A reliable customer: hunting site fidelity by an actively foraging neotropical colubrid snake

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ABSTRACT – Snakes are known to employ two major hunting strategies, ambush or wide foraging. Whatever the strategy a snake supposedly chooses potentially profitable hunting grounds. Whereas hunting site fidelity is recorded for a few ambushing species, there seems to be no records available for such fidelity for a widely foraging snake. We report on hunting site fidelity by the Eastern green whiptail (*Philodryas olfersii*), a widely foraging colubrid, in southeast Brazil.

SNAKES employ two major hunting strategies; ambush or sit-and-wait, and active or wide foraging (see Reinert *et al*., 1984; Mushinski, 1987). An ambushing snake waits for its prey in a previously chosen site (e.g., Reinert *et al.*, 1984), whereas an actively foraging snake searches for its prey in a wider area (e.g., Marques & Souza, 1993; Marques & Sazima, 2004). In both strategies the snakes supposedly choose potentially profitable hunting grounds (e.g., Reinert *et al*., 1984; Strüssmann & Sazima 1990; Marques & Souza 1993; and Hartmann *et al*., 2003). Whereas hunting site fidelity is recorded for a few ambushing species, mostly viperids (e.g., Reinert, *et al*., 1984; Hartmann *et al*., 2003) no record seems available for hunting site fidelity by a widely foraging snake. Here we report on hunting site fidelity by a widely foraging xenodontine colubrid, the Eastern green whiptail (*Philodryas olfersii*), in southeast Brazil. This species is a diet generalist, preying on several vertebrate types including birds (Hartmann & Marques, 2005).

We recorded an adult *P. olfersii* (total length *ca.* 120 cm) visiting, and successfully foraging on, a small tree for a span of *ca.* two months (January–March 2006). The snake was recognized by irregularities on two ventral scales and a light fleck on the belly. The tree, *ca.* 3 m high, was in a garden in the suburban area of Campinas (22°49'35"S, 47°04'16"W), São Paulo, southeast Brasil. It bore small berries and had a bird feeder regularly supplied with peeled bananas, both fruits sought by several perching bird species throughout the daytime.

This snake was sighted three times on the tree for a span of 54 days, each time securing an adult or a fully grown juvenile bird prey (Table 1) swallowed headfirst (Figure 1). In two hunting episodes one or both of the wings of the caught bird locked within the snake's jaws, rendering the prey difficult to swallow. When this happened the snake moved backwards, dragging the prey over the branches.

Each time the snake secured a prey, several bird species (including conspecifics of the prey) gathered around and mobbed the predator. The loudest and most actively mobbing one was the Chalk-browed mockingbird (*Mimus saturninus*) (Figure 2) but the alarm calls of the fruit-eating birds also attracted the attention of some bird species that do not fed on the fruits, such as the Rufous hornero (*Furnarius rufus*) and the Rufous-

DATE (2006)	TIME OF SIGHTING	BIRD SPECIES
22nd January	~10:00 h	*Passer domesticus* (House sparrow)
31st January	~11:30 h	*Coereba flaveola* (Bananaquit)
16th March	~11:15 h	*Thraupis sayaca* (Sayaca tanager)

Table 1. Hunting periods and bird prey of an Eastern green whiptail (*Philodryas olfersii*) in three visits made to the same tree in a garden in southeast Brazil.

collared sparrow (*Zonotrichia capensis*), which also mobbed the snake. In the first preying episode, the snake was mobbed by *ca.* 20 individuals of eight bird species. Mobbing is a type of harassing behaviour employed by birds in the presence of potential predators including snakes (McFarland, 1981; Sick, 1997).

Philodryas olfersii is regarded as a semi-arboreal snake, foraging both on vegetation and on the ground, which feeds on a variety of prey types (Sazima & Haddad, 1992; Hartmann & Marques, 2005). Birds were the third most important dietary item, preceded by frogs and mammals, in the most complete study on this snake species in southern Brazil (Hartmann & Marques, 2005). However, most of the bird prey of *P. olfersii* reported by Hartmann & Marques (2005) were nestlings. Additionally, several other Neotropical species of colubrid snakes are known to prey mostly, if not only, on nestlings (Marques & Sazima, 2004; our pers. obs.). The venom toxicity of *P. olfersii* (Assakura *et al*., 1992) likely favours capture of adult or fully grown juvenile birds and allows some snakes to specialize on this particular prey over a given time period. Birds were found in the dietary study of this species mostly in the austral spring/summer (Hartmann & Marques, 2005), which is consistent with our report.

The hunting site fidelity demonstrated by the individual of *P. olfersii* reported here indicates that some species of actively searching snakes are able to revisit a successful hunting spot (likely by learning processes) for a span of at least two months. Additional field records will probably disclose further instances of hunting site fidelity for snakes with diverse dietary types and belonging in different phylogenetic groups. Potential candidates are species of the genus *Chironius* (Colubrinae) known to inspect bromeliads while foraging for frogs (Carvalho-Silva & Fernandes, 1994; Marques & Sazima, 2004), and fish predators such as species of the genus *Helicops* (Xenodontinae, Hydropsini) recorded to hunt on particular spots in some streamlets in the Pantanal, western Brazil (IS, pers. obs.) or *Liophis miliaris* (Xenodontinae, Xenodontini) reported to forage in marine tidal pools by the Atlantic forest, southeast Brazil (Marques & Souza, 1993).

Figure 1. An adult Eastern green whiptail (*Philodryas olfersii*) at the beginning of swallowing a female House sparrow (*Passer domesticus*) caught on a particular tree in a garden in southeast Brazil (top). The same snake at the end of swallowing a fully grown juvenile Bananaquit (*Coereba flaveola*) caught on the same tree nine days later (bottom). © I. Sazima.

Note added in proof – the same snake was sighted again on the same tree referred to in the text, on 30th December 2006 at ~11:30 h (thus, about nine months and two weeks after its last sighting). The snake was mobbed by a family group of Chalk-browed mockingbirds (*Mimus saturninus*) feeding on fruits, and missed a strike at one of the birds. It then left the tree and found an adult Eared dove (*Zenaida auriculata*) sitting in an empty nest in a wall. The snake missed again a strike at the bird, which it tried to grab from behind the tail (the nest was above the foraging snake). It is noteworthy that the snake attacked two bird species considerably larger (21 and 26 cm, 60 and 70 g) than its largest previous prey (17 cm, 40 g). The large size was likely the main cause of the snake's

Figure 2. A mobbing Chalk-browed mockingbird (*Mimus saturninus*) perched above an Eastern green whiptail (*Philodryas olfersii*) that caught a House sparrow (not visible in photograph). © I. Sazima.

two failed preying attempts. Two weeks latter (14th January 2007 at 13:10 h), the snake was recorded on the same tree and again was thoroughly mobbed by a group of mockingbirds and Bananaquits (*Coereba flaveola*). The snake left the tree and returned to it four times in a period of about 90 min, but secured no prey. During the time the snake searched for prey on the branches no bird fed on the fruits, likely alerted by the mobbing group. As the fruiting tree was used by the same mockingbird group for two consecutive years, the birds possibly developed a searching image of the snake and hampered its preying attempts on that particular tree.

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