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Toxoplasma gondii in free-ranging brown bears (*Ursus arctos*) from Romania: molecular evidence of sylvatic circulation

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ABSTRACT

Toxoplasma gondii is a widespread zoonotic protozoan parasite, but molecular data on infection in brown bears remain limited. This study investigated heart tissue samples from 148 brown bears (*Ursus arctos*) originating from 19 Romanian counties, using trypsin digestion and qPCR. *T. gondii* DNA was detected in 48 bears (32.43%), with positive individuals identified in 13 counties. To our knowledge, this represents the first molecular report of *T. gondii* in brown bears from Romania, highlighting its circulation in wildlife.

1 INTRODUCTION

- *Toxoplasma gondii* is an obligate intracellular protozoan parasite with worldwide distribution, infecting numerous warm-blooded species, including humans.
- The brown bear (*Ursus arctos*) is one of the largest terrestrial carnivores in Europe, with Romania hosting one of its largest populations.
- Molecular data on *T. gondii* infection in brown bears remain limited, highlighting the importance of wildlife surveillance.

AIM

To assess the occurrence and geographical distribution of *T. gondii* infection in free-ranging brown bears (*Ursus arctos*) from Romania.

2 MATERIALS AND METHODS

Study period: 2024–2025

Sample size: 148 brown bears

Origin: 19 Romanian counties

Biological samples: Heart tissue

Sample processing: Trypsin digestion followed by DNA extraction

Molecular detection: qPCR targeting the B1 gene and the 529-bp repetitive element

3 RESULTS

32.43% overall occurrence | **48/148** positive brown bears

- *T. gondii* DNA was detected in 48 of the 148 examined brown bears.
- Positive individuals were identified in 13 of the 19 investigated counties.

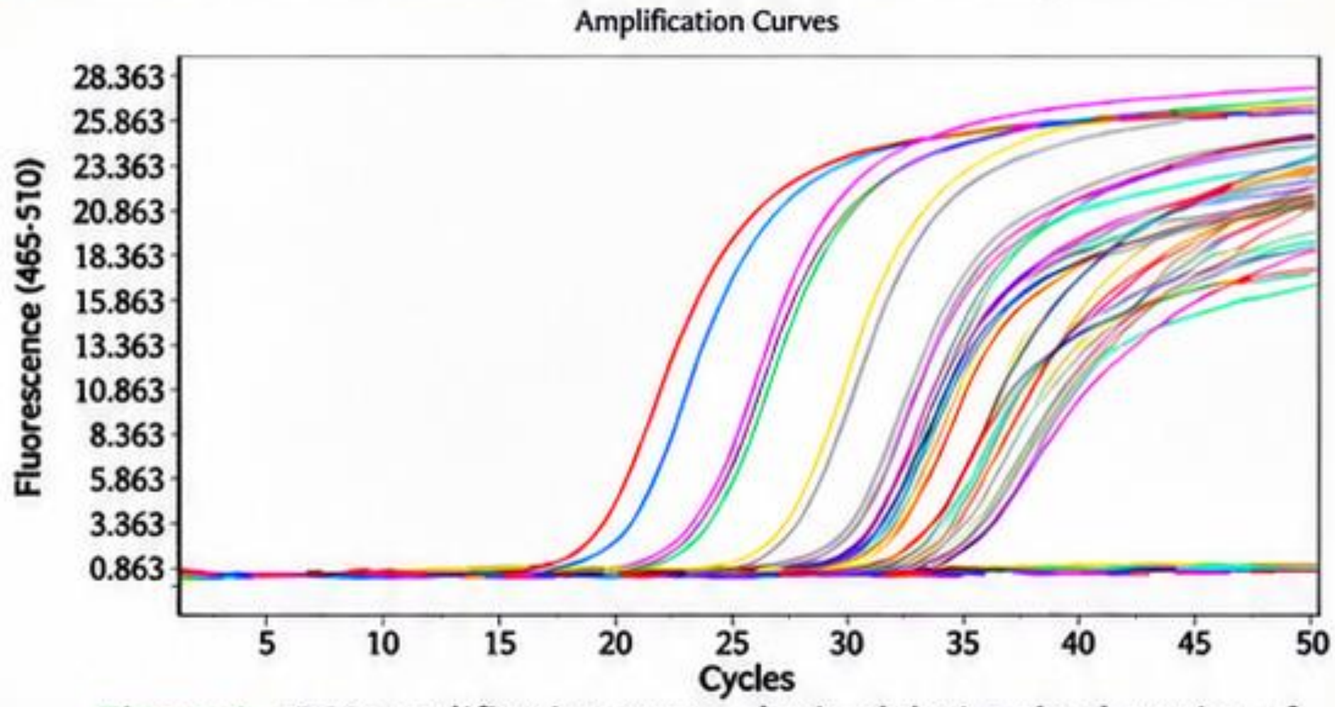


Figure 1. qPCR amplification curves obtained during the detection of *Toxoplasma gondii* DNA lo heart tissue samples from brown bears (*Ursus arctos*)

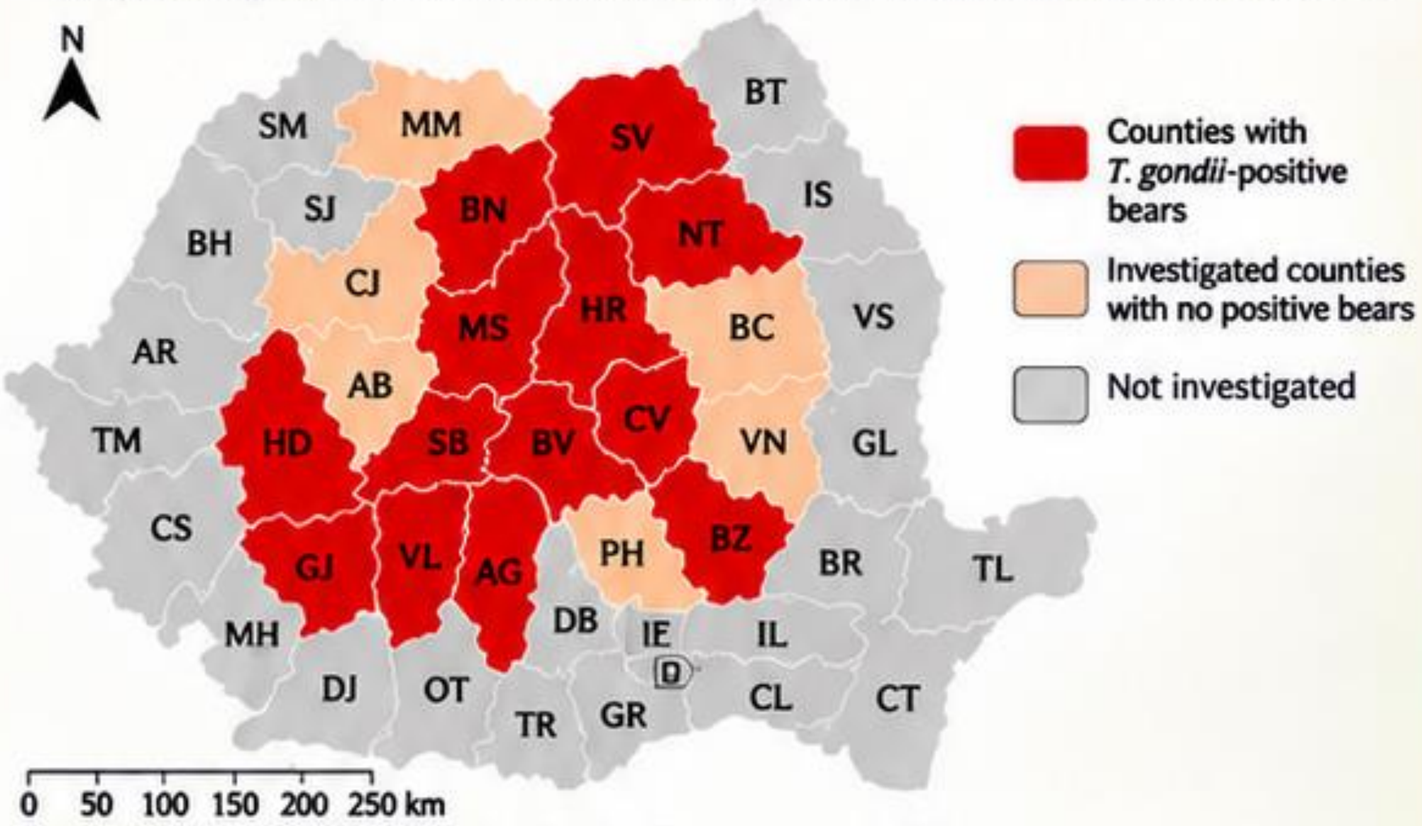


Figure 2. Geographical distribution of *Toxoplasma gondii* detection in brown bears (*Ursus arctos*) from Romania

CONCLUSIONS

- To our knowledge, this study represents the first molecular report of *T. gondii* in brown bears from Romania.
- The detection of *T. gondii* DNA in brown bears from 13 of the 19 investigated Romanian counties provides evidence of the parasite's circulation in wildlife and highlights the importance of continued parasitological surveillance.