

# The molecular detection of *Babesia microti* protozoan in *Ctenocephalides* fleas collected from pets

Olga Pawełczyk, Marek Asman, Krzysztof Solarz

Medical University of Silesia in Katowice, School of Pharmacy with the Division of Laboratory Medicine in Sosnowiec, Department of Parasitology, Poland

**BACKGROUND.** Fleas from the *Ctenocephalides* genus are multihost external parasites of mammals. Cat flea (*Ctenocephalides felis felis*) and dog flea (*C. canis*) most frequently occur on domestic cats (*Felis catus*) and dogs (*Canis lupus familiaris*). Moreover, they may be vectors and reservoirs of many pathogens, including *Yersinia pestis*, *Bartonella henselae*, *Rickettsia typhi* and *R. felis*. In addition, their larvae may be indirect hosts of *Dipylidium caninum*, *Hymenolepis diminuta* and *H. nana* tapeworms. Some studies suggest that fleas also can be reservoirs and vectors for other zoonotic pathogens.

**AIMS OF THE STUDY.** The aims of this study were the detection of *Babesia microti* in adult *C. felis felis* and *C. canis* collected from pets.

**MATERIAL AND METHODS.** Fleas were collected from pets in veterinary clinics, animal shelters and pet grooming salon located in cities of the Silesia Province, Poland. The material was conserved in plastic tubes with 70% ethyl alcohol, then determined to species and sex. DNA was isolated from flea by using the ammonia method. *B. microti* was detected by nested PCR using specific primers for the 18S rRNA sequence. The amplification products were separated electrophoretically on a 2% agarose gel stained with ethidium bromide and were visualized in UV light. The presence of the reaction products of the size: 238 bp and 154 bp for *B. microti* were considered as a positive.

**RESULTS.** 155 fleas were captured from domestic dogs and cats in Silesia Province, Poland. Among them, 4 species were determined – *C. felis felis* (68,39%), *C. canis* (28,39%), *Pulex irritans* (1,94%) and *Archaeopsylla erinacei* (1,29%). Female fleas occurred in the vast majority, constituted 84,52% of total collected material. 150 fleas were molecularly analyzed, including 106 of *C. felis felis* and 44 of *C. canis* fleas. *B. microti* was detected in similar number of cat fleas (11,32%) and dog fleas (11,36%).

**CONCLUSIONS.** Both cat flea and dog flea can play a potential role as reservoirs and vectors for *B. microti*. The exposition of people to *C. felis felis* and *C. canis* fleas, which hosts are domestic cats and dogs can pose a potential risk of infection of this protozoan in humans.

**KEY WORDS.** *Ctenocephalides felis felis*, *Ctenocephalides canis*, *Babesia microti*

Address for correspondence: O. Pawełczyk, Medical University of Silesia in Katowice, Department of Parasitology, Jedności 8, 41-218, Sosnowiec, Poland. (32) 364-11-92; olga.pawelczyk@sum.edu.pl