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MICROBIOTA ORAL DE THAMNODYNASTES SP (SERPENTES, DIPSADIDAE) MANTIDA EM CATIVEIRO

ORAL MICROBIOTA OF COLUBRID SNAKE *THAMNODYNASTES* SP (SERPENTES, DIPSADIDAE) IN CAPTIVITY

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RESUMO: As serpentes do gênero Thamnodynastes (Dipsadidae) são pequenas, vivíparas, opistóglifas e ocupam diversos ecossistemas de grande parte da América do Sul. Acidentes com serpentes opstóglifas podem causar lesões no local da picada e algumas pesquisas mostram uma relação entre os microorganismos presentes na lesão com aqueles presentes na cavidade oral da serpente. O objetivo desse trabalho foi caracterizar morfologicamente a microbiota da cavidade oral de Thamnodynastes sp. Para o material analisado foi observada maior incidência de bacilos Gram negativos e menor incidência de cocos Gram positivos.

Palavras-chave: *Thamnodynastes*, bactérias, bacilos gram-negativos, cocos gram-positivos, manejo, serpentes.

ABSTRACT: The snakes of the genus colubrid snake *Thamnodynastes* (Dipsadidae) are small, viviparous, opisthoglyphous and occupy several ecosystems in most of South America. Incidents that occurwith opisthoglyphous snakes can cause injury at the bite

site. Some research shows a relationship between the microorganisms present in the wound with those present in the oral cavity of the snake. The aim of this work was to morphologically characterize the microbiota of the oral cavity of *Thamnodynastes* sp. The results of the analyzed material presented a higher occurrence of Gram-negative bacilli and a lower incidence of Gram-positive cocci. The analyzed material observed a higher incidence of Gram-negative bacilli and a lower incidence of Gram-positive cocci.

Keywords: *Thamnodynastes*, bacteria, gram-negative bacilli, gram-positive cocci, management, snakes.

The genus colubrid *Thamnodynastes* Wagler, 1830 (Dipsadidae; Dipsadinae) is widely distributed in South America, however there is little known information about its biology, morphology, taxonomy and ecology (FRANCO & FERREIRA, 2002). *Thamnodynastes* are small to medium-sized, viviparous, opisthoglyphous and nocturnal (STRUSSMANN & SAZIMA, 1993). Their diet is mainly composed of small animals such as lizards, amphibians, small mammals, fish, and small snakes (BERNARDE et al., 2000; RUFFATO et al., 2003; BARBOSA et al., 2006; WINKLER et al., 2011). Although it is not considered a poisonous snake of medical interest, recent studies have shown similarities between their venom and other poisonous snakes, havingobserved proteolytic activity (CHING et al., 2012).

Studies on the oral microbiota of snakes are uncommon in Brazil (FONSECA *et al.*, 2009).These studies are usually associated with the snakes that have a higher incidence of biting, like *Bothrops* (ANDRADE et al., 1989; JORGE & RIBEIRO, 1990; JORGE et al., 1994), *Crotalus* (FERREIRA JUNIOR et al., 2009), *Micrurus* and *Lachesis*.

In addition, it is important to highlight that snake bites with necrosis caused by venom injected, can facilitate a secondary infection with potential to lead to the formation of an abscess at the site of the bite (MURPHY, 2008). Several studies have sought associations between these infections and the microorganisms present in the oral cavity of snakes (BLAYLOCK, 1999; CHEN et al., 2011). Research of this nature is of great importance; since they are seeking to expand the knowledge about the relationship between the microorganisms and the snakes as well as assist in the understanding of

etiologic agents and infections resulting from snakebites (JORGE et al., 1994; CHEN et al., 2011).

The present study is aimed to identify the oral cavity microbiota of captive *Thamnodynastes* sp. based on bacterial morphology.

We have studied five adult specimens of *Thamnodynastes* sp. from the municipalities of Salgueiro, Petrolina and Custódia, state of Pernambuco, Brazil. The specimens were physically restrained to collect weekly samples of oral microbiota. The samples were collected from June to July of 2011. The samples were taken directly from the oral cavity of each specimen during in the pre- and postprandial periods. A sterile swab was moistened with lactose-broth before the sample was taken.

In the Microbiology Laboratory at the Center of Wildlife Conservation and Management of Caatinga (CEMAFAUNA/UNIVASF), samples were plated with nutrients and MacConckey agar without the addition of antibiotics, and the samples were incubated at 37ºC under aerobic conditions for 24 hours. Subsequently colored slides were prepared in accordance with Gram staining for microscopic analysis of bacterial morphology.

The microscopic analyzsis of the bacterial morphology that was obtained from samples collected from *Thamnodynastes* sp. revealed the presence of gram-negative bacilli (GNB), gram-positive rods (GPB), cocci gram-negative (CGN) and gram-positive cocci (GPC). The GNB were the most abundant among all categories and were present in 75% of the samples from the oral cavity. Between the GNB, *Morganella morganii*, *Enterobacter* spp. and *Clostridium* spp. (Enterobacteriaceae group) are most commonly isolated in *Bothrops* and *Crotalus*.

The GPC was found in a single sample and only from a postprandial period, suggesting a transient microbiota that coming from the food. Based on the literature, among the most common GPC are Enterococci, Staphylococci and Streptococci (ANDRADE et al., 1989; JORGE & RIBEIRO, 1990; JORGE et al., 1994; CHEN et al., 2011).

Morganella morganii and Enterococci are bacteria most commonly found in the oral cavities of snakes (SHEK et al., 2009; WONG et al., 2010). Most of these bacteria are not commonly found in the human skin microbiota (ISENBERG & D'AMATO,

1985). *Morganella morganii* has the highest prelevence in cases of injury with abscesses (JORGE et al., 1994; BLAYLOCK, 1999).

Besides the oral microbiota of snakes, antiseptic practice such as aspirations of the venom, cut the area and apply various types of substances before medical treatment, can contribute to the formation of infection. The location of the injury may contribute to a secondary infection, where the microbiota and the type of exposure that the surface features, may favor the opportunistic infections (JORGE et al., 1994). Bacterial infections that result from snake bites have been reported like as cases of cellulitis and necrotizing fasciitis, whichs required surgery, and have a high risk of death (CHEN et al., 2011).

The results indicated that there is a considerable risk with the management or an accidental encounter with a colubrid snake *Thamnodynastes*. This is based on the microbiological findings and the potential for infections associated with the bite and the venom of these serpents. The characterization performed in this study will help in the selection of antimicrobials for future incidents. A more detailed analysis is necessary for a complete characterization of the oral microbiota of these snakes.

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