

# Serological and molecular detection of *Babesia caballi* and *Theileria equi* in horses from Latium, between July 2018 and April 2021: a retrospective study.

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## INTRODUCTION

*Babesia caballi* and *Theileria equi* are Ixodid tick-transmitted protozoans, causative agents of equine piroplasmiasis (EP), which has a worldwide economic impact on the equine industry. Although *B. caballi* and *T. equi* can cause similar clinical pictures, *T. equi* infection has a higher mortality rate compared to *B. caballi* (Butler et al., 2005, Tijdschr. Diergeneesk., 130:726–731.). Horses surviving clinical infection may remain inapparent carriers. The aim of this retrospective study is to document the prevalence of equine piroplasmiasis (EP) in Latium using molecular and serological methods.

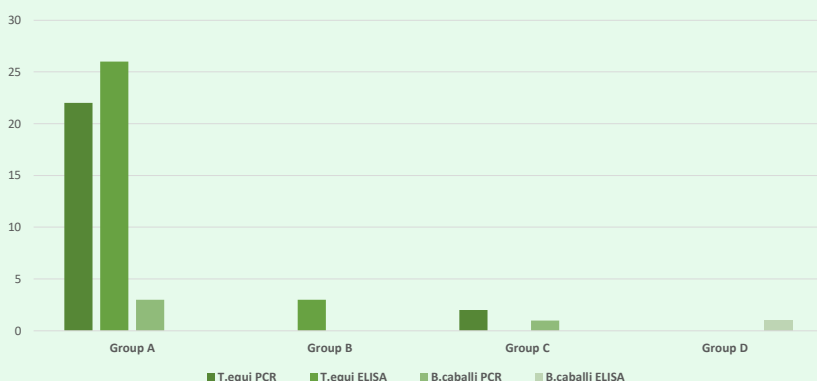
## MATERIALS AND METHODS

A total of 95 horses living in Latium (Central Italy), sampled between July 2018 and April 2021, were included in the study. Out of 95 horses examined, 79 were subjected to both Enzyme-linked Immunosorbent Assay (ELISA) and to Real time PCR (qPCR) for both pathogens (Group A), 9 horses were examined using only ELISA (Group B) and 3 horses using only qPCR (Group C), 4 horses were subjected only to qPCR for *B. caballi* and ELISA for both pathogens (Group D).

## RESULTS AND CONCLUSIONS

In Group A 26 horses (32.9%) had antibodies towards *T. equi*, while 22 horses (27.8%) molecularly were positive to *T. equi* and 3 (3.8 %) to *B. caballi*. In Group B 3 horses (33.3%) resulted positive to *T. equi*, in Group C 2 (66.7%) scored positive to *T. equi* and 1 (33.3%) to *B. caballi*. Within Group D 1 horse (25%) showed antibodies for *B. caballi*. In one horse a mixed infection by both pathogens was detected using qPCR. Total qPCR positivity was 29% for *T. equi* (A, C) and 4.6 % for *B. caballi* (A, C, D). Total seropositivity (A, B, D) was 31.5% for *T. equi* and 1.1% for *B. caballi*. These results show the higher presence of *T. equi* compared to *B. caballi*. Ticks control and detection of horses acting as healthy carriers may help preventing horses to be infected, lowering the risk of clinical disease in endemic areas (Tirosh-Levy et al., 2020, Ticks Tick Borne Dis., 11:1-12) and minimizing economical losses, as international movimentation often requires horses to be serologically and molecularly negative for EP. Few data are available in literature regarding EP epidemiology in Italy (Moretti et al., 2010, Vet. J., 184:346-350; Bartolomè Del Pino et al., 2016, Ticks Tick Borne Dis., 7:462-469), thus further studies are needed to better understand the distribution of EP in a larger population of horses from endemic and non-endemic areas to implement the control strategies.

Positive samples distribution within Groups



TOTAL HORSES SAMPLED

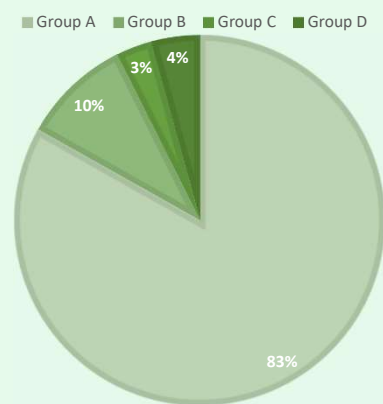


Figure 1.

Distribution of the horses within the 4 groups. Group A is the most representative, including 83% of total horses.

Figure 2.

In group A, because of the highest number of samples, there is the highest number of horses positive to the PCR for *T. equi* and ELISA for *T. equi*. Although not showed within the graphic, the highest percentage of horses (66.7%) positive to the PCR for *T. equi*, was observed within Group C.