CASE STUDY

Detection of Tick-Borne Encephalitis Virus in Ear Tissue and Dried Blood Spots from Naturally Infected Wild Rodents

Reference/Citation: Pascoe, E.L., de Vries, A., Esser, H.J. et al. Detection of tick-borne encephalitis virus in ear tissue and dried blood spots from naturally infected wild rodents. Parasites Vectors 16, 103 (2023).
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Keywords

Tick-borne encephalitis virus, Reservoir host, Sampling, Surveillance, FastPrep 24-5G, Lysing Matrix Z

Aim of Study

To investigate if tick-borne encephalitis virus (TBEV) RNA can be detected in non-destructively obtained samples, specifically ear tissue and dried blood spots (DBS), from naturally infected wild rodents.

Samples

Ear Tissue, Dried blood spot (DBS)

Materials

FastPrep™ 24-5G, Lysing Matrix Z

Method

Ear tissue was first removed from the ethanol and dried. The ear tissue was then placed in 400 µl MagNA Pure 96 External Lysis Buffer together with 200 µL Minimum Essential Medium (MEM) (Thermofisher Scientific) in 2-mL tubes with Lysing Matrix Z (MP Biomedicals). Samples were homogenized by bead beating for 40 s at 6.0 m/s (FastPrep-24™ 5G, MP Biomedicals)

Results

The study showed that tick-borne encephalitis virus (TBEV) RNA could be detected in non-destructively obtained samples from naturally infected wild rodents. Out of 117 tested individuals, TBEV-RNA was identified in ear tissue and dried blood spots (DBS) from five rodents. All positive individuals had a TBEV-positive ear sample, with only two also having a positive DBS. Notably, no rodents exhibited a positive DBS with a negative ear sample, supporting previous findings that the virus can replicate in the skin even when undetectable in the blood.

Species	Location	Sex	Breeding Status	Ear Tissue	Dried Blood Spot
Apodemus Sylvaticus	B	Male	Adult	+ (30.70)	+ (25.38)
	C	Male	Adult	+ (30.71)	-
	B	Female	Adult	+ (29.12)	-
Myodes Glareolus	C	Male	Adult	+ (25.73)	+ (32.94)
	A	Male	Adult	+ (24.27)	NA

Overview of biological samples collected from rodents that tested positive by real-time RT-PCR for tick-borne encephalitis virus. Ct scores are provided in brackets. Samples were homogenized by beating for 40 s at 6.0 m/s (FastPrep-24™ 5G, MP Biomedicals)

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