

This study was supported by the Brazilian Research Council.

**Raquel O. Simões,
Fernando A. Monteiro,
Elizabeth Sánchez,
Silvana C. Thiengo,
Juberlan S. Garcia,
Sócrates F. Costa-Neto,
José L. Luque,
and Arnaldo Maldonado, Jr.**

Author affiliations: Fundação Oswaldo Cruz, Rio de Janeiro, Brazil (R.O. Simões, F.A. Monteiro, E. Sánchez, S.C. Thiengo, J.S. Garcia, S.F. Costa-Neto, A. Maldonado Jr.); and Universidade Federal Rural do Rio de Janeiro, Seropédica, Brazil (R.O. Simões, J.L. Luque)

DOI: 10.3201/eid1707.101822

References

- Lindo JF, Waugh C, Hall J, Canningham-Myrie C, Ashley D, Eberhard ML, et al. Enzootic *Angiostrongylus cantonensis* in rats and snails after an outbreak of human eosinophilic meningitis, Jamaica. *Emerg Infect Dis.* 2002;8:324–6. doi:10.3201/eid0803.010316
- Wang QP, Lai DH, Zhu XQ, Chen XG, Lun ZR. Human angiostrongyliasis. *Lancet Infect Dis.* 2008;8:621–30. doi:10.1016/S1473-3099(08)70229-9
- Caldeira RL, Mendonça CLF, Gouveia CO, Lenzi HL, Graeff-Teixeira C, Lima WS, et al. First record of molluscs naturally infected with *Angiostrongylus cantonensis* (Chen, 1935) (Nematoda: Metastrongylidae) in Brazil. *Mem Inst Oswaldo Cruz.* 2007;102:887–9. doi:10.1590/S0074-02762007000700018
- Lima AR, Mesquita SD, Santos SS, Aquino ER, Rosa LRS, Duarte FS, et al. Alicate disease: neuroinfestation by *Angiostrongylus cantonensis* in Recife, Pernambuco, Brazil. *Arq Neuropsiquiatr.* 2009;67:1093–6. doi:10.1590/S0004-282X2009000600025
- Thiengo SC, Maldonado A, Mota EM, Torres EJJ, Caldeira R, Oliveira APM, et al. The giant African snail *Achatina fulica* as natural intermediate host of *Angiostrongylus cantonensis* in Pernambuco, northeast Brazil. *Acta Trop.* 2010;115:194–9. doi:10.1016/j.actatropica.2010.01.005
- Maldonado A Jr, Simões RO, Oliveira APM, Motta EM, Fernandez MA, Pereira ZM, et al. First report of *Angiostrongylus cantonensis* (Nematoda: Metastrongylidae) in *Achatina fulica* (Mollusca: Gastropoda) from southeast and south regions of Brazil. *Mem Inst Oswaldo Cruz.* 2010;105:938–41.
- Chen HT. Un nouveau nématode pulmonaire, *Pulmonema cantonensis* n. g., n. sp., des rats de Canton. *Ann Parasitol Hum Comp.* 1935;13:312–7.
- Bowles J, Blair D, McManus DP. Genetic variants within the genus *Echinococcus* identified by mitochondrial DNA sequencing. *Mol Biochem Parasitol.* 1992;54:165–73. doi:10.1016/0166-6851(92)90109-W
- Jefferies R, Shaw SE, Viney ME, Morgan ER. *Angiostrongylus vasorum* from South America and Europe represent distinct lineages. *Parasitology.* 2009;136:107–15. doi:10.1017/S0031182008005258
- Thiengo SC, Faraco FA, Salgado NC, Cowie R, Fernandez MA. Rapid spread of an invasive snail in South America: the giant African snail, *Achatina fulica* in Brazil. *Biol Invasions.* 2007;9:693–702. doi:10.1007/s10530-006-9069-6

Address for correspondence: Arnaldo Maldonado Jr, Laboratório de Biologia e Parasitologia de Mamíferos Silvestres Reservatórios, Instituto Oswaldo Cruz/Fiocruz, Av. Brasil 4365 Manguinhos 21.040-900, Rio de Janeiro, RJ, Brazil; email: maldonad@ioc.fiocruz.br

Aircraft and Risk of Importing a New Vector of Visceral Leishmaniasis

To the Editor: Kala-azar, or visceral leishmaniasis, is a parasitic disease that leads to fever, anemia, and hepatosplenomegaly. Death is the usual outcome when infection is not treated. The majority of infections are caused by the protozoan *Leishmania donovani*, restricted to India and eastern Africa, but the most widespread are caused by *L. infantum*, found from People's Republic of China to the New World, where it infects humans, dogs, and wild canids. All Mediterranean

countries are affected by *L. infantum*, where most patients are co-infected with HIV. Several species of sand flies transmit the disease (1).

During the 1980s, urban transmission of kala-azar became a major problem in Brazil. More than 3,000 cases are reported annually, and the disease has spread from northeastern Brazil westward to the Amazon region, as well as to the industrialized southeast. Several as yet unproven explanations for the urbanization of kala-azar in Brazil have been proposed (2), but whatever the reason, it is associated with proliferation of *Lutzomyia longipalpis* sand flies, which, in turn, are strongly associated with human environments. The vector can easily spread by entering buses or trains looking for food at night or for hiding places at dawn. Invasion of new areas by sand flies through transportation of ornamental plants has been observed (R. Brazil, pers. comm.), possibly by insect eggs or larvae being carried in organic matter.

Kala-azar has now reached the temperate Brazilian south and Argentina. This spread of the disease warns us of the danger of introduction in other temperate areas. Europe is particularly vulnerable because of the existing natural transmission of *L. infantum*. This risk is increased by recently created daily direct flights to Lisbon from Fortaleza, Natal, Brasília, and Belo Horizonte (Figure), Brazilian cities where epidemics of the disease have occurred. Lisbon is suitable to canine infection, and >10% of dogs may be infected (3). The climate is a barrier for the introduction of many vectors outside their normal range, such as *Anopheles gambiae* mosquitoes in temperate zones (4,5), but the threshold of change for *L. longipalpis* sand flies is minimal. The Mediterranean area is as dry as northeastern Brazil, where the disease is now highly endemic. Furthermore, the annual average temperature and



Figure. Commercial air transport routes between Lisbon, Portugal, and cities in Brazil that could make possible the accidental importation into Europe of *Lutzomyia longipalpis* sand flies, a vector of visceral leishmaniasis.

cooler months in Lisbon (at 38°44'N) are only 3–4°C lower than those of São Borja, Rio Grande do Sul state, the southernmost city where *L. longipalpis* transmits kala-azar, and even warmer than Chajarí, Argentina (at 30°46'S, ≈500 km from Buenos Aires and only 8° farther from a pole than Lisbon), at the highest southern latitude where this vector is found (6).

Human kala-azar is less common in Europe, possibly because sand flies there are less anthropophilic. If aircraft introduce anthropophilic *L. longipalpis* sand flies in Lisbon, the situation could change dramatically, and kala-azar might become a major urban disease in Europe. The International Health Regulations recommends disinfection of aircraft by preflight and blocks-away spraying with pyrethroids (7). However, significantly reduced susceptibility to pyrethroids in wild populations of *L. longipalpis* sand flies was recently

described in Brazil (8). Centuries after its introduction to South America by Iberian colonizers, kala-azar may make its way back to Europe with a more forceful vector—this time by air, not by sea. To reduce this risk, much information needs to be known about the biology of *L. longipalpis* sand flies, such as minimum temperature tolerance, mechanisms of urban spread, presence in aircraft, and role in inducing more severe disease.

Carlos H.N. Costa and Isabel K.F. de Miranda-Santos

Author affiliations: Federal University of Piauí, Brazil (C.H.N. Costa) and University of São Paulo at Ribeirão Preto, Brazil (I.K.F. de Miranda-Santos)

DOI: 10.3201/eid1707.102002

References

1. Ready PD. Leishmaniasis emergence in Europe. *Euro Surveill.* 2010;15:19505.

2. Costa CH. Characterization and speculations on the urbanization of visceral leishmaniasis in Brazil. *Cad Saude Publica.* 2008;24:2959–63. doi:10.1590/S0102-311X2008001200027
3. Abranches P, Silva-Pereira CD, Conceição-Silva FM, Santos-Gomes GM, Janz JG. Canine leishmaniasis: pathological and ecological factors influencing transmission of infection. *J Parasitol.* 1991;77:557–61. doi:10.2307/3283159
4. Gratz NG, Steffen R, Cocksedge W. Why aircraft disinfection? *Bull World Health Organ.* 2000;78:995–1004.
5. Tatem AJ, Rogers DJ, Hay SI. Estimating the malaria risk of African mosquito movement by air travel. *Malar J.* 2006;5:57–63. doi:10.1186/1475-2875-5-57
6. Salomón OD, Fernández MS, Santini MS, Saavedra S, Montiel N, Ramos MA, et al. Distribución de *Lutzomyia longipalpis* en la Mesopotamia Argentina, 2010. *Medicina (B Aires).* 2011;71:22–6.
7. Hardiman M, Wilder-Smith A. The revised international health regulations and their relevance to travel medicine. *J Travel Med.* 2007;14:141–4.
8. Alexander B, Barros VC, de Souza SF, Barros SS, Teodoro LP, Soares ZR, et al. Susceptibility to chemical insecticides of two Brazilian populations of the visceral leishmaniasis vector *Lutzomyia longipalpis* (Diptera: Psychodidae). *Trop Med Int Health.* 2009;14:1272–7. doi:10.1111/j.1365-3156.2009.02371.x

Address for correspondence: Carlos H.N. Costa, Federal University of Piauí—Institute of Tropical Diseases Natan Portella, Rua Artur de Vasconcelos 151-Sul, Teresina PI 64049-750, Brazil; email: chncosta@gmail.com

Letters

Letters commenting on recent articles as well as letters reporting cases, outbreaks, or original research are welcome. Letters commenting on articles should contain no more than 300 words and 5 references; they are more likely to be published if submitted within 4 weeks of the original article's publication. Letters reporting cases, outbreaks, or original research should contain no more than 800 words and 10 references. They may have 1 Figure or Table and should not be divided into sections. All letters should contain material not previously published and include a word count.