JOINED SPECIES OF HARD TICKS ON AMERINDIANS, QUILOMBOLAS AND DOMESTIC ANIMALS IN THE STATE OF THE PARAHYBA

Nicolau Maués Serra-Freire

Abstract

We surveyed the Atlantic coast area of the state of Paraíba, from North to South, investigating the parasitism of hard ticks, potential vectors of protozoosis agents. A total of 2,896 specimens were captured, resulting in the identification of six species within the 1,646 Rhipicephalus (56.84%), 881 Amblyomma (28.70%), 235 Boophilus (8.11%), and 184 Anocentor (6.35%) genera. The predominant species was Rhipicephalus sanguineus, followed by Amblyomma cajennense, Boophilus microplus, Anocentor nitens, Amblyomma auricularium, and Amblyomma coelebs. Basically, all hard ticks (CI = 99.52%) were found in animals, but 14 of them were fixed on human beings, and eight of them were R. sanguineus.

Keywords. Ixodidae; Ixodida; Acari; Human ixodidosis.

ESPÉCIES DE CARRAPATOS DUROS PARASITOS DE AMERÍNDIOS, QUILOMBOLAS E ANIMAIS DOMÉSTICOS NO ESTADO DA PARAÍBA

Resumo

Foi percorrida a costa atlântica do estado da Paraíba, de norte a sul, investigando o parasitismo de carrapatos duros, vetores potenciais de agentes de protozoosis. Foram capturados 2.896 espécimes, identificados em seis espécies, em quatro gêneros, sendo 1.646 Rhipicephalus (56.84%), 881 Amblyomma (28.70%), 235 Boophilus (8.11%), e 184 Anocentor (6.35%). A espécie dominante era Rhipicephalus sanguineus, seguida por Amblyomma cajennense, Anocentor nitens, Boophilus microplus, Amblyomma auricularium e Amblyomma coelebs. Praticamente todos os carrapatos (CI = 99.52%) foram encontrados em animais, mas 14 deles estavam fixados em humano, sendo oito R. sanguineus.

Palavras-chave. Ixodidae; Ixodida; carrapato duro; Ixodidose humana.

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INTRODUCTION

Ticks and tick-borne diseases affect animal and human health worldwide and are the cause of significant economic and health losses. Approximately 10% of the currently known tick species act as vectors of a broad range of pathogens of domestic animals and humans and are also responsible for damage directly due to their feeding behavior. Moreover, ticks can cause severe toxic conditions, such as ticks paralysis (SERRA-FREIRE, 1983; ALMEIDA et al., 2012) and tick toxicosis, irritation, and may also produce allergic manifestations.

Whereas the importance of tick-borne diseases for humans and pets animals is measured by morbidity and mortality, the diseases that the agent transmits by ticks to livestock are an additional major constraint to animal production, predominantly in (sub)tropical areas of the world. This fact is particularly relevant in parts of Brazil and other countries of Latin America where the demand for livestock products is increasing rapidly (DELGADO et al., 1999).

Ticks and tick-transmitted infections have coevolved with various wild animal hosts which often live in a state of equilibrium with them and constitute reservoir hosts for ticks and tick-borne pathogens of livestock, pets and humans. They have become problems of domestic livestock only when these wild hosts came into contact with them, either because man moved livestock into infested regions, or moved livestock infested with the ticks into previously non-infested regions (JONGEJAN & UILENBERG, 2004).

An example of the man moving ticks and tick-borne diseases with livestock is the introduction of Amblyomma cajennense (Fabricius, 1787), Anocentor nitens (Neumann, 1897). Boophilus microplus (Canestrini, 1887) ticks together with the livestock diseases they transmit into the urban area, and Rhipicephalus sanguineus (Latreille, 1829) from de cities on human and domestic animals into the rural areas (LABRUNA et al., 2001; MARQUES et al., 2006; SERRA-FREIRE, 2009). Only the last genus includes a single species in Brazil of medical importance for the possible transmission of leishmania to dogs and men, and had esteem
transmission risks human being for ticks (SHERLOCK, 1964; MCKENZIE, 1984; SILVA et al., 2000; COUTINHO, 2003; COUTINHO et al., 2005; DANTAS-TORRES, 2006a, b; DANTAS-TORRES et al., 2006). In the research carried through in, Vicente Férrer (SILVA et al., 2000) does not have register of cases of American Visceral Leishmaniasis (AVL) in human beings, at least in the last three years of work of the group of the Centro de Pesquisas Aggeu Magalhães/Fiocruz in the city; nor of its main vector, the mosquito straw [Lutzomyia longipalpis (Lutz & Neiva)], as the National Foundation for Health (Funasa). However, the researcher already made a survey of 503 dogs of the agricultural area of the city, and, when analyzing the collected serum samples in these animals, he verified that about 62 (12.3%) of them were positive for Leishmania sp. infection. This fact stimulated another study to relate the ectoparasites (fleas and ticks) found in the dogs with the results serum and parasitological positives, arriving at the discovery of the presence of leishmania in the red tick.

In Brazilian areas, these hard ticks show a high richness of species (Barros-Battesti et al., 2006; SERRA-FREIRE & MELLO, 2006), with high index of local diversity in the studied regions, or geopolitical spaces (ROZENTAL et al., 2002; TEIXEIRA et al., 2008; SERRA-FREIRE & LEAL, 2009; SERRA-FREIRE & MAGNO, 2009). Of more than 50 species of Ixodida already identified in Brazil, six have anthropophilic behavior characteristics (SOARES et al., 2007). In Parahyba it was not possible to determine such qualities, because the research performed couldn't provide enough data.

A substantial knowledge of Ixodidae diversity, species prevalence, abundance distribution and dominance behavior, especially in areas changed from forest to farming and cattle raising exploration, is necessary to understand the natural history of parasite transmissions and to perform an effective disease control (SERRA-FREIRE, 2010). The current study supplies more information on the diversity of tick fauna in state of Parahyba, an area occupied by Potiguar Amerindians and quilombolas and identifies the potential tick vector of the parasites in the region.
MATERIALS AND METHODS

Hard ticks were captured during December of 2009 until November, 2010, with manual capture on domestic animals and human in Amerindian villages and quilombolas areas of Akajutibiro, Carapibus, Conde, Coqueirinho, Cumaru, Galego, Gariju, Independência, Jacumã, Juripiranga, Monte-Mor, Pitimbu, and Três Rios, into three Municipalities: Baia da Traição, Marcação, and Rio Tinto. In some of these villages, leather and feather handiwork is the main economic activity of a great deal of families, as well as the small breeding of animals - dogs (*Canis familiaris* L.), cows (cross of the *Bos indicus* L. and *B. taurus* L.), goats (*Capra hircus* L.), sheep (*Ovis aries* L.), donkeys (*Equus asinus* L.), horses (*Equus caballus* L.), pigs (*Sus scrofa* L.), paca (*Agouti paca*), armadillo (*Dasypus novemcinctus*), chickens (*Gallus gallus* L.), ducks (*Cairina moschata* L.), guinea fowls (*Numida meleagris* L.) and turkeys (*Meleagris gallopavo* L.) usually placed in the backyard of the habitations.

During the local work, it was undertaken regular collections of tick specimens in 14 places, mainly during one day each month in every location; it were examined five specimens of each ten specimens of animal hosts in the country and also through permanent collaboration of several friends. Human that reported to be infected by ticks were examined and enclosed in the sample, characterizing another species of evaluated host.

Ticks were arrested manual, during the daylight, removed from the host and preserved into ethanol 70%. For identification and acceptable de specie, were used keys and works publications (*ARAGÃO & FONSECA*, 1961; *CAMICAS et al.*, 1998; *WALKER et al.*, 2000; *HORAK et al.*, 2002; *BARROS-BATTESTI et al.*, 2006; *SERRA-FREIRE & MELLO*, 2006).

RESULTS AND DISCUSSION

By the inspection and palpation body of de hosts, capturing only metaninphs and adult specimens, this methodology cannot divulge any information on the biology of the collected
ticks' species. However, this method does give information on the relationship activity of the species. Our experience during several years shows that afternoon and evening period of ticks attached capture, the total catch to ticks specimens is scarce; this is identical of the ticks species in State of Pará (SERRA-FREIRE, 2010).

In all the localities, human being had ixodidosis, totalizing 188 cases (Tab.1). During our investigation, six ticks' species were recorded in State of Parahyba (Tab. 1, Fig. 1). Among these, the presence of four species has been confirmed a human parasite (A. cajennense, R. sanguineus, B. microplus, Amblyomma coelebs Neumann, 1899). Two species are considered parasites of mammals and birds (A. cajennense, R. sanguineus).

Misidentification is strongly suspected. A. cajennense and A. coelebs are similar and difficult to separate morphologically (BARROS-BATTESTI et al., 2006; CAMICAS et al., 1998). A. coelebs is cited (CAMICAS et al., 1998) which a synonymy of A. cajennense, but is considered valid species (BARROS-BATTESTI et al., 2006), which did not allow for a rigorous distinction between the two species, and in the work we considered A. coelebs valid specie.

The sampling took as base the voluntary task of the townspeople to participate of the work, therefore the number of investigated hosts was not the same in all the communities, for this reason leaves to proceed the comparative analyses of the samples from different origins.

It was confirmed that A. cajennense, A. coelebs, B. microplus and R. sanguineus are human parasites, also north-eastern of Brazil, and registered the meeting of Amblyomma auricularium (Conil, 1878) in the State of Parahyba. The predominant species were R. sanguineus (dominant coefficient, DC = 56.84%), followed by A. cajennense (DC = 29.73%), B. microplus (DC = 8.11%), and A. nitens (DC = 4.23%). We can confirm the human infection by A. auricularium (Ferreira et al. 2008).

Table 1. List of the 2,896 hard ticks species recorded from State of Parahyba, from December 2009 to November 2010, place and hosts data.
<table>
<thead>
<tr>
<th>Tick Specie</th>
<th>Number</th>
<th>Vertebrate host</th>
<th>Place occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amblyomma auricularium</td>
<td>12</td>
<td>Armadillo [Dasypus novemcinctus] (08); Paca [Agouti pac] (4).</td>
<td>Três Rios.</td>
</tr>
<tr>
<td>Amblyomma coelebs</td>
<td>8</td>
<td>Homem (1), cão (2), paca (04), jumento (1).</td>
<td>Conde, Galego, and Monte-Mor.</td>
</tr>
<tr>
<td>Anocentor nitens</td>
<td>134</td>
<td>Homem (1), cão (2), cabra (1), vaca (3), jumento (16), cavalo (111).</td>
<td>Carapibus, Galego, Monte-Mor, and Pitimbu.</td>
</tr>
<tr>
<td>Boophilus microplus</td>
<td>235</td>
<td>Homem (03), cão (07), vaca (109), cabra (102), ovelha (03), jumento (05), cavalo (06).</td>
<td>Carapibus, Conde, Galego, Guruji, Independência, Juripiranga, Monte-Mor, Pitimbu and Três Rios.</td>
</tr>
<tr>
<td>Rhipicephalus sanguineus</td>
<td>1,646</td>
<td>Homem (86), cão (1.457), vaca (39), cabra (17), jumento (18), cavalo (20), galinha (6), and peru (3).</td>
<td>Akajutibiro, Carapibus, Conde, Coqueirinho, Cumaru, Galego, Guruji, Independência, Jacumã, João Pessoa, Monte-Mor, Pitimbu and Três Rios.</td>
</tr>
</tbody>
</table>
Figure 1. Ticks (*Amblyomma cajennense*) attached on calf skin (cross *Bos taurus* x *Bos indicus*), Community of Galego, State of Parahyba, from December/2009 to November/2010.

BIBLIOGRAPHIC REFERENCES


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