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Short Communication

Presence of *Lutzomyia longipalpis* (Diptera: Psychodidae) in the Parque Estadual da Serra da Tiririca, State of Rio de Janeiro, Southeastern Brazil

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Abstract

Introduction: The sand fly, *Lutzomyia longipalpis,* is the main vector of *Leishmania infantum* in the Americas, primarily occurring in areas of apparent anthropomorphic modifications in several regions of Brazil. **Methods**. Sand flies were captured using light traps. **Results**: Out of all captured species, *Lu. longipalpis* numbers had increased within the park. **Conclusions**: We report the occurrence of *Lu. longipalpis* in an area of Atlantic Forest, possibly representing the first sylvatic population of *Lu. longipalpis* in an area absent of peridomestic captures, but with the risk of *L. infantum* transmission in the areas of Niterói and Maricá.

Keywords: *Lutzomyia longipalpis*. Sylvatic population. Rio de Janeiro.

Sand flies (Diptera: Psychodidae: Phlebotominae) are natural hosts of various microorganisms, including viruses, bacteria and protozoa; consequently, sand flies are etiological agents in diseases of medical and veterinary importance[1]. The species *Lutzomyia longipalpis* (Lutz & Neiva, 1912) is the main vector of *Leishmania infantum*, the etiological agent of visceral leishmaniasis (VL) in the Americas[2], even though this disease is also wide spread in Europe, Africa, and Asia. In Brazil, VL is a serious public health problem in rural, periurban, and, now, urban areas. In the past 20 years, the dispersion of the vector and its parasite across Brazil has become a major challenge for Brazilian Health Authorities[3].

In the State of Rio de Janeiro, the occurrence of VL is important, despite being sporadic and restricted to a few municipalities. After the first autochthonous VL cases were reported in this state, the presence of *Lu. longipalpis* has been observed in other areas where the disease has not been previously reported[4].

Lutzomyia longipalpis was first reported in the State Rio de Janeiro by Martins et al.[5] in Macaé and later in Ilha Grande[6] and Campo Grande[7]. More recently, Brazil et al.[8] and Rodrigues et al.[9] showed the presence of *Lu. longipalpis* in transition areas of Atlantic Forest in Saquarema and Niterói, respectively. The authors of both studies suggested that both populations are typically sylvatic, as there was no evidence of *Lu. longipalpis* in peridomestic captures during previous surveys[10]. Here, we aimed to identify and discuss the presence of this population of *Lu. longipalpis* in an urban preserved park in the metropolitan region of Rio de Janeiro.

The *Parque Estadual da Serra da Tiririca* (PESET) was recently created to protect remnants of the Atlantic Forest, which were threatened by real estate speculation and other forms of human activities. The park is situated between the municipalities of Niterói and Maricá in the State of Rio de Janeiro (22° 48′, 23° 00′ S and 42° 57′ and 43° 02′ W), on the coastline of the Serra do Mar, and covers an area of 2,260ha.

Sand flies were captured from June 2013 to June 2014, with an average of 1 survey per month, by using modified HP (Hoover Pugeto) light traps[11] These traps were adapted for use with plastic recipients (200mL capacity) instead of cloth cages. The plastic recipients contained 80% alcohol and were attached to the trap by using a 20cm-long thin silk stocking, which was secured using rubber bands at the base of the trap. Thus, insects were attracted to the light trap and were then sucked into the ventilation, falling directly into the alcohol. The altered traps better preserved the insects for transport and subsequent identification. Each trap was kept in place for at least 48h, with each trap being used for a total of 576h. The survey was conducted in 3 areas, with 14 traps being used in total. Area 1 (named Mirante) was located within the park, area 2 was located in a forested area of the park (Itacoatiara), and area 3 was located in a peridomestic environment. All 3 areas were

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located in the municipality of Niteroi. Most of the trails in area 2 are open to the public (tourists) visiting the park (**Figure 1**). However, we selected a part of the forest without open trails, to minimize any anthropogenic effects. Sand flies were identified following the taxonomic key provided by Galati[10]. Mounted specimens were deposited in the collection of our laboratory.

To date, the sand fly fauna of the park included 13 species, as shown by a previous study during 2010-2011[11]. In this previous study, only 2 specimens of *Lu. longipalpis* were present. Thus, we speculated that this species had an isolated sylvatic population at this site, with subsequent studies being required to assess its presence in a preserved Atlantic Forest area.

During 12 months of captures' (June 2013 to June 2014, except December 2013), a total of 13 species were collected (**Figure 2**). However, only 10 individuals (4 females 6 males) of *Lu. longipalpis* were identified in area 2 (preserved area) of the park. While this species occurred in low numbers, the year-round presence of *Lu. longipalpis* confirms that it

FIGURE 1. View of capture sites in the area of the State Park Serra da Tiririca, State of Rio de Janeiro, Southeastern Brazil.

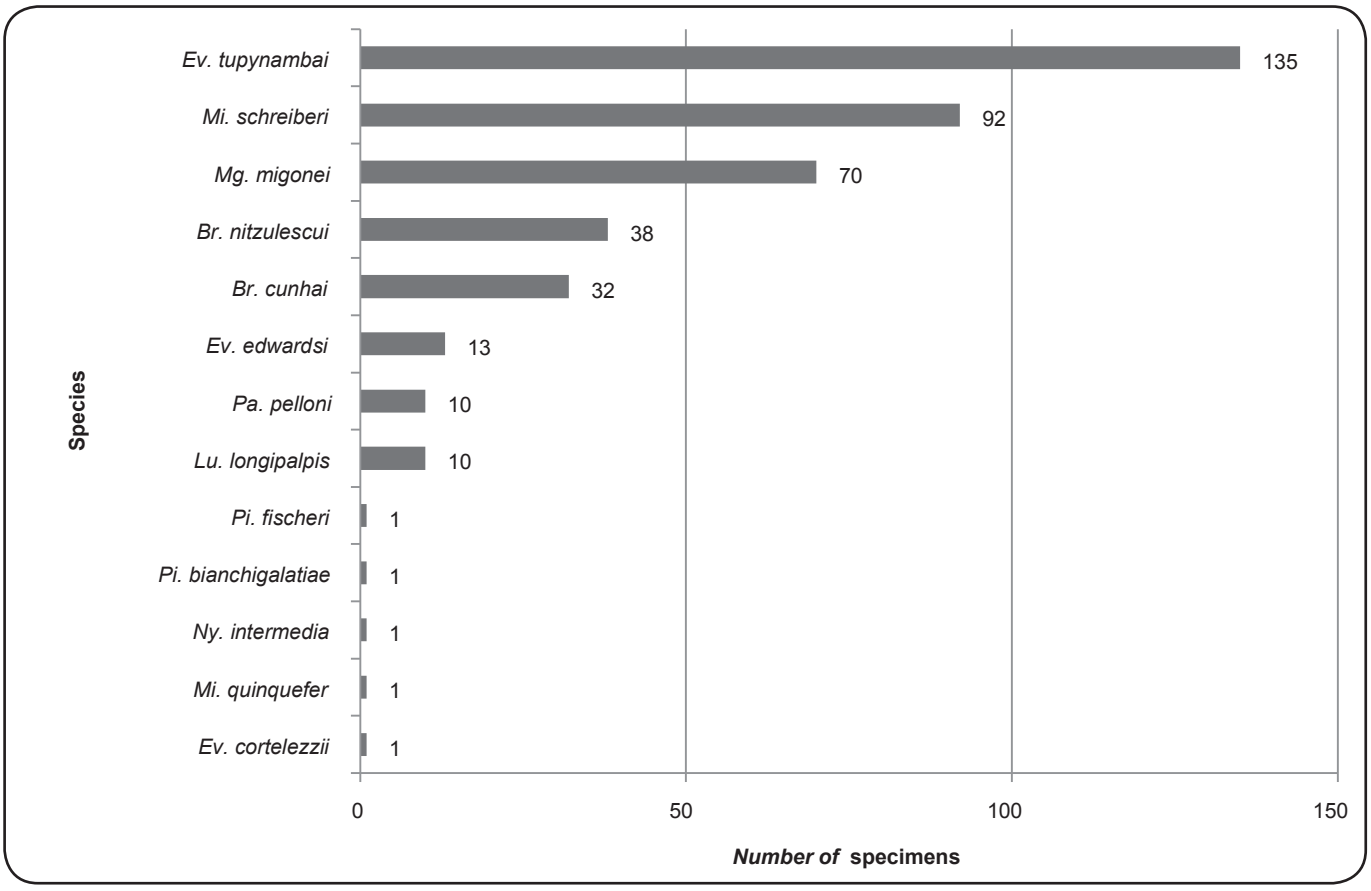

FIGURE 2. Sand fly species found between June 2013 and June 2014. ***Ev.:*** *Evandromyia;* ***Mi.:*** *Micropygomyia;* ***Mg.:*** *Migonemyia;* ***Br.****: Brumptomyia;* ***Pa.:*** *Psatyromyia;* ***Lu.:*** *Lutzomyia;* ***Pi.:*** *Pintomyia;* ***Ny.****: Nyssomyia.*

inhabits the forested environment. *Lu. longipalpis* has also been observed in other sylvatic environments[4] [12]; however, it tends to dominate other sand fly species in modified or urbanized areas[13] [14]. Furthermore, climatic factors, such rain, humidity, and temperature, appear to directly influence the seasonality of *Lu. longipalpis* in urbanized areas[14] [15]; yet, no such positive correlation was observed in our study. In conclusion, we speculate that this small population might contribute to the maintenance and dispersion of this species to human-modified areas.

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Conflict of interest

The authors declare that there is no conflict of interest.

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REFERENCES

1. Brazil RP, Rodrigues AAF, Andrade Filho JD. Sand fly vectors of *Leishmania* in the Americas - a mini review. Entomol Ornithol Herpetol 2015; 4:144.
2. Gontijo CMF, Melo MN. Leishmaniose visceral no Brasil: quadro atual, desafios e perspectivas. Rev Bras Epidemiol 2004; 7:338-349.
3. Salomón OD, Feliciangeli MD, Quintana MG, Afonso MMS, Rangel EF. *Lutzomyia longipalpis* urbanisation and control. Mem Inst Oswaldo Cruz 2015; 110:831-846.
4. Carvalho BM, Maximo M, Costa WA, Santana ALF, Costa SM, Rego TANC, et al. Leishmaniasis transmission in an ecotourism area: potential vectors in Ilha Grande, Rio de Janeiro State, Brazil. Parasit Vectors 2013; 6:325.
5. Martins AV, Williams P, Falcão AL. American sandflies (Diptera, Psychodidae, Phlebotominae). Rio de Janeiro: Academia Brasileira de Ciências; 1978. 195p.
6. Araújo Filho NA, Sherlock IA. Nota sobre a presença da *Lutzomyia longipalpis* (Lutz & Neiva, 1912) na Ilha Grande, Estado do Rio de Janeiro, Brasil. Rev Soc Bras Med Trop 1981; 14:81-83.
7. Lima LCR, Marzochi MCA, Sabrosa PC. Flebotomíneos em área de ocorrência de leishmaniose tegumentar no Bairro de Campo Grande, RJ, Brasil. Rev Brasil Malariol Doenç Trop 1981; 33:64-74.
8. Brazil RP, Pontes MC, Passos WL, Rodrigues AA, Brazil BG. The sand fly fauna (Psychodidae: Phlebotominae) in the region

of Saquarema, State of Rio de Janeiro, Brazil, an endemic area of cutaneous leishmaniasis transmission. J Vector Ecol 2011; 36 (suppl 1):S95-S98.

9. Rodrigues AA, Barbosa VA, Andrade-Filho JD, Brazil RP. The sandfly fauna (Diptera: Psychodidae: Phlebotominae) of the Parque Estadual da Serra da Tiririca, Rio de Janeiro, Brazil. Mem Inst Oswaldo Cruz 2013; 108:943-946.
10. Brazil RP, Brazil BG, Gouveia MC, Almeida DC, Oliveira SMP, Menezes JA. Epidemiological studies on cutaneous leishmaniasis in the State of Rio de Janeiro, Brazil. Domestic and peridomestic sandfly fauna. *In:* Hart DT, editor. Leishmaniasis, Life Sciences NATO ASI Series, Zakinthos 1989; 163:159-163.
11. Pinto IS, Tonini JFR, Ferreira AL, Falqueto A. A brief inventory of sand flies (Diptera, Psychodidae) from the National Forest of Rio Preto, state of Espirito Santo, southeastern Brazil. Biota Neotrop 2012; 12:323-326.
12. Galati EAB. Morfologia e Taxonomia. *In*: Rangel EF, Lainson R, editors. Flebotomíneos do Brasil, Rio de Janeiro: Editora FIOCRUZ; 2003. p. 23-52.
13. Saraiva L, Reis AS, Rugani JMN, Sampaio Pereira AA, Rêgo FD, Lima ACVMR, et al. Survey of sand flies (Diptera: Psychodidae) in an environmentally protected area in Brazil. PLoS ONE 2015; 10:e0134845.
14. Brazil RP. The dispersion of *Lutzomyia longipalpis* in urban areas. Rev Soc Bras Med Trop 2013; 46:263-264.
15. Resende MC, Camargo MCV, Vieira JRM, Nobi RCA, Porto MN, Oliveira C, Lourenzo et al. Seasonal variation of *Lutzomyia longipalpis* in Belo Horizonte, State of Minas Gerais. Rev Soc Bras Med Trop 2006; 39:51-55.