First evidence of *Leishmania major* infection in a cat in Western Europe

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**BACKGROUND**

*Leishmaniosis* is a worldwide vector-borne disease caused by protozoa belonging to the genus *Leishmania*, which infects several mammal species, including humans. *Leishmania infantum* is the only species believed to be endemic in Western European countries for decades, causing cutaneous and visceral disease forms, with the latest being fatal if left untreated. In Portugal, *L. infantum* infection is prevalent throughout the country, with rates of up to 12.0% and 9.9% in dogs and cats, respectively, while human leishmaniosis is considered a hypoendemic disease. Since the 1980s, more than 250 parasite strains have been isolated from humans, dogs, cats, foxes and phlebotomine sand flies. Based on isoenzymatic and/or molecular typing methods, all of them have been identified as *L. infantum*, but more recently four *L. major/L. infantum* hybrids were isolated from humans and *L. major* DNA detected in a phlebotomine sand fly. In this study, the partial nucleotide sequences of four gene markers (*cytB*, *g6pdh*, *hsp70*, *ITS-rDNA*) were explored to investigate the genetic diversity of *Leishmania* spp. detected in cats from Portugal.

**METHODS AND RESULTS**

- **DNA extraction**
- **PCR Screening**
  - SSU-rDNA
  - Molecular characterisation:
    - *cytB*
    - *g6pdh*
    - *hsp70*
    - *ITS-rDNA*
- **Electrophoresis**
- **DNA sequencing**
- **Phylogenetic reconstruction**
  - Bayesian
  - Maximum Likelihood

**RESULTS**

- Domestic/stray cats (n=344)
- Lisbon metropolitan area
- Between February 2017 and August 2018

5.2% (18/344)

1 *L. major*
   - Based on *cytB* and *ITS-rDNA* trees
   - Stray cat
   - Approx. 7-month-old
   - Blood collection - out of sand fly seasonal activity period

3 *L. donovani complex*[^1]
   - Based on *cytB*, *g6pdh*, *hsp70* and *ITS-rDNA* trees
   - Composed by *L. infantum* and *L. donovoni* species

**CONCLUSIONS**

- First detection of *L. major* DNA in a cat in Western Europe.
- The detection of *L. major* DNA in the blood of a young cat, out of sand fly seasonal activity, indicates a true infection situation.
- The concordant sequence identity results strongly suggest the presence of *L. major* parasites and reinforces the hypothesis that *L. major* already circulates in Portugal.
- Eco-epidemiological and phylogenetic studies are needed to clarify the possible maintenance and transmission of *L. major*.

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