

Sarcocystosis in urban wild boars (*Sus scrofa*), a neglected zoonosis?



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1. Introduction and objectives

Sarcocystis sp. (phylum Apicomplexa) is one of the most prevalent parasitic diseases of mammals, including humans. Wild boar (*Sus scrofa*) is the intermediate host (IH) of *Sarcocystis miescheriana*, *S. suihominis* (zoonotic) and *S. porcifelis* [1]. Little is known about *Sarcocystis* in wildlife of Spain. The objectives of the present study were a) to estimate the prevalence of *Sarcocystis* sp. in urban and periurban wild boars from Barcelona city, b) to identify the species of *Sarcocystis* spp. and c) to analyze different risk factors for *Sarcocystis* infection.

2. Materials & Methods

Sarcocystis prevalence was estimated by histological analysis of myocardium and skeletal muscles from 43 captured wild boars from Barcelona city and periurban areas (Fig 1). Transmission electron microscopy (n=2) was performed in order to characterize the *Sarcocystis* sp. circulating. Risk factors (age and sex) and type of sample of *Sarcocystis* infection were analyzed. Pearson's Chi-squared test with Yates' continuity correction and generalized linear model was used to analyze the different risk factors.



Figure 1. Barcelona city and outskirts map with sampling areas of wild boar. Each yellow dot corresponds to an animal. Inset: human feeding an urban wild boar.

Table 1. Detection and risk factors for *Sarcocystis* spp. infection in wild boar (n=43). CI: confidence intervals.

	Animals (n)	Prevalence (%) (95% CI)	p Value
Type of sample			
Myocardium	43	37.21 (22.8 - 51.7)	0.0004
Skeletal muscle	43	55.81 (41.0 - 70.7)	
Age group (months)			
Piglets (<6)	7	0 (0 - 35.4)	0.0005
Juveniles (7-12)	10	30 (1.6 - 58.4)	
Yealings (13-24)	15	80 (59.8 - 1)	
Adults (>24)	11	90.91 (73.9 - 1)	
Gender			
Male	24	54.17 (34.2 - 74.1)	0.7777
Female	19	63.16 (43.2 - 83.1)	

3. Results

The overall prevalence of *Sarcocystis* infection was 58.14%. Statistically significant differences were present among prevalences between different muscle samples and age groups (Table 1). Significant differences in parasitic burden were seen among muscle samples, age groups and gender. Morphological characteristics of sarcocysts were consistent with *S. miescheriana* (Fig 2).

4. Conclusions

- High *Sarcocystis* prevalence has been found in wild boars of Barcelona from urban and periurban areas, being *Sarcocystis miescheriana* the prevalent species.
- Future studies of *Sarcocystis* characterization should consider the skeletal muscle sample as the tissue of choice for *Sarcocystis* detection.
- *Sarcocystis suihominis* has not been detected in urban and periurban wild boars. Although the risk of infection seems low, the presence of *S. suihominis* should not be ruled out and therefore, further studies on the characterization of circulating *Sarcocystis* species in game species, specially the wild boar, should be performed.

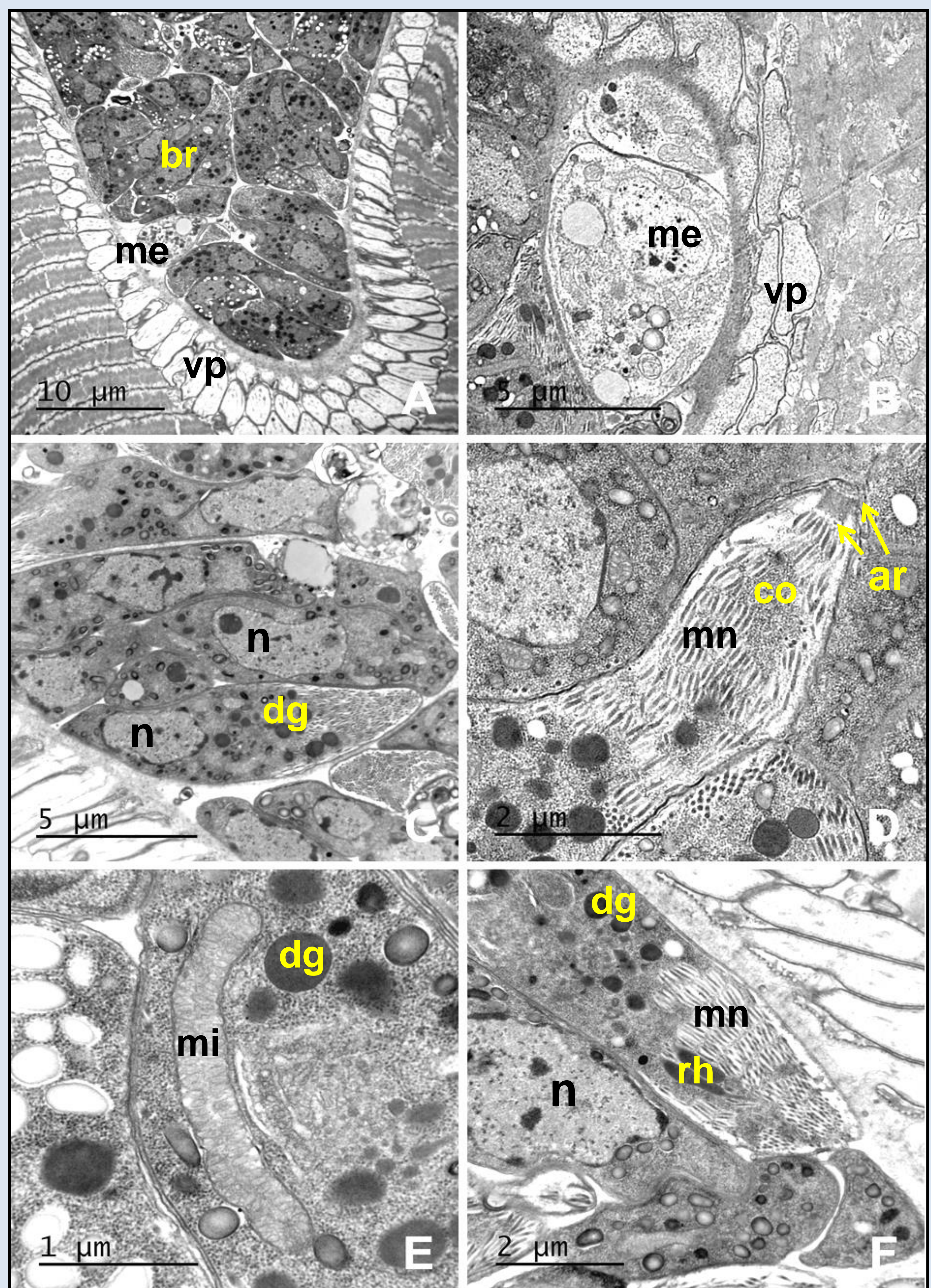


Figure 2. TEM of wild boar (*Sus scrofa*) *Sarcocystis* tissue cysts in skeletal muscle. (A) Longitudinal section of a sarcocyst with packaged bradyzoites (br). (B) A pallid metrocyte (me) found in the periphery of the cyst, underneath the wall. (C) Longitudinal section of a group of packaged bradyzoites. Note the dense granules (dg) and the nucleus (n). (D) Part of a bradyzoite showing the conoid (co), numerous micronemes (mn) and the apical rings (ar). (E) Detailed section of a bradyzoite showing the large mitochondrion, and (F) Apical section of a bradyzoite, note the two rhoptries (rh).

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