BLOOD PARASITES AND HEALTH STATUS OF

Glossophaga soricina BATS

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INTRODUCTION

Parasites are ubiquitous organisms and are currently considered as strong regulating factors for wildlife populations (Anderson and May 1979, Hudson *et al*. 1998). However, there is little empirical evidence for this parasite-mediated population control in Neotropical species, especially bats, neither for their blood parasites. Lower body condition and alterations in white blood cell type ratios are signs of physiological stress in response to parasites, which can ultimately lead to impaired survival or reproduction, and to population regulation.

OBJECTIVES

The aim of this study was to assess whether the infection with blood parasites is related to low body condition or alterations in white blood cell ratios of *Glossophaga soricina* bats.

METHODS

Here we present a case study with a population of *G. soricina* from a protected area in Southeast Brazil. Twenty-four adult bats (17 males and 7 females) were trapped with mist nets at Lapinha and Pacas caves, Sumidouro State Park (44°90'E – 43°52'W, 19°30'N – 19°45'S), in October 2012. Blood smears were made by extracting one drop of blood, after cutting the tip of one foot nail. Smears were tainted with Panoptic stain, and subjected to microscopic search. Blood parasites were measured and counted, along with standard hematological counting of 100 white blood cells (monocytes, limphocytes, eosinophils, mature and young neutrophils were found). Individual host data such as sex, weight and forearm length were also collected. We then calculated a body condition index dividing the weight by the forearm length of the animals. We assessed the relationship between the presence (binary data) and intensity (number of parasites) of infection with weight, size, body condition, and white blood cell ratios of bats through, respectively, univariate logistic and linear regression analysis. We also compared these variables between infected and non-infected groups using analysis of variance (ANOVA). Differences in prevalence and intensity of infection between males and females were evaluated by the Student T-test.

RESULTS

The only blood parasite found was the nematode microfilariae identified as *Litomosoides* sp. (Rêgo 1961). Microfilariae were found in 50% (12/24) of bat blood smears. The number of microfilariae found in each positive smear ranged from 2 to 39. No differences in prevalence or intensity of infection were found between males and females (T-test, $p>0.05$). There was no relationship between presence of infection or the number of parasites with any of the variables analyzed, according to logistic and linear regressions ($p>0.05$). The ANOVA tests also

revealed that none of the parameters differed between infected versus non-infected animals ($p>0.05$).

DISCUSSION

The infection with microfilariae *Litomosoides* sp. seems not to affect the health status of *G. soricina* bats, and probably represents a weak regulating factor for the population. Other authors did find a negative relationship between parasites and body condition in Neotropical mammals (Puttker *et al*. 2008), but the significance for population ecology must be interpreted with caution since there are many other reasons, including food supply and other types of parasites (e.g. viruses), for decreased body condition that can be confusing factors in such cross-sectional studies. An alternative approach for the question of whether parasites regulate specific populations lies on the manipulation of parasitism and monitoring demographic parameters before and after the intervention, or across field experimental replicates (see Hudson *et al*. 1998, Pedersen and Greives 2008). Furthermore, physiological impacts of the infection are yet to be elucidated.

CONCLUSION

The infection by *Litomosoides* sp. is apparently unable to regulate *G. soricina* populations, what is in agreement with the assumption that not all parasites are detrimental to their hosts. Nonetheless, deeper studies are necessary to broadly assess this question.

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