

First report of *Leishmania infantum* in captive non-human primates in Italy

G. Barlozzari^{1*}, V. Galletta¹, L. Salvato¹, F. Romiti¹, C. De Liberato¹, G. Marafini¹, V. Russini¹, K.G. Friedrich², P. Di Cerbo², M. Scarpulla¹ & C. Eleni¹

¹Istituto Zooprofilattico Sperimentale del Lazio e della Toscana M. Aleandri, Rome, Italy; ²Fondazione Bioparco, Rome, Italy ; *giulia.barlozzari@izslt.it

Introduction

The leishmaniasis are a group of diseases transmitted by phlebotomine sand flies. Leishmania infects many mammalian hosts, including non-human primates (NHPs). Natural infections in NHPs are rare, especially in Old World NHPs (OWNHPs), which generally develop milder forms and often recover spontaneously, unlike New World NHPs (NWNHPs), which experience potentially lethal forms (1).

Materials and Methods

In the period 2021-2023, 28 NHPs (23 OW, 1 NW, 4 prosimians) from Bioparco Zoological Garden of Rome, were tested for the presence of leishmania DNA through ITS1 nPCR on blood and spleen samples (2). Positive samples were subjected to Restriction Fragment Length Polymorphism (RFLP) and sequencing. Phlebotomine sand fly catches were carried out in the zoo every 15 days using CDC traps.

Results



Macaca fuscata. © Foto Massimiliano Di Giovanni – Archivio Bioparco



Cercopithecus atys lunulatus. © Foto Massimiliano Di Giovanni – Archivio Bioparco

- 92 *Phlebotomus perniciosus* were collected in the zoo

- 5/28 NHPs (17.9%) and 5/23 OWNHPs (21.7%) were positive for *L. infantum* DNA on blood
- Positive animals were 4 Japanese macaques (*Macaca fuscata*) and 1 sooty mangabey (*Cercopithecus atys lunulatus*)

NHP category	Species	Number	PCR+ (n)	P (%)
Prosimians	<i>Lemur catta</i>	4	-	
Total (n)		4		
NW	<i>Cebuella pygmaea</i>	1	-	
Total (n)		1		
OW	<i>Cercopithecus atys lunulatus</i>	5	1	20
	<i>Macaca fuscata</i>	7	4	57.1
	<i>Mandrillus sphinx</i>	6	-	
	<i>Pongo pygmaeus</i>	1	-	
Total (n)		23	5	21.7
Total (n)		28	5	17.9

Collection date	Collection area	<i>P. perniciosus</i> (n)	Sex
01/09/2022	<i>Cercopithecus</i>	4	F
	<i>Macaca</i>	11	F
	Penguin	50	F
14/09/2022	<i>Cercopithecus</i>	0	
	<i>Macaca</i>	5	F
	Penguin	22	F
Total (n)		92	F

- Positive samples were confirmed through RFLP and sequencing (PP972735.1-PP972739.1)

Discussion

Several NHP species were screened but *L. infantum* DNA was detected only in 5 OWNHPs, with a prevalence of 21.7%. Positive NHPs did not show clinical signs in line with previous reports. Natural infections in OWNHPs are rare, with few studies assessing prevalence. Surprisingly, we found a prevalence of 21.7% by PCR. To our knowledge, this is the first case of natural infection by *L. infantum* in NHPs in Italy, where the disease is endemic, and the first report in Japanese macaques and sooty mangabey worldwide. Further analyses will be needed to clarify if the positivity detected is consistent with a recent or transient infection. The identification of competent vectors in the zoo suggests the need to implement proper surveillance and preventive measures.

References

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