

ABSENCE OF ECTOPARASITES IN *Boa constrictor amarali* (SQUAMATA: BOIDAE) FROM ANTHROPIC ENVIRONMENTS OF THE CAPIVARI RIVER BASIN, SÃO PAULO STATE, BRAZIL

[Ausência de ectoparasitas em jibóias (*Boa constrictor amarali*) (Squamata: Boidae) de ambientes antrópicos da Bacia do Rio Capivari, estado de São Paulo, Brasil]

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Abstract - As part of the municipal Epidemiology Surveillance Program of Brazilian Spotted Fever of Monte Mor county, São Paulo state, 55 free living boas (*Boa constrictor amarali*) were captured and inspected during a 36 months period, for identification of their ectoparasitic fauna, after notification of their presence by local citizens whose found the animals at a random basis. The weight of boas ranged from 0.1 to 5.75 kg for the 29 captured males (mean 2.56 kg) and 0.1 to 6.9 kg for the 24 captured females (mean 3.49 kg). The length ranged from 0.5 to 1.95 cm for males and 0.5 to 1.85 cm for females, with averages of 1.47 and 1.45 respectively. No macroscopic ectoparasite was found on the inspected individuals. Since boas came from disturbed natural areas, it is possible that the animals are profiting from the anthropic environment, occupying an inadequate environment to maintain their natural populations of ectoparasites.

Keywords: snake, feeding habit, introduced species, ophidian, prevalence, tick.

Resumo - Como parte do programa municipal de Vigilância Zoonosária e Epidemiológica da Febre Maculosa Brasileira do município de Monte Mor, situado na região metropolitana de Campinas, estado de São Paulo, durante um período de 36 meses, foram inspecionadas 55 jibóias (*Boa constrictor amarali*) de vida livre, capturadas pelo Serviço de Controle de Zoonoses para a identificação da fauna de ectoparasitas, após a notificação de moradores da cidade que encontravam os animais ao acaso. O peso das jibóias variou de 0,1 a 5,75 kg para os 29 machos (média de 2,56 kg) e de 0,1 a 6,9 kg para as 24 fêmeas (média de 3,49 kg). O comprimento variou de 0,5 a 1,95 cm para os machos e de 0,5 a 1,85 cm para as fêmeas, com médias respectivamente de 1,47 e 1,45 para machos e fêmeas. Em nenhum dos exemplares capturados foi registrada a presença de ectoparasitas macroscópicos. Por serem provenientes de áreas naturais alteradas, é provável que as jibóias estejam se beneficiando do meio antrópico, ocupando locais inadequados para manter as populações naturais de seus ectoparasitas.

Palavras-chave: serpente, hábito alimentar, espécie introduzida, carrapato, ofídio, prevalência.

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Introduction

The parasitism by mites of the Prostigmata and Mesostigmata suborder (Order Parasitiformes) is reported for different serpent species (Jacobson, 2007). The suborder Ixodida includes ticks, which in Brazil consists of about 60 described species (Guimarães et al., 2001). Ticks are harmful to serpents as they cause wounds on the fixation site and for being vectors of pathogenic agents (Jacobson, 2007). The reports of ticks infesting boas (*Boa constrictor*) in Brazil are restricted to the ixodidae genus *Amblyomma* sp.

Amblyomma dissimile, was found infesting boas in Pará (Adis, 1975), Amapá (Schumaker & Barros, 1994) and also in United States of America in specimens imported from the Americas (Burrige & Simons, 2003). Cunha et al. (1999) refers parasitism in boas by *Amblyomma fuscum*, and also by *Amblyomma rotundatum* in the state of Pernambuco (Cunha et al., 2003), findings that were repeated by Dantas-Torres et al. (2008). Aragão (1936) and Figueiredo et al. (2010) in Maranhão state report the parasitism of *A. rotundatum* in brazilian boas. Other tick species like *A. scutatum*, *A. quadricavum* (Burrige & Simmons, 2003) and *A. argentineae* (Guglielmone et al., 2001) have been recovered from boas in other neotropical countries.

Report of parasitism by mesostigmata mite *Ophionyssus natricis* exist from boas in captivity, these being suspected of acting as a vector of the causative agent of the *Inclusion Body Disease* (IBD) of unknown etiology probably caused by a virus and that affects the mite infested *Boa constrictor* (Jacobson, 2007).

As part of the municipal Zoosanitary and Epidemiological surveillance program of the Brazilian Spotted Fever, during the period of November 2007 to October 2010, free ranging boas (*Boa constrictor amarali*) captured during routine activities of municipal zoonoses control service of Monte Mor county, state of São Paulo, were inspected to determine the prevalence of ectoparasites in this species, especially in relation to ticks.

Materials and Methods

Monte Mor is located in the micro-region of Campinas, 22°56'48" latitude south, 47°18'57" longitude west, at an altitude of 560 meters. The

climate is considered tropical altitude Cwa. The county territory is crossed by Capivari river, belonging to the hydrographic basin of Tietê River. Estimated population in the county is 48,592 inhabitants. The county area is 241 km² (IBGE, 2010) and 31.24 km² (12.96% of the municipal area) is composed by natural vegetation distributed in 131 small fragments (Candido & Nunes, 2010) and riparian forest (tropical atlantic rainforest). It shares its boundaries with cities of Campinas, Hortolândia, Santa Bárbara D'Oeste, Sumaré, Indaiatuba, Elias Fausto and Capivari, located at 122 kilometers from the city of São Paulo (Figure 1). Together with 18 other cities, it makes up the Metropolitan Region of Campinas, which has an approximate total of 3,200,000 inhabitants distributed in an area of 3,645.6 km² (IBGE, 2010).

After capture, boas were transported to the service site for clinical examination, including external visual inspection to find ectoparasites. The length, weight and sex of each specimen were recorded and they were numerically identified by incision on the caudal ventral scales. Each snake was photographed in dorsal, ventral and caudal positions, aiming individual identification. Individuals with severe lesions and with bad prognostics were euthanatized. After clinical evaluation, healthy snakes were transferred to forest areas in the outskirts of the area. Serpents found dead were weighed, measured and necropsied.

Results

During the study period, 55 boas were captured and examined (24 female, 29 male and two with undetermined gender). From these, 51 were from Monte Mor and four were from boundary areas with Hortolândia and Sumaré counties. Weight of the animals varied from 0.1 to 5.75 kg for males (Mean of 2.56 kg; SD 1,45 kg; Median 2,2 kg) and from 0.1 to 6.9 for females (Mean of 3,49 kg; SD 1,88 kg; Median 3,82 kg). According to unpaired t test mean weight of males and females did not differ significantly ($p = 0,0639$). The length varied from 0.5 to 1.95 cm for males (Mean of 144,9 cm; SD 33,5 cm; Median 146,5 cm) and 0.5 to 1.85 cm for females (Mean of 146,6 cm; SD 35 cm; Median 154 cm). According to unpaired t test, mean length of males and females did not differ significantly ($p = 0,8649$). Mean weight and length were 3.09 kg and 1.46 meters considering all captured specimens.

None of the *Boa constrictor amarali* specimens presented any macroscopic ectoparasite, including ticks, resulting in zero prevalence.

Discussion

Parasite species are part of the communities included in the ecosystems (Thomas et al., 2006). Parasite populations can benefit from the environmental changes caused by humans, increase their densities and distributions, and become harmful to man and its domestic animals. Ectoparasites can also act as vectors of pathogenic agents or cause direct harm to wild animals, impacting the preservation of species that are either rare or threatened by extinction (Nihjof et al., 2005; Tonetti et al., 2009).

In relation to ectoparasites of serpents, Dunn *apud* Guimarães et al. (2001) reports that over 60% of the ophidians captured in a forest area of Panamá were infested by *Amblyomma dissimile*. *Boa constrictor* from South America are considered often heavily infested with ticks (Chiaraviglio *apud* Reed & Rodda, 2009).

Boa constrictor amarali is found in the Southeastern region of Brazil (Reed & Rodda, 2009), which includes the region of the Capivari river basin. The absence of ectoparasites in the studied population, especially *Amblyomma* spp., is interesting because it differs from the literature reports of other Brazilian regions (Adis, 1975; Schumaker & Barros, 1994; Cunha et al., 1999; Cunha et al., 2003; Dantas-Torres et al., 2008). Such information is remarkable because of the significant sample of 55 free living animals examined, obtained from an area of approximately 240 km², during a 36 months study period.

In Monte Mor county, the tick *Amblyomma cajennense* is abundant and is found usually attached to horses, dogs and humans in immature and adult phases. Furthermore, wild animals like the opossum (*Didelphis aurita* and *Didelphis albiventris*) and the coypu (*Myocastor coypus*) have been found infested locally by immature forms of *Amblyomma* spp.. The capybara (*Hydrochaeris hydrochaeris*) was found parasitized by *Amblyomma* spp. adult specimens and the Brazilian porcupine (*Sphiggurus villosus*) infested by *Amblyomma longirostre* adult specimens in the county area (Cutolo, A.A., unpublished data). Some birds, amphibian and other reptile specimens, coming from the same

studied area, were also examined during routine work in the same period of time with no tick species found on them. Despite of that, it is important to mention that sylvatic ectoparasitic cycles may be happening unnoticed, with wild intermediate hosts harboring immature stages of ectoparasites like *Amblyomma* sp.. This situation was not identified due to the lack of a systematic evaluation on other potentially tick host species.

Most of the specimens of *Boa constrictor amarali* reported in this paper were casually found in anthropic areas by local citizens, who have immediately informed the municipal animal's collection service. These boas came from urban and/or peri urban areas, including backyards and chicken coops of houses located close to streams or swampy areas within or connected to small spots of secondary or riparian remnant Atlantic forest.

It seems that this local population of boas is benefiting from the anthropic environment, feeding over domestic or synanthropic animals. During capture or clinical examination of these reptiles seven out of 55 were observed preying or regurgitating its prey. Three boas regurgitated an opossum (*Didelphis albiventris*), two specimens preyed adult chicken (*Gallus domesticus*), one boa regurgitated a tegu lizard (*Tupinambis teguichim*) and another boa was caught in the roof of a house swallowing an adult eared dove (*Zenaida auriculata*) (Cutolo, A.A., unpublished data).

Size and weight of the captured specimens during the studied period indicates also that reproduction is taking place into or near the peri urban zones, showing that population of boas seems established in the studied area. Mean weight and length were within the range of animals sexually mature (90 to 160 cm and 0,225 to 1,75 kg for males and 120 to 230 cm and 0,8 to 5 kg for females) (Reed & Rodda, 2009), and recruitment of neonatal individuals are occurring since small specimens were captured during the observational period: four specimens out of 55 were below 100 cm length, two of these were 50 cm length and weighed 50 grams each.

Boa constrictor is considered a generalist species able to adapt to different habitats and diet. It is known to colonize islands and to remain common in human-disturbed areas, establishing more introduced populations than any other boidae species (Reed & Rodda, 2009). Well

succeed introduced populations are known from Cozumel Island since 1971 in Mexico (Martínez-Morales & Cuarón, 1999; Romero-Nájera et al., 2007) and Aruba since 1999 (Quick et al., 2005), posing a threat to potential preys, especially endemic species of mammals and birds.

There are no reports dealing with prevalence of tick's infestation in free living snakes in Brazil. Reports are limited to descriptions of scarce captured individuals, this way results obtained in the present work lack references for comparison for a better interpretation and discussion of data, reinforcing the necessity of parasite prevalence studies in free living reptiles in pristine or anthropic altered habitats.

Conclusion

The zero prevalence of ticks and other macroscopic ectoparasites in boas from the studied area may be an indication that the host population are not in equilibrium with the surrounding habitat, occupying unsuitable places to maintain the natural populations of their parasites and/or potential intermediate hosts. Follow up studies of these reptiles and local vertebrate fauna are necessary to clarify on the relationship between the hosts, its parasites and the disturbed anthropic environment they are occupying.

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