 1818) is a 20 cm long parrot, predominantly green, easily identified by its yellow and blue tones on its wings (Pivatto, Bernardon & Endrigo, 2012; Ridgely et al., 2015). It is considered to be common in arboreal landscapes, including orchard, farms and cities, naturally occurring from 300-1400m of altitude within central South America, from northern Argentina across Paraguay, Bolivia and reaching the Brazilian northeast through the Cerrado biome (Ridgely et al., 2015; IUCN, 2017; HBW, 2017). Its feeding habits consist on fruits, flowers and seeds (Gwynne et al., 2010; Paranhos, Araújo & Machado, 2007) and it is considered as least concern regarding its conservation status (International Union for Conservation of Nature, 2017).

Monogamy is the most common mating system found on parrots, with only a few exceptions, in which extra pair mating is documented (Juniper & Parr, 1998; Ekstrom et al., 2007; Spoon et al., 2007). It is known that the Yellow-chevroned Parakeet nests on rocky cliffs, ravine cavities, arboreal termite mounds and arboreal cavities (Sigrist, 2014; The Cornell Lab of Ornithology, 2017) and may also use abandoned nests of Furnariidae birds (T. Pires, 2013). The breeding season for the species extends from May to September, when the female lays five white eggs, which incubate in 26 days, and the young leave the nest after eight weeks (Handbook of the Birds of the World, 2017, Wikiaves, 2017). However, even though the reproductive habits of the species are well known, there are no observations of the mating display, which is described here.

METHODOLOGY

On 07:37h AM of 09 September 2017 a couple of Yellow-chevroned Parake-

et was visualized landing on top of a Silk Floss Tree (*Ceiba speciosa* A.St.-Hil, Malvaceae) on the Triple Frontier Mark of the city of Puerto Iguazú, Misiones, Argentina (25°35'40.61"S; 54°35'01.51"W). The photographs were made with camera Canon Eos Rebel T5i, while a video of the mating display was made by using a Nikon CoolPix p 510 camera. We used the video to generate an ethogram based on the time (in seconds) the birds spent in each specific mating behavior.

RESULTS

The couple landed separately on the top of the tree, first the female that was followed by the male. The male began to approach the female promptly, initializing courtship behavior by bending his body, lowering his head, and dragging his beak along the branch while walking towards the female, which at first refused him and moved away a few centimeters. After performing this display for about 20 seconds, the female allowed him to get close. At this point, the male started to feed her by regurgitating inside her beak after the characteristic peristaltic and mechanical movements of the body. Each feeding act lasted around 5 seconds and was repeated right after the previous one ended, on a total of seven repetitions. There was no refusal by the female.

On the seventh and last feeding act, the male began copulation, placing his right foot on the female's back and keeping the left feet on the branch, rubbing his cloaca on hers (Figure 1). Copulation lasted 77 seconds, and the male performed 72 back-and-forward movements above the female. During copulation, the female searched for more food on the male's beak for five times, each attempt lasting around 2 seconds (Figure 2). The male did not reciprocate with more food. Right after the copulation act finished, the female moved away from the male by walking



Figure 1. Couple of Yellow-chevroned Parakeet, female to the left and male to the right executing A) courtship, B) male feeding female before copulation, C) copulation and D) female reaching the male in search for food during copulation. Author: Andriola, J.V.P. 2017.

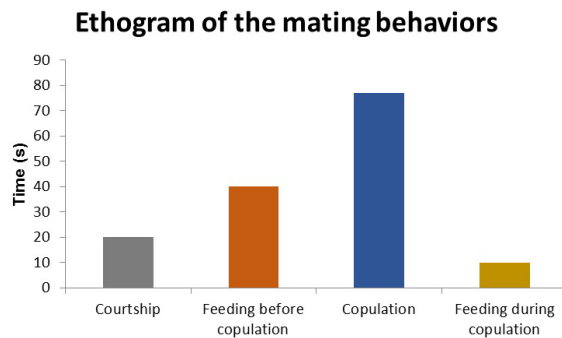


Figure 2. Ethogram of the mating behaviors in chronological order highlighting the time spent on each by the couple.

alongside the branch, scratched herself and searched for Silk Floss Tree’s fruits for feeding. The male remained still for a few seconds and soon started to clean his feathers. After a while, the female flew away and was followed right after by the male.

DISCUSSION

Similar courtship and copulation behaviors can be observed in other species of parrots, such as the Peach-fronted Parakeet (*Eupsittula aurea* Gmelin, 1788) or the Golden Parakeet (*Guaruba guarouba* Gmelin, 1788), even though the duration and sequence of the behaviors are different. Female resistance to the male approach at the beginning of the courtship and the male feeding the female can also be observed for the Peach-fronted Parakeet. Based on our observation, however, the feeding act occurs at different moments: before the copulation on this register for the Yellow-chevroned Parakeet and after the copulation for the Peach-fronted Parakeet. Also, there was seen a difference on the copulation duration, being of only a few

seconds for the Peach-fronted Parakeet and more than one minute for the Yellow-chevroned Parakeet (Paranhos, Araújo & Machado, 2008). For the Golden Parakeet, copulation time also differs, extending over two minutes after the couple mutually takes care of each other's feathers (Silveira & Belmonte, 2005). However, based on only a single observation, it is not possible that the order and duration of the breeding behaviors evaluated here are representative of a pattern for the species, for which further observations are necessary.

Data on Neotropical birds' mating biology are scarce (Stutchbury & Morton, 2001), even though it may be important for evolutionary and behavioral investigations, as well as for taking conservative actions, making it possible to verify the breeding behaviors in both *in situ* and *ex situ* conservation (Boyce, 1992; Reed, Elphick & Oring, 1998). Parrots are one of the most traded groups of animals in the world, and many species are threatened while many others might become threatened if the trade ratio continues to increase (S. F. Pires, 2012). Because it is possible that this parakeet may face future threats of extinction, such as the increase of the illegal trade and habitat loss, knowing such mating aspect of this species' sexual behavior in advance may help on *ex situ* breeding, for example, by adapting pairs of Yellow-chevroned Parakeet that do not show matching behaviors in captivity, and *in situ* conservation, by observing the behavior of wild individuals of a population and verifying the occurrence and frequency of breeding behaviors.

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