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Observations of Nesting Gray-headed Kites (*Leptodon cayanensis*) in Southeastern Brazil

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The Gray-headed Kite (*Leptodon cayanensis*) occurs in lowland tropical forests from the Amazon region, west to Ecuador, north to the Guianas and Trinidad, and southern Tamaulipas and Oaxaca, Mexico (del Hoyo et. al 1994). This raptor is characterized by a gray head, blackish back, white chest and legs. It ranges in length from 46–54 cm, and has a mass between 416–643 g (Brown and Amadon 1989, Thorstrom 1997). Current knowledge about this species is mostly anecdotal, with the exception of a description of nests and behavior in Guatemala (Thorstrom 1997). We studied this species in southeastern Brazil, where in Brazil, Gray-headed Kites were probably restricted to the Amazon basin (Sick 1997). In this paper, we present new information on the eggs, nests, nesting behavior, and diet of the Gray-headed Kite.

Study Area and Methods

We collected data from July 1999–September 2001 in two different areas and cover types. The first study site (19°21′S, 44°12′W) was in the municipality of Sete Lagoas, ca. 60 km north of Belo Horizonte. The mean annual rainfall is 1328.7 mm, and the mean annual temperature ranges from 15.6–28.2°C. The altitude of the site varies between 700–900 m. This area is characterized by pasture containing some small forest fragments. Almost all the forest habitat of this region has been converted to pastures. The second site (20°02′S, 43°59′W) was located in Belo Horizonte, in a protected area called APE (environmental protection area), located in the Barreiro district, which belongs to the sanitation company of Minas Gerais (COPASA-MG). The mean annual rainfall is 1300 mm, and the mean annual temperature ranges from 18–24°C. The altitude of the site varies between 850–950 m. The cover type at this site consists of a Cerrado complex and riparian forests. The composition of a Cerrado biome consists of species such as cagaita tree (*Eugenia dysenterica*), pequi tree (*Caryocar brasiliense*), ipe tree (*Tabebuia ochracea*), macaw palm (*Acrocomia aculeate*), and araticum tree (*Annona crassiflora*; Lins and Mendonca 2000)

In both areas, we searched for all nesting raptors, especially, in forested areas. We observed the three Gray-headed Kite nests that we found as frequently as possible from July 1999–September 2001. Observations were made using 10× binoculars at distances of 15 m. An observation blind was constructed in a tree up slope of each nest. We measured nest dimensions with a tape measure, and nest heights using a direct line above the ground We measured eggs with calipers, to the nearest 0.1 mm

During 130 hr of observation, we noted adult behavior at and near nests, and recorded prey deliveries. Nestlings were marked with aluminum bands. We could not distinguish between the adults on most of the occasions when they visited the nests.

Results

We located two nests in 1999 and one in 2001 in two different territories.

Nest 1. On 12 September 1999, we observed a Gray-headed Kite building a nest 15 m up in a Copaíba tree (*Copaifera langsdorffii*) that was 16.5 m tall and 155 cm in diameter breast height (DBH). The nest was 52 m from an occupied Rufous-thighed Hawk (*Accipiter erythronemius*) nest. The habitat around this nest site consisted of Cerrado complex. On our next visit (29 September), an adult kite was observed incubating. We climbed the nest tree and observed two eggs. The eggs had many conspicuous dark-brown spots, with a greater concentration of spotting near the base and fading toward the narrow end The eggs measured 50.7 × 40.8 mm and 52.1 × 40.7 mm (Fig. 1). The nest was made of small-diameter twigs and measured 39 × 39 cm across, and was 13.9 cm in depth. The nest cup measured 21 × 22 cm and was 7.5 cm deep On 17 October the first young hatched. It was covered with fluffy white down and had a yellow cere and tarsi, black beak, and a black supraocular stripe. On 14 November 1999, nearly one month after hatching, the nestling's body was covered with white downy feathers and its wing and tail feathers were starting to emerge from the blood sheaths. The cere and feet were brighter yellow than when the chick was younger; the young was banded during this visit. From the tree blind, we observed adult kites delivering small, dark-colored snakes ($N = 6$ snakes) in their talons to feed the nestling. The nestling swallowed the snakes whole, making identification difficult. Total observation time at this nest was 56 hr. In this nest, 2 young hatched, but only one fledged.

Nest 2. On 14 October 1999, we discovered a second nest, with an adult incubating. This nest was composed of small sticks, 16.5 m above ground in a 17.5 m high in a Brazilian cherry (*Peltogyne confertiflora*) 140 cm in DBH.

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Figure 1. Egg and nest of Gray-headed Kites, in Minas Gerais, Brazil. Photo by Gustavo Diniz M. Carvalho.

The nest was 79 m from an occupied Bicolored Hawk (*Accipiter bicolor*) nest. On 19 October, we visited the nest and observed two heavily brown-spotted eggs similar to those at the first nest. We could not reach the nest, and therefore, no measurements were taken. On 4 November, the pair was still incubating when we visited this site. On 15 November we made another visit to this nest, and found the nest empty and abandoned. The cause of failure may have been a severe rainstorm that moved through the area several days earlier. Total observation time at this nest was 20 hr.

Nest 3. On 2 October 2001, we observed a pair of kites on a nest in the same crotch of the same tree where the first nest was located on 12 September 1999 (nest 1). The nest was 63 m from an occupied Rufous-thighed Hawk nest. The nest was constructed with new sticks and measured 40 × 40 cm in diameter and 13.8 cm in depth. The nest cup was 22 × 21 cm and 8 cm deep. The nest held two heavily brown-spotted eggs, which measured 52.0 × 40.7 mm and 51.1 × 40.8 mm. We returned on 2 November, when we found two small nestlings, one of them visibly larger than its sibling. They were brown and covered by white down, and their feet and cere were dark yellow with a black supraocular stripe. On 25 November, we again visited the nest and found only one nestling. Its head and back were a mixture of dark gray and black plumage and its chest was white, striped with black. Its cere and feet were dark yellow. This nestling was quite aggressive and attacked us with its feet when we banded it (Fig. 2). On this date, we observed three dark-colored snakes delivered to the nestling by an adult. Based on casual observations, we believe that this pair commonly hunted in the open areas of the Cerrado. The total time of nest observation was 41 hr.

DISCUSSION

At the three Gray-headed Kite nests that we observed in southeastern Brazil, the breeding season began in September with nest construction, incubation began by early to mid October, and young fledged in late November and December. Each of three nests held a two-egg clutch. A one-egg clutch was reported by Thorstrom (1997) in Guatemala, and two and three eggs were reported for two nests of this species by del Hoyo et al. (1994). However, the three-egg clutch reported by del Hoyo et al. (1994) apparently was erroneous. The original data slips for these three eggs were obtained and examined by D. Whitacre (pers. comm.) and these clearly describe three single-egg clutches. Gray-headed Kites appear to lay a one- to two-egg clutch. Our eggs averaged 51.5 × 40.8 mm, slightly smaller than the 54.8 × 42.1 mm egg reported from Guatemala (Thorstrom 1997). The smaller egg sizes we found in Brazil may be related to the cost of laying a two-egg versus a one-egg clutch in Guatemala.

Figure 2. The fledgling Gray-headed Kite at nest 3 in (Belo Horizonte) Sete Lagoas-MG, Brazil. Photo by Eduardo Pio Carvalho.

All nests were composed of small dry sticks, and were flimsily constructed in the crotch near the end of a small-diameter branch. The three Brazilian nests, averaged 39.5 × 39.5 cm and the nest cups averaged 21.5 × 22.5 cm and with a depth of 7.8 cm, similar in size to the nest described in Guatemala (Thorstrom 1997).

Young Gray-headed Kites fledged with dark pupils, dark gray and black feathers on the head and back, a white chest with vertical dark-brown streaks, white tarsal feathering, and dark-yellow cere and feet. Also, there may be variations of the immature plumage (Foster 1971) that we are not able to describe.

Gray-headed Kites are reported to feed on many different insects, with a fondness for wasp larvae (Hymenoptera; Haverschmidt 1962, Brown and Amadon 1989), and stomach contents have included remnants of a frog and a bird's egg (Haverschmidt 1962). The only prey items we observed Gray-headed Kites delivering to nests were nine snakes. Based on the strong odor of two captured adults, Thorstrom (1997) speculated that these kites may feed upon snakes. There has also been a report of a feeding association between Gray-headed Kites and buffy-headed marmosets (*Callithrix flaviceps*; Ferrari 1990).

We observed that all three nests were located near to occupied *Accipiter* nests. Thorstrom et al. (in press) also observed one nest of the Gray-headed Kite 50 m from an occupied Bicolored Hawk (*Accipiter bicolor*) nest in Guatemala.

The Gray-headed Kite is an uncommon species in the Sete Lagoas area, perhaps due to deforestation. Conservation of the remaining forest fragments is likely important for preserving this and other species dependent on these woodlands for nesting.

OBSERVACIONES SOBRE LA NIDIFICACIÓN DE *LEPTODON CAYANENSIS* EN EL SUDESTE DE BRAZIL

RESUMEN.—Estudiamos individuos de la especie *Leptodon cayanensis* que se encontraban nidificando entre julio de 1999 y septiembre de 2001. Las observaciones se realizaron en dos sitios con diferentes tipos de cobertura: una pradera con parches remanentes de bosque y un bosque ribereño. La construcción de los nidos comenzó en septiembre, la incubación ocurrió en septiembre y octubre,

y los polluelos salieron de los nidos entre noviembre y diciembre. Los nidos fueron de construcción endeble y constituidos por ramas secas y se situaron en las bifurcaciones de las ramas de árboles a una altura promedio de 15 m sobre el suelo ($N = 3$). Las dimensiones promedio de los nidos fueron 39.5 × 39.5 cm y 13.9 cm de profundidad exterior, con una copa de 21.5 × 22.5 cm y 7 8 cm de profundidad. El tamaño modal de la nidada fue dos ($N = 3$ nidos). Los huevos presentaron manchas de color café con marcas más fuertes en la base ($N = 6$ huevos) y tuvieron un tamaño promedio de 51.5 × 40.8 mm ($N = 4$). Los polluelos eclosionaron de forma asincrónica. En total, de tres intentos de nidificación, dos polluelos emplumaron exitosamente, lo que representa un éxito de nidificación del 66.6%. Todas las presas llevadas a los polluelos en el nido fueron serpientes ($N = 9$).

[Traducción del equipo editorial]

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COOPERATIVE NESTING BY A TRIO OF BOOTED EAGLES (*HIERAAETUS PENNATUS*)

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KEY WORDS: *Booted Eagle*; Hieraaetus pennatus; *cooperative breeding*; *polygamy*; *polygyny*; *trio.*

Although monogamy is the most common mating system among raptors, alternative systems like polygyny, polyandry, and cooperative breeding have been recorded in several species (Newton 1979, Korpimäki 1988, Stacey and Koening 1990). A recent review on the topic showed that this was a frequent phenomenon in well-studied species and that the mating system was probably not determined in many other species because of the difficulty in making appropriate observations and given the fact that many raptors have not been well studied (Kimball et al. 2003). Cooperative breeding has been observed among 3% of bird species, including at least 42 diurnal raptors (Brown 1987, Kimball et al. 2003).

Here, we report a case of cooperative nesting by a trio in an intensively-monitored breeding population (21–29 pairs) of Booted Eagles (*Hieraaetus pennatus*) in south-

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