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STUDY OF SERUM METABOLOME IN DOGS WITH *BABESIA CANIS* INFECTION BY NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

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Canine babesiosis is an important tick-borne disease with worldwide distribution, caused by parasites of the *Babesia* genus [1]. Acute renal failure is one of the most common complication in canine babesiosis, which could result in decrease of glomerular filtration, and consequently developing azotemia and uremia [2]. The main goal of early diagnosis of renal disease and renal failure in dogs is to apply the therapy as soon as possible to slow or halt disease progression. Current conventional diagnostic tests of kidney damage in blood are widely used for diagnosis and monitoring of kidney disease [3]. However, they all have important limitations, such as serum creatinine concentration will only be increased when already 75% of functional renal mass is lost [4]. Blood contains multitude, unstudied, and unknown biomarkers. Hence, analysis of metabolites represents a sensitive measure of biological status in health or disease, respectively the analyses of metabolites are essential to the understanding of biological systems and the mechanism of disease progression. The basic analytical technique for metabolomics analysis is nuclear magnetic resonance (NMR) spectroscopy. The goal of the research was to examine the differences of serum metabolom between dogs infected with *B. canis* and healthy dogs using NMR spectroscopy. Serum samples were collected from 4 dogs of various breeds and sex with naturally occurring babesiosis caused by *B. canis*, admitted to Faculty of Veterinary Medicine. Blood was collected at the admission day. Serum was also collected from 4 healthy dogs. Dogs with babesiosis was non-azotemic (serum creatinine < 140 μmol/L) with UPC > 0.5. Our preliminary results confirm that NMR is good platform for investigation of biomarkers in babesiosis.

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REFERENCES

- [1] Irwin, P. J. *Vet. Clin Small Anim*, **2010**, 40, 1141.
- [2] Matijatko, V., Klš, I., et al., *Vet. Parasitol.* **2009**, 162, 263.
- [3] Kuleš, J., Bilić, P., et al., *Ticks and Tick-borne Diseases*, **2018**, 9, 1508.
- [4] Braun, J. P., Lefebvre, H. P. et al., *Vet Clin Pathol.* **2003**, 32, 162.