Alianța Timișoara Universitară

Ministerul Cercetării, Inovării și Digitalizării

Ministerul Educației

Administrația Prezidențială

Academia Română

uefiscdi

Smart Diaspora 2023

Universitatea de Științe Agricole și Medicină Veterinară 1869 USAMV Cluj-Napoca

Revoluții și evoluții ale științelor omice în epoca postgenomică

10 - 13 Aprilie 2023, Timișoara

www.diaspora-stiintifica.ro

Eveniment aflat sub înaltul patronaj al Președintelui României

Universitatea de Vest din Timișoara

Universitatea de Medicină și Farmacie Victor Babeș | Timișoara

Universitatea Politehnica Timișoara

Smart Diaspora 2023

Revoluții și evoluții ale științelor omice în epoca postgenomică

Epidemiology and Genetic Diversity of *Toxoplasma gondii* in Animals in Romania

Anamaria Ioana PAȘTIU

INTRODUCTION

- *Toxoplasmosis* is a widespread zoonotic diseases, qualifies as a **One health disease**, produced by a coccidian parasite from Sarcocystidae Family - ***Toxoplasma gondii***.

- *Toxoplasmosis* represents a significant public health problem worldwide.

- The purpose of this study is to report the increased prevalence of *T. gondii* in both domestic and wild animals, as well as to point out that the consumption of raw/undercooked meat represents a real risk of human contamination.

MATERIALS AND METHODS

Domestic animals

- Sheep
- Goats
- Pigs
- Horses

Wild animals

- Wild boars
- Red foxes

MATERIALS AND METHODS

Epidemiology

- ELISA
- IFAT
- MAT

Genetic diversity

- PCR
- Bioassay on mice
- Genotyping analysis – microsatellites markers

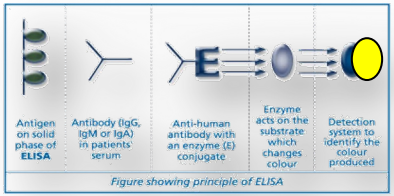
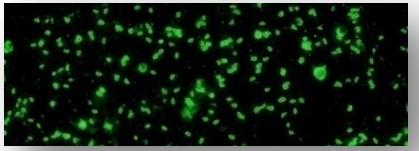
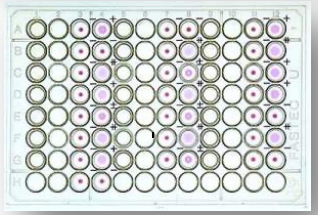


Figure showing principle of ELISA





RESULTS - SHEEP

- 2650 sheep (2067 adults and 583 lambs) – ELISA

- 328 pairs of diaphragmatic muscle-serum
- samples were collected from lambs aged between 2 and 4 months – MAT;
- bioassayed in mice; genotyped using 15 microsatellites markers

- 76 sheep abortions (brain and heart samples) – PCR.

Paștiu et al. Parasites & Vectors (2023) 16:24
https://doi.org/10.1186/s13071-022-05634-8

Parasites & Vectors

RESEARCH Open Access

Toxoplasma gondii infection in sheep from Romania

Anamaria Ioana Paștiu[1,2*], Viorica Mircean[1], Aurélien Mercier[3,4], Karine Passebosc-Faure[4], Nicolas Plault[3], Marie-Laure Dardé[3,4], Radu Blaga[5], Isabelle Villena[6,7], Dana Liana Pusta[2], Anamaria Cozma-Petruț[8] and Adriana Györke[1]

RESULTS - SHEEP

- 53.5% of the tested sheep were *T. gondii* seropositive adults 61.1% in adults and 26.4% in lambs

- Seroprevalence - slaughtered lambs (MAT) was 37.5%
- 56 diaphragmatic tissues were bioassayed in mice
- 18 *T. gondii* strains were isolated
- 6 strains were genotyped using 15 microsatellite markers and belonged to genotype II

- *T. gondii* DNA was detected in 11.8% (9/76) of sheep abortions

RESULTS - PIGS

- 94 pairs of blood and heart samples
- samples were collected from backyard pigs, home slaughtered for private consumption – IFAT;
- heart samples - PCR
- bioassayed in mice; genotyped using 15 microsatellites markers


Paştiu et al. Parasites Vectors (2019) 12:586
https://doi.org/10.1186/s13071-019-3842-8

Parasites & Vectors

RESEARCH Open Access

Prevalence and genetic characterization of *Toxoplasma gondii* in naturally infected backyard pigs intended for familial consumption in Romania

Anamaria Ioana Paştiu[1,2], Anamaria Cozma-Petruț[3*], Aurélien Mercier[4,5], Anamaria Balea[1], Lokman Galal[4,5], Viorica Mircean[1], Dana Liana Pusta[2], Liviu Bogdan[6] and Adriana Györke[1]

RESULTS - PIGS

- seroprevalence - backyard pigs (IFAT) was 46.8%
- PCR – 26.6%
- 44 heart samples were bioassayed in mice.
- 3 *T. gondii* strains were isolated
- 3 strains were genotyped using 15 microsatellite markers and belonged to genotype II


Paştiu et al. Parasites Vectors (2019) 12:586
https://doi.org/10.1186/s13071-019-3842-8

Parasites & Vectors

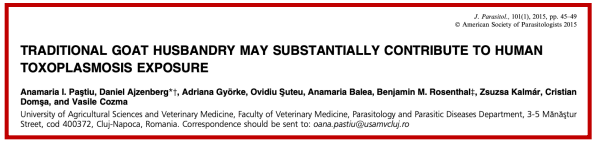
RESEARCH Open Access

Prevalence and genetic characterization of *Toxoplasma gondii* in naturally infected backyard pigs intended for familial consumption in Romania

Anamaria Ioana Paştiu[1,2], Anamaria Cozma-Petruț[3*], Aurélien Mercier[4,5], Anamaria Balea[1], Lokman Galal[4,5], Viorica Mircean[1], Dana Liana Pusta[2], Liviu Bogdan[6] and Adriana Györke[1]

RESULTS - GOATS

- 181 pairs of blood and diaphragm samples
- samples were collected from 3- to 4-mo-old goat-kids slaughtered for human consumption during Easter – ELISA;
- diaphragm samples - PCR
- bioassayed in mice; genotyped using 15 microsatellites markers



J. Parasitol., 101(1), 2015, pp. 45–49

TRADITIONAL GOAT HUSBANDRY MAY SUBSTANTIALLY CONTRIBUTE TO HUMAN TOXOPLASMOSIS EXPOSURE

Anamaria I. Paştiu, Daniel Ajzenberg*†, Adriana Györke, Ovidiu Şuteu, Anamaria Balea, Benjamin M. Rosenthal‡, Zsuzsa Kalmár, Cristian Domşa, and Vasile Cozma

University of Agricultural Sciences and Veterinary Medicine, Faculty of Veterinary Medicine, Parasitology and Parasitic Diseases Department, 3-5 Mănăştur Street, cod 400372, Cluj-Napoca, Romania. Correspondence should be sent to: *oana.pastiu@usamvcluj.ro*

RESULTS - GOATS

- seroprevalence - goat-kids (ELISA) was 33.1%
- PCR – 6.1%
- 32 diaphragm samples were bioassayed in mice
- 2 *T. gondii* strains were isolated
- 2 strains were genotyped using 15 microsatellite markers and belonged to genotype II

J. Parasitol., 101(1), 2015, pp. 45–49

TRADITIONAL GOAT HUSBANDRY MAY SUBSTANTIALLY CONTRIBUTE TO HUMAN TOXOPLASMOSIS EXPOSURE

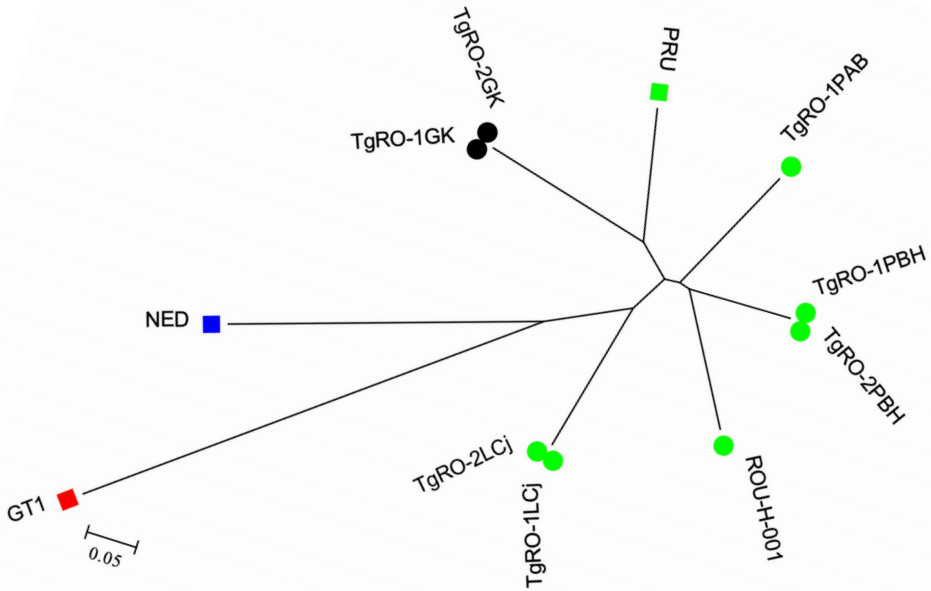
Anamaria I. Paştiu, Daniel Ajzenberg*†, Adriana Györke, Ovidiu Şuteu, Anamaria Balea, Benjamin M. Rosenthal‡, Zsuzsa Kalmár, Cristian Domşa, and Vasile Cozma

University of Agricultural Sciences and Veterinary Medicine, Faculty of Veterinary Medicine, Parasitology and Parasitic Diseases Department, 3-5 Mănăştur Street, cod 400372, Cluj-Napoca, Romania. Correspondence should be sent to: *oana.pastiu@usamvcluj.ro*

RESULTS

				Microsatellite markers														
Genotype	Isolate ID	Origin	Host species	**TUB2**	**W35**	**TgM-A**	**B18**	**B17**	**M33**	**IV.1**	**XI.1**	**M48**	**M102**	**N60**	**N82**	**AA**	**N61**	**N83**
II	TgRO-1LCj	Romania	Lamb	289	242	207	158	336	169	274	356	221	174	138	111	277	91	312
II	TgRO-2LCj	Romania	Lamb	289	242	207	158	336	169	274	356	221	174	138	111	277	91	312
II (11/15)	TgRO-3LCj	Romania	Lamb	289	NA	207	158	NA	169	274	356	221	174	138	111	277	NA	NA
II (14/15)	TgRO-4LCj	Romania	Lamb	289	242	207	158	336	169	274	356	NA	174	138	111	277	91	312
II (13/15)	TgRO-5LCj	Romania	Lamb	289	242	207	158	336	169	274	NA	221	174	NA	NA	277	91	312
II (14/15)	TgRO-6LCj	Romania	Lamb	289	242	207	158	336	169	NA	356	221	174	138	111	277	91	312
II	TgRO-1PAB	Romania	Pig	289	242	207	158	336	169	274	356	225	176	142	113	259	95	312
II	TgRO-1PBH	Romania	Pig	289	242	207	158	336	169	274	356	217	176	142	125	277	93	312
II	TgRO-2PBH	Romania	Pig	289	242	207	158	336	169	274	356	217	176	142	125	277	93	312
II	ROU-H-001	Romania	Human	289	242	207	158	336	169	274	356	231	176	138	109	273	93	312
II	TgRO-1GK	Romania	Goat	289	242	207	158	336	169	274	356	235	176	140	115	275	115	310
II	TgRO-2GK	Romania	Goat	289	242	207	158	336	169	274	356	235	176	140	115	275	115	310
Reference strains*																		
I	GT1	SUA	Sheep	291	248	209	160	342	169	274	358	209	168	145	119	265	87	306
II	PRU	France	Human	289	242	207	158	336	169	274	356	209	176	142	117	265	123	310
III	NED	France	Human	289	242	205	160	336	165	278	356	209	190	147	111	267	91	312

RESULTS


TgRO-2GK
PRU
TgRO-1PAB
TgRO-1GK
TgRO-1PBH
NED
TgRO-2PBH
TgRO-2LCj
ROU-H-001
TgRO-1LCj
GT1
0.05

RESULTS - HORSE

- 82 pairs of blood and heart samples
- samples were collected from slaughtered horses for human consumption during Easter – ELISA; MAT
- heart samples - PCR
- bioassayed in mice

Contents lists available at ScienceDirect

Veterinary Parasitology

journal homepage: www.elsevier.com/locate/vetpar

Short communication

Toxoplasma gondii in horse meat intended for human consumption in Romania

Anamaria Ioana Paştiu[a,b], Adriana Györke[b,*], Zsuzsa Kalmár[b], Pompei Bolfă[c,d], Benjamin Martin Rosenthal[e], Miruna Oltean[b], Isabelle Villena[f], Marina Spînu[g], Vasile Cozma[b]

RESULTS - HORSE

- seroprevalence – horses: 39% (ELISA); 37,8% (MAT)
- PCR – 0%
- 10 heart samples were bioassayed in mice
- 2 *T. gondii* strains were isolated

Contents lists available at ScienceDirect

Veterinary Parasitology

journal homepage: www.elsevier.com/locate/vetpar

Short communication

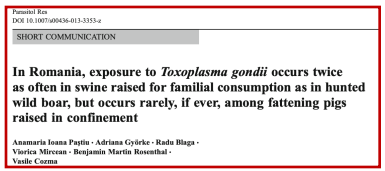
Toxoplasma gondii in horse meat intended for human consumption in Romania

Anamaria Ioana Paştiu[a,b], Adriana Györke[b,*], Zsuzsa Kalmár[b], Pompei Bolfă[c,d], Benjamin Martin Rosenthal[e], Miruna Oltean[b], Isabelle Villena[f], Marina Spînu[g], Vasile Cozma[b]

RESULTS – WILD ANIMALS

- 150 wild boars – serum samples
- IFAT – 16%

- 182 red foxes (*Vulpes vulpes*) – brain samples
- PCR – 6%



Parasitol Res
DOI 10.1007/s00436-013-3353-z

SHORT COMMUNICATION

In Romania, exposure to *Toxoplasma gondii* occurs twice as often in swine raised for familial consumption as in hunted wild boar, but occurs rarely, if ever, among fattening pigs raised in confinement

Anamaria Ioana Paștiu · Adriana Györke · Radu Blaga · Viorica Mircean · Benjamin Martin Rosenthal · Vasile Cozma

DOI: 10.7589/2013-07-167

Journal of Wildlife Diseases, 50(3), 2014, pp. 713–716

Red Foxes (*Vulpes vulpes*) in Romania are Carriers of *Toxoplasma gondii* but not *Neospora caninum*

Ovidiu Şuteu,[1] Andrei Daniel Mihalca,[1] Anamaria Ioana Paştiu,[1,4] Adriana Györke,[1] Ioana Adriana Matei,[1] Angela Ionică,[1] Anamaria Balea,[1] Miruna Oltean,[1] Gianluca D'Amico,[1] Sándor Barabási Sikó,[2] Dan Ionescu,[3] Călin Mircea Gherman,[1] and Vasile Cozma[1] [1]Parasitology and Parasitic Diseases Department, Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, 3-5 Mănăştur Street, 400372 Cluj-

CON-CLUJ-IONS

- *Toxoplasma gondii* remains a challenge for both human and veterinary medicine.
- All the knowledge related to the parasite biology, its genetic diversity, risk factors, immune response and epidemiology should be used to reduce the contamination of the environment as well as the transmission of the parasite.
- The present review highlights a high prevalence of *T. gondii* infection in sheep/ lambs, goats/goat-kids, backyard pigs, horses and in wild animals.
- Consumption of raw or undercooked meat can be a potential source of human infection.
- The study also emphasizes that the role of *T. gondii* as etiological agent associated with abortion and stillbirth in sheep should not be forgotten.

THANK YOU FOR ATTENTION !!!!