

# HIDDEN DIVERSITY: SARCOCYSTIS PARASITES IN CATTLE (*Bos taurus*) RAISED IN LITHUANIA

Mingailė Stanionytė<sup>1</sup>, Petras Prakas<sup>2</sup>, Dalius Butkauskas<sup>2</sup>, Donatas Šneideris<sup>2</sup>, Naglis Gudiškis<sup>2</sup>

<sup>1</sup>Vilnius University, Life Sciences Center, Lithuania

<sup>2</sup>State Scientific Research Institute Nature Research Centre, Lithuania  
[mingaile.stanionyte@gmc.stud.vu.lt](mailto:mingaile.stanionyte@gmc.stud.vu.lt)

Parasites of the genus *Sarcocystis* are widely distributed among domestic and wild animals, with cattle (*Bos taurus*) representing one of the most important intermediate hosts, making studies of these parasites highly relevant to both veterinary and public health [1]. In recent years, the increasing number of *Sarcocystis* species and their zoonotic potential have highlighted the need for more precise diagnostic methods, as morphological approaches are often insufficient for reliable identification of taxonomically closely related species [2]. In Lithuania, the prevalence and species diversity of *Sarcocystis* parasites in cattle are still insufficiently investigated using molecular methods, and infections often remain undetected due to the absence of clinical signs and the difficulty of detecting microscopic cysts [3].

The aim of this study was to evaluate the species diversity of *Sarcocystis* spp. parasites in cattle raised in Lithuania and to determine their genetic characteristics using microscopic and molecular methods. The analysis of stained and unstained muscle tissue samples was performed using the compression microscopy method to detect sarcocysts in tissues. Subsequently, genomic DNA was extracted from selected samples and used for molecular analysis. Parasite identification was carried out using nested polymerase chain reaction (PCR) targeting the *cox1* gene as a genetic marker, the obtained PCR products were analyzed by electrophoresis.

A total of 28 bovine heart muscle samples were examined using the compression microscopy method. Sarcocysts were detected in 60.71% (17/28) of the samples. According to proposed classification by Bogush (1976) [4] and Malakauskas et al. (2001) [5], a low parasite burden was observed in most of positive the samples, while a moderate infection intensity was detected in only one sample (13 sarcocysts/g). The mean length of the detected sarcocysts was 650.93 µm (271,65–1052,90 ± 241,87, n = 28) and the mean width was 57.78 µm (29,49–85,02 ± 15,94, n = 28). Morphological characteristics were consistent with microscopic *Sarcocystis* species infecting cattle. Molecular analysis identified two species: *Sarcocystis cruzi* and *Sarcocystis bovifelis*, of which *S. cruzi* was dominant and detected in 75.0% (21/28) of the samples, whereas *S. bovifelis* was detected in 7.14% (2/28) of the samples.

The results further demonstrated a limited diversity of *Sarcocystis* species in Lithuanian cattle, highlighting the importance of molecular methods for accurate parasite identification and evaluation of zoonotic potential. In future studies, it is planned to expand the number of analyzed samples and to optimize molecular and viability assessment methods to more reliably evaluate the prevalence of these parasites in cattle and their significance for veterinary and public health.

- 
- [1] J. P. Dubey, E. Van Wilpe, R. Calero-Bernal, S. K. Verma, and R. Fayer, "Sarcocystis heydorni, n. sp. (Apicomplexa: Sarcocystidae) with cattle (*Bos taurus*) and human (*Homo sapiens*) cycle," *Parasitology Research*, vol. 114, no. 11, pp. 4143–4147, Aug. 2015, doi: 10.1007/s00436-015-4645-2.
- [2] J. J. Hu, S. Huang, T. Wen, G. W. Esch, Y. Liang, and H. L. Li, "Morphology, Molecular Characteristics, and Demonstration of a Definitive Host for *Sarcocystis rommeli* from Cattle (*Bos taurus*) in China," *Journal of Parasitology*, vol. 103, no. 5, pp. 471–476, Jun. 2017, doi: 10.1645/16-187.
- [3] P. Prakas et al., "Molecular identification of four *Sarcocystis* species in cattle from Lithuania, including *S. hominis*, and development of a rapid molecular detection method," *Parasites & Vectors*, vol. 13, no. 1, p. 610, Dec. 2020, doi: 10.1186/s13071-020-04473-9.
- [4] A. A. Bogush, *Swine Muscle Parasitoses and Preventive Measures Against Them*. Minsk, Belarus: Urodzhai, 1976.
- [5] M. Malakauskas, J. Grikiėnienė, and G. Januškevičienė, "Mėsai medžiojamų žvėrių sarkocistozė," *Veterinarija ir Zootechnika*, vol. 14, no. 36, pp. 36–43, 2001.