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Seroprevalence of *Toxoplasma gondii* and Hepatitis E virus (HEV) in free-ranging wild boars hunted in six Brazilian states

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Introduction

Wild boars, including Eurasian wild boars (*Sus scrofa* Linnaeus), feral pigs (*Sus scrofa domesticus*), and hybrids between the two, have increased dramatically around the world. Currently, subpopulations of this invasive exotic species are present in more than 20 Brazilian states (1). In Brazil, wild boars are classified as exotic invasive species, with nationwide hunting officially permitted for control (2). These free-living populations can harbor many infectious agents transmissible to domestic pigs and other animal species including human (3). Considering the high dissemination of these populations and the increasing popularity of consumption of wild boar meat and meat products, the foodborne pathogens transmission is an increasing threat to human and animal health.

Toxoplasma gondii and Hepatitis E virus (HEV), are multi-hosts zoonotic foodborne pathogens that may be transmitted through the consumption of raw or undercooked infected meat and meat products.

The aim of this study is to provide an overview of the seroprevalence of *Toxoplasma gondii* and Hepatitis E virus in free-living wild boar hunted for population control and surveillance proposes, in six Brazilian States during the year 2019.

Materials and Methods

During the year 2019, a total of 245 wild boar sera samples were collected with collaboration of hunters licensed for population control of these specie and by research team.

Blood samples were collected by puncture in the cavernous sinus or heart, by exsanguination (cervical major veins) or from the thoracic cavity, immediately after death. Then were transported to the laboratory for centrifugation and stored at -20°C until serological analysis.

The samples were tested for detection of antibodies against *T. gondii* using a commercial indirect enzyme-linked immunosorbent assay (ELISA; ELISA ID Screen Toxoplasmosis Indirect Multi-species, IDvet, Grabels, France) and the apparent seroprevalence was estimated. The screening to detect anti-HEV specific IgG antibodies was performed using the commercially available indirect enzymatic immunoassay (ELISA; PrioCHECK® HEV Antibody porcine ELISA Kit. Thermo Fisher Scientific™, Waltham, MA, USA). The HEV seroprevalence was estimated considering the sensitivity (91,0%) and specificity (94%) of the test. The serological tests were performed according the manufacturer's instructions.

Results

The Tables 1 and 2 summarize the distribution and apparent seroprevalence for *Toxoplasma gondii* and HEV seroprevalence in wild boar in six Brazilian states.

Table 1. Seroprevalence of *Toxoplasma gondii* in wild boar hunted during 2019 in six Brazilian States.

States	N° Positive/ Tested	<i>Toxoplasma gondii</i>	
		Prevalence (%)	(CI 95%)
MS	0/11	0,0	(0,0% - 0,5%)
MG	27/80	33,8	(23,2% - 44,2%)
SP	20/49	40,8	(27,0% - 54,7%)
PR	18/27	66,7	(48,7% - 84,6%)
SC	14/25	56,0	(36,3% - 75,7%)
RS	21/53	39,6	(26,4% - 52,9%)
Total	100/245	40,8	(34,6% - 47,0%)

Table 2. Seroprevalence of Hepatitis E virus in wild boar hunted during 2019 in six Brazilian States.

States	N° Positive/ Tested	HEV	
		Prevalence (%)	(CI 95%)
MS	5/11	46,4	(156,5% - 76,3%)
MG	11/80	13,8	(6,1% - 21,4%)
SP	18/49	36,7	(23,1% - 50,3%)
PR	3/27	11,1	(0,0% - 23,2)
SC	5/25	20,0	(4,1% - 35,9%)
RS	6/53	11,3	(2,7% - 19,9%)
Total	48/245	19,6	(14,6% - 24,6%)

Discussion and Conclusion

The seroprevalence of *T. gondii* and HEV detected in this investigation indicates that there are a potential risk for human and animals health by consumption of wild boar meat products.

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