

A bird assemblage mobs an adult pitviper in southeastern Brazil

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ABSTRACT: Birds mostly mob avian or mammalian predators, but harass snakes as well. The mobbed snakes are potential or actual bird predators, but records of birds mobbing vipers are rare. I report herein on an avian assemblage mobbing an adult Jararaca Lancehead (*Bothrops jararaca*) in the Atlantic Forest of southeastern Brazil. The bird assemblage was composed of 8 species and 11 individuals. The most insistent mobber was a Golden-crowned Warbler. Two bird species dived at close range of the moving pitviper: the Sayaca Tanager and the Short-crested Flycatcher, which dived at the snake 2 and 1 times respectively. The snake seemed undisturbed by the harassing birds, but stopped moving after each of the dives. The Jararaca Lancehead occasionally forage at daytime, climb on vegetation, and prey on birds. Thus, it may actually pose a predation risk to the mobbing birds when they are nesting in the vicinity or when they are much distracted while harassing.

KEY-WORDS: Anti-predator behaviour, snake-mobbing, Atlantic Forest birds.

Mobbing is a type of anti-predator behaviour displayed by potential prey animals, vertebrates from fish to birds and mammals (Curio 1978, Ostreiher 2003). While mobbing, birds and mammals utter alarm calls and approaches (sometimes charging or diving) or follow the predator from close range (Owings & Owings 1979, Ostreiher 2003). Mobbing individuals may be in danger while displaying this behaviour and several instances of actual preying on these individuals are recorded (Sordahl 1990, Corrêa & Coutinho 1997, Motta-Junior. 2007, Foerster 2008).

Mobbing by birds is directed mostly at avian raptors such as hawks, falcons, and owls [e.g. Altmann 1956, Sordahl 1990, Motta-Junior. 2007 (review for Brazil in Cunha & Fontenelle 2014)]. Records of bird mobbing snakes are scarcer than those of mobbing birds of prey, and involve snakes that are potential or actual bird predators (Blem 1979, Francis *et al.* 1989, Matheus *et al.* 1996, Mercado *et al.* 2002, Sazima & Marques 2007). I found only four records of birds mobbing vipers (Mounts 1927, Buskirk 1981, Bussière & Underhill 2012, Bussière 2013), all of which prey on birds even if occasionally (e.g. Garton & Dimmick 1969, Mehrrens 1987). Herein I report on what seems to be the first record of birds mobbing a South American viper.

A bird assemblage was recorded while mobbing an adult Jararaca Lancehead (*Bothrops jararaca*) near an

abandoned building (22°26'20" S, 44°36'28" W, 1073 m above sea level) at the edge of the montane Atlantic forest in the Itatiaia range in southeastern Brazil, on 28 March 2014 at midday. Throughout the observation I used the "ad libitum" sampling method, which is adequate to record rare events (Altmann 1974). Ten digital photos of the mobbed snake and three mobber bird species are housed as vouchers in the Museu de Zoologia, Universidade Estadual de Campinas (ZUEC).

Following the insistent and noisy birdcalls broadcasted from a small group of treelets up to 3 m tall I found a mobbed Jararaca Lancehead, an adult male about 1 m total length. The snake was slowly ascending one of the treelets (Figure 1a) and attracted a varied bird assemblage composed of 8 species and 11 individuals. The most insistent mobber was a Golden-crowned Warbler (*Basileuterus culicivorus*), which closely followed the snake from a distance of about 15-20 cm (Figure 1a) hopping from one branch to another. A Ruby-crowned Tanager (*Tachyphonus coronatus*) male (Figure 1b) was the noisiest bird within the assemblage, calling persistently. The other birds mobbing the pitviper were two Sayaca Tanagers (*Tangara sayaca*), two Pallid Spinetails (*Cranioleuca pallida*), one Short-crested Flycatcher (*Myiarchus ferrox*), two Bananaquits (*Coereba flaveola*), a Violet-capped Woodnymph (*Thalurania glaucopis*) male, and a White-barred Piculet (*Picumnus cirratus*) male,

an apparently uncommon bird in mobbing assemblages (Figure 1c).

Only two bird species dived at close range (20-30 cm) of the moving pitviper: the Sayaca Tanager and the Short-crested Flycatcher, which dived at the snake 2 and 1 times respectively. The remaining birds followed the snake and uttered alarm calls or stayed silent and watched the snake's progress on the branches. The pitviper seemed undisturbed by the mobbing bird group, although it stopped tongue flicking and moving after each of the three dives. The assembled birds dispersed after the viper

moved to an adjacent treelet and from there came down and became out of sight within a bush. As the mobbing was already in course when I arrived at the scene, the total duration of the mobbing behaviour remains unknown. Eight minutes elapsed from my noticing the noisy bird assemblage to their dispersing (12:08-12:16 h). I searched the treelet where the snake was mobbed for any bird nest but found none. However, I found an occupied nest of the Sayaca Tanager on a palm about 4 m tall in the vicinity (7 m apart) of the treelets where the bird group mobbed the snake.



FIGURE 1. Birds mobbing an adult Jararaca Lancehead (*Bothrops jararaca*) male. A Golden-crowned Warbler (*Basileuterus culicivorus*) close to the head of the ascending snake (a); the noisiest mobber, a Ruby-crowned Tanager (*Tachyphonus coronatus*) male (b); a White-barred Piculet (*Picumnus cirratus*) male (c), a seemingly uncommon mobber. Photos: Ivan Szazima

The Golden-crowned Warbler and the Bananaquit, as well as several species of tanagers, tyrant-flycatchers, and hummingbirds are already recorded mobbing snakes in other Neotropical areas (Buskirk 1981, Matheus *et al.* 1996, Mercado *et al.* 2002, Sazima & Marques 2007). Indeed, Bananaquits were consistently recorded mobbing the Puerto Rican Boa (*Epicrates portoricensis*) by Mercado *et al.* (2002). Birds that forage in groups and explore varied vegetation strata, such as tanagers and Bananaquits usually do, would find and mob arboreal snakes with frequency (Buskirk 1981, Matheus *et al.* 1996, Mercado *et al.* 2002, Sazima & Marques 2007). On the other hand, only two species of woodpeckers, the Puerto Rican Woodpecker (*Melanerpes portoricensis*) and the White-barred Piculet are recorded mobbing a snake (Mercado *et al.* 2002, this paper). Apparently, woodpeckers play only occasionally the role of a snake mobber.

The Jararaca Lancehead is mostly terrestrial and nocturnal, and forages on rodents by ambush, but may forage actively at daytime, climb on vegetation, and prey occasionally on birds (Sazima 1992). Thus, the mobbed pitviper might actually pose a predation risk to the assembled birds when they are nesting in the vicinity or when they are much distracted by mobbing (Sordahl 1990, Matheus *et al.* 1996).

Field biologists and ornithologists in particular are generally aware of snakebite risks while working in the field. As all the four viper species mobbed by birds (Mounts 1927, Buskirk 1981, Bussière & Underhill 2012, Bussière 2013, this paper) are common and involved in snakebites (Greene 2007), I suggest here that paying attention to unusual movements and/or alarm calls of birds at a given site may lessen the risk of this accident type.

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