



## Wildlife reservoirs for vector-borne canine, feline and zoonotic infections in Austria



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### ABSTRACT

Austria's mammalian wildlife comprises a large variety of species, acting and interacting in different ways as reservoir and intermediate and definitive hosts for different pathogens that can be transmitted to pets and/or humans. Foxes and other wild canids are responsible for maintaining zoonotic agents, e.g. *Echinococcus multilocularis*, as well as pet-relevant pathogens, e.g. *Hepatozoon canis*. Together with the canids, and less commonly felids, rodents play a major role as intermediate and paratenic hosts. They carry viruses such as tick-borne encephalitis virus (TBEV), bacteria including *Borrelia* spp., protozoa such as *Toxoplasma gondii*, and helminths such as *Toxocara canis*.

The role of wild ungulates, especially ruminants, as reservoirs for zoonotic disease on the other hand seems to be negligible, although the deer filaroid *Onchocerca jakutensis* has been described to infect humans. Deer may also harbour certain *Anaplasma phagocytophilum* strains with so far unclear potential to infect humans. The major role of deer as reservoirs is for ticks, mainly adults, thus maintaining the life cycle of these vectors and their distribution. Wild boar seem to be an exception among the ungulates as, in their interaction with the fox, they can introduce food-borne zoonotic agents such as *Trichinella britovi* and *Alaria alata* into the human food chain.

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### 1. Introduction

Austria is a comparatively small Central European country with a high biodiversity and abundant mammalian wildlife. At the interface of wildlife habitats and human activities, a range of pathogens can be transmitted from wild to domestic animals and to humans (Fig. 1). This concerns both established populations of mammals, like deer, fox or wild boar, and invasive alien species like the racoon dog, the racoon and the golden jackal. Latter group of species are also referred as “neozoans”, so called if they are alien species and introduced to a region after 1492 (Kowarik and Starfinger, 2003). Wild animals may serve as indicators for the presence of parasites; however, transmission risks to domestic animals or humans are usually subject to speculation.

Wildlife may also be reservoirs for arthropod-borne infections that can be transmitted to domestic animals and/or humans. Among these, for example *Anaplasma phagocytophilum*, *Borrelia burgdorferi* s.l. and tick-borne encephalitis virus (TBEV) transmitted by *Ixodes ricinus* are endemic in Austria and are all related to wildlife reservoirs.

A lot of discussion surrounds the possible introduction of the Brown Dog Tick, *Rhipicephalus sanguineus*, into Central Europe. It represents the most important vector of canine tick-borne diseases worldwide and has been introduced several times into animal shelters in Austria in the past.

We here summarize the current knowledge on the possible role of wildlife in the transmission of zoonotic parasites and arthropod-borne pathogens to domestic animals and humans in Austria as an example of a Central European country with diverse habitats from lowlands to alpine regions with different faunas and abundant contact between wild animals and humans and their pets.

### 2. Wildlife animals as reservoir for zoonotic pathogens and vector-borne parasites

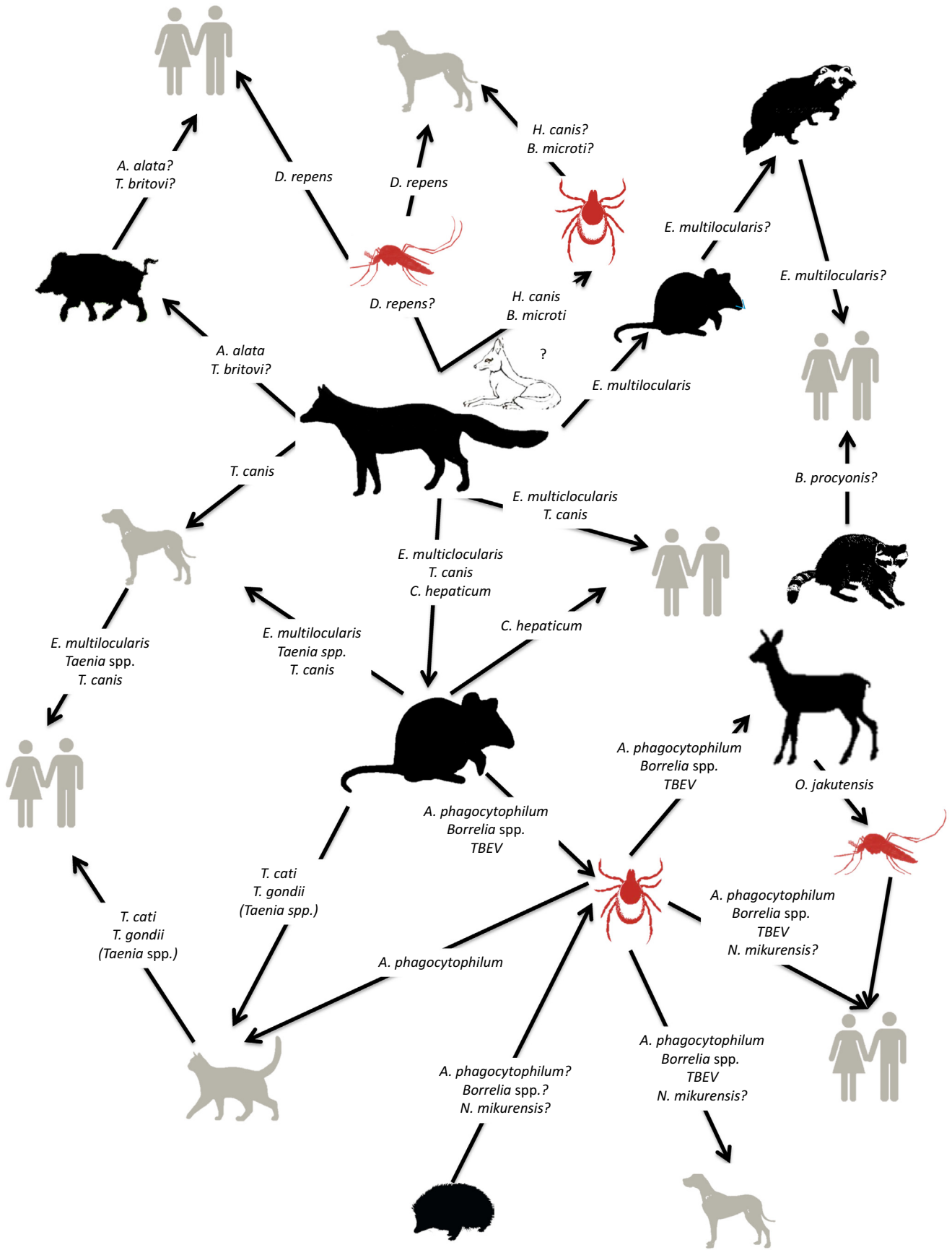
#### 2.1. Wild canids

##### 2.1.1. Red foxes (*Vulpes vulpes*)

Foxes obviously play a key role in the interface between wildlife, pets and humans. Reasons for this include the increasing population density of foxes, their susceptibility to relevant pathogens, their hunting preference for small mammals which leads to frequent ingestion of intermediate hosts, and their wide distribution and vicinity to human settlements as a consequence of their

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