Occurrence of Ixodiphagus sp. (Hymenoptera: Encyrtidae) as a parasitoid of

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Abstract

The objective of this study is to describe the first occurrence of *Ixodiphagus* sp. (Hymenoptera: Encyrtidae) sp. parasitizing *Rhipicephalus microplus* (Canestrini 1888) (Acari: Ixodidae) in Goiás, Brazil. Engorged females of *R. microplus* collected from naturally infested cattle will be taken to the laboratory. After their death, they will be dissected to check for the presence of parasitoids. From November 2013 to October 2014, 151 engorged females belonging to the species *R. microplus* were collected, from which a specimen of the species *Ixodiphagus* sp. The percentage of parasitism was 0.6%.

Key words: Ticks, Biocontrol, Natural enemy, cattle, First occurrence.

Introduction

Ticks are obligated hematophagous ectoparasites that feed on a wide variety of mammals, including humans and cattle. *Rhipicephalus microplus* (Canestrini 1888) (Acari: Ixodidae) is a cattle one-host-tick, with a tropical and subtropical cosmopolitan distribution. The *R. microplus* tick is responsible for considerable economic losses in Brazil, causing leather damage, weight loss and reduced milk production in cattle and results in the transmission of pathogens. Currently, the main method for controlling this tick is using acaricides, but their indiscriminate use is one of the major causes of resistance dissemination (Almazán et al. 2010, Labruna et al. 2000, 2001, Hila et al. 2016).

Hymenopteran parasitoids have been shown to be of potential value in tick biocontrol (Alberto et al. 1981). The Family Encyrtidae and a general form are endoparasitoids of eggs, immature and adults or egg predators mainly of cochineals (Hemiptera: Coccidae and Pseudococcidae), although several hosts have already been registered in several groups of Arthropoda, as well as hyperparasitoids (Noyes 1995). Most egg and pupe parasitoids have idiobiont strategy, while larval parasitoids have Koinobiont strategy. Several particularities are noted in the biology of Encyrtidae (Noyes 1995). *Ixodiphagus* Howard 1907 wasps (Hymenoptera: Encyrtidae) have been known as parasitoids of ticks since the beginning of the 20th Century. Currently, there are seven recognized species. These wasps have been found parasitizing ticks...
belonging to the genera *Ornithodoros* Koch 183, *Amblyomma* Koch 1844, *Dermacentor* Koch 1844, *Hyalomma* Koch 1844, *Haemaphysalis* Koch 1844, *Ixodes* Latreille 1795 and *Rhipicephalus* Koch 1844 (Hu et al. 1998).

The objective of this study is to describe the first occurrence of *Ixodiphagus* sp. parasitizing *R. microplus* in Goiás, Brazil.

**Materials and Methods**

The experiment will be carried out in the pastures of the farm of the Veterinary School of the Federal University of Goiás, Goiania, and Goiás, Brazil. Engorged females of *R. microplus* collected from naturally infested cattle will be taken to the laboratory. Placed inside Petri dishes and taken to BOD there until the emergence of nymphs or parasitoids. The dead adults were dissected to see the possibility of parasitoids meeting. The emergent tick parasitoids will be identified morphologically with the aid of a stereomicroscope and subsequently preserved in 70% alcohol.

**Results**

From November 2013 to October 2014, 151 engorged females belonging to the species *R. microplus* were collected, from which a specimen of the species *Ixodiphagus* sp. The percentage of parasitism was 0.6%. This low percentage of parasitism may be due to the proximity of the experiment site to be close to the houses or to its small degree of synanthropy.

**Discussion**

Due to the importance of these arthropods, their biological control has been studied as an alternative to chemical control, which is a good ecological and environmental strategy.

In Brazil ticks are the most important vectors in the transmission of pathogens that involve protozoa, Rickettsia; *da Rocha-Lima*, 1916, spirochetes, viruses and nematodes to animals and humans. *R. microplus* in China is is principal vector of bovine babesiosis and anaplasmosis, may cause anaemia, weight loss and death (Shi *et al.* 2017).

Tick parasitoids has been reported only once in Brazil when *Ixodiphagus* was reported parasitizing *Rhipicephalus sanguineus* (Latreille) (Acari: Ixodidae) nymphs in Rio de Janeiro. Herein, we report the occurrence of *Ixodiphagus* spp. in ticks from three different regions of Brazil (Alberto *et al.* 1981). In the state of Maranhão, in northeastern Brazil, parasitoids were detected in *R. sanguineus* nymphs on three occasions, during August 2009 and September 2010 (dry season), and January 2011 (rainy season) (Alberto *et al.* 1981).

All parasitoids found in northeastern Brazil were identified as *Ixodiphagus hookeri* (Howard, 1908) . (Acari: Ixodidae). In the state of Mato Grosso do Sul (west-central Brazil), one *Amblyomma* sp. (Acari: Ixodidae) engorged nymph was shown to be parasitized by *I. hookeri*. In the state of Rondônia (northern Brazil), one *Amblyomma* sp. engorged nymph was parasitized by *Ixodiphagus texanus* Howard 1907 (Acari: Ixodidae).

It is considered one of the most important ectoparasites of cattle in Mexico, negatively affecting weight gain and milk production, which results in substantial economic losses.
Because *Ixodiphagus* spp. are present in ecologically distinct and geographically distant areas of Brazil, they are of potential use for biocontrol in the country (Alberto et al. 1981).

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