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NEW RECORD OF *LILOPTENA MAZAMAE* RONDANI, 1878 AS A *MAZAMA GOUAZOUBIRA* (FISCHER, 1814) PARASITE IN SOUTHERN BRAZIL

NOVO REGISTRO DE *LILOPTENA MAZAMAE* RODANI, 1878 COMO PARASITO DE *MAZAMA GOUAZOUBIRA* (FISCHER, 1814) NO SUL DO BRASIL

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### Resumo

Moscas da família Hipoboscidae (*Lipoptena mazamae*) são parasitos muito importantes do veado-catingueiro (*Mazama gouazoubira*), podendo ser encontrados em uma considerável abundância nesse mamífero. Sua distribuição é conhecida em apenas alguns locais, como em algumas cidades do estado do Rio Grande do sul, e, por causa disso, é muito importante reportar novos registros dessa associação de parasitismo. Para contribuir com o conhecimento dessa associação, é reportado aqui um novo registro dessa mosca parasitando um indivíduo de veado-catingueiro na cidade de Curitiba, estado de Santa Catarina, sul do Brasil. Esses registros se destacam, pois *L. mazamae* possui importância médica e veterinária, devido ao seu potencial de veicular agentes etiológicos causadores de doenças, como bartonelose. Além disso, depois de nossas pesquisas, concluímos que este é apenas o quinto estudo reportando essa associação na América do Sul, indicando, portanto, sua relevância. Estudos como este são importantes, pois contribuem com novos registros dessa associação de parasitismo, e, portanto, pode-se também servir como alerta às autoridades para a possível associação desses parasitos com doenças que podem causar danos à saúde humana e de outros animais.

**Palavras-chave:** Moscas, parasitos, Santa Catarina, veado-catingueiro.

### Abstract

Louse flies (*Lipoptena mazamae*) are important Gray brocket deer (*Mazama gouazoubira*) parasites, and can be found in large numbers in this mammal. Their distribution is known for just a few locations, such as in a few municipalities of the state of Rio Grande do Sul, and because of this, it is so important to report new records of this association. To contribute with knowledge concerning this parasitism relationship, a record of this fly species parasitizing a deer individual in

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the municipality of Curitiba, state of Santa Catarina, southern Brazil, is reported herein. Such records are paramount, as *L. mazamae* displays both zoonotic and medical importance, due to the potential propagation of etiological agents that cause diseases, such as Bartollosis. Moreover, as far as we know, this study is only the fifth study that reports this association in South America, indicating its relevance. It is very important to perform studies as these, because we may contribute to new records of this association of parasitism, therefore, we contribute to alert authorities to the possible association of these parasites with diseases that may pose problems for human and other animal health.

**Keywords:** Gray brockets, Louse flies, Parasites, Santa Catarina state.

## 1. INTRODUÇÃO

*Lipoptena mazamae* Rondani, 1878 are commonly known as Louse flies or deer keds, and belong to the Hippoboscidae family (Diptera order). This species is distributed throughout several countries in the American continent, and, in Brazil, has been reported in the states of Amazonas, Pará, Mato Grosso, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul (GRACIOLLI and CARVALHO, 2003). In the state of Santa Catarina, *L. mazamae* was recorded for the first time in 2008, parasitizing a *Mazama gouazoubira* (Fischer, 1814) (Gray brocket) specimen, in the municipality of Lages, by Marques et al. (2009).

Members belonging to the *Lipoptena* genus feed on blood and parasite of both mammals and birds, including deer from the family Cervidae. In this regard, both *Odocoileus virginianus* (Zimmermann, 1780) and *M. gouazoubira* have been recorded as hosts (e.g. SAMUEL and TRAINER, 1972; RIBEIRO et al., 2003). Normally this parasitic genus tends to scarify and bite around the neck and posterior region of their hosts, causing significant blood and weight loss and, when present in high parasitic loads, may predispose the animals to secondary infections by other agents, leading to death. This parasitic genus has also been considered an *Anaplasma* spp. carrier in cattle and *Trypanosoma* spp. in cervids (BÖSE and PETERSEN, 1991; GARCIA et al., 2020).

In addition, *L. mazamae* has been reported as infected with *Bartonella* spp. in Southern Brazil and other areas (e.g. SOUZA et al., 2017). This is a Gram-negative bacterium that infects certain cells, such as erythrocytes, causing the disease known as Bartonellosis, which evolves to cause a long-lasting, relapsing, and intraerythrocytic bacteremia (BREITSCHWERDT, 2014). The fact that *L. mazamae* may be infected by *Bartonella* species is of increasing concern, as several animal species may act as reservoirs, including rodents, ground squirrels and both insectivorous and frugivorous bats. This indicates that Bartonellosis may be a disease displaying zoonotic importance, which may endanger human lives (e.g. MÜHLDORFER, 2013). Hence, assessments on this host-parasite association are paramount, as (1) knowledge concerning the distribution of both species in this relation of parasitism is still scarce, thus emphasizing basic science; and (2) local and even national authorities may be alerted in relation to another record of parasites exhibiting public health importance, since they may transmit etiological agents that display the potential to cause both human and other animal diseases.

Therefore, the aims of the present study comprise reporting a dipteran species parasitizing a brocket (*M. gouazoubira*), perform a compilation of previous records of this parasitic relationship worldwide and, finally, to comment on the importance of this parasitic relationship between insects and vertebrates regarding public health.



## 2. MATERIAL AND METHODS

An adult female *M. gouazoubira* was received by the Anatomy Laboratory belonging to the Federal University of Santa Catarina (UFSC), located in the municipality of Curitiba, in the state of Santa Catarina, southern Brazil, on February 8<sup>th</sup>, 2018. The deer was found on the banks of the BR-470 Highway between the municipalities of Curitiba and Frei Rogério, and was integrated into the laboratory collection for further studies. The presence of louse flies *L. mazamae* ectoparasites on the Gray brocket was noted, comprising 56 adult individuals distributed in the deer's neck, auricular pavilion and gluteal regions. The flies were stored and forwarded to the Laboratory of Parasitic Animal Diseases (LaDoPA - UFSC) for standard taxonomic classification and for their maintenance in its zoological collection as well (Figure 1).

Figure 1. *Lipoptena mazamae*. A- Dorsal surface. B- Ventral surface.

## 3. RESULTS AND DISCUSSION

The deer health conditions are unclear, and health problems due to the parasitic flies or transmitted pathogens by these flies were not assessed. Investigations of live or necropsied animals are paramount to determine and obtain information on the distribution of parasitic hosts, leading to understanding of their pathogenicity and seasonality patterns.

Unfortunately, the animal was found run over on the banks of a highway, which is very common in Brazil. Wild animal roadkill represents an important record of local loss of biodiversity, and may result in significant declines in the populations of many species (TUMELEIRO et al., 2006; OLIVEIRA and SILVA, 2012). Many measures are proposed to avoid accidents, such as the construction of underpasses and overpasses, fences and speed reducers (GRILLO et al., 2010). However, in a study on roadkill animals conducted in western Santa Catarina, none of these measures were found on routes used to verify the number of dead animals on roads (ORLANDIN et al., 2015).

Very few records of *L. mazamae* parasitizing *M. gouazoubira* are available, both for Brazil and worldwide, and only four articles reporting this parasitic relationship were found in a literature search (RIBEIRO et al., 2003; DEEM et al., 2004; MARQUES et al., 2009; SOUZA et al., 2017), one from Gran Chaco, Bolivia (DEEM et al., 2004) (Table 1). On the other hand, several records of *L. mazamae* as parasites in other mammals, such as *O. virginianus* (white-tailed deer) (BEQUAERT, 1956; SAMUEL and TRAINER, 1972; GARCIA et al., 2020) and cattle (EADS, 1949; DRUMMOND, 1966) have been reported.

Table 1. Records of *L. mazamae* as *M. gouazoubira* parasites worldwide.

The present study is relevant, as few studies concerning parasite records for *M. gouazoubira* are available. In addition to contributing to further knowledge on this relationship, these types of assessments are relevant to serve as warnings, as *L. mazamae* may be infected with certain pathogens, i.e. the bacterium *Bartonella* (e.g. SOUZA et al., 2017). Bartollosis caused by this bacterium is of zoonotic importance, and is of concern to human health. Therefore, more reports and information are required to determine the main parasitic agents found in *L. mazamae*, the geographical distribution of the insect parasitizing Gray brocket deer, and its distribution throughout Brazil.

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Figure 1.



Table 1.

Ectoparasite	Host	Site	Reference
<i>L. mazamae</i>	<i>M. gouazoubira</i>	Herval do Sul and São Francisco de Paula (Rio Grande do sul state, Brazil)	Ribeiro et al. (2003)
<i>L. mazamae</i>	<i>M. gouazoubira</i>	Lages (Santa Catarina state, Brazil)	Marques et al. (2009)
<i>L. mazamae</i>	<i>M. gouazoubira</i>	Caçapava do Sul, São Sepé, São Jerônimo, Arroio dos Ratos, Bagé, Hulha Negra, Santana do Livramento, and Maquiné (Rio Grande do Sul state, Brazil)	Souza et al. (2017)
<i>L. mazamae</i>	<i>M. gouazoubira</i>	Gran Chaco (Bolivia)	Deem et al. (2004)