



## Scientific Note

# Diet of a Maguari Stork (*Ciconia maguari*, Aves, Ciconiidae) in southern Brazil: the opportunist predation of snake like preys?

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**Abstract.** Here we present the first record of the diet of the Maguari Stork (*Ciconia maguari*) in a Brazilian wetland obtained from stomach contents of an adult male. Amphisbaenians (*Amphisbaena trachura*) accounted for more than half of the total volume of prey suggesting the importance of elongate preys.

**Key words:** Feeding, wetland, predation, snakes, Brazil

**Resumo.** Dieta do João-grande (*Ciconia maguari*, Aves, Ciconiidae) no extremo sul brasileiro: uma predação oportunista de presas serpentiformes? Apresentamos o primeiro registro da dieta de *Ciconia maguari*, obtido em banhados brasileiros pela análise do conteúdo estomacal de um exemplar adulto. Anfisbenas (*Amphisbaena trachura*) representaram mais que a metade do volume total de presas, sugerindo a importância de presas alongadas.

**Palavras chave:** Alimentação, banhados, serpentes, Brasil

The Maguari Stork (*Ciconia maguari*) is a large bird of the Ciconiidae family. Its South American distribution ranges from east Andes to the Atlantic Ocean coast, and latitudinally from Venezuela to Argentina (Sick 1997). This species occurs in a wide variety of freshwater wetlands, including swamps, grasslands with ponds, and flooded pastures (Sick 1997). Scant information is available about the biology of the Maguari Stork (González 1996, 1998, Oliveira 2006) and the few records on its diet indicate that it feeds mainly on aquatic preys including invertebrates, small mammals, frogs and fishes (Thomas 1984, 1986). Despite not being a threatened species, current

impacts on wetlands reinforce the importance of compiling basic ecological data (Grim 2006). Here we present the first record of the diet of *C. maguari* in a Brazilian wetland based on the analysis of stomach contents of an adult.

On 29 August 1998 at 16:00 h an individual of *Ciconia maguari* recently hit by a car was found dead on a highway adjacent to a wetland in Capão Seco, municipality of Rio Grande, (31°50'18"S, 52°19'74"W) in southern Brazil. The stork was an adult male with body mass of 4200 g and 1285 cm of total length. Stomach contents were analyzed in laboratory and the food items measured (body mass, length and volume) and identified to the species

level when possible. Invertebrates (N = 4), amphisbaenians (N = 20), snakes (N = 5), one fish, and one frog were found (Table I). The total volume of prey was 0.867 l (= 613.35 g; Table I). Amphisbaenians accounted for more than half of the total volume (Table I) and were also the most frequent food item (N = 20), followed by snakes (N = 5; Tables I and II). The volume of the latter was

the same as that of fish only (Table I). The visible injuries on preys corresponded to the marks caused by the pressure of the beak during handling, which apparently were not lethal. Only amphisbaenians showed puncture marks. Six of the 31 items were in advanced stage of digestion suggesting a time interval between the consumption of these and other items (Table II).

**Table I** – Prey categories found in the stomach of a *Ciconia maguari* and their corresponding mass and volume. Invertebrates were composed by one Giant Water Bug (*Belostoma sp.*, Hemiptera: Belostomatidae), two Mole Crickets (*Scapteriscus abbreviatus*, Orthoptera: Gryllotalpidae) and one unidentified Centipede (Chilopoda).

Prey categories	Number of items	Volume (ml)	Mass (g)	Relative volume	Relative mass
Invertebrates	4	2	1.20	<0.002	0.002
Fishes	1	200	150.80	0.23	0.25
Amphisbaenians	20	450	305.40	0.52	0.50
Snakes	5	200	146.65	0.23	0.24
Anurans	1	8	8.30	0.01	0.01
Total	31	867	612.35		

**Table II** – Information on vertebrate items identified from the stomach contents of a *Ciconia maguari*. CB = complete body; IB = incomplete body; PE = perforated by the beak; PR = pressed by the beak

Class / Order	Family / Species	N	Mass (g)	Prey total length (mm)	Material found	Digestion progress	External lesion
Reptile / Squamata	Amphisbaenidae	20					
	<i>Amphisbaena trachura</i>		305.4	263 (median)	16 CB / 4 IB	16 poorly / 4 high	7 with PE and 13 with PR
	Dipsadidae	1					
	<i>Helicops infreniatus</i>		113.5	609	CB	poorly	PE
	<i>Liophis jaegeri</i>	1	2.5	183	CB	poorly	PE
	<i>Liophis poecilogyrus</i>	1	7.4	229	CB	poorly	PE
	<i>Philodryas patagoniensis</i>	1	17.15	540	CB	highly	none
Actinopterygii/ Characiformes	Unidentifiable snake	1	6.1	175	IB	highly	none
	Curimatidae	1					
	<i>Cyphocharax voga</i>		150.8	170	CB	poorly	PE
Amphibian / Anura	Leptodactylidae	1					
	<i>Leptodactylus latrans</i>		8.3	55	CB	poorly	none

Although the presence of snakes in the diet of *C. maguari* has been previously documented, the

available records describe an opportunistic behavior (Kahl 1971, Belton 1994). In addition the

opportunistic ingestion of snake-like prey by other species of *Ciconia* was previously reported (Mužinic & Rašajski 1992, Antczak *et al.* 2002). Our findings, on the other hand, reveals that snake-like prey are frequently ingested (especially amphisbaenians) in a single sample. The fossorial habits of amphisbaenians suggest that capture occurs mainly when the stork introduces its bill into the substrate during tactile foraging (Thomas 1984, Sick 1997, Oliveira 2006). This is supported by the presence of puncture marks only in this type of prey. Interestingly, studies in the same area where the stork was collected show that amphisbaenians account for less than 2% of captures (by visual search and pitfall traps) of reptiles and less than 0.0001% of captures of anurans (A. M. Tozetti unpub. data.). The frequency of fish in the stomach analyzed was also low, although their abundance in local water bodies was high (pers. obs.). Thus, despite the sample limitations, our data suggest that amphisbaenians are predated at a higher rate than expected based on random encounters. The intake of preys with elongated bodies might be advantageous, as they occupy a relatively smaller volume in the stomach. The voucher specimens were deposited at the *Museu de Ciências e Tecnologia da PUCRS* and the following numbers are: MCP 171 (*Ciconia maguari*); MCP 18875 - 18800 (*A. trachura*); MCP 18802 (*H. infrataeniatus*); MCP 18803 (*L. poecilogyrus*); MCP 45679 (*C. voga*).

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