Preliminary study on gastrointestinal parasite community of urban brown rats (*Rattus norvegicus*), Vienna, Austria

Diana S. Gliga[1,*] (Presenter), Lisa Fritz[2], Margaret Odom[3], Chris Walzer[1,4], Barbara Hinney[2], Amélie Desvars-Larrive[1]

[1]Conservation Medicine, Research Institute of Wildlife Ecology, University of Veterinary Medicine, Vienna, Austria; [2]Institute of Parasitology, University of Veterinary Medicine, Vienna, Austria; [3]Cornell University, New York, USA; [4]Wildlife Conservation Society, 2300 Southern Blvd. 10460 Bronx, New York, USA;
*diana.s.gliga@gmail.com

■ Background

Brown rats are highly adapted to urban settings. Rats can serve as reservoir of zoonotic pathogens, which can be transmitted directly or via contaminated environments.

■ Objectives

- To investigate the gastrointestinal parasite community of urban brown rats in Vienna, Austria.
- To investigate potential contamination of sandpits in selected children playgrounds.

■ Methods

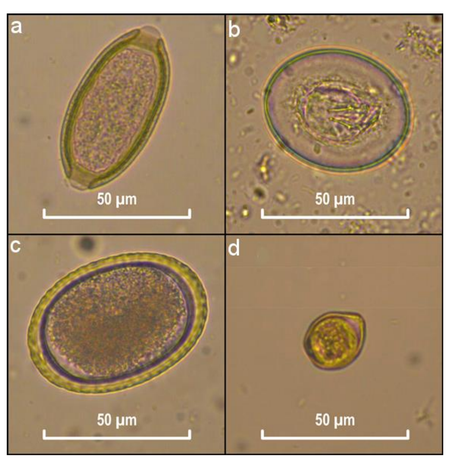
- Fifty rats were captured in Vienna (06/03/2017 - 20/06/2017).
- Fresh faeces were collected from the rectum and stored in formalin 10%.
- Sandpits from 10 public children playgrounds were sampled.
- Sugar flotation method was performed.
- A network approach [1] was used to investigate multiple parasite relationships.

Trap setting.

■ Results

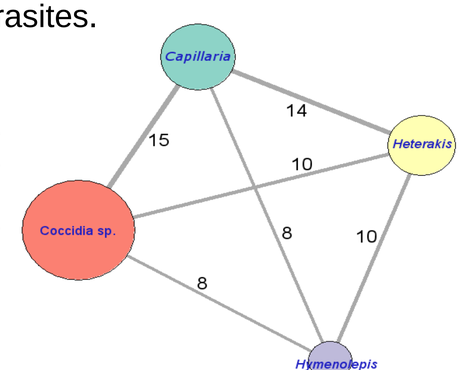
- We identified eggs of *Capillaria hepatica* (22/50, 44%), *Heterakis spumosa* (40%), *Hymenolepis* sp. (26%), and oocysts *of Coccidia* spp. (66%).
- 52% of the rats shed eggs/oocysts from more than one parasite species, mean number of parasite species per host = 2.7 ±0.8 (significantly higher in adults but no gender difference).
- Prevalence of *C. hepatica* was significantly higher in adult rats. Age and gender did not influence *Hymenolepis* sp. prevalence.

Microscope images:
a.Eggs of *C. hepatica*,
b.*Hymenolepis* sp.,
c.*H. spumosa*,
d.Oocyst of *Coccidia* spp.



- Shedding of *H. spumosa* eggs was significantly associated with shedding of *C. hepatica* and *Hymenolepis* sp. eggs.
- None of the environmental samples contained eggs from gastrointestinal parasites.

Structuring of the excreted parasitic eggs/oocysts of the sampled rats using the network approach (*graph.density* connectance function, *igraph* R package).



■ Discussion

- We report two potentially zoonotic species: *C. hepatica* and *Hymenolepis* sp.
- Both are acquired through ingestion of eggs and not considered a major public health risk although certain groups of people can be more exposed.
- Tested children playgrounds present a low risk of transmission of zoonotic helminths.
- Fecal excretion of *Capillaria* occurs when rats ingest eggs from the environment or through cannibalism.

Reference

1. Vaumourin E, Vourc'h G, Telfer S,et al. (2014) To be or not to be associated: power study of four statistical modelling approaches to identify parasite associations in cross-sectional studies. Front Cell Infect Microbiol 4:62.

This study was approved by the institutional ethics and animal welfare committee and the national authority according to §§ 26ff. of Animal Experiments Act, Tierversuchsgesetz 2012 – TGV 2012 (GZ 68.205/0196-WF/V/3b/2016).

ADL and DSG are financially supported by the University of Veterinary Medicine Vienna, Austria