

BREEDING BIOLOGY OF THE KING VULTURE (*SARCORAMPHUS PAPA*) IN SOUTHEASTERN BRAZIL

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Resumo. – **Biologia reprodutiva de Urubu Rei (*Sarcoramphus papa*) no sudeste do Brasil.** – Este artigo apresenta dados sobre a biologia reprodutiva do Urubu Rei (*Sarcoramphus papa*) em uma reserva particular da Fazenda Cauaia situada no município de Matozinhos-MG. O estudo foi desenvolvido entre Outubro de 2001 a Abril de 2003. A incubação ocorreu em Outubro ao final de Novembro de 2001 e o desenvolvimento do ninhego entre Novembro de 2001 a Abril de 2002. O ninho foi descoberto em 27 de Outubro de 2001, em um penhasco de formação rochosa de 70 m, quando um adulto saiu voando de uma fenda situada a 44 m do solo. O ovo era branco medindo 95.6 mm x 63.6 mm. O ninhego abandonou o ninho com aproximadamente 130 dias após o nascimento. Foram encontrados no ninho oito pedaços de ossos de dedos de bezerras (*Carpicus unaris*).

Abstract. – We studied nesting King Vultures (*Sarcoramphus papa*) between October 2001 and April 2003. The study was accomplished at a private reserve belonging to CAUAIA' s farm, situated in Matozinhos, Minas Gerais, inside of APA CARSTE environmental protection area of Lagoa Santa, Minas Gerais. Incubation occurred in October and November 2001, and the development of the nestling lasted from late November 2001 to early in April 2002. The nest was located in a fissure 44 m above ground of a 70 m calcareous quarry. A single egg was found in the nest: it was white and measured 95.6 mm x 63.6 mm. The nestling left the nest 130 days after hatching. We collected eight pieces of finger bones of young oxen (*Carpicus unaris*). *Accepted 30 October 2003.*

Key words: *Sarcoramphus papa*, Cathartidae, cerrado, egg, nest, nestling, reproduction, King Vulture, southeastern Brazil.

INTRODUCTION

The reproductive ecology of tropical new world vultures is little known. Among the five species that occur in Brazil, the nest of two of them, Lesser Yellow-headed Vulture (*Cathartes burrovianus*) and Greater Yellow-headed Vulture (*Cathartes melambrotus*), remains undescribed, and a bare minimum is known for the third one. A few observations on the nesting of the King Vulture (*Sarcoramphus papa*) have been made in Venezuela (Ramo & Busto 1988). This vulture inhabits Neotropi-

cal forests and open pasture, and occurs from Mexico to northern Argentina and all over Brazil (del Hoyo *et. al.* 1994). The present study provides additional information on the nest, egg, nestling development, and behavior.

METHODS

The study was conducted in a private reserve belonging to an agricultural concern (CAUAIA), measuring approximately 900 ha, and situated in the city of Matozinhos, Minas



FIG. 1. Limestone cliff, in a crevice of which, the King Vulture nest was located (indicated by an arrow)
Photo: Eduardo Pio Carvalho.

Gerais. This reserve is part of the environmental protection area of APA CARSTE in Lagoa Santa, Minas Gerais, at 19°28'S, 44°02'W. The climate is predominantly savannah-like with dry winter. The average annual rainfall is 1328.7 mm, and the mean annual temperature ranges from a minimum of 15.6°C to a maximum of 28.2°C. The altitude of the site varies between 600 and 650 m. The region studied is characterized by "cársticas" formations, outcrops of limestone and vegetation predominantly of the open pasture, ranging from closed field to open pasture with "capoeira" and deciduous bushes. The area holds a forest area of approximately 500 ha, deciduous and semi-deciduous bushes, and also areas of grass and diverse plantations.

Beginning in July 2000, we made a qualita-

tive survey of raptor species of the region, and searched for nests with the aid of 10 x 25 and 8 x 40 binoculars. Observations were noted while traveling throughout the reserve, totaling 90 ha of fieldwork. We discovered the nest on 21 October 2001 in the Cauaia Farm, in a crevice of a 70 m high limestone wall (Fig. 1), while surveying raptors in the area. However, we were on the ground, next to the cliff, and first checked the nest only on 27 October. The nest was examined weekly during the first month and biweekly until the young left the nest. The egg and nestling were photographed using a Canon-A2E camera with 28–80 mm and 200–400 mm lenses. A 1.5 m³ blind was made of green cloth for observing and photographing the nest. A 100 m rope and climbing equipment were used to descend to the nest.



FIG. 2. King Vulture egg on the ground in the crevice. The substrate is made of sticks, pebbles, and feathers. Photo: Eduardo Pio Carvalho.

The height of the nest was measured from the ground using a rope. The egg was measured using calipers to the nearest 0.05 mm, and weighed with a Pesola 300-g scale.

RESULTS AND DISCUSSION

Threatened by our approach when we first examined the nest, one of the adults flew from the crevice. On the same wall was a nesting pair of American Kestrels (*Falco sparverius*), and a pair of Black Vultures (*Coragyps atratus*). We observed no interactions among these different species. We found one single egg on the ground, along with some sticks, pebbles and feathers (Fig. 2). The egg was white and measured 95.6 x 63.6 mm. On 10

November, the egg weighed 191 g. The incubation period of King Vultures in captivity varies from 56 to 58 days (Brown & Amadon 1968). King Vulture nests were described in Panama and Venezuela, also with one egg (Smith 1970, Ramo 1988), and Ruschi (1979) described one nest on the ground with two eggs. The development of the nestling (weight, total length and wing span) was followed according to dates listed in Table 1. The nestling hatched during the morning of 23 November and measured 13.9 cm in total length. The adults were uneasy and both continued entering and leaving the nest while we were descending to it. The nestling kept its eyes closed and its body was covered with soft white down, except for the feet and the head.

TABLE 1. Informations on nestling's development of a King Vulture nestling.

Date	Days after hatching	Total length (cm) (From beak to tail feathers)	Wingspan (cm)	Weight (g)	Observations
23/11/2001	Some hours	13.9	—	—	Nestling few hours after hatching
08/12/2001	15	31.5	27	650	
15/12/2001	22	33	40	1000	
26/12/2001	33	41	54	1350	
05/01/2002	43	50	64	1960	The primary remiges had 1 cm of length
21/01/2002	59	53	94	2420	Rectrices quills started to appear
16/02/2002	85	60.5	134	3090	
13/03/2002	110	72.7	160	3490	Nestling well developed, few days to leave the nest
08/04/2002	136	—	—	—	The nestling was not in the nest anymore

These non-covered parts were pink except for the surrounding region of the eyes which was dark (Fig. 3). After 22 days, the nestling had doubled in length to 33 cm, and its weight reached 1000 g. The down-remains were white in color, with the head and throat black

(Fig. 4). This coloration remained until the feathers appeared. The nestling demonstrated an intense stress in our presence, emitting croaking sounds with regurgitating motions, lowering the head close to the feet, suggesting that such a posture is adopted in the case of



FIG. 3. Nestling shortly after hatching, on 23 November. Photo: Giancarlo Zorzin.



FIG. 4. The nestling on 15 December, 22 days after hatching, and prior to fledging. Photo: Eduardo Pio Carvalho.

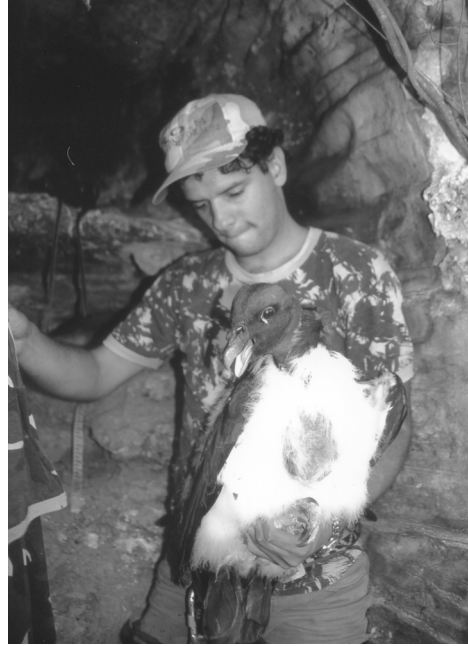


FIG. 5. The nestling on 13 March 2002. Photo: Giancarlo Zorzin.

some threat. This behavior was also observed in a nestling found in a rotten stump in Venezuela (Ramo & Busto 1988). After one month of life, the nestling demonstrated an aggressive behavior, trying to intimidate us by stamping its feet on the ground and attacked with the beak. The feathers of the wings began to emerge after 41 days, and then those of the tail, and afterwards the body contours. On 13 March 2002, it was well developed and still more aggressive, weighing more than 3 kg, and was difficult to handle (Fig. 5). The bird abandoned the nest at approximately 130 days after hatching. At this time, the covering feathers were dark gray, but the chest and abdomen were not fully covered with feathers, as observed by Ramo & Busto (1988), and the flight feathers were of a uniform black. Eight pieces of finger bones of young oxen (*Carpicus unaris*) were found in the nest.

The adults were observed eight times, during 14 visits to the nest. The first three observations were during the incubation period. During the fourth observation, the parents showed some signs of stress, most probably because the nestling had just hatched. At other times, only one adult was observed next to the nest, always in the morning, at about 10:00 o'clock. Its presence was not registered during our afternoon visits, suggesting that adult attendance at the nest was most frequent during the morning. Adults were observed feeding on oxen carcasses. On 12 October 2002, we observed a juvenile King Vulture on a tree closed to the nest area. Its plumage was whole black and it was accompanied by an adult, suggesting that breeding occurs every two years.

Detailed research on the breeding biology of this species is fundamental for a better understanding of its population dynamics.

High cliffs are of vital importance for the conservation of King Vultures and many other raptor species, thus any mining activity in these formations should be done with caution, or stopped during breeding season.

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