

## SUMMARY

Canine babesiosis is a common and clinically significant tick-borne disease caused by hematozoan parasites of the genus *Babesia*. The classification of *Babesia spp.* places them in order *Piroplasmida* within the phylum *Apicomplexa*. The main etiological factor in Poland and other European country causing canine babesiosis is *B. canis*.

The first symptoms of babesiosis are non-specific. Infected animals suffer from fever, apathy, the decrease of appetite. Higher blood pressure and the increasing numbers of breath are also noticeable. In the longer term, pale mucous membrane, hemoglobinuria, vomiting and diarrhea can also occur. Hematology study generally concludes anemia and thrombocytopenia

Considering problems incident to decreasing effectiveness of antiprotozoal agents as well as animals' not always positive drug tolerance, there is a necessity to conduct research on some new substances that could be used to combat the invasion of *Babesia*.

In recent years increasing interest in capsaicin contained in habanero peppers and its healing properties, concerning combat the antiprotozoa invasions on both human being and animals, were observed.

The purpose of conducted in vitro research was determining the antiprotozoal effectiveness of dried habanero peppers containing capsaicin in relation to *Babesia canis* parasites kept in dogs' erythrocytes culture. Since the recent observations indicate that dog's babesiosis is a disease of varied clinical courses which is still considered as a therapeutical problem.

The research was conducted in three groups of red cells cultures infected with *B. canis* 18S-RNA-A, 18S-RNA-B and 18S-RNA-C strains. Differentiation of parasites was based on the results of molecular tests (i.e. PCR and sequencing). Dried habanero peppers extract, consisting increasing dilution of capsaicin, was added to infected cultures. The antiprotozoal effectiveness of the extract was compared with imidocarb effectiveness, which served as a model.

The most successful effectiveness of dried habanero peppers was shown in relation to piroplasma 18S-RNA-B strain. The dilution of extract consisting capsaicin at concentration 43 µg/ml and 4.3 µg/ml contained parasitemia adequately in 90% and 80%.

In the case of cultures infected with 18S-RNA-A strains, the antiprotozoal effectiveness of dried habanero peppers consisting capsaicin, was lower. At both concentrations, i.e. 43 µmg/ml and 4.3 µg/ml, it was stated as moderate, as the level of containment parasitemia totalled adequately 60% and 50%. The antiprotozoal effectiveness of dried habanero peppers was lower in cultures infected with 18S-RNA-C strains than in the first examined group. At the concentration of capsaicin 43 µg/ml was stated as moderate as the level of containment parasitemia totalled 50%. Considering the rest of concentrations, the content of capsaicin in dried habanero peppers was 4.3 µg/ml, 0.43 µg/ml and 0.043 µg/ml, it was considered not to be activated as the level of containment parasitemia was between 30% to 40%.

Considering several research groups the IC50 values of capsaicin were as follows. The cultured infected with 18S-RNA-B strains totalled 0.43 µg/ml, another one infected with 18S-RNA-A strains reached 4.3 µg/ml and the last researched culture infected with 18S-RNA-C equalled 43 µg/ml.

It may be stated, based on own observations, that particular strains of *B. canis*, isolated from dogs are featured not only by its virulence] but also different sensitivity to capsaicin. The least malignant strain i.e. 18S-RNA-B showed the highest sensitivity to alkaloid at the same time. In comparison with 18S-RNA-B strain, responsible for progression of acute babesiosis 18S-RNA-B strains as well as responsible for progression of chronic and subclinical babesiosis 18S-RNA-C strains. Both seem to be more resistant to the effect of the mentioned substance.

A positive correlation between low value of IC50 and nonoccurrence of hemacytolysis regarding researched groups shows that capsaicin is a safe substance that does not damage red cells in vitro.

Promising antiprotozoal effect shown in some of dilution of capsaicin proves profound research aiming at finding an explanation of its effect as well as its effectiveness in vitro.