

Invasive species, raccoons and raccoon dogs, as potential reservoir hosts for vector-borne pathogens

Joanna Hildebrand, Agnieszka Perec-Matysiak, Izabella Gordzielik,
Ewa Stefanik, Katarzyna Buńkowska-Gawlik, Marcin Popiołek

Department of Parasitology, University of Wrocław

In recent years more and more attention is focused on pathogens transmitted to the human and animals during the bite of blood-sucking arthropods. These pathogens (VBP, vector borne-pathogens), mainly protozoa and bacteria, cause serious diseases such as Lyme disease, babesiosis, anaplasmosis or rickettsiosis. They are obligatory intracellular parasites that are not able to survive outside the host and need a carrier to acquire new hosts. The human-induced changes in ecosystems, as well as climate changes, are factors affecting the communities of wild living animals (withdrawal and emergence of species). In addition, urbanization and changes occurring in urban and suburban areas, as well as increasing human mobility, facilitate the potential contact of domestic animals and humans with blood-sucking arthropods, mainly ticks, and thus with the pathogens they carry.

The hypothesis of this study was as follows: the invasive species of mesocarnivores, raccoon *Procyon lotor* and raccoon dog *Nyctereus procyonides*, expand the host reservoir for pathogens transmitted by vectors. The area of western and south-western Poland seems to be predisposed to this research, where in recent years changes have been observed in populations the wild-living carnivores, among others as a result of the expansion of the raccoon and raccoon dog.

Material for molecular examination were tissues (liver, spleen and skin fragments) collected from co-occurring carnivores – native (red fox) and invasive (raccoon dog, raccoon), obtained thanks to the cooperation with the Pedagogical University in Krakow (Dr. D. Merta) and Ruszów Forest District (Mr. J. Kobielski) as part of a project for reintroduction of the *Tetrao urogallus* in Bory Dolnośląskie (Lower Silesia) and related predator control. The choice of genetic markers and primers was based on the literature data and own previous research, i.e. Anaplasmatatacae – 16S, *groEL*; *Borrelia* sp. – *flaB* *Rickettsia* sp. – *gltA*. PCR positive products were purified and sequenced. BLAST searches were conducted to find a homology of newly obtained sequences with sequences deposited in GenBank and to taxonomic identify.

Our results show rather low level of VBP infection, what suggests that raccoons and raccoon dogs may not be relevant reservoir of haemopathogens in environment. But on the other hand, we observed the short-lasting bacteremia of *Borrelia* and *Rickettsia* in skin samples of raccoons. That phenomenon could be the result of a relatively still new vector-pathogen-host relationships referring to these invasive carnivores in Lower Silesia.