

Activities of the Veterinary Faculty and the Veterinary Institute, University of Sarajevo – Laboratory for Parasitology: Update on *Trichinella* Research



20th Workshop of the National Reference Laboratories for Parasites

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About us: where we are, who we are, what we do



- Established in 1949 to support post-war recovery of livestock production and strengthen veterinary services in Bosnia and Herzegovina.
- Became part of the Socialist Federal Republic of Yugoslavia's academic network.
- Formation of the Veterinary Institute within the Faculty integrated several accredited laboratories, including the Parasitology Laboratory.



Buildings of the Veterinary Faculty and the Veterinary Institute



- During the 1992–1995 war, the Faculty and Institute continued operating under extremely difficult conditions.
- Despite heavy shelling, teaching activities were maintained, and food was produced for the residents of besieged Sarajevo.



Buildings of the Veterinary Faculty and the Veterinary Institute

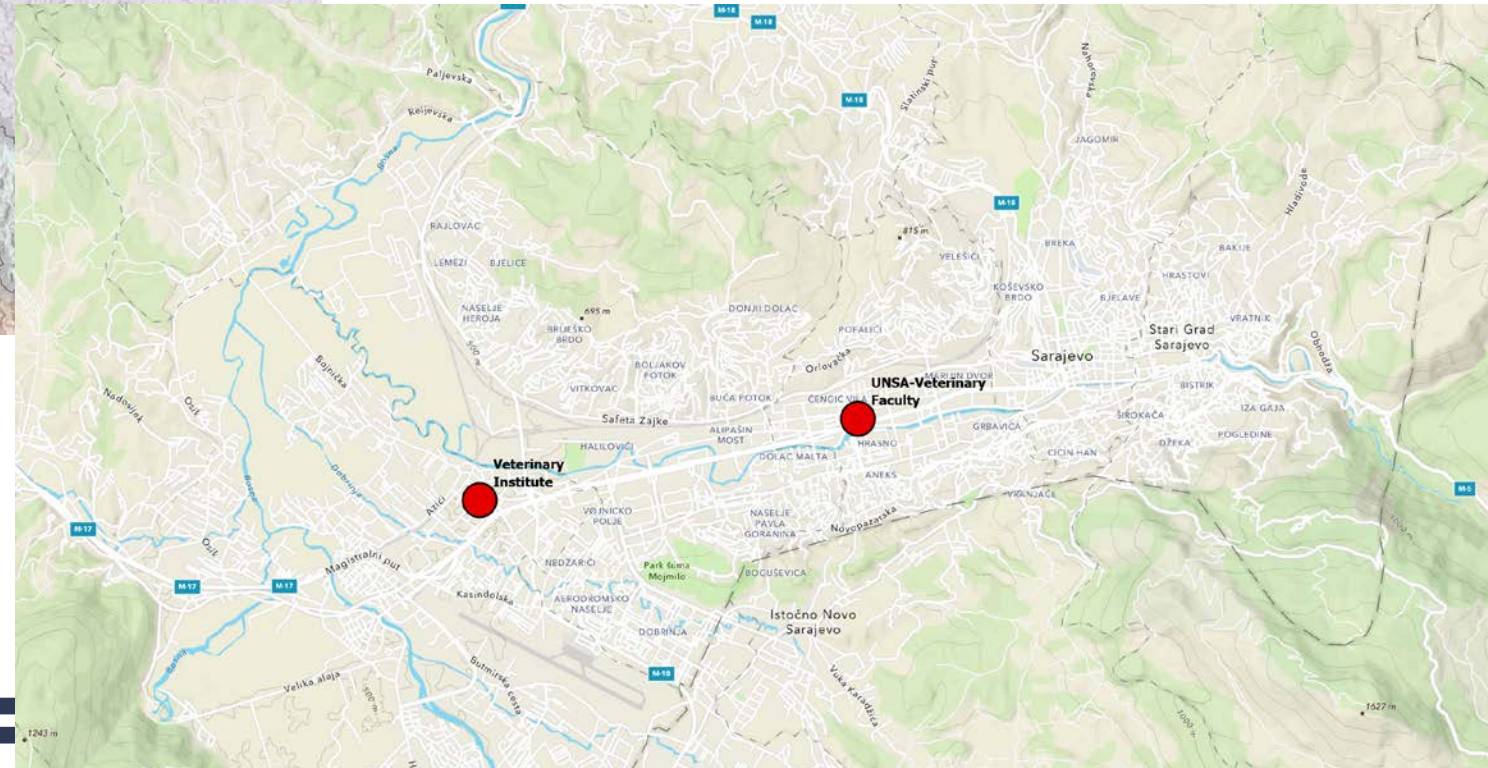


Today, the Veterinary Faculty works closely with the Veterinary Institute and its laboratories.

Veterinary Faculty and the Veterinary Institute



The Veterinary Faculty is located in the Malta area of Sarajevo, while the Veterinary Institute operates at the Stup location, together forming an integral part of the country's veterinary education, diagnostics and research network.





Team of the Parasitology Laboratory



Jasmin Omeragić



Adnan Jažić



Amra Škrijelj



Naida Kapo



Almedina Zuko

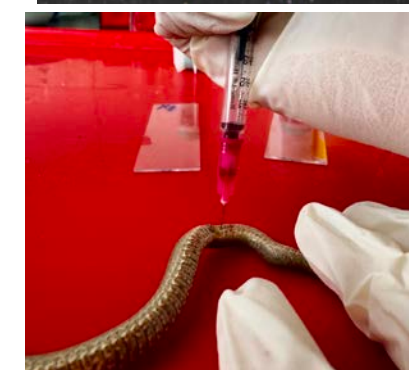
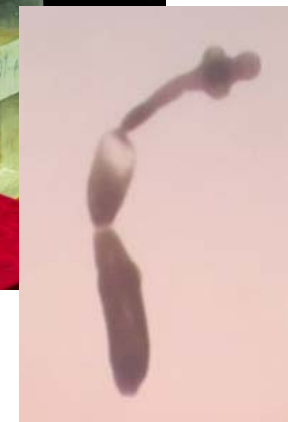


Ajša Kos

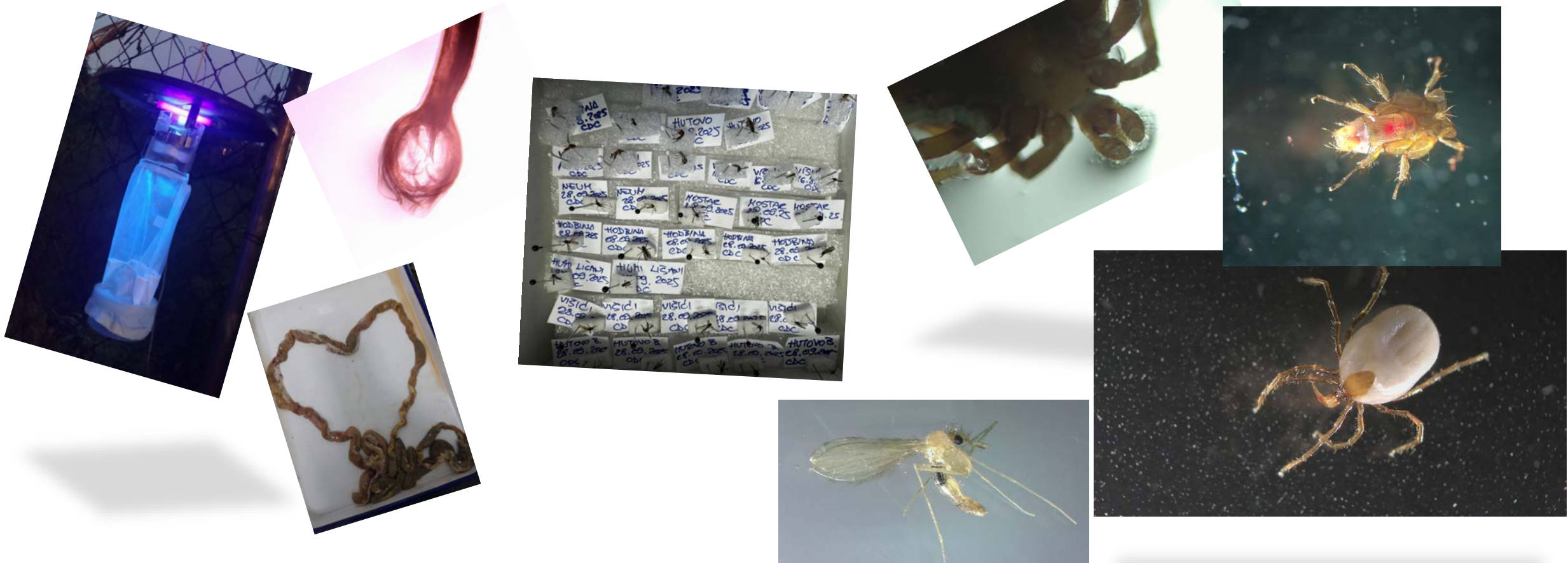


Services and Research

- ✓ Diagnostic testing of parasites/parasitic diseases
- ✓ Expert consultations and professional support
- ✓ Participation in surveillance and monitoring programs
- ✓ Implementation of scientific and applied research projects
- ✓ Preparedness planning and risk assessment activities
- ✓ Functions of the National Reference Laboratory (NRL)
- ✓ Active participation in research projects, preparedness, and risk assessment within the One Health framework.
- ✓ Educational and training activities – organization of training programs and examiner approvals for *Trichinella* diagnostics
- ✓ Proficiency Testing



Responsibilities - Competence



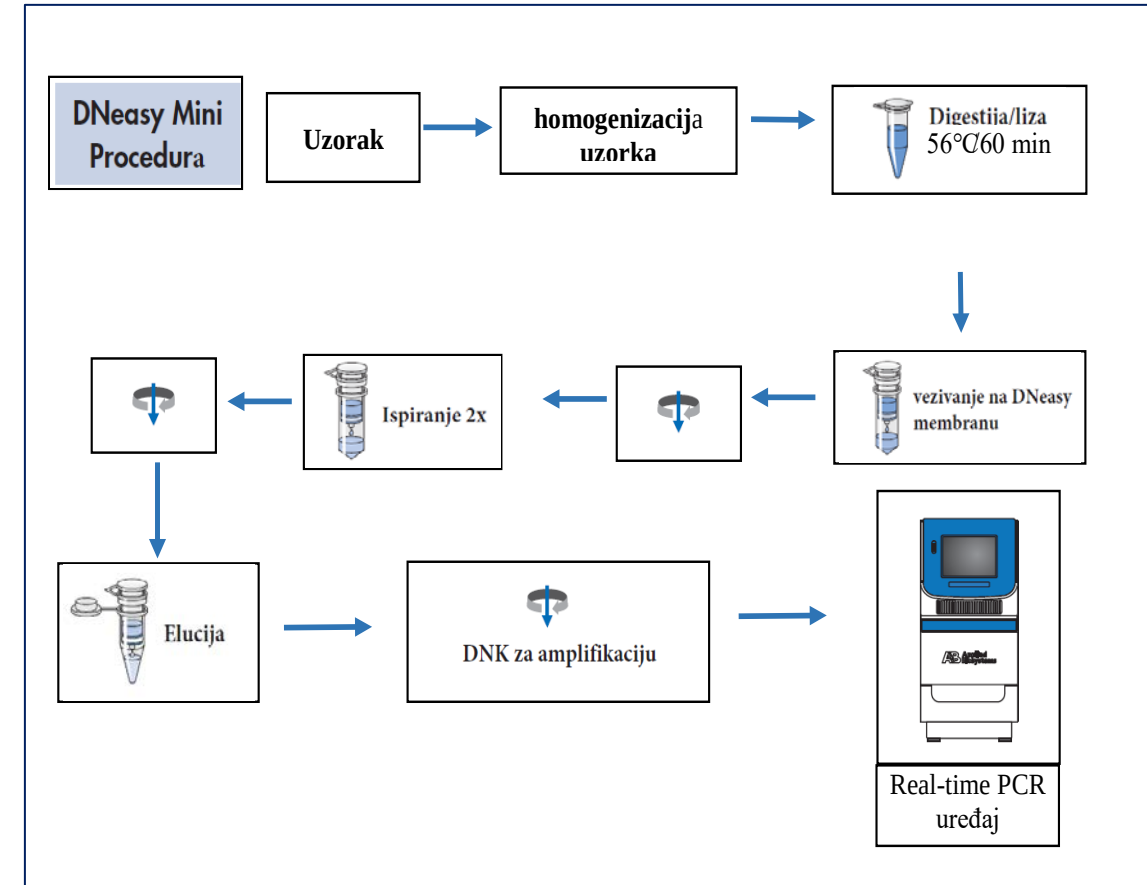
- ✓ Recent work has focused on zoonotic wildlife parasites, anthelmintic resistance, and vector-borne diseases, with ongoing participation in vector monitoring across the country.

Artificial digestion/Detection and Genotyping of *Trichinella* spp. Using SYBR Green Real-Time PCR

- ✓ Among the different parasitological examinations we carry out, trichinella diagnostics is one of the main accredited methods.
- ✓ Routine meat examination performed using the artificial digestion method.
- ✓ Procedure follows national and international standards for the detection of *Trichinella* larvae.

Artificial digestion/Detection and Genotyping of *Trichinella* spp. Using SYBR Green Real-Time PCR

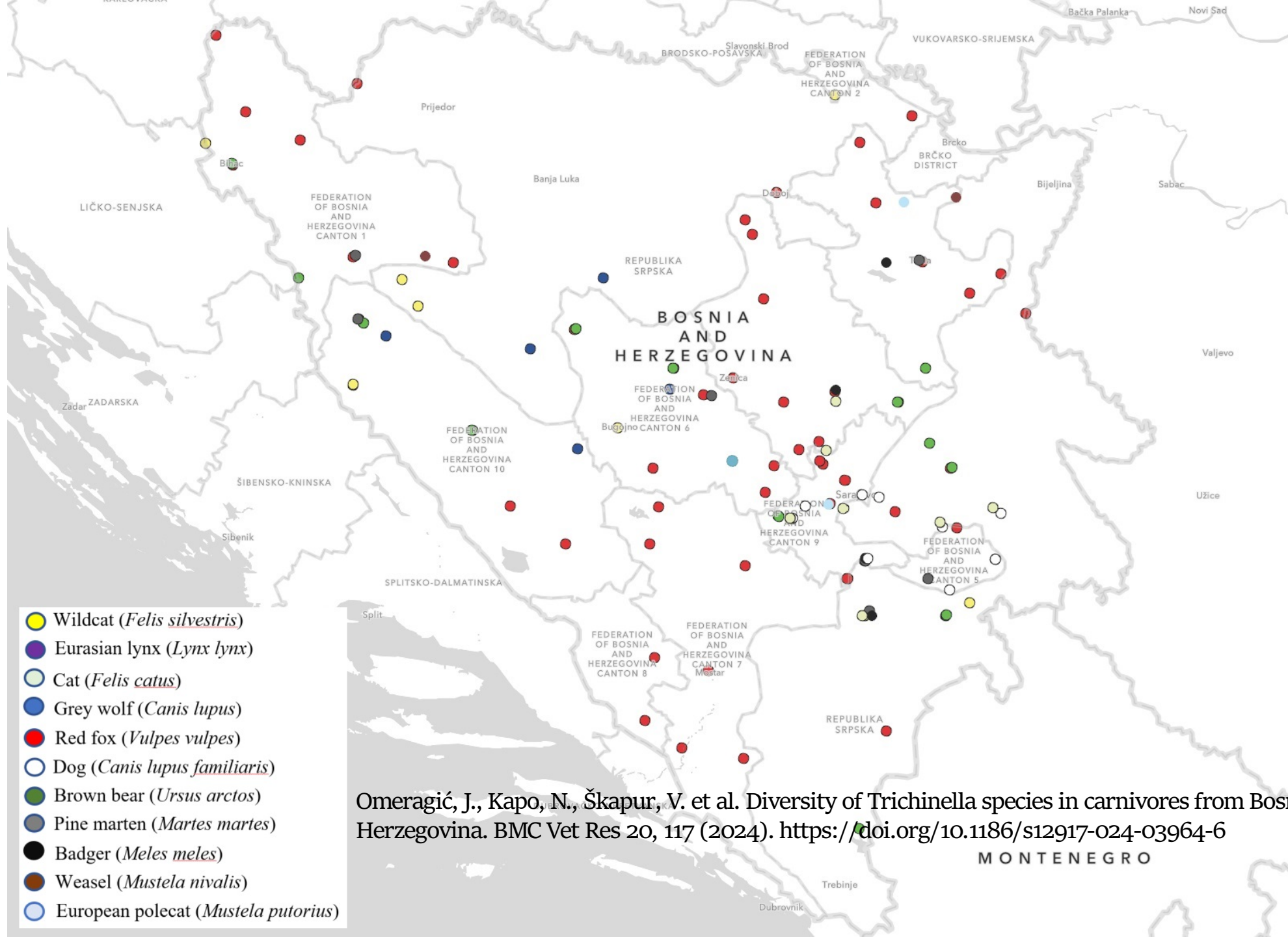
In accordance with the laboratory procedure, samples that tested positive by artificial digestion were further analyzed using SYBR Green real-time PCR to confirm the presence of *Trichinella* DNA and to verify the efficiency of DNA extraction. The method followed a modified protocol of Cuttall et al. (2012), targeting a conserved region of the mitochondrial *rrnS* gene common to all known *Trichinella* species. The specificity of amplification was confirmed by melt-curve analysis, comparing the melting profiles of samples with those of reference controls. Genotyping and species identification were performed using multiplex SYBR Green real-time PCR according to a modified protocol of Guenther et al. (2008). This assay enabled the differentiation of *T. spiralis*, *T. pseudospiralis*, *T. britovi*, and *T. nativa* based on characteristic melting temperatures of amplified fragments.



Overview of *Trichinella* investigations in Bosnia and Herzegovina (2015–2025)

- ✓ 2,148 samples examined; 211 (9.82%) positive for *Trichinella* spp.
- ✓ Sampling of domestic and wild pigs within the official national monitoring program, following standardized veterinary procedures.
- ✓ Samples from wild carnivores and other wildlife collected during hunting, poaching, incidental findings, or accidental deaths.
- ✓ Investigations conducted as part of scientific research and mandatory health surveillance, in line with national animal health and wildlife protection legislation.





Omeragić, J., Kapo, N., Škapur, V. et al. Diversity of *Trichinella* species in carnivores from Bosnia and Herzegovina. BMC Vet Res 20, 117 (2024). <https://doi.org/10.1186/s12917-024-03964-6>

Results

Host species	n (examined)	n ⁺ (positive)	Prevalence (%)
Domestic pigs (<i>Sus scrofa domestica</i>)	356	8	2.2
Wild boar (<i>Sus scrofa</i>)	1071	37	3.4
Felidae			
Wildcat (<i>Felis silvestris</i>)	38	16	42.1
Eurasian lynx (<i>Lynx lynx</i>)	1	1	100.0
Cat (<i>Felis catus</i>)	11	0	0.0
Canidae			
Grey wolf (<i>Canis lupus</i>)	51	21	41.1
Red fox (<i>Vulpes vulpes</i>)	532	97	18.2
Dog (<i>Canis lupus familiaris</i>)	24	4	16.6
Ursidae			
Brown bear (<i>Ursus arctos</i>)	32	17	53.1
Cervidae			
Roe deer (<i>Caproleus caproleus</i>)	10	0	0.0
Mustelidae			
Pine marten (<i>Martes martes</i>)	16	8	50.0
Badger (<i>Meles meles</i>)	6	2	33.3
Total	6582	655	3.26

Results

Host species	n ⁺ (PCR-positive)	Ct range	Determined <i>Trichinella</i> species
Domestic pigs (<i>Sus scrofa domestica</i>)	8	16.3 - 20.2	<i>T. spiralis</i> (2)
Wild boar (<i>Sus scrofa</i>)	37	17.5 – 24.3	<i>T. britovi</i> (75), <i>T. spiralis</i> (0)
Felidae			
Wildcat (<i>Felis silvestris</i>)	16	18.2 – 34.3	<i>T. britovi</i> (58), <i>T. pseudospiralis</i> (6)
Eurasian lynx (<i>Lynx lynx</i>)	1	18.3	<i>T. britovi</i> (5)
Canidae			
Grey wolf (<i>Canis lupus</i>)	21	17.3 – 25.8	<i>T. britovi</i> (65)
Red fox (<i>Vulpes vulpes</i>)	97	17.9 – 34.2	<i>T. britovi</i> (31)
Dog (<i>Canis lupus familiaris</i>)	4	20.4 – 24.6	<i>T. britovi</i> (8)
Ursidae			
Brown bear (<i>Ursus arctos</i>)	17	19.7 – 29.4	<i>T. britovi</i> (51)
Mustelidae			
Pine marten (<i>Martes martes</i>)	8	19.3 – 29.7	<i>T. britovi</i> (1), <i>T. spiralis</i> (5)
Badger (<i>Meles meles</i>)	2	18.7 – 23.2	<i>T. britovi</i> (6)

- ✓ The results of long-term monitoring in Bosnia and Herzegovina confirmed the presence of *Trichinella* spp. in both domestic and wild animals, with *T. britovi* identified as the predominant species in wildlife and *T. spiralis* as the main species in domestic pigs.
 - ✓ Wild carnivores, particularly red foxes and wolves, were found to be the key reservoirs maintaining the sylvatic cycle of infection.
 - ✓ These findings highlight the importance of continuous surveillance and molecular characterization of *Trichinella* species as essential components of animal and public health protection under the One Health framework.
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Thank you for attention



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