

Overview of food- and water- borne Zoonotic Parasites in Croatia

RELJA BECK

LABORATORY FOR PARASITOLOGY

CROATIAN VETERINARY INSTITUTE

Long history of food borne parasites

Austro- Hungarian empery

Kingdom of Serbs Croatian and Slovenians

Kingdom of Yugoslavia

Federal People's Republic of Yugoslavia

Socialist Federal Republic of Yugoslavia

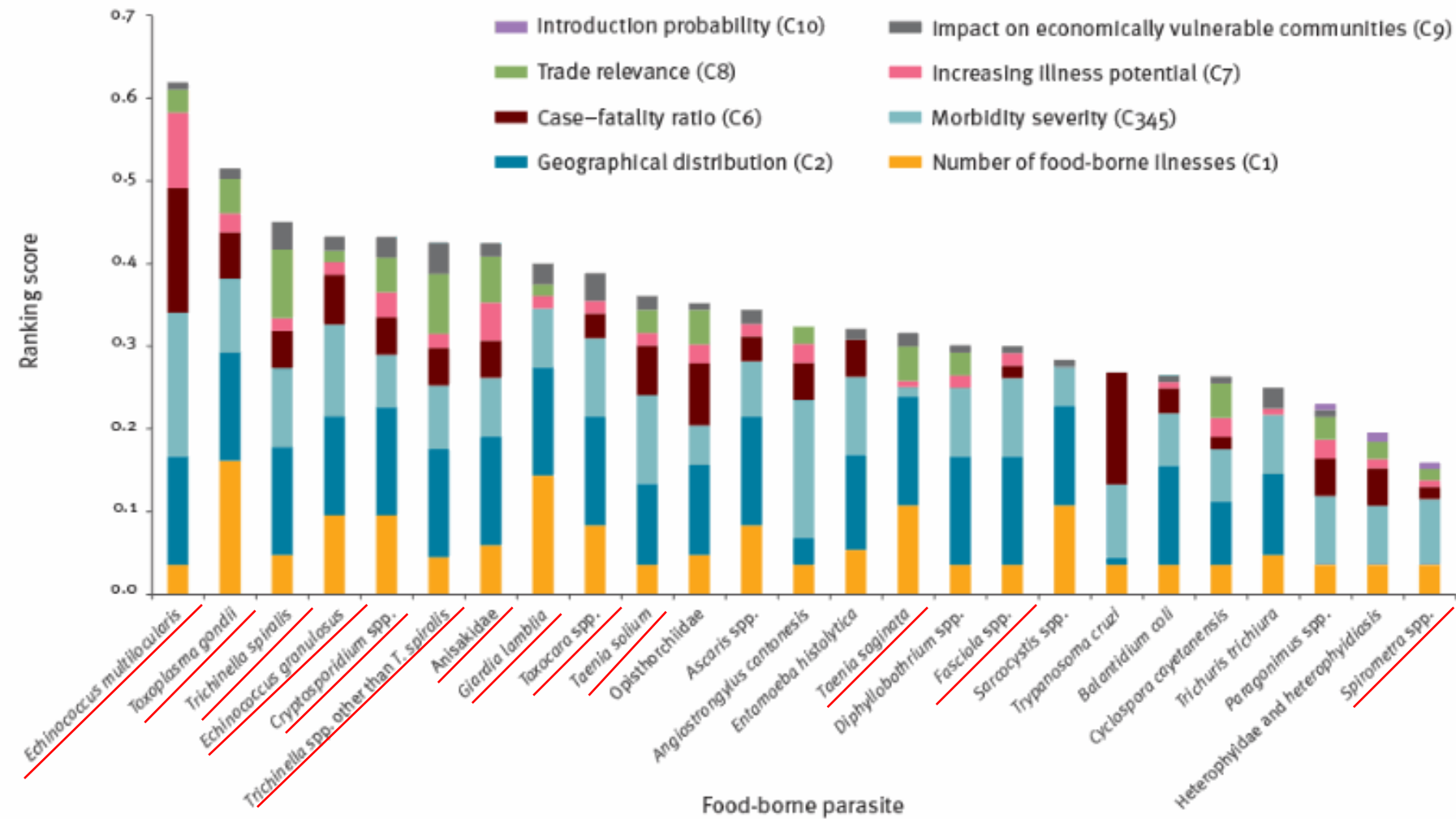
Republic of Croatia



Prioritisation of food-borne parasites in Europe, 2016

Martijn Bouwknegt¹, Brecht Devleesschauwer², Heather Graham³, Lucy J Robertson⁴, Joke WB van der Giessen¹, the Euro-FBP workshop participants⁵

1. Centre for Infectious Disease Control Netherlands, National Institute for Public Health and the Environment, Bilthoven, the Netherlands
2. Department of Public Health and Surveillance, Scientific Institute of Public Health (WIV-ISP), Brussels, Belgium
3. Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands
4. Department of Food Safety and Inspection Service, United States Department of Agriculture, Ames, Iowa, USA
5. The Euro-FBP workshop participants



Old and new pathogens

Taenia saginata

Taenia solium

Echinococcus granulosus

Trichinella spiralis

Echinococcus multilocularis

Spirometra mansoni

Echinococcus canadensis

Taenia crasiceps

Taenia martis

Trichinella pseudospiralis, *T. brittovi*

Toxocara canis

Toxocara cati

Anisakis spp.

Fasciola hepatica

Alaria alata

Metagonimus romanicus

Toxoplasma gondii

Cryptosporidium spp.

Giardia duodenalis

Example of cystic echinococcosis

LIJEČNIČKI VJESNIK

GLASILO ZBORA LIJEČNIKA HRVATSKE
THE JOURNAL OF THE MEDICAL ASSOCIATION OF CROATIA
ORGANE OFFICIEL DE LA SOCIÉTÉ MÉDICALE DE CROATIE

God. LXXIX.

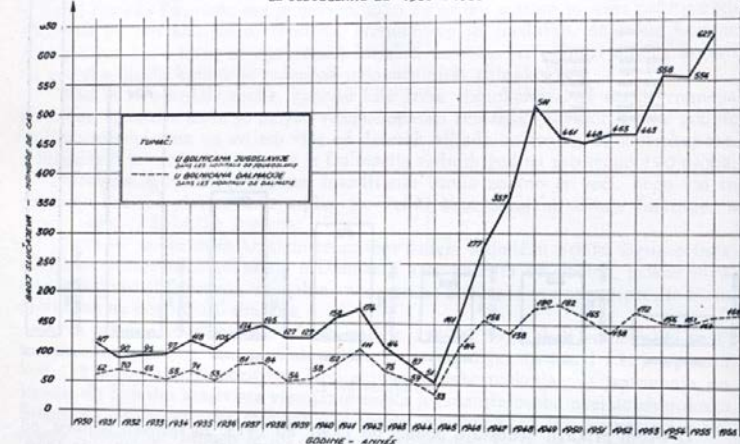
Zagreb, rujan—listopad 1957.

Broj 9—10

Proslava 50-godišnjice osnutka
Slobodne organizacije liječnika Dalmacije

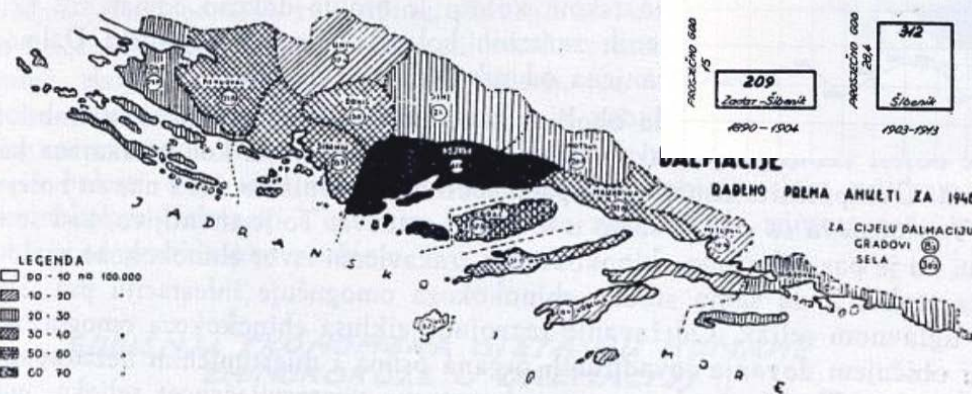
BROJ SLUČAJEVA ECHINOKOKUSA LIJEČENIH U BOLNICAMA JUGOSLAVIJE OD 1930-1956

NOMBRE DES MALADES ATTEINTS D'HYDATIDOSE SOIGNÉS DANS LES HÔPITAUX
DE YOUGOSLAVIE DE 1930 À 1956



Grafikon br. 2.

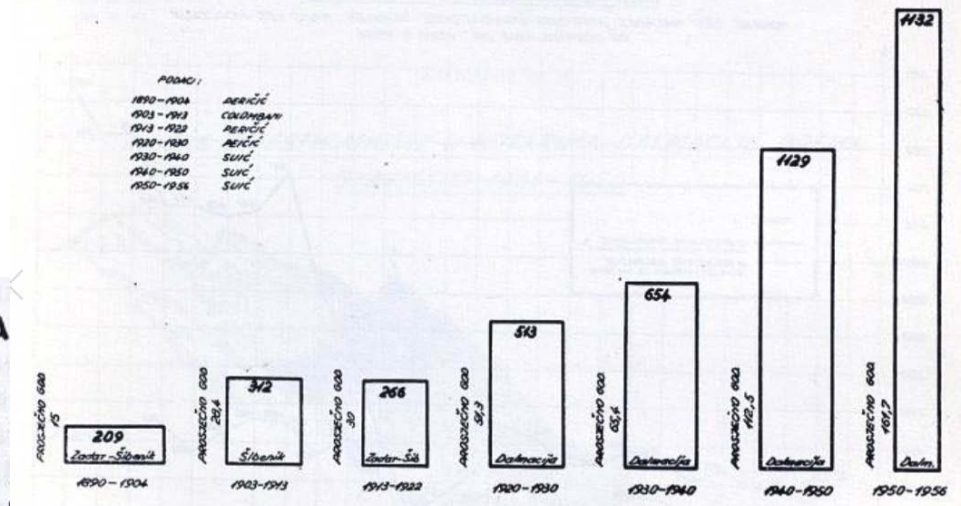
HUMANA ECHINOKOZOZA



Kartogram br. 3.

BROJ SLUČAJEVA ECHINOKOKUSA LIJEČENIH U BOLNICAMA DALMACIJE

PERIODI:
1930-1934 PERIĆ
1935-1939 COLONJAN
1940-1944 PERIĆ
1945-1949 PERIĆ
1950-1954 PERIĆ



taenia echinococcus

Br. 5.

U Zagrebu 15. svibnja 1899.

God. XXI.

LIEČNIČKI VIESTNIK.

List izlazi jedanput na mjesec na podrug do dva arka. — Članovi ga dobivaju besplatno.
Predplata za nečlanove na godinu 6 for., na pol godine 3 for.
Članarina, predplata i sve ostale uplate imaju se poslati „Mjenjačnici hrv. eskomptne banke“ u Zagrebu, Jelačićev trg br. 3.
Reklamacije radi „Liečničkoga Viestnika“ imaju se upravit na Dioničku tiskaru u Zagrebu, Gundulićeva ulica br. 18.
Dopisi se šalju predsjedništvu zbora ili uredništvu lista (dru. M. pl. Čačkoviću, Gajeva ulica br. 7. Telefon br. 295).
Za oglašavanje plaća se po dvostupačnom reduku ili prostoru 15 novč.

kora da se ima voditi samo kao Flavedo.

(Nastavit će se).

O slučajevih taeniae echinococcus opažanih i vidanih u zemaljskoj bolnici u Arbanasih od g. 1891.—1898.

Priobćuje dr. Ivo Marčelić, primarni liečnik.

Po Dalmaciji toliko je razprostranjena taeniae echinococcus, da ju se može ubrojiti medju najčešće bolesti; i kako u svih nevoljah Dalmacija imade neku prednost, tako se odlikuje i u slučajevih ove bolesti, jer se može reći, da nadmašuje u tom pogledu sve ostale zemlje. Ob ovoj se bolesti ne može reći, da se ograničuje na pojedina mjesta, ili da obuhvaća samo kakav osobiti sloj pu-

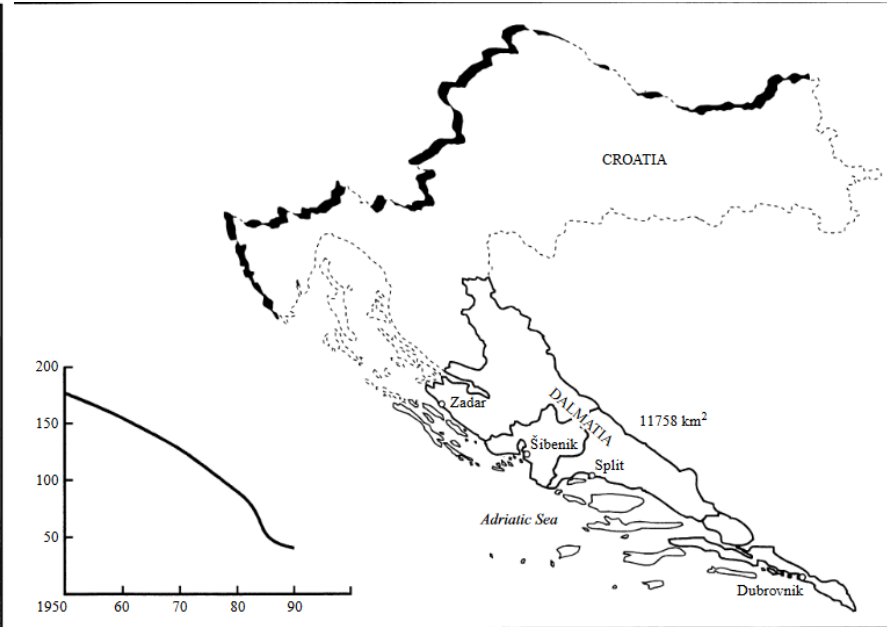
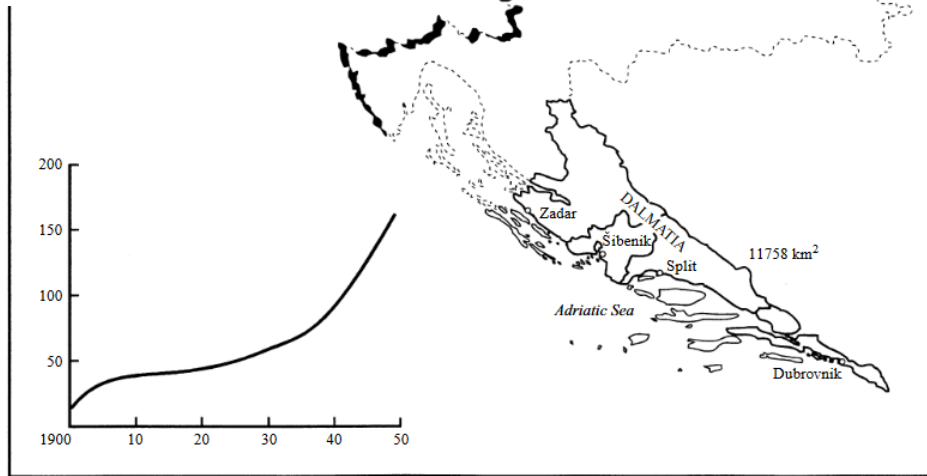
Kroz navedeno vrijeme opažao sam 50 slučajeva taeniae echinococcus raznovrstnih dielovih čovječjega tiela. Veći broj istih bio je vidan ili po ili uz moju pomoć.

Ako podielim navedenih 50 slučajeva po dielovih isti spadaju na:

Jetra	26	Zatiljak	1
Mrežicu (omentum)	8	Ligament. lat. uteri	1
Pluća	6	Hrbat (dorsum)	1
Bubrege	4	Možgane	1
Mišice prsne (M. pector).	1	Bedro	1

Od tih spada 31 na mužke, a na ženske 19.

Vidano je bilo 36 slučajeva, od kojih 33 dobrim uspjehom, 2 bolest



ig. 2a. Annual rate of new cases of human hydatidosis in Dalmatia, Croatia, 1950–90.

Epidemiol. Infect. (1997), **119**, 271–276. Printed in the United Kingdom © 1997 Cambridge University Press

SHORT PAPER Human hydatidosis in Dalmatia, Croatia

M. MOROVIĆ

*Clinic for Infectious Diseases, Clinical Hospital Centre of Rijeka, Medical Faculty University of Rijeka,
Kresimirova 42, HR-51000 Rijeka, Croatia*

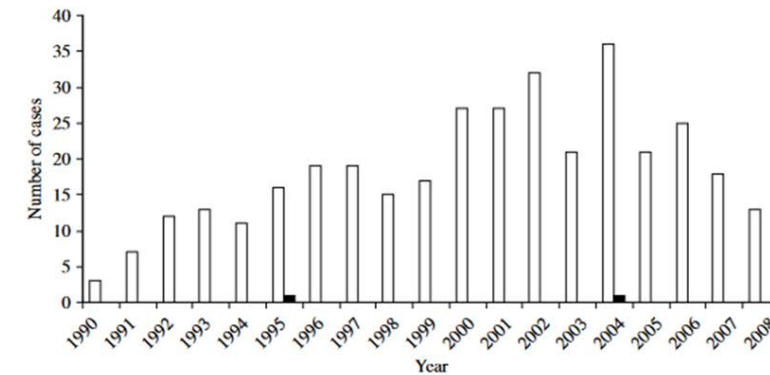


Fig. 1. Annual number of reported human cases of echinococcosis in Croatia, 1990–2008. White bars, number of reported human cases; black bars, number of deaths. (Unpublished data from the Reference Epidemiology Centre, CNIPH.)

From 1952–6:33% of cattle, 18% of sheep, 5% of goats and 20% of pigs were found to be infected

SUPPLEMENTARY file 4. Data source of human cystic echinococcosis cases that have been used for: A) the calculation of the total number of cases and incidence trends within the years 1997–2021, and B) time trends analysis within the years 1997–2019, at country level.

		A) DATA SOURCE FOR THE CALCULATION OF THE TOTAL NUMBER OF CASES AND INCIDENCE TRENDS *																									
COUNTRY	Data sources §	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
Albania	1,4	25	33	42	41	61	64	163	124	40	57	57	54	59	41	42	41	40	47	43	31	34	114	105	93	78	
Austria	1,3,4	26	31	43	23	22	18	32	25	31	24	11	7	18	18	4	8	17	13	4	22	40	32	16	18		
Belarus	4	4	5	1	2	4	11	8	2	11	12	10	15	20	10	10	18	22	4				13				
Belgium	1,3,4,5	1	1				2	1		8	5			35	7	11	4	12	12	5	10	9	10	12	10	1	
Bosnia-Herzegovina	1,4	11	14	18	108	23	24	32	38	36	39	45	26	24	33	13	13	18	25	14	17	15	12	11	7	8	
Bulgaria †	1,2,3	473	632	632	600	567	642	557	590	492	476	461	386	323	291	307	320	278	302	313	296	218	206	193	95	83	
Croatia	1	a19	15	17	27	27	32	21	36	21	25	18	13	16	10	15	13	15	19	7	11	15	7	4	3	2	

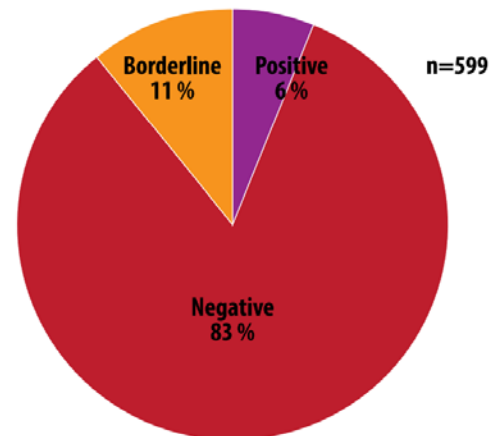
Unveiling the incidences and trends of the neglected zoonosis cystic echinococcosis in Europe: a systematic review from the MEmE project

Casulli, Adriano ; Abela-Ridder, Bernadette ; Petrone, Daniele ; Fabiani, Massimo ; Torgerson, Paul R ; Müllhaupt, Beat ; et al

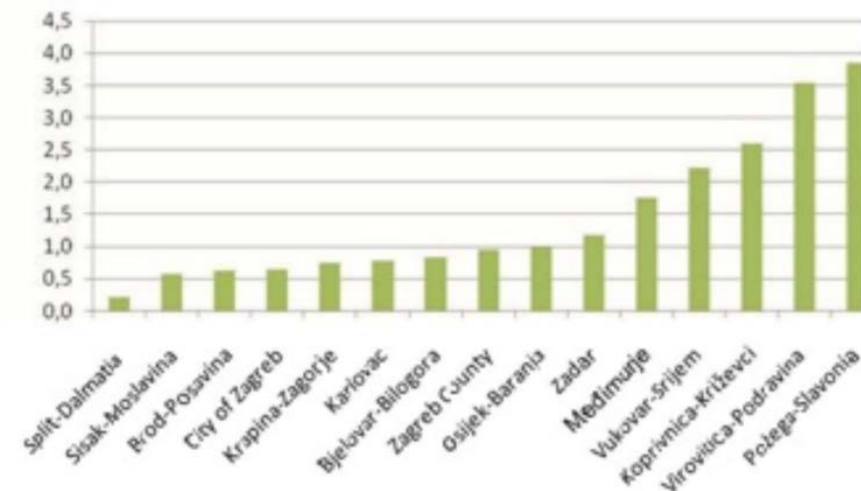
Public health significance of echinococcosis

Pejnović, A., B. Njari²

godina XIX (2017.) ■ ožujak - travanj ■ broj 2 ■ MESO ■ 163



Positive = 34; Borderline = 65; Negative = 500 samples.



Journal of Helminthology (2011) 85, 192–195
© Cambridge University Press 2010

doi:10.1017/S0022149X10000

Seroprevalence of *Echinococcus granulosus* infection in Croatian patients with cystic liver disease

I. Tabain, M. Sviben*, S. Ljubin-Sternak, T. Vilibić-Čavlek
and G. Mlinarić-Galinović

Between January 2008 and July 2009

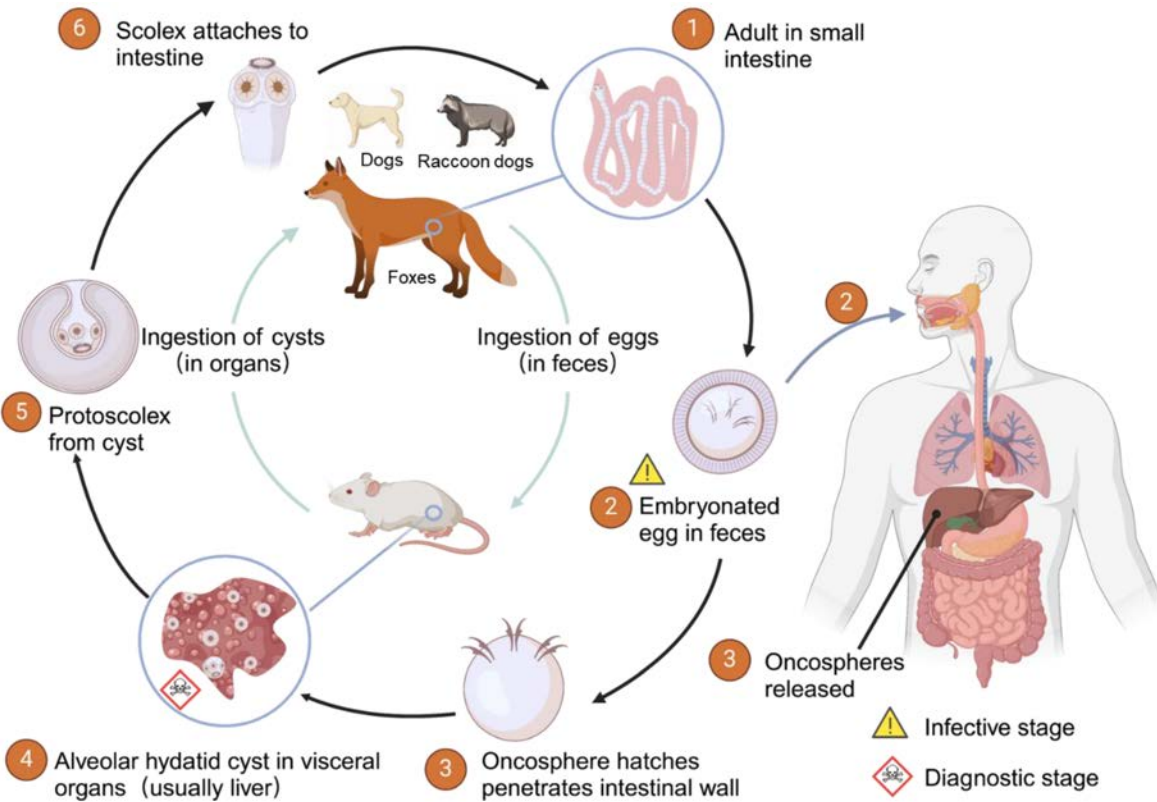
540 serum samples were collected from patients with hepatic
cysts detected by imaging methods

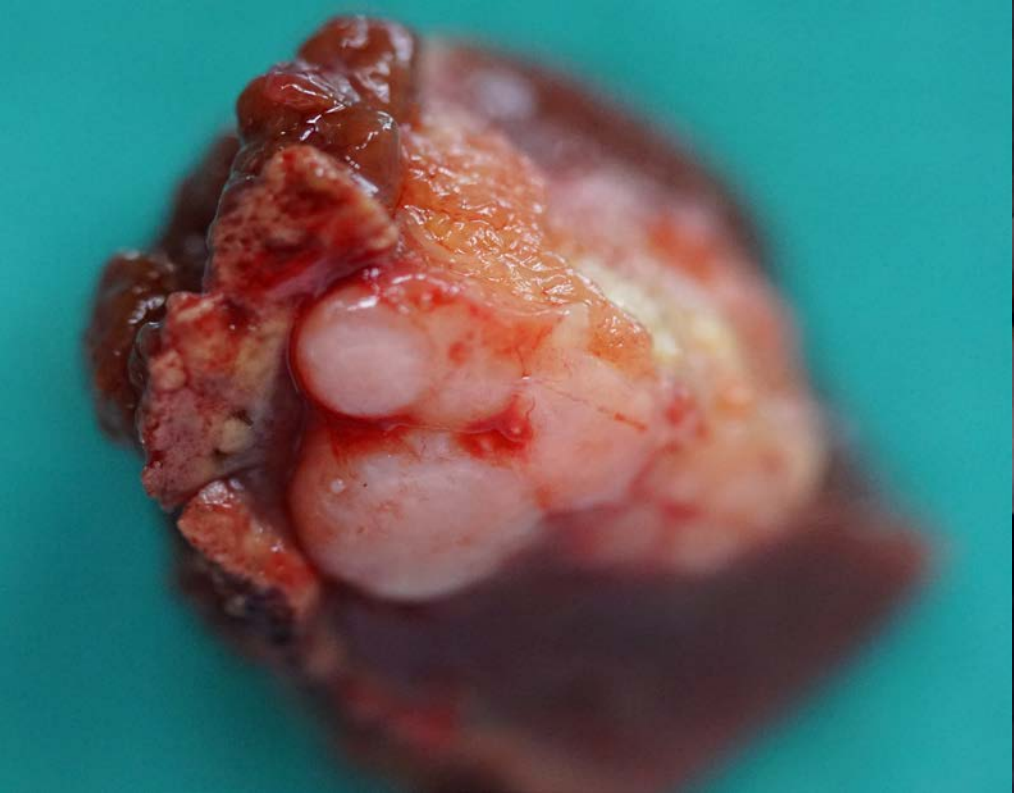
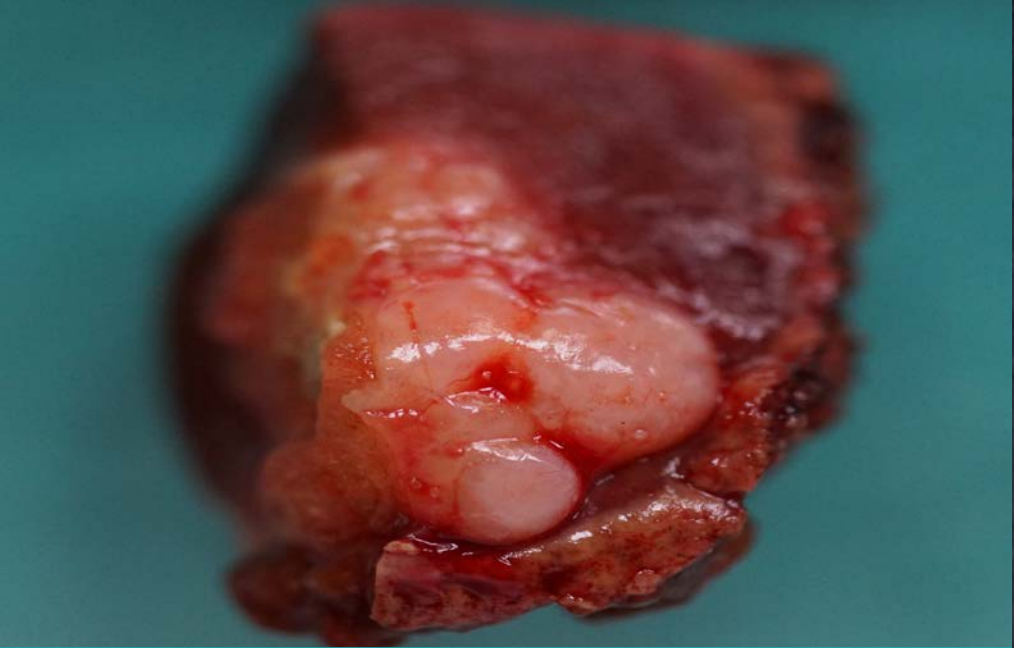
In 51 (9%) IgG antibodies to *Echinococcus* were detected by
ELISA.

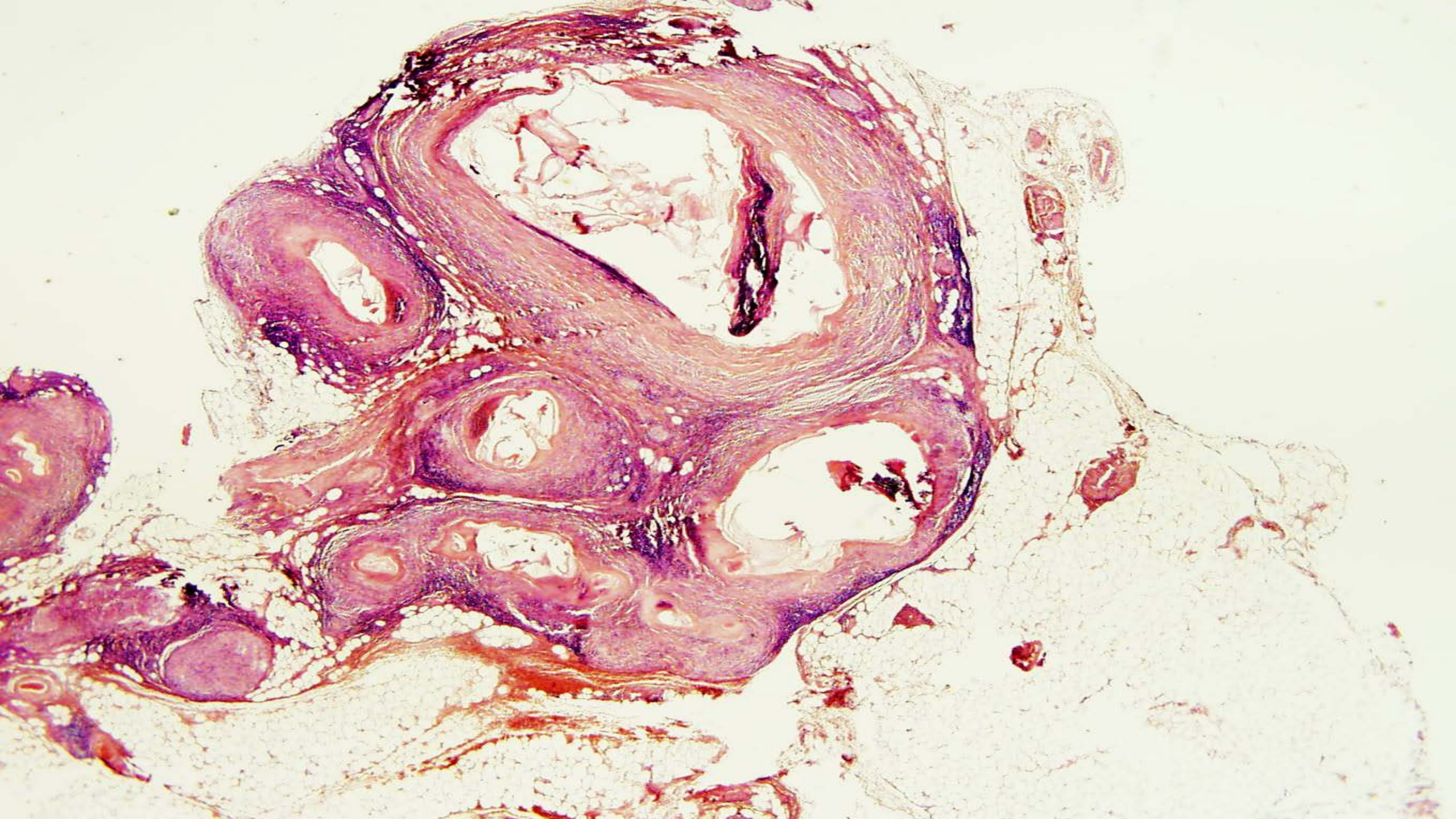
Of 51 positive serum samples only 21 (3.9%) were confirmed by
WB

Echinococcus multilocularis infection was not found in this
study

Echinococcus multilocularis











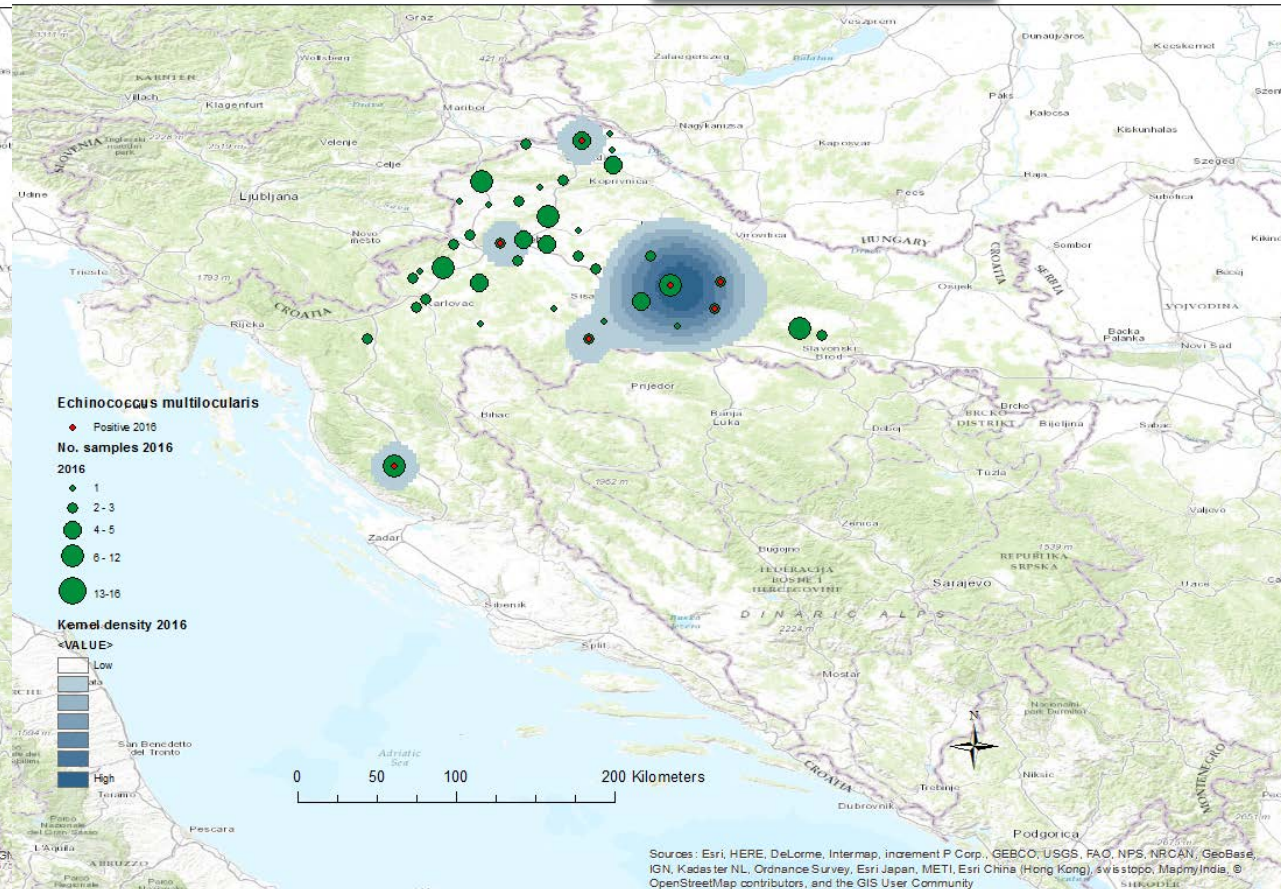
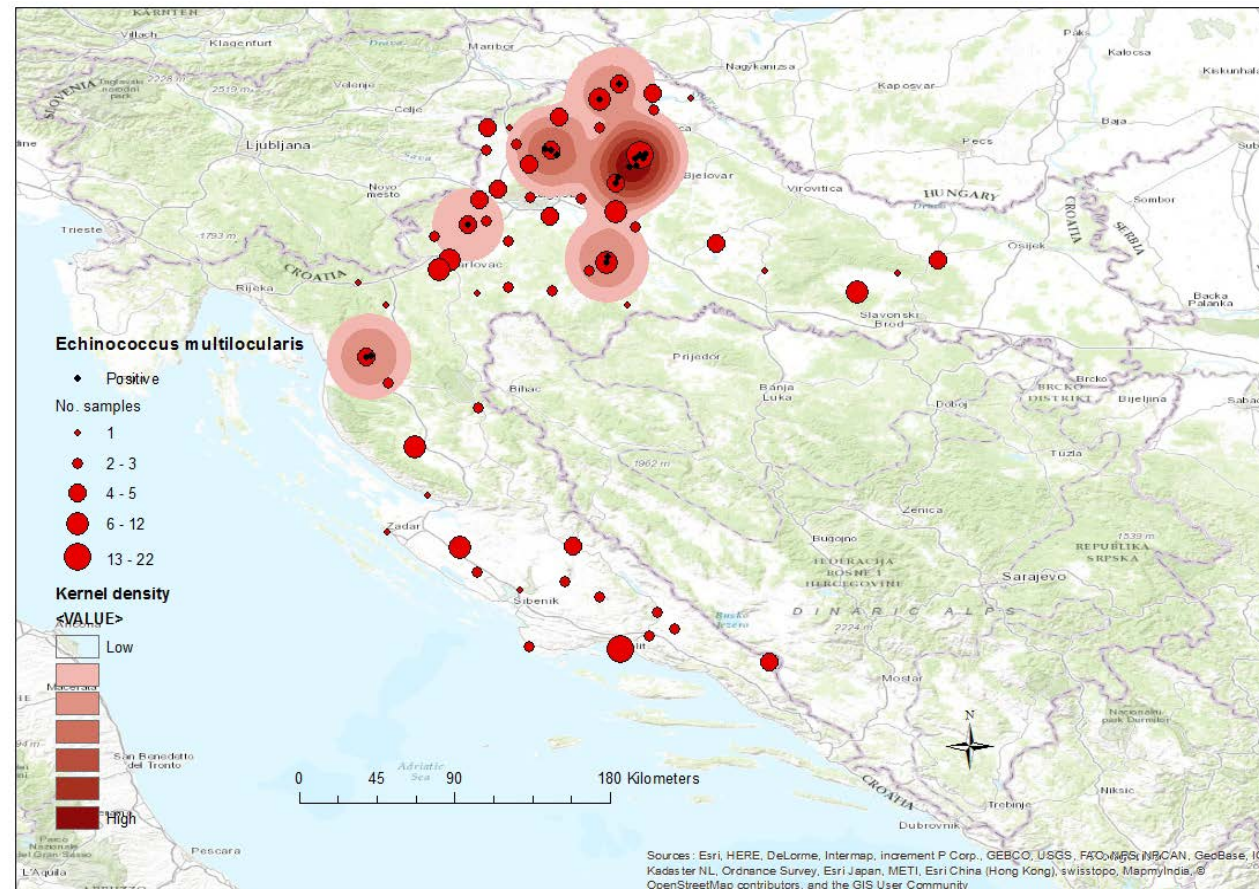
Infected red foxes

7.5%, 2015

First detection of *Echinococcus multilocularis* in Croatia

Relja Beck¹ · Željko Mihaljević² · Renata Brezak¹ · Sanja Bosnić¹ · Ivana Lohman Janković³ · Peter Deplazes⁴

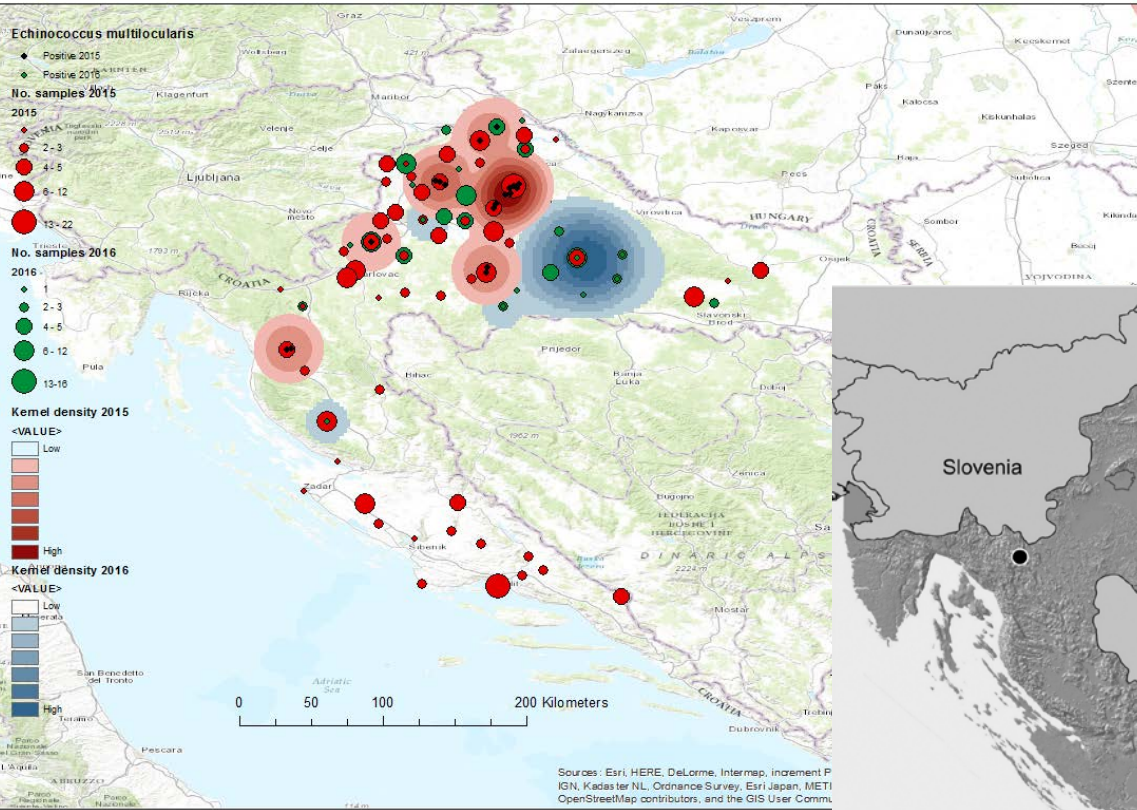
6.8%. 2016.



SHORT COMMUNICATION

First detection of *Echinococcus multilocularis* in Croatia

Relja Beck¹ · Željko Mihaljević² · Renata Brezak¹ · Sanja Bosnić¹ · Ivana Lohman Janković³ · Peter Deplazes⁴



7.2%

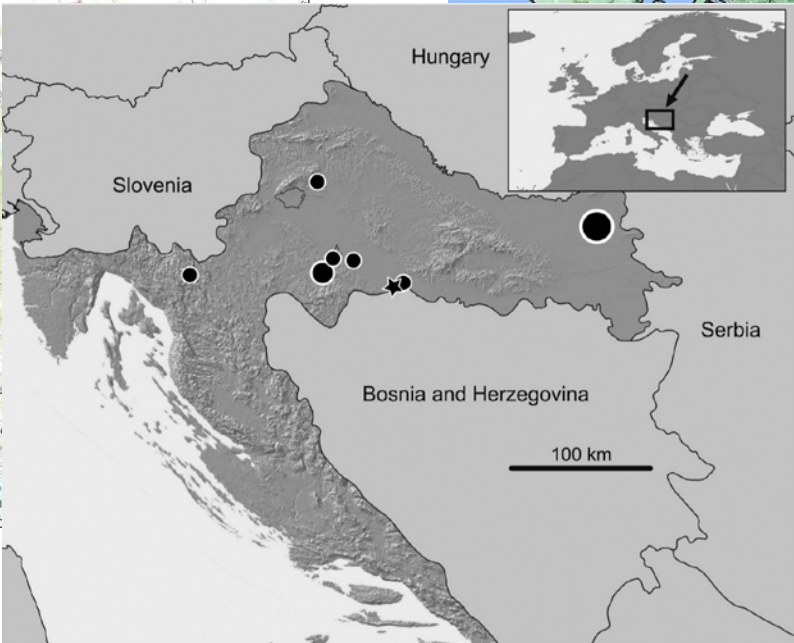


DOI: 10.1017/sap.2018.0019
© W. Sifonaki Institute of Parasitology, PAS
Acta Parasitologica, 2018, 63(3), 654–656, ISSN 1230-2021

RESEARCH NOTE

First identification of *Echinococcus multilocularis* in golden jackals in Croatia

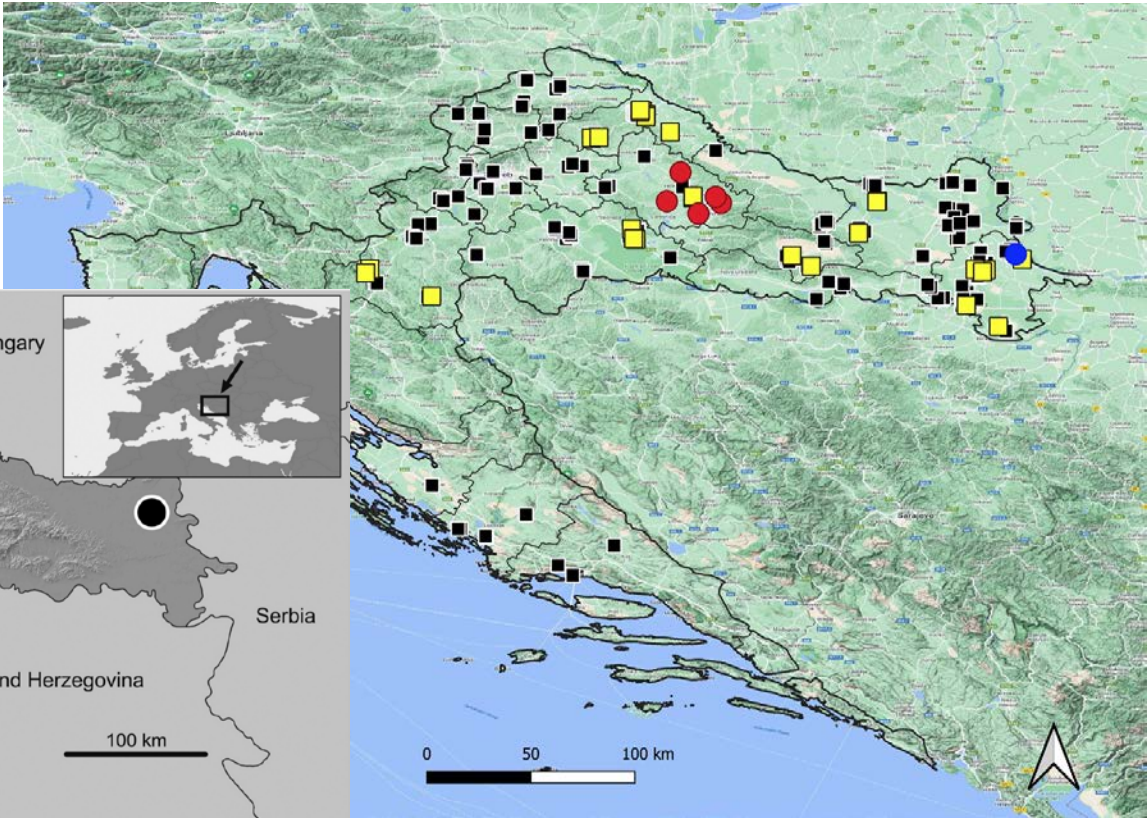
Magda Sindić, Miljenko Bujančić, Iva Štimac, Franjo Martinković, Nikola Tuskun, Marina Špehar and Dean Konjević



Brief Report

Emergence of *Echinococcus multilocularis* in Central Continental Croatia: A Human Case Series and Update on Prevalence in Foxes

Mirjana Balen Topić^{1,2,*}, Neven Papić^{1,2}, Klaudija Višković^{1,3}, Mario Sviben^{2,4}, Tajana Filipec Kanižaj^{2,5}, Stipislav Jadrijević^{2,5}, Daria Jurković⁶ and Relja Beck⁶



11.24% 29/249

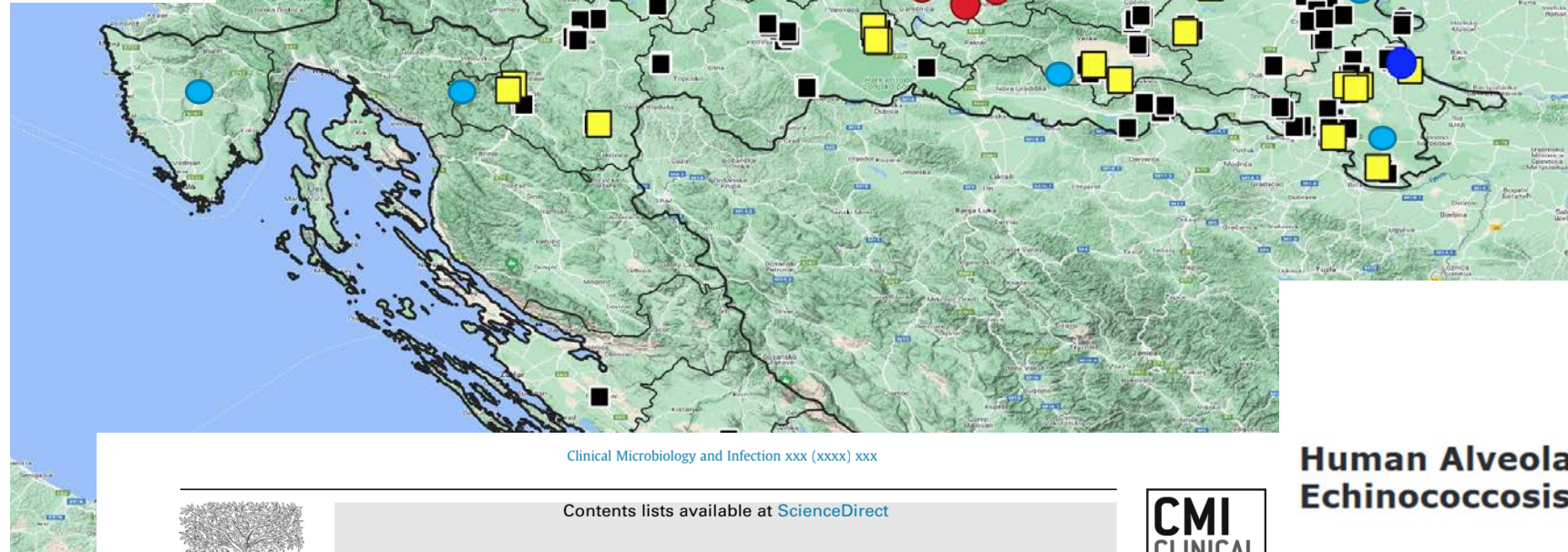
The first case of alveolar echinococcosis from southern Croatia:
progressive course of the disease in an immunocompromised patient
Ivan Mihanović^{1,*}, Relja Beck², Marin Petric³, Natasa Males Raskovic⁴, Ana Dunatov Huljev⁵, Dijana Perkovic⁶,
Mirela Pavicic Ivelja⁷



Case Report

Double Trouble on the Lower Leg—Unique Human Coinfection with *Echinococcus granulosus* and *Echinococcus multilocularis* Without Liver Involvement

David Beck^{1,2}, Mirjana Balen Topić^{1,2,*}, Klaudija Višković^{2,3}, Neven Papić^{1,2}, Rado Žic^{1,4}, Mario Sviben^{1,5},
Tomislav Meštrović^{6,7}, Adrijana Baković Kovačević⁸ and Relja Beck⁹



Clinical Microbiology and Infection xxx (xxxx) xxx



Clinical Microbiology and Infection

journal homepage: www.clinicalmicrobiologyandinfection.com



Human Alveolar Echinococcosis, Croatia

Davorka Dušek, Adriana Vince, Ivan Kurelac, Neven Papić, Klaudija Višković, Peter Deplazes, Relja Beck

Author affiliations: University Hospital for Infectious Diseases, Zagreb, Croatia (D. Dušek, A. Vince, I. Kurelac, N. Papić, K. Višković); University of Zagreb School of Medicine, Zagreb (D. Dušek, A. Vince, N. Papić); University of Zurich, Zurich, Switzerland (P. Deplazes); Croatian Veterinary Institute, Zagreb (R. Beck)

DOI: <https://doi.org/10.3201/eid2602.181826>

Commentary

A ticking time bomb? A position paper on the rising and neglected threat of alveolar echinococcosis in the Republic of Croatia

Tomislav Meštrović^{1,2}, Mario Sviben^{3,4}, Antonija Jurišić³, Filip Stevanovski⁵, Relja Beck⁶, Mirjana Balen Topić^{3,7,*}



Brief Report

Emergence of *Echinococcus multilocularis* Continental Croatia: A Human Case Series Prevalence in Foxes

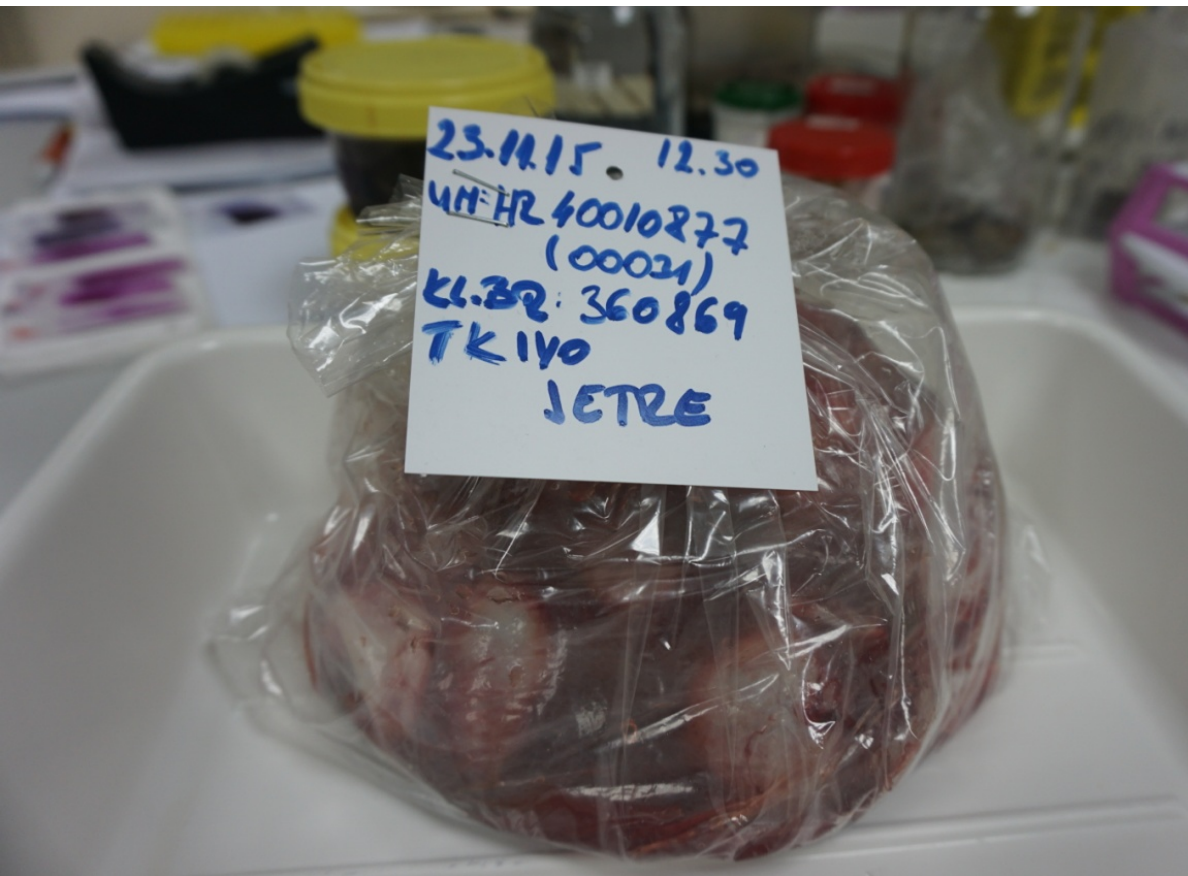
Mirjana Balen Topić^{1,2,*}, Neven Papić^{1,2}, Klaudija Višković^{1,3},
Tajana Filipec Kanižaj^{2,5}, Stipislav Jadrijević^{2,5}, Daria Jurković⁶ and

Echinococcosis and cysticercosis Surveillance From 2012 to 2022.

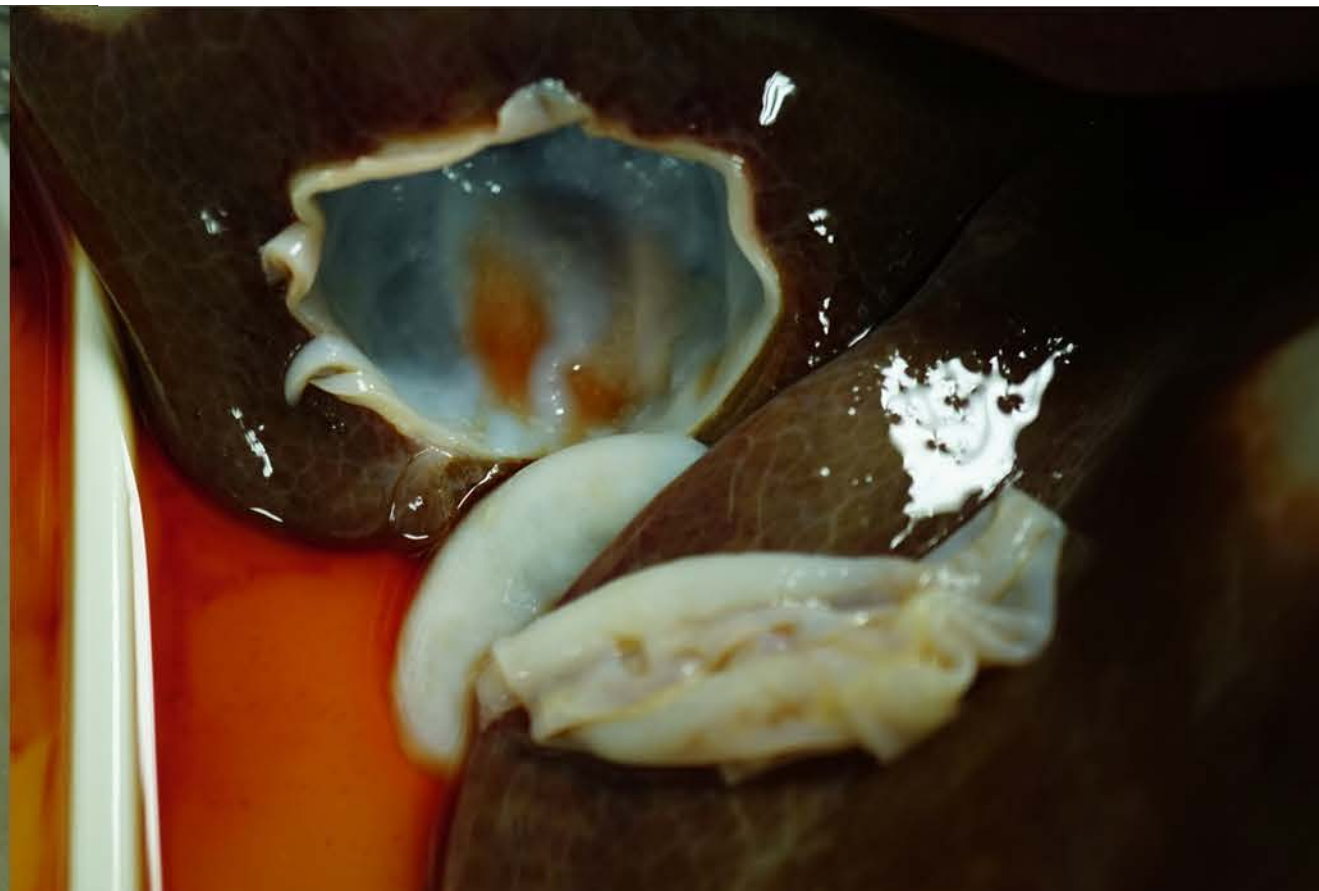
- Official veterinarians or inspectors
- Submit altered parenchymal organs
- In case of lesions on the slaughter line or during wild game cutting
- For examination in an official lab

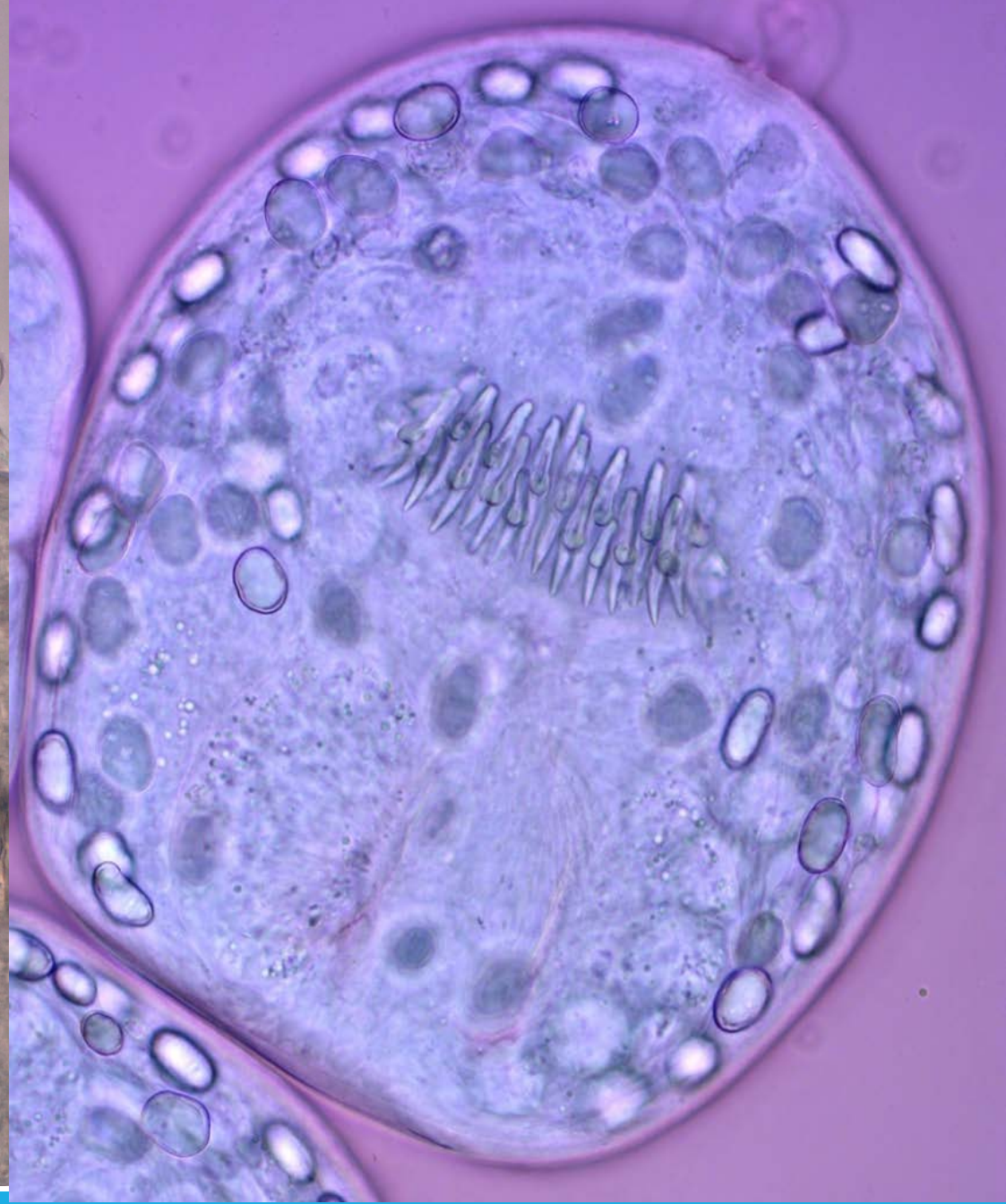
	2012.	2013.	2014.	2015.	2016.	2017.	2018.	2019.	Total
Ehinokokoza	(1/0G 4/4S)	0	3/1 (3G)	1/1 (1S)	36/0	13/11	(5/4G, 3/1S)	5/3 (5S)	76: 28
Cisticerkoza	0	0			10/0	4/0	4/0 G 13/1 Ovca	(4/0G, 1/0S)	36: 1

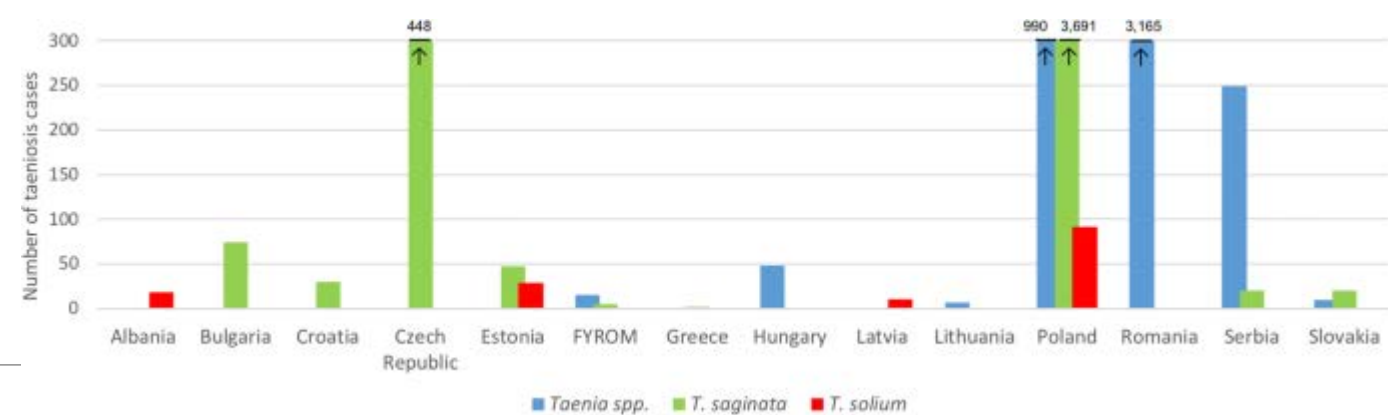
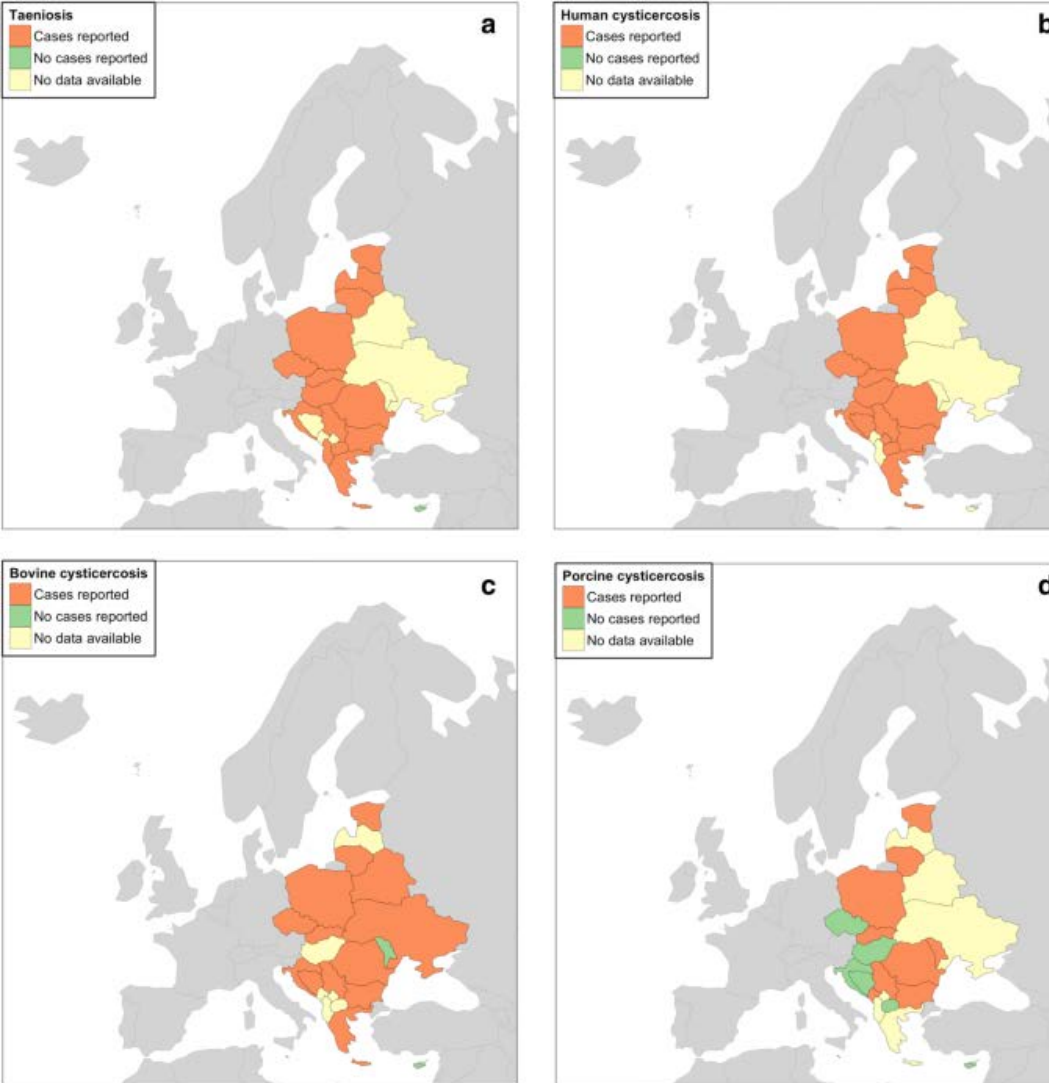
Echinococcus granulosus sensu stricto



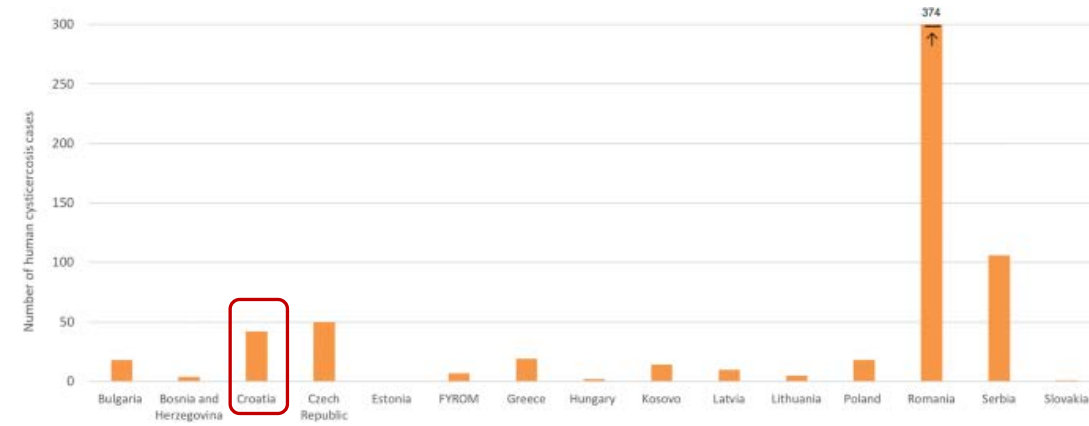
Echinococcus canadensis







Taeniosis cases reported in scientific publications, authority reports, epidemiological bulletins, and laboratories in eastern Europe (published/reported between 1990–2017).



Number of identified human cysticercosis cases in eastern Europe - data sources published and unpublished between 1990–2017

Cysticercus cellulosae- T. solium



Slučaj racemoznoga cysticerea možgjana.

Priobćuje dr. F. Durst, aspirant u bolnici milosrdnih sestara u Zagrebu.*

Marija V., 51 god., poljodjelka, primljena 1. rujna 1901. u bolnicu milosrdnih sestara u Zagrebu na chirurški odel primarnoga liečnika dra. Wikerhausera.

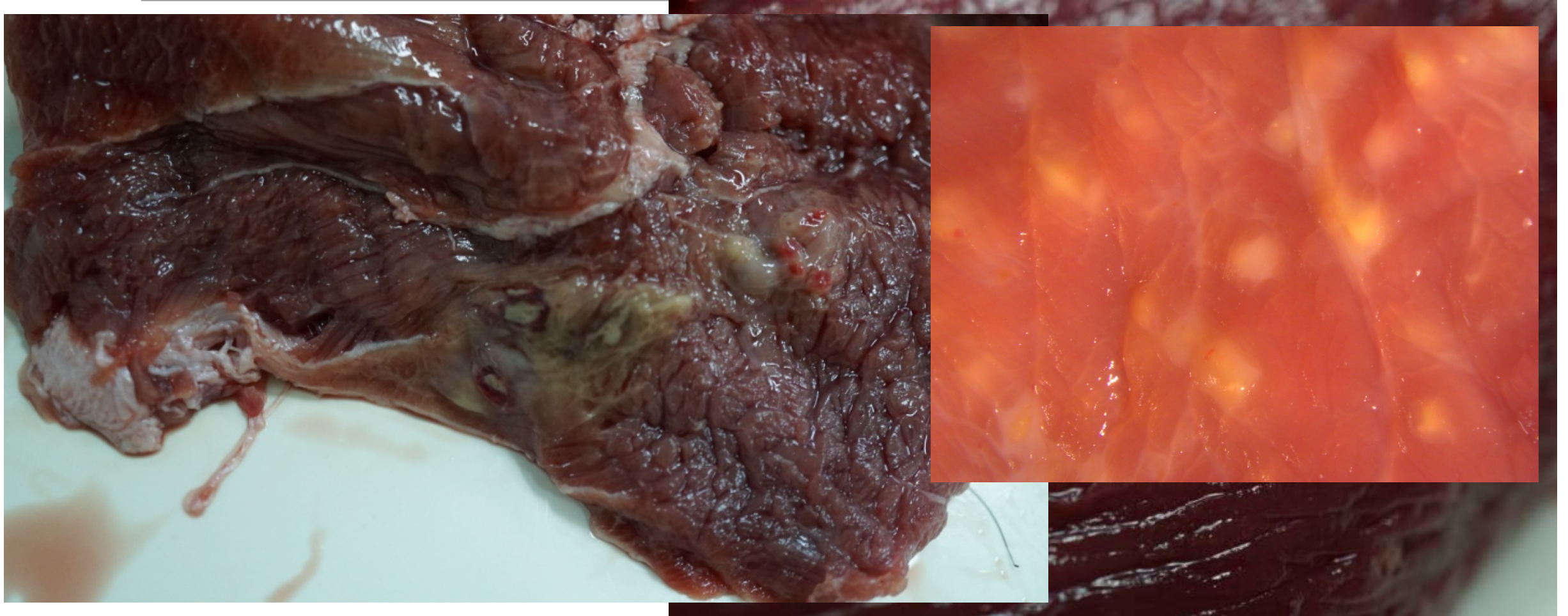
Seroprevalence of *Taenia solium*

- Between 2005 and 2009, a total of 770 serum samples were collected from patients aged 3-76 with a clinical diagnosis of epilepsy
- Of 23 positive serum samples, 11 (1.5%) were confirmed by WB

Meštrović T., Sviben M., Vilibić-Čavlek T., Ljubin-Sternak S., Tabain I., Mlinarić-Galinović G. (2012) Seroprevalence of *Taenia solium* infections in Croatian patients presenting with epilepsy. *Journal of Helminthology*, 86 (3). pp. 259-62.

From 1992 four case reports of neurocysticercosis described without molecular confirmation

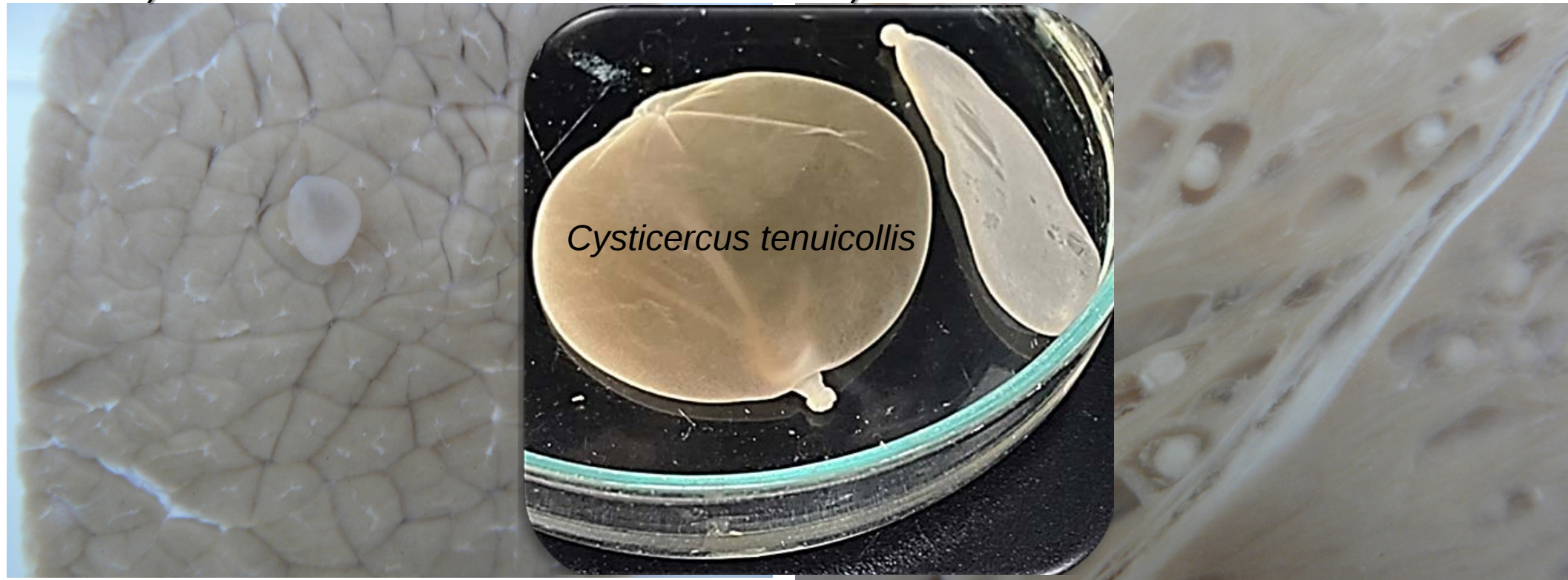
Samples from monitoring



Taenia saginata *Taenia solium*

Cystercus bovis

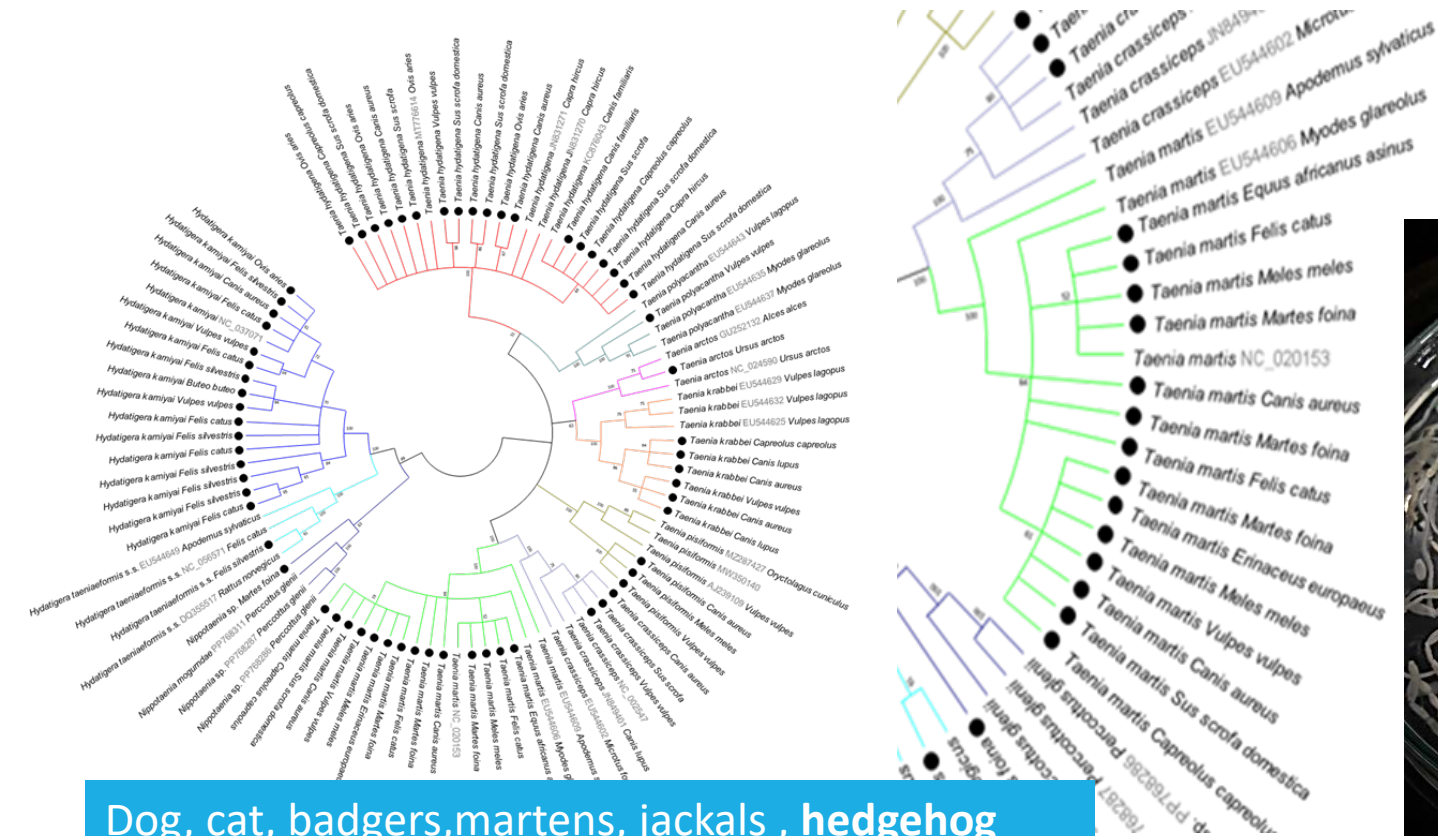
Cystercus cellulosae



Not detected

Dog, cat, badgers, martens, jackals , **hedgehog**

Domestic pig, roe deer



Taenia martis

Human *Taenia martis* Neurocysticercosis, Switzerland

Valentin K. Steinsiepe, Marie-Therese Ruf,
Marco Rossi, Claudia Fricker-Feer, Danijela Kolenc,
Brigitte Suter Buser, Maura Concu, Andreas Neumayr,
Ulf C. Schneider

Author affiliations: Cantonal Hospital of Lucerne, Lucerne,
Switzerland (V.K. Steinsiepe, M. Rossi, C. Fricker-Feer,
D. Kolenc, U.C. Schneider); Swiss Tropical and Public Health
Institute, Allschwil, Switzerland (M.-T. Ruf, M. Concu, A. Neumayr);
University of Basel, Basel, Switzerland (M.-T. Ruf, M. Concu,
A. Neumayr)

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 29, No. 12, December 2023

EMERGING INFECTIOUS DISEASES®

ISSN: 1080-6059

Volume 30, Number 3—March 2024

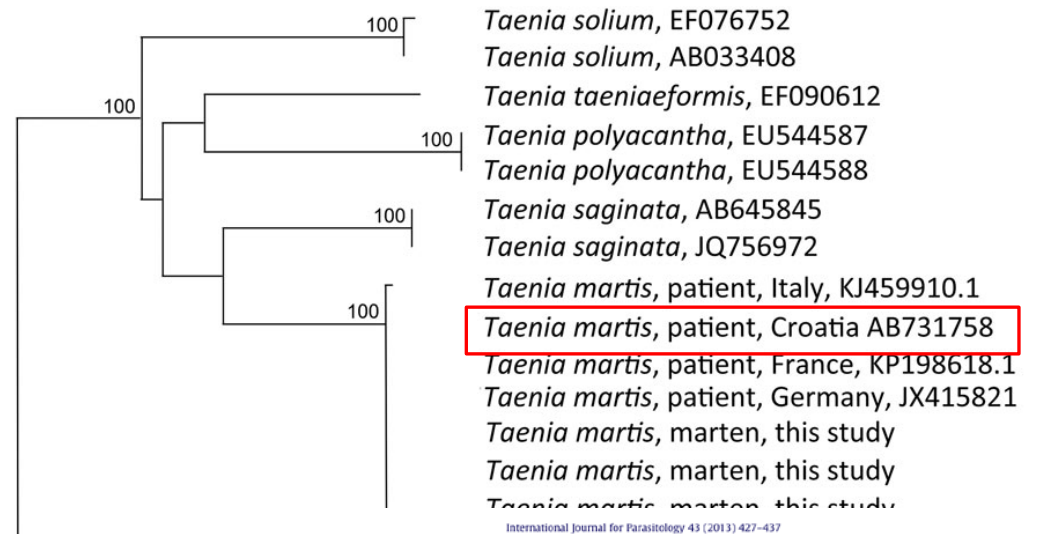
Dispatch

Taenia martis Neurocysticercosis-Like Lesion in Child, Associated with Local Source, the Netherlands

Table. Overview of published cases of human *Taenia martis* infections

Authors (year of publication)	Country	Patient age, y/sex	Chief complaint	Location of lesion	False-positive serologic assays	Treatment
Eberwein et al. (2013) (6)	Germany	43/F	Flashing lights and paracentral scotoma	Left eye	No	Albendazole 400 mg 2x/d, dexamethasone 20 mg/d for 8 d, surgical excision
Brunet et al. (2015) (7)	France	44/F	Right hemiparesis	Left	<i>T. solium</i>	Surgical excision, praziquantel 50

Koch et al. (2016) (8)	Gen
Rudelius et al. (2017) (9)	Gen
Mueller et al. (2020) (10)	Gen
Steinsiepe et al. (2023) (this report)	Switz



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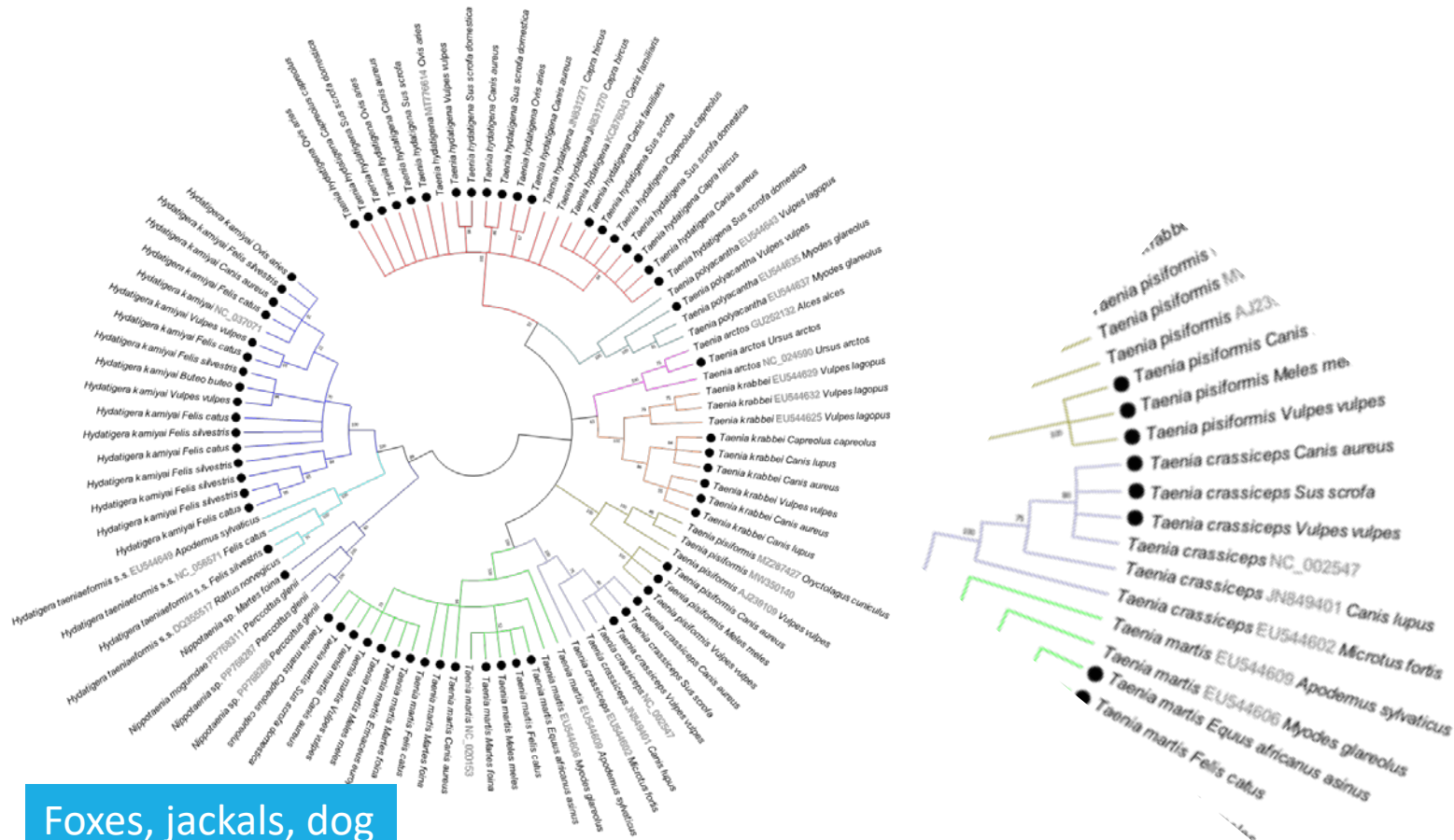
journal homepage: www.elsevier.com/locate/ijpara



Molecular phylogeny of the genus *Taenia* (Cestoda: Taeniidae): Proposals for the resurrection of *Hydatigera* Lamarck, 1816 and the creation of a new genus *Versteria*☆

Minoru Nakao^{a,*}, Antti Lavikainen^b, Takashi Iwaki^c, Voitto Haukialmi^{d,e}, Sergey Konyaev^f, Yuzaburo Oku^g, Munehiro Okamoto^h, Akira Ito^a

Taenia crassiceps



Foxes, jackals, dog



pathogens

Case Report

Comprehensive Diagnosis, Treatment, and *Taenia crassiceps* Cysticercosis in a Ring-Tailed Lemur (*Lemur catta*) from a Croatian Zoo: No Long-Term

Lea Grbavac ^{1,*}, Ana Šikić ¹, Petar Kostešić ², Ivan-Conrado Šoštarić-Zucke ³, Jadranko Boras ⁵, Ingeborg Bata ⁵, Andrija Musulin ², Tara Kostanjšak ⁶ and T



Taenia crassiceps

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ISSN: 1080-6059

Volume 31, Number 9—September 2025

Research Letter

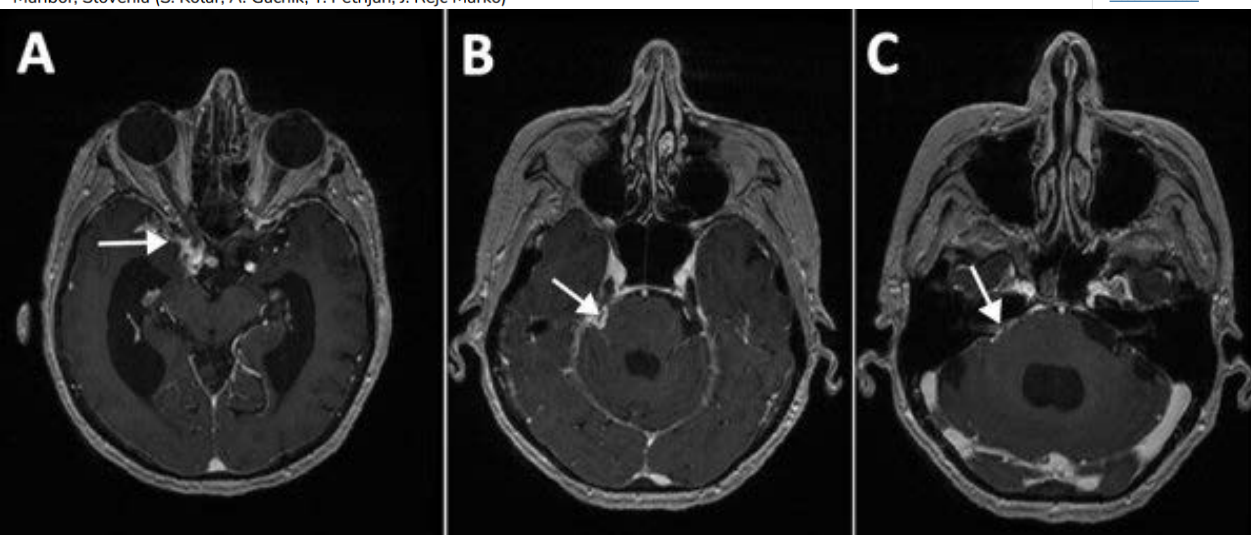
Subarachnoid Neurocysticercosis Caused by Larval-Stage *Taenia crassiceps* Tapeworm, Slovenia

Barbara Šoba, Sandra Kolar, Albin Gačnik, Manca Radež, Timotej Petrijan, and Jana Rejc Marko

Author affiliation: Author affiliations: University of Ljubljana, Ljubljana, Slovenia (B. Šoba, M. Radež); University Medical Centre Maribor, Maribor, Slovenia (S. Kolar, A. Gačnik, T. Petrijan, J. Rejc Marko)

On This Page

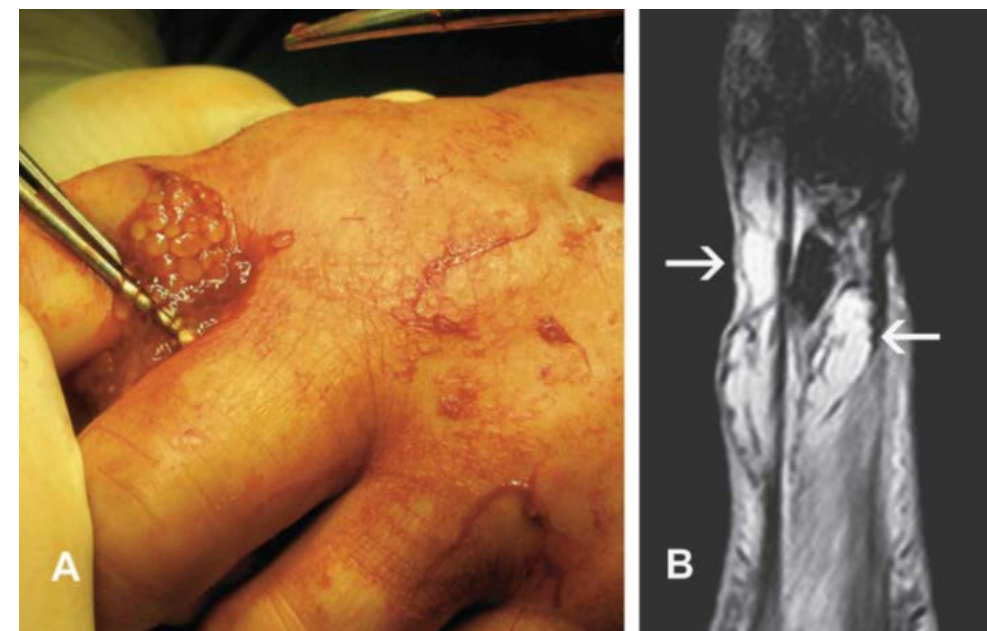
[Research Letter](#)



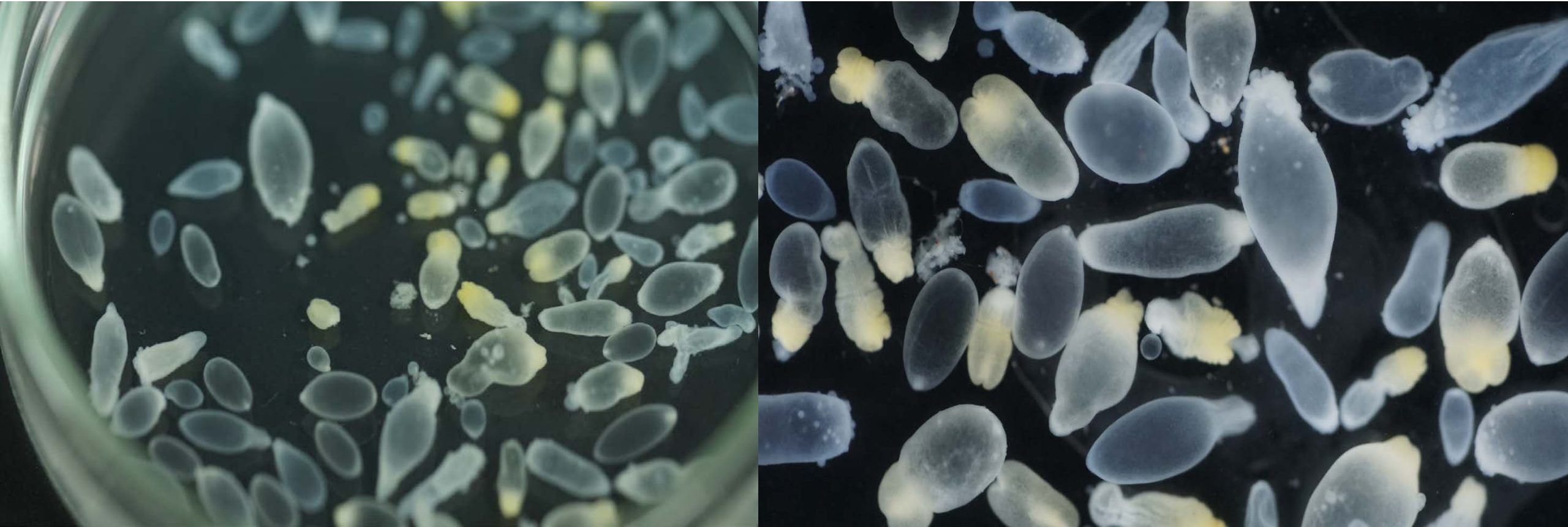
Am. J. Trop. Med. Hyg., 75(1), 2006, pp. 108–111
Copyright © 2006 by The American Society of Tropical Medicine and Hygiene

SUBCUTANEOUS *TAENIA CRASSICEPS* INFECTION IN A PATIENT WITH NON-HODGKIN'S LYMPHOMA

KATHARINA HELDWEIN, HANS-GERNOT BIEDERMANN, WOLF-DIETER HAMPERL, GISELA BRETZEL, THOMAS LÖSCHER, DAVIDE LAREGINA, MATTHIAS FROSCH, DIETRICH W. BÜTTNER, AND DENNIS TAPPE*
Medical and Surgery Department, General Hospital Trostberg, Trostberg, Germany; Department of Infectious Diseases and Tropical Medicine, Ludwig-Maximilians-University, Munich, Germany; Institute of Hygiene and Microbiology, University of Würzburg, Würzburg, Germany; Department of Helminthology, Bernhard-Nocht-Institute for Tropical Medicine, Hamburg, Germany



Taenia crassiceps cysticercus



Taenia crassiceps cisticerkus

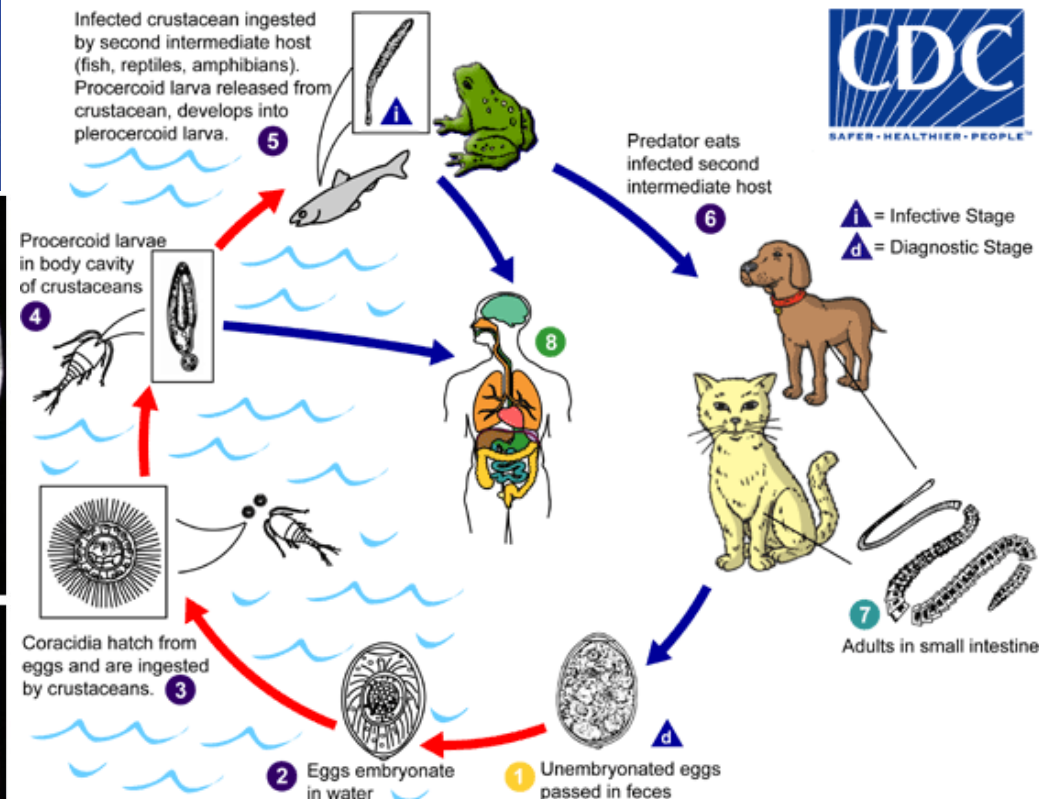
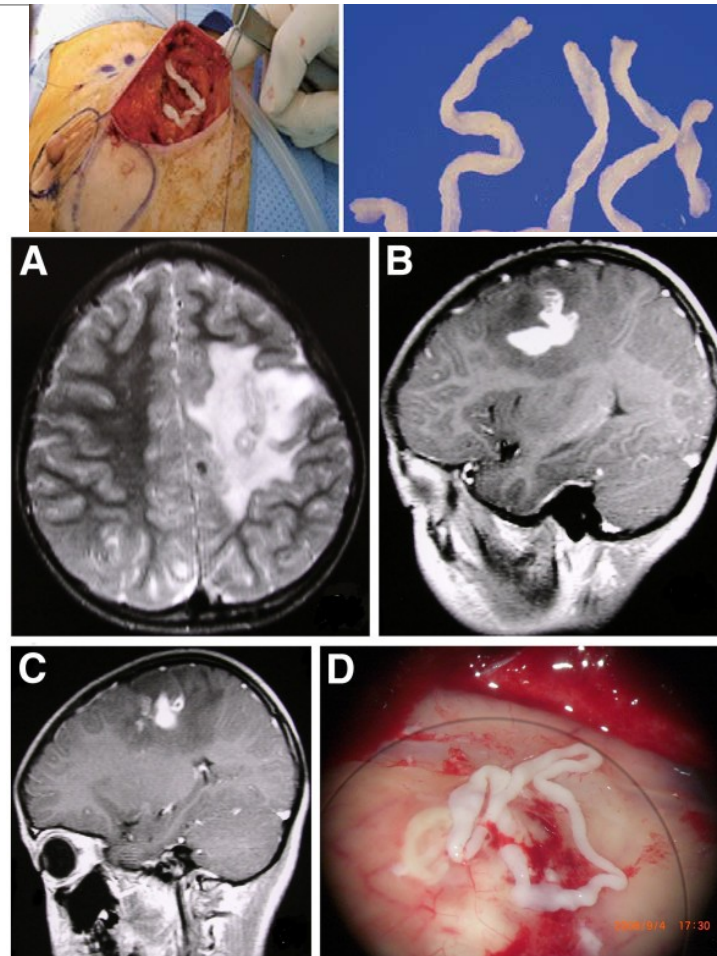


Spirometra mansoni- sparagranosis

Plerocercoid larva

Most common sites of infection:

abdominal wall and internal organs
urogenital organs
extremities
central nervous system
thoracic cavity, orbital region
neck and oral cavity





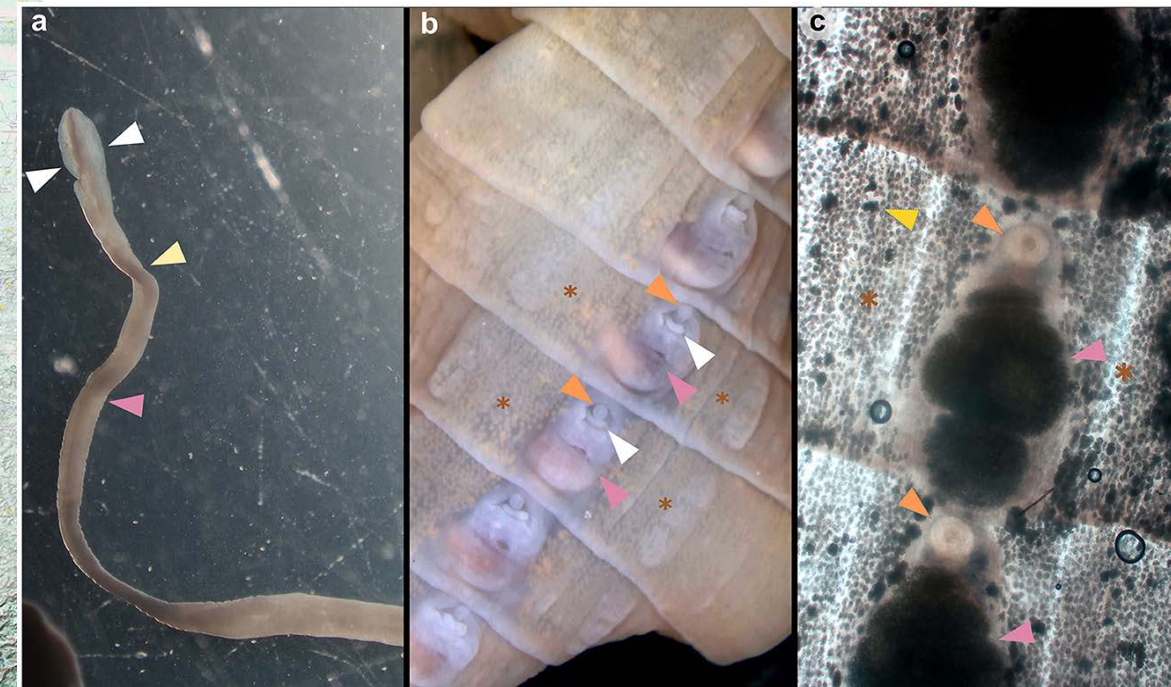
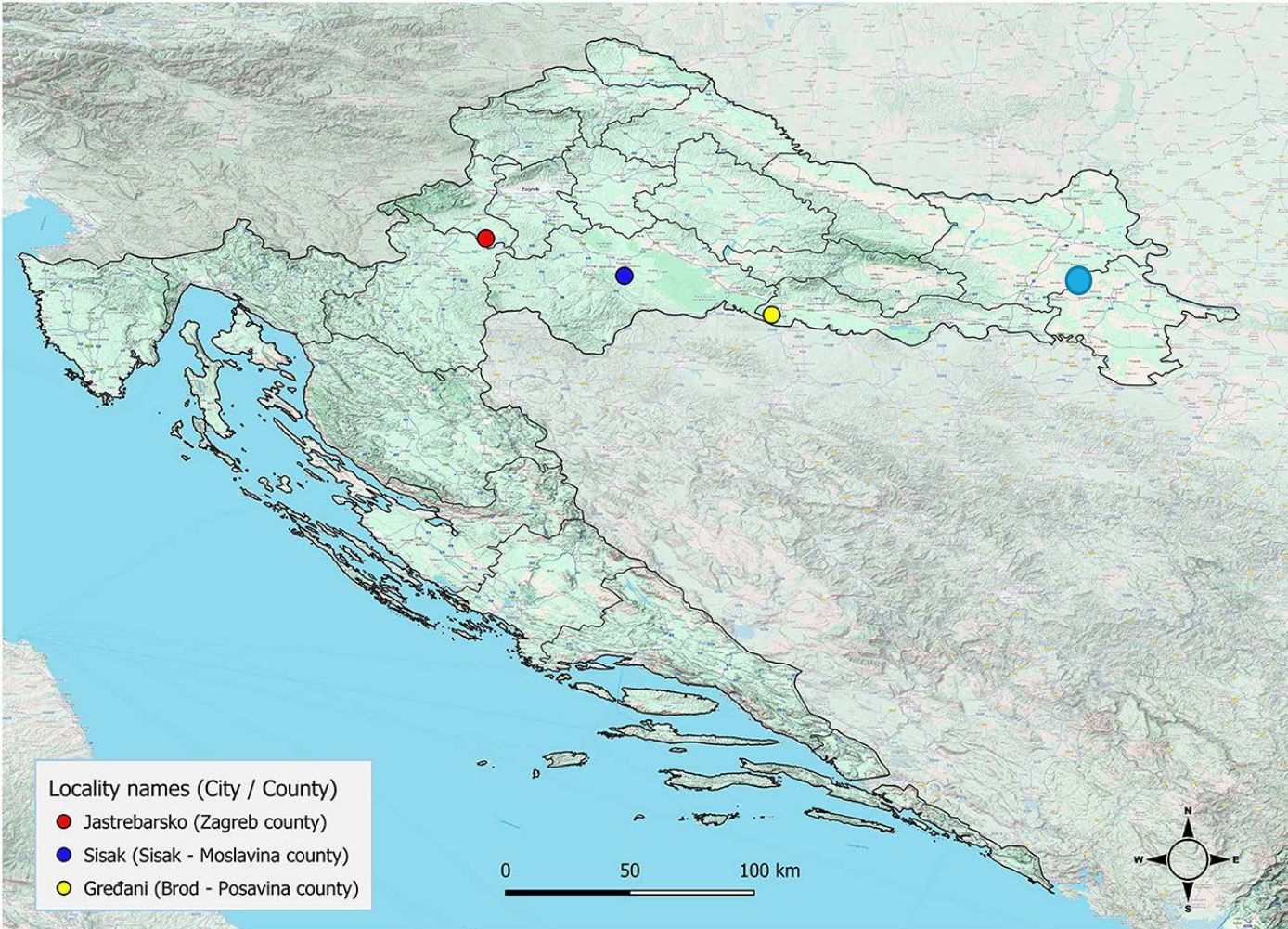
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EDITED BY
Calin Mircea Gherman,
University of Agricultural Sciences and
Veterinary Medicine of Cluj-Napoca, Romania

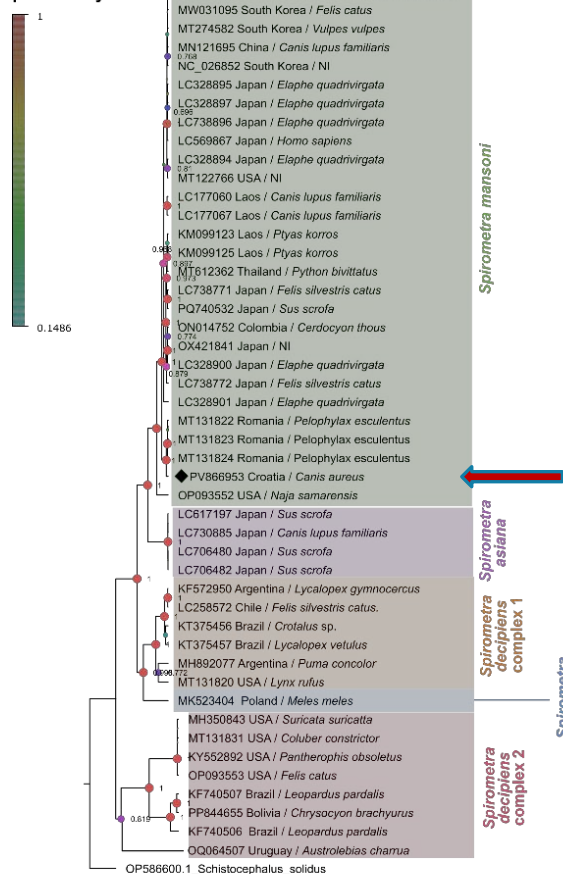
REVIEWED BY
Roman Kuchta,
Academy of Sciences of the Czech Republic
(ASCR), Czechia
Jan Brabec,
Czech Academy of Sciences, Czechia
Aida Vafae Eslahi,
Gazvin University of Medical Sciences, Iran

First molecular identification of *Spirometra mansoni* in the golden jackal (*Canis aureus*) in Croatia

Ana Šikić¹, Ema Gagović², Alicia Rojas³, Magda Sindičić⁴,
Daria Jurković Žilić², Šimun Naletlić⁵, Davor Balić⁶,
Adnan Hodžić⁷ and Relja Beck^{2*}



Posterior probability



Year	Country	Sex/Age	Sparganosis	Reference
Autochthonous cases				
1950 ^a	Poland to Czech Republic	M/?	Proliferative cerebral	[22]
1953	Italy	F/40	Subcutaneous	[19]
1953	Italy	F/53	Subcutaneous	[19]
1953	Italy	F/29	Subcutaneous	[19]
1953 ^a	Czech Republic	M/?	Subcutaneous	[23]
1958	Russia (or Belarus)	F/33	Subcutaneous	[24]
1964	Italy	M/30	Subcutaneous	[19]
1967	Ukraine (or Belarus)	M/64	Subcutaneous	[25]
1969	Greece (in Canada)	F/23	Subcutaneous	[20]
1976	Italy	M/28	Cerebral	[19]
1982	Greece (in United States)	F/27	Cerebral	[21]
1997	France	M/21	Subcutaneous	[19]
1999	France	M/14	Ocular	[19]
2002	Italy	M/50	Subcutaneous	[19]
2006	Czech Republic	M/14	Ocular	[19]
2015	Italy	M/61	Subcutaneous	[19]
2018	Poland	F/60	Subcutaneous	[19]
Imported cases				
1995	Vietnam to Czech Republic	M/29	Subcutaneous	[19]
2003	Sri Lanka to France	M/17	Ocular	[19]
2008	Bangladesh to Switzerland	M/39	Cerebral	[19]
2013	Japan to Germany	F/68	Subcutaneous	[19]
2014	South America to Germany	M/61	Subcutaneous	Clinical Infectious Diseases REVIEW ARTICLE
2014	China to United Kingdom	M/50	Cerebral	
2015	Bolivia to Spain	M/29	Cerebral	
2018	Thailand to Switzerland	F/55	Subcutaneous	

^aYear of the case is unknown.

REVIEW ARTICLE

 IDSA
 Infectious Diseases Society of America
  hivma
 hiv medicine association

Sparganosis (*Spirometra*) in Europe in the Molecular Era

Roman Kuchta,¹ Marta Kołodziej-Sobocińska,² Jan Brabec,^{1,3} Daniel Młoticki,^{4,5} Ruslan Salamatov,⁴ and Tomáš Scholz¹

¹Institute of Parasitology, Biology Centre, Czech Academy of Sciences, České Budějovice, Czech Republic, ²Mammal Research Institute, Polish Academy of Sciences, Białowieża, Poland, ³Natural History Museum of Geneva, Geneva, Switzerland, ⁴Department of General Biology and Parasitology, Medical University of Warsaw, Warsaw, Poland, and ⁵W. Stefański Institute of Parasitology, Polish Academy of Sciences, Warsaw, Poland

Toxocara canis, Toxocara cati



Dogs: 15,365 tested from 2016 to 2022

Prevalence: 2.2 to 4.2%

Cats: 7,234 tested from 2016 to 2022

Prevalence: 0.8 to 1.9%

Golden jackals and red foxes:

15–20%

Single study in children

- A total of 142 serum specimens from Croatian children aged 3–18 years
- with peripheral eosinophilia and without any clinical symptoms,
- tested for the presence of *Toxocara canis* IgG antibodies- (ELISA) and Western blot
- The overall *T. canis* seropositivity was 31%

Journal of Helminthology (2009) **83**, 369–371
© Cambridge University Press 2009

doi:10.1017/S0022149X09381213

Seroprevalence of *Toxocara canis* infection among asymptomatic children with eosinophilia in Croatia

M. Sviben*, T.V. Čavlek, E.M. Missoni and G.M. Galinović

Croatian National Institute of Public Health, Microbiology Service,
Rockefellerova 7, 10000 Zagreb, Croatia

Flukes

Fasciola hepatica

Dicrocoelium lanceolatum

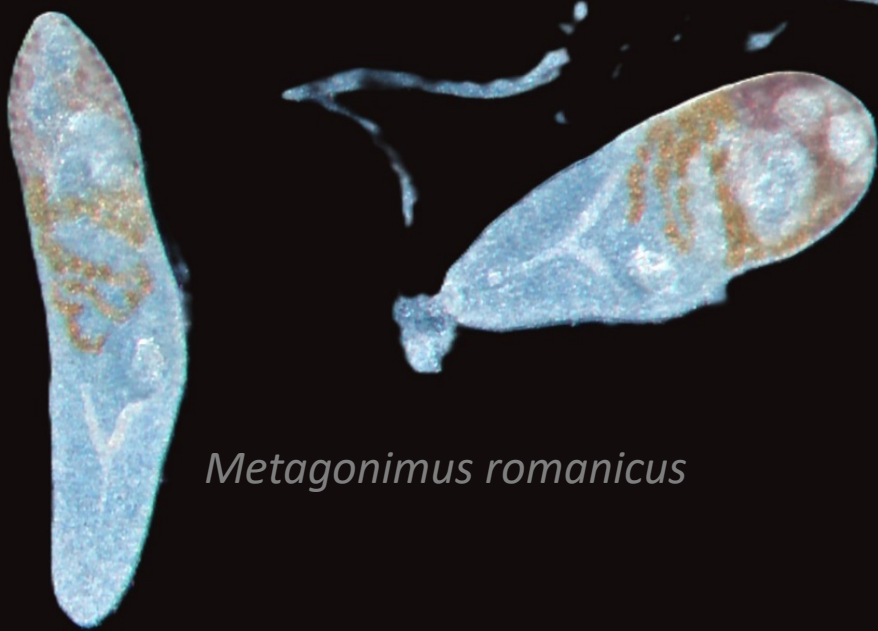
Liver and gall bladder-
ruminants, horses bears

Alaria alata

Metagonimus romanicus

Intestines- wild canids

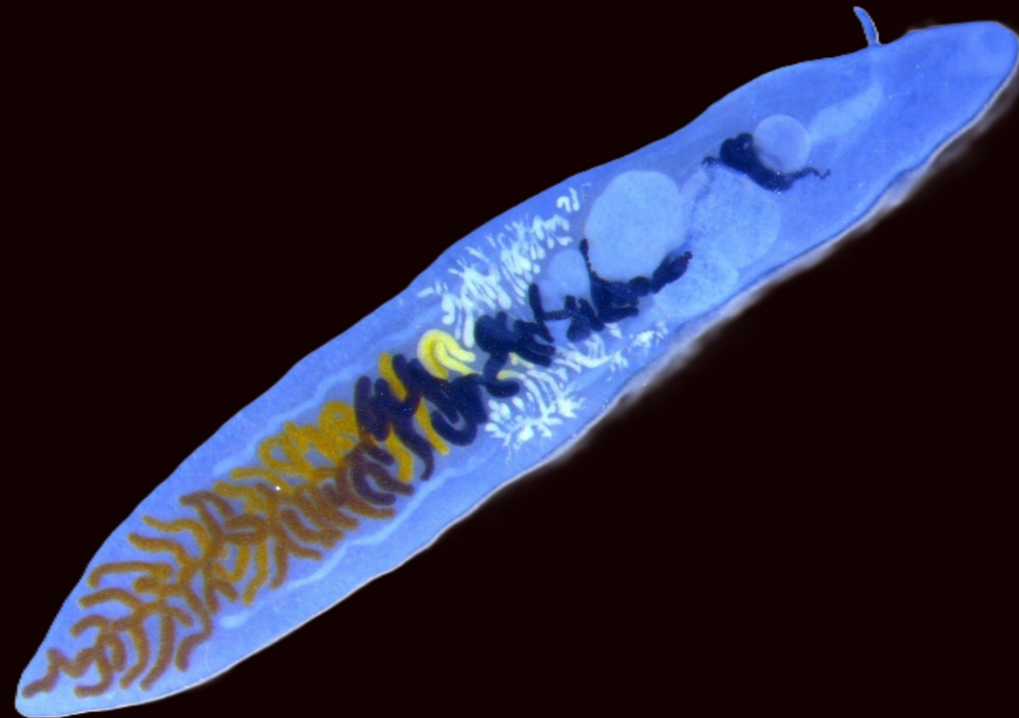
All regions



Metagonimus romanicus



Alaria alata



Humans-only historical descriptions



Oboljenja od metiljavosti kod čovjeka. Dr. Walter Rukavina, sreski liječnik, Križevci.

U godinama od 1927 do 1930 imao sam prilike promatrati nekoliko oboljenja od metilja. Pošto držim, da su ova oboljenja česta kod ljudi, naročito u godinama kad se javlja i veći broj oboljenja kod blaga, smatram opravdanim, da i svoja opažanja priopćim.

U mnogim dijelovima naše države imala je metiljavost katastrofalne posljedice za privredu. Naročito je stradalo stočarstvo u nekim dijelovima Hrv. Zagorja. Uporedo s oboljenjem domaćeg blaga, javljaju se slučajevi oboljenja kod ljudi.

O infekciji sa distoma haepaticum kod čovjeka veoma je malo izneseno u literaturi. Naišao sam svega na nekoliko kraćih referata o pojedinim slučajevima u stranoj literaturi u koliko mi je ista bila onda pristupačna. Kod nas, iak

Ako embrij uspije, da u kraćem vremenu nađe međudomaćina, koji je kod nas maleni puž Limnea truncatula, razvije se u njemu u sporocistu. Embrij uvijek ulazi u dišni trakt puža. Sporocista se u pužu dalje razvija te se u njoj razvijaju dugoljaste larve, t. zv. redie, koje ostavljaju sporocistu te se useljuju u jetru puža. U jetri se redie ili množe ili u njima nastaju nove larve, koje pune tijelo redie. Kad se ove larve razviju ostave tijelo redie, te probavnim cestama puža izlaze iz njega. To su cercarije, koje u tom stadiju razvoja imaju i rep, kojim se veoma brzo pomiču u vodi, te se već prostim okom vide. Ovo živo kretanje u vodi prestaje nakon nekoliko sati, te se cercarije priljube uz predmet u vodi ili ostanu nepomične na dnu bare. Tada gube i rep, koji im više nije potreban, jer se dalje ne miču. Stanovite žlijezde odmah stanu izlučivati gustu, polutekuću masu, koja se pomalo skrćuje. Ovako nastaje cista, u kojoj leži mladi metilj. Time je ciklus razvoja dovršen. Kad ova cista kod sisavaca uđe kroz usta i dođe u želudac, raspadne se cista djelovanjem želučanog soka. Mladi metilj se tada oslo-

Iz prakse.

Metiljavost (distomatosis) kod čovjeka.

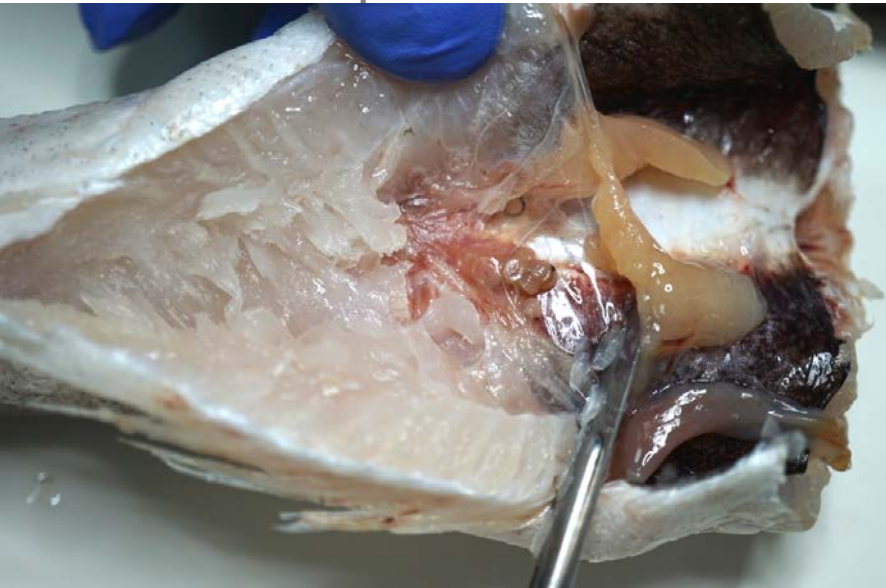
Dr. Mijo Kolibaš, ravnatelj bolnice, Virovitica.

U nizu posljednjih godina raspravljalo se u veterinarskim krugovima veoma mnogo o metiljavosti kod životinja. Propagandom medju narodom i dijeljenjem distola, kao jedinog uspješnog sredstva protiv te bolesti, narod je veoma dobro danas upućen i kako izgleda uspijeva da si očuva blago od te teške zarazne bolesti. — Nitko nije ni pomišljao, da je metilj (distomum hepaticum, fasciola hepatica) patogen i po ljude.

	Datum pregleda	Faeces	Nalaz u krvi	Eosinofilija	Klinički simptomi	Terapija
Stjepan Š. uč. osn. škole 12 god. Konjščina	16 III 1928	4 jaja u 10 preparata	Hemoglobin 65% Eritrociti 4,600.000 Leukociti 16.000	18%	Jetra se pipa subfebr. temp. bljed. Ikterus nije postojao.	Primio 10 injekcija Silbosana a 2 ccm
	1 III 1929	u tri stolice niju su nađena jaja	Hemoglobin 70% Eritrociti 4,500.000 Leukociti 6.000	8%	Veoma dobro izgleda, nema smetnja.	
Marija B. 16 god. Mače	17 II 1928	3 jaja u 12 preparata jaja od askarida	Hemoglobin 68% Eritrociti 420.000 Leukociti 9.000	13%	Subfebrilna bljedila, boli pod d. rebr. lukom, jetra se ne pipa.	Extr. fil. maris 80 primila 4 puta
	4 I 1929	ne nalazim jaja u opetovanom pregledu stolice	Hemoglobin 70% Eritrociti 4,000.000 Leukociti 5.000	4%	Bljedila, slaba, kašlje, Nastid d. plućnog vrška. Boli u predjelu jetre. Temp. subfebr. snoji se po noći.	
Janko K. 14 god. sluga kod vlastelinstva Poznanovec	21. V 1928	2 jaja u 18 preparata	Hemoglobin 70% Eritrociti 5,000.000 Leukociti 13.000	17%	Subikteričan subfebrilan, jetra se ne pipa. Boli u predjelu jetre. Kroz 2 mjeseca recidivirajuća urtikarija.	Simptomatična Extr. fil. maris 80 2 puta
	2 XII 1928	nema jaja kod opetovanih pregleda stolice	nije pregledano	3%	Od kolovoza nema nikakve simptome, osjeća se dobro.	

Anisakidae

- Veterinary or sanitary inspections
- Majority- Internal control of large producers – imported fish, fish products
- In humans- two described cases, antibodies in 1.2- 2.4%
- Inspection and artificial digestion



Cryptosporidium

TABLE 1

Number of laboratory-confirmed *Cryptosporidium* spp. and *Giardia intestinalis* cases^a and reported incidence per 100,000 inhabitants^b, 10 countries in the eastern part of Europe, 2016

Country	Origin of stool samples	Investigation method used	Investigation period	Cryptosporidium spp.a			Giardia intestinalisa			Notifiable disease		Mean number of cases/100,000 inhabitants/yearb	
				n positive	n total	% (95% CI)	n positive	n total	% (95% CI)	Cry	Gia	Cry	Gia
European Union countries													
Croatia	Routine obligatory health checks of healthy people working with food and beverages	MIFC	2006–2015 (10 years)	–	–	–	164 ^c	245,321 ^c	0.07 (0.06–0.08) ^c	Yes	Yes	0.02	1.42
	Patients with intestinal symptoms	MIFC		–	–	–	41 ^c	17,183 ^c	0.24 (0.17–0.32) ^c				
	Patients with bloody diarrhoea	Ziehl-Neelsen staining, microscopy		0 ^c	20 ^c	0.00 (0.00–13.91) ^c	–	–	–				

KRIPTOSPORIDIOZA U DJECE NA PODRUČJU ZAGREBA

CRYPTOSPORIDIOSIS IN CHILDREN IN THE ZAGREB AREA

BISERKA MATICA,¹ BRANKO RICHTER,² NASTJA KUČIŠEC,³ IVAN VODOPIJA⁴

Stručni članak

Deskriptori: Kriptosporidioza; Proljev u djece

Sažetak. Od prosinca 1984. do prosinca 1985. pregledano je u Zavodu za zaštitu zdravlja grada Zagreba 3113 uzoraka stolice od djece ambulantnih bolesnika s akutnim proljevom te 375 uzoraka od djece bez gastrointestinalnih smetnji na prisutnost oocista roda *Cryptosporidium*. Među oboljelom djecom nađena su 42 slučaja kriptosporidioze (1,34 %), dok među zdravom djecom nije utvrđen ni jedan slučaj. U djece s proljevom bio je pozitivan nalaz značajno češći u dobi do 2 godine negoli u dobi od 3 do 6 godina. Učestalost oocista prema doba godine (hladno-toplo) nije pokazivala značajnih razlika.

Professional paper

Descriptors: Cryptosporidiosis; Diarrhea, infantile

Summary. From December 1984 to December 1985 3113 stool samples from children with acute diarrhoea and 375 samples from matched controls have been examined for *Cryptosporidium* oocysts in the Zagreb Institute of Public Health. Forty two samples from children with diarrhoea were positive (1.34 %) whereas no positive cases were detected in the control group. The incidence of positive findings was significantly higher among children aged 0–2 years than in the age group from 3–6. No significant difference in the incidence of positive findings of oocysts with regard to the season (cold-warm) was found.

Case Report

Wien Klin Wochenschr (2006) 118/15–16: 485–487
DOI 10.1007/s00508-006-0637-7

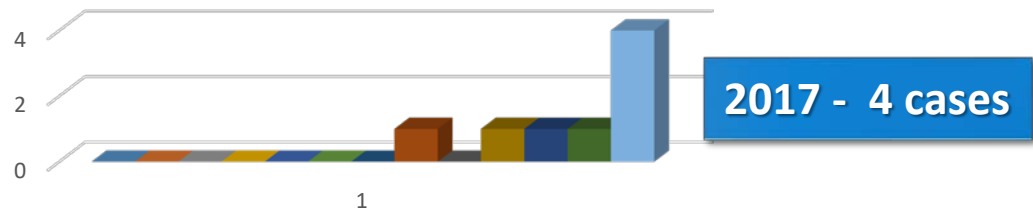
WIENER KLINISCHE
WOCHENSCHRIFT
The Middle European Journal
of Medicine
Printed in Austria

A family outbreak of cryptosporidiosis:
probable nosocomial infection and person-to-person transmission

Nenad Pandak¹, Kristof Zeljka², and Ante Cvitkovic³

In humans

Cryptosporidiosis 2014-2016



January February March April May
June July August September October
November December total

Source: Epidemiological Journal, Croatian Institute of Public Health, Division for Epidemiology of Communicable Diseases



Crypto outbreak- 23 holyday cases

Confirmed in Germany, not in Croatia

RAPID COMMUNICATION

Increased number of cryptosporidiosis cases with travel history to Croatia might be related to swimming pools, Germany, 2023

Anja Schoeps^{1,2,*}, Klara Röhl^{3,*}, Nicole Walter⁴, Andrea Neute⁵, Bernadette Walter^{3,6}, Inga Freudenau⁷, Annette Jurke⁷, Christiane Klier⁸, Petra Heinmüller⁹, Syamend Saeed^{3,9}, Jasmin Metz^{3,10}, Hendrik Wilking¹¹, Philipp Zanger^{1,2}

1. Heidelberg Institute of Global Health (HIGH), Heidelberg University, Heidelberg, Germany
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 3. Postgraduate Training for Applied Epidemiology (PAE), Department of Infectious Disease Epidemiology, Robert Koch Institute, Germany
 4. District Public Health Authority Rhein-Pfalz-Kreis, Ludwigshafen, Germany
 5. Landesamt für Arbeitsschutz, Verbraucherschutz und Gesundheit (LAVG), Potsdam, Germany
 6. Department for Health Protection, Infection Control and Epidemiology, State Health Office, Ministry of Social Affairs, Health and Integration Baden-Württemberg, Stuttgart, Germany
 7. Landeszentrum Gesundheit Nordrhein-Westfalen, Fachgruppe Infektionsepidemiologie, Bochum, Germany
 8. Niedersächsisches Landesgesundheitsamt, Abt. 2: Infektionsepidemiologie, Hannover, Germany
 9. Hessisches Landesamt für Gesundheit und Pflege (HLfGP), Abteilung 2 Gesundheits- und Infektionsschutz, Dillenburg, Germany
 10. Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit, München, Germany
 11. Department of Infectious Disease Epidemiology, Robert Koch Institute, Germany
- * These authors contributed equally to this work and share first authorship.

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Citation style for this article:

Schoeps Anja, Röhl Klara, Walter Nicole, Neute Andrea, Walter Bernadette, Freudenau Inga, Jurke Annette, Klier Christiane, Heinmüller Petra, Saeed Syamend, Metz Jasmin, Wilking Hendrik, Zanger Philipp. Increased number of cryptosporidiosis cases with travel history to Croatia might be related to swimming pools, Germany, 2023. Euro Surveill. 2024;29(1):pii=2300699. <https://doi.org/10.2807/1560-7917.ES.2024.29.1.2300699>

Article submitted on 8 Dec 2023 / accepted on 3 Jan 2024 / published on 4 Jan 2024



Giardia duodenalis

VECTOR-BORNE AND ZOO NOTIC DISEASES
Volume 12, Number 3, 2012
© Mary Ann Liebert, Inc.
DOI: 10.1089/vbz.2011.0751

Genotyping *Giardia duodenalis* Isolates from Dogs: Lessons from a Multilocus Sequence Typing Study

Relja Beck,¹ Hein Sprong,² Edoardo Pozio,³ and Simone M. Cacciò³

VECTOR-BORNE AND ZOO NOTIC DISEASES
Volume 00, Number 00, 2010
© Mary Ann Liebert, Inc.
DOI: 10.1089/vbz.2010.0113

VBZ-2010-0113-Beck_1P
Type: research-article
ORIGINAL RESEARCH

A Large Survey of Croatian Wild Mammals for *Giardia duodenalis* Reveals a Low Prevalence and Limited Zoonotic Potential

Relja Beck,¹ Hein Sprong,² Snjezana Lucinger,³ Edoardo Pozio,⁴ and Simone M. Cacciò⁴



Prevalence and molecular typing of *Giardia* spp. in captive mammals at the zoo of Zagreb, Croatia

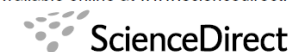
Relja Beck^a, Hein Sprong^b, Ingeborg Bata^c, Snjezana Lucinger^d, Edoardo Pozio^e, Simone M. Cacciò^{e,*}

Identification of *Giardia* species and *Giardia duodenalis* assemblages by sequence analysis of the 5.8S rDNA gene and internal transcribed spacers

SIMONE M. CACCIÒ^{1*}, RELJ. and EDOARDO POZIO¹



Available online at www.sciencedirect.com



International Journal for Parasitology 38 (2008) 1523–1531



www.elsevier.com/locate/ijpara

Multilocus genotyping of *Giardia duodenalis* reveals striking differences between assemblages A and B^{☆,☆☆}

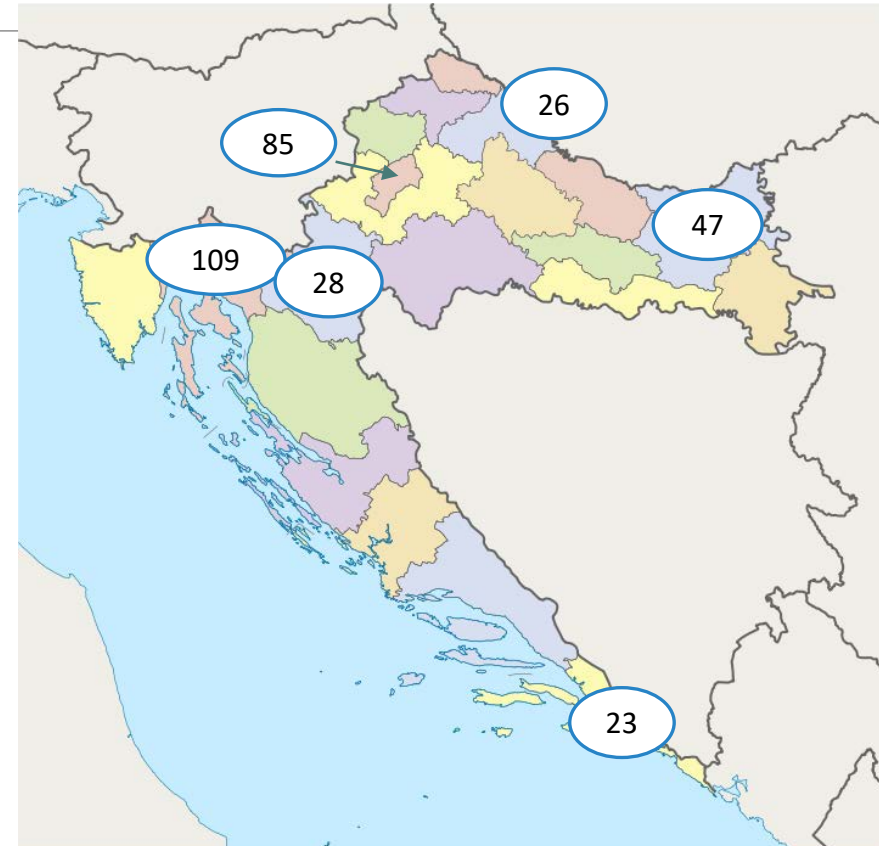
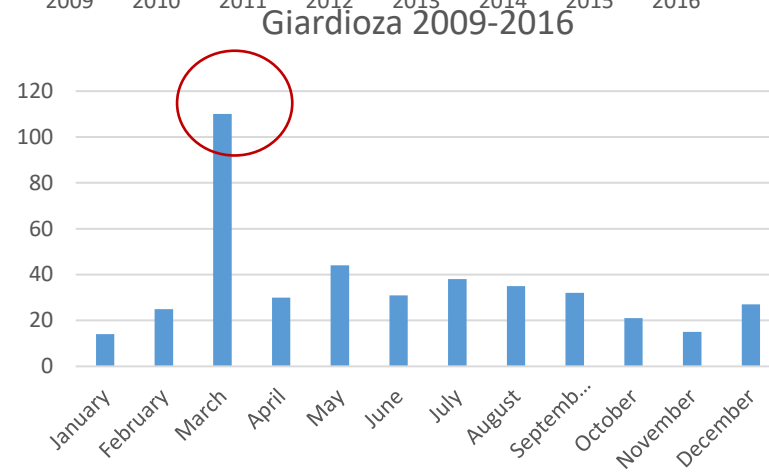
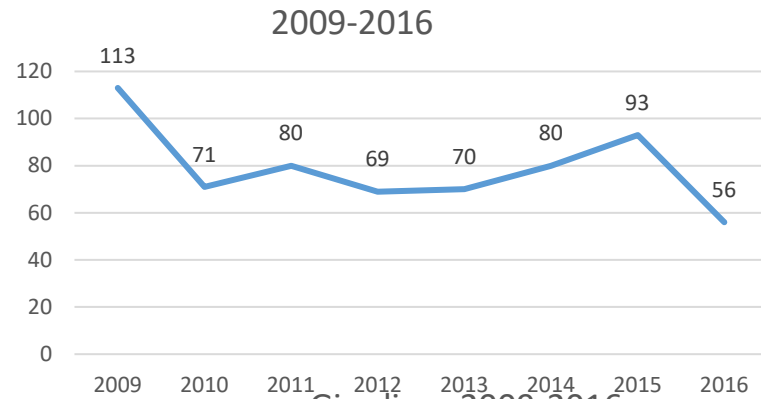
S.M. Cacciò^{a,*}, R. Beck^{a,b}, M. Lalle^a, A. Marinculic^b, E. Pozio^a



Article

The Influence of *Giardia duodenalis* on the Occurrence of Clinical Signs in Dogs

In humans



Cycles exchanges



Boys are back to town

zagrebinfo VIJESTI ZAGREBAČKE PRIČE GRADSKA SCENA EKO SPORT

BOŽIČNA PRIČA

Već je savladala engleski tijekom spavanja u 1 noći

Naučite kako trgovati cijenom zlata na burzi - Preuzmite besplatni vodič



Amica Mazura - Zakaj volim Zagreb

Grožđe mikrolova: Jučer sam se s košice družila sa pištomom igom na Miroslavcu - jedino mjesto na kojem se može družiti. Čak je i potražio, imala sam osjećaj da razmišlja to i prišla da sam je primila u svoje zagruge - to je da sam joj ispružila ruku - Bila sam tražila grubi dragog znanca prije spavanja, a dragi vesnik kao da je poslušao što da me govore, da ne kujem - Bilo je nešto magičnog i bezvremenskog u tom druženju - drago mi je da mi je bilo, bio u ruci

da trudi me se - Komunisti - Podigni

20 min 2 gude 30 comments

10 min 20 min 30 min 40 min 50 min 60 min 70 min 80 min 90 min 100 min 110 min 120 min 130 min 140 min 150 min 160 min 170 min 180 min 190 min 200 min 210 min 220 min 230 min 240 min 250 min 260 min 270 min 280 min 290 min 300 min 310 min 320 min 330 min 340 min 350 min 360 min 370 min 380 min 390 min 400 min 410 min 420 min 430 min 440 min 450 min 460 min 470 min 480 min 490 min 500 min 510 min 520 min 530 min 540 min 550 min 560 min 570 min 580 min 590 min 600 min 610 min 620 min 630 min 640 min 650 min 660 min 670 min 680 min 690 min 700 min 710 min 720 min 730 min 740 min 750 min 760 min 770 min 780 min 790 min 800 min 810 min 820 min 830 min 840 min 850 min 860 min 870 min 880 min 890 min 900 min 910 min 920 min 930 min 940 min 950 min 960 min 970 min 980 min 990 min 1000 min

Lisica i Mači Priše kod naših prijatelja

MAČI PRIŠE

VA U MIRU BOŽJEM

24 PLUS+ NEWS SHOW SPORT LIFE&STYLE VIRAL VIDEO

Hrvatska Crna kronika Svijet Rat u Ukrajini Politika Vrijeme Kolumne

SNIMILI SU JE U DUBRAVI

VIDEO Mačka i lisica oči u oči: 'Pun ih je grad. Rekli su nam da ih ne diramo jer nisu opasne'

Piše Katarina Bitić, utorak, 04.7.2023. u 10:41



Foto: Jelena Pavković/canva

INDEX HR NASLOVNICA VIJESTI SPORT MAGAZIN OGLASI RECEPTI OSTALO

VIDEO U Zagrebu snimljene divlje svinje

Index Vijesti
17:26, 24. travnja 2024.



NAJNOVIJE

- 6 min Plenk: žrtvu:
- 11 min Biden poma uvjetu
- 24 min Novi c kod V pripac
- 34 min Preds državi SAD i
- 42 min Erdog Pozve pobur

Screenshot: Hrvatski Javni portal Forum

24 PLUS+ NEWS SHOW SPORT LIFE&STYLE VIRAL VIDEO

Viral fotke Fun video Misteriji Dobre vijesti Čudne vijesti Životinje Ljub

VIDEO Divlje svinje se prošetale Dubravom u Zagrebu: 'Nisam se bojavao, no mogu biti opasne...'

Piše Domagoj Plantak, petak, 01.10.2021. u 14:51



There is a lot to do

Biodiversity of zoonotic food borne parasites

(new and neglected species in domestic and wild animals)

Changes in pathogen ecology

(climate, migration, invasive species, host behavior)

Increased risk for humans

(contaminated water/food, habits, food production)

Need to raise awareness and adapt diagnostics

(education, molecular methods, monitoring)



Emerging pathogens, environmental changes, and the merging of sylvatic with rural, peri-urban, and urban cycles — along with changes in human behavior — will increase exposure and risk of infection

ParaKod

NextGenerationEU

Ministry of Science and Education of the Republic of Croatia



Funded by
the European Union

Molecular identification of nematodes, tapeworms, flukes and obligatory myases in domestic and wild animals" (PARAKOD)

