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Multiplex serology to determine the role of wild boar as a reservoir host for hepatitis E virus and a sentinel host for West Nile virus and tick-borne encephalitis virus

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Active wildlife surveillance, as part of a One Health approach, enables an early detection of emerging infections to allow the prevention of wildlife-human spillover events. The Eurasian wild boar (*Sus scrofa*) is a key wildlife species, which is widely distributed in Europe and easily adapts to different habitats. Wild boar and domestic pigs are the main reservoir for hepatitis E virus (HEV) genotype 3, which can be transmitted to humans mainly through consumption of undercooked meat. Wild boar can also serve as effective sentinels for emerging zoonotic pathogens like West Nile virus (WNV), a mosquito-borne orthoflavivirus, and the related tick-borne encephalitis virus (TBEV).

To establish an efficient multi-pathogen serological screening system for wild boar surveillance, we developed a multiplex Luminex magnetic bead-based assay for the detection of antibodies against HEV, WNV and TBEV. Screening of 960 wild boar sera collected in 2023 from eight districts in Saxony revealed high exposure levels to HEV and TBEV in wild boar, whereas WNV was detected at considerably lower levels. HEV RNA was found in five individuals, with phylogenetic analysis indicating a close relationship to subtype HEV-3i.

These findings provide evidence for the circulation of HEV, WNV and TBEV in Saxony, highlighting the value of multiplex serological screening in wild boar as an effective tool for wildlife-based surveillance of these viruses.

Keywords

Hepatitis E virus, West Nile virus, Tick-borne encephalitis virus, Luminex, Multiplex, Serology, Wild boar

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Professional Status of the Speaker

Postdoc

Junior Scientist Status

No, I am not a Junior Scientist.

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