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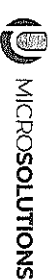
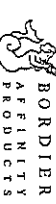
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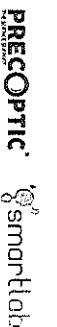
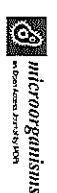
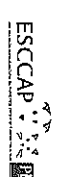
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tom (*veva lake*), and the trematode *Cyprinocotyle ligura*. The most important zoonotic parasites from freshwater fish are trematodes *Meteorchistis* spp., *Ophiorhynchium*, *Percariostrongylus* spp., *Pseudodiplostomum truttae*, and the cestode *Diplostomum* spp. The research on their identification, detection and treatments in fish products significantly improved during the past decade. Fish-borne parasites are usually identified by molecular techniques: immunossays, proteomics, and conventional and quantitative PCR, the latter valuable for isolation and mitochondrial DNA markers. Detection, visualisation and isolation techniques (UV-pressure method, artificial digestion) have been also optimised, while innovative tools, optical hyperspectral sensing and the use of AI need further development and validation. Lastly, treatments for inactivating parasites in fishery products, such as heating, high-pressure processing, pulsed electric fields, drying, ultrasound, salting, marinating and the use of natural products have been compared for efficiency, resulting in some of these to be dismissed as ineffective, such as ultrasound treatment or different marinate combinations.

EFSA BIOHAZ Panel (EFSA Panel on Biological Hazards), Kontonissios K, Allende A, Alvarez Ordóñez A, Bover-Cid S, Cheney M, De Coetzee A, Hennessy L, Hillier F, Lindqvist R, Manu M, Nonno R, Peze L, Ro G, Simonsen M, Skjoldsvang P, Suffredini E, Buchmann K, Carabob Al... Bolton D (2023) Re-evaluation of certain aspects of the EFSA Scientific Opinion of April 2010 on risk assessment of parasites in fishery products, based on new scientific data. Part 1: Table 3. EFSA Journal, 22(4), e8719.

Keywords: Antisickles, EFSA Scientific Opinion, fish-borne parasites

OS – oral session

Session: [PS2] Food and Waterborne Parasitology (Journal of the EFP) Plenary Session

Transmission of parasites to people via food and water: where are we now and should we care?

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Abstract
It is a given fact that many parasites can be transmitted via food and/or water, either as contaminants (e.g. eggs, oocysts, cysts shed in faeces), or via particular infectious stages occurring in food animals (e.g. larvae) or in water (e.g. cercariae, trophozoites). Efforts to combat these transmission routes have been of varying success. For example, in many industrialised countries, awareness of waterborne parasites combined with introduction of ultra-violet treatment of drinking water has likely contributed to reducing the occurrence of outbreaks of waterborne giardiasis and cryptosporidiosis. Similarly, efforts to eliminate dracunculiasis have had a major impact on its occurrence – but have not yet reached elimination status.

Different national and international bodies are gradually realising the importance of food and waterborne transmission of parasite as their impact is quantified and compared. With a basis in food-borne/waterborne parasites that are usually transmitted orally, the intention of this presentation is twofold. Firstly, to provide some insights into where we are now based on the assessments that have been conducted and are in progress. Secondly, to address which ambitions we might have, what is realistic, and if we wish to reach total interruption of some life cycles (and thus elimination), what obstacles lie ahead and how might we address them.

This is an exciting period in food and waterborne parasitology, and we should capitalise on the current interest in this important field.

Keywords: Burden, control, foodborne transmission, life cycles, waterborne transmission

OS – oral session

Surface water (10 L) was concentrated by filtration through a 1.2 µm polycarbonate filter. Crustaceans were collected using sieves. Total DNA was extracted from the water pellet and crustaceans using Trizol reagent and the 529bp RE and β-galactin in 6/8 amplified using specific primers. *T. gonitii* was detected in 6/8 freshwater samples, and in 1/4 crustacean samples (*Cyclops* sp.).

Giardia spp. gDNA was not detected. All samples originated from freshwater ecosystems from areas which are heavily used for commercial and recreational purposes around Belgrade and are habitats for wildlife, thus providing opportunities for parasite exchange. Surface water in some areas is contaminated with *T. gonitii* oocysts while copepods may be an underappreciated link in their transmission. As frogs carry pathogenic fungi, they could be important as vectors for zoonotic parasites due to their biphasic life cycle, and an investigation of frogs in the transmission of *Sporozoa* spp. is underway.

This research was supported by the Science Fund of the Republic of Serbia, #2424, Environmental Monitoring of Food and Waterborne Parasites - PARASITE_HUNTER.

Keywords: Freshwater ecosystems, zoonotic parasites, *Toxoplasma gondii*, *Giardia* spp., reservoirs

PS – poster session

Session: [PS2] Food and Waterborne Parasitology (Journal of the EFP) Plenary Session

Unusual food poisoning due to massive infection with *Antitakis simplex sensus lato*

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Abstract
Antisickidosis is a food-borne parasitic disease due to the consumption of raw or undercooked fish or shellfish. This disease can manifest either as acute gastric forms, late intestinal forms, or allergic manifestations. Most infections are self-limiting in humans. We report two cases of food poisoning caused by *Antitakis simplex (L.)* following the consumption of homemade European lake (*Merluccius merluccius*) ceviche in a single family in 2021. Massive infection in one of the two patients led to the removal of more than forty larvae by gastroscopy, performed two days after the consumption of contaminated meal, illustrating the singularity of this case. Based on morphological characteristics, larvae were identified as *Antitakis* belonging to *A. simplex (L.)* using mitochondrial DNA cytochrome c oxidase 2 sequencing. The European lake, widely traded in commercial markets, is also known for its high prevalence of *Antitakis* spp. larvae infestation. Epidemiological data about human antisickidosis are still scarce in France, but 37 cases have been reported in a national survey conducted between 2010 and 2014 in Parasitology laboratories of university hospitals and collective food poisoning is probably underrated. These cases underline the importance of raising awareness of this disease in the general population and reminding the importance of cooking/freezing fish before raw consumption in case of homemade dishes.

Keywords: *Antitakis*, Antisickidosis, foodborne parasitic disease

PS – poster session

Session: [PS2] Food and Waterborne Parasitology (Journal of the EFP) Plenary Session

Synanthropic birds and rodents as indicators for *Toxoplasma gondii* oocyst contamination in urban and suburban environments

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Abstract
Synanthropic rodent species are known reservoirs of *Toxoplasma gondii* and due to their diet may serve as indicators of environmental contamination with *T. gondii* oocysts. Although hooded crows (*Corvus corax*) and rooks (*Corvus frugilegus*) are common resident omnivorous bird species of urban and suburban environments, that frequently feed off the ground, their role as reservoirs and potential indicators of environmental contamination with *T. gondii* oocysts has been poorly investigated.

For this study, hearts were collected from 27 legally hunted synanthropic birds (n = 17 *C. corax*, n = 10 *C. frugilegus*) and from 15 rodents obtained from rodent control in two suburban areas of Belgrade. Most birds (n = 19) and all rodents originated from an area near the Sava River with fewer human habitats, while the remaining samples originated from a residential area further away from the river. Total DNA was extracted using Trizol reagent and the presence of *T. gondii* gDNA was ascertained by amplification of the 529 bp repeat element. *Toxoplasma gondii* was detected in 12/15 (80%) rodents and 10/27 (37%) birds. In the area closer to the river with less human habitats, 6/17 hooded crows and 1/2 rooks harboured *T. gondii*, as did 3/8 rooks from the residential area. The results show that 40% of rooks and 35.3% of hooded crows are infected with *T. gondii*, indicating significant exposure to the parasite which suggests environmental contamination with oocysts. Preliminary investigation of surface water in the area confirmed the presence of *T. gondii* gDNA while studies in soil are currently underway. The results of these studies will show whether synanthropic birds can serve as indicator species for environmental contamination with *T. gondii* oocysts.

This research was supported by the Science Fund of the Republic of Serbia, #2424, Environmental Monitoring of Food and Waterborne Parasites - PARASITE_HUNTER.

Keywords: synanthropic birds, *Toxoplasma gondii*, oocysts, environment, indicators

PS – poster session

Session: [PS2] Food and Waterborne Parasitology (Journal of the EFP) Plenary Session

***Trichinella* infection in Southeastern Europe**

Sasa Malley*, Ivana Mitić*, Laurentia Mihai Ciupescu*, Nikolay Lalkovskii*, Davon Balci*, Jovana Stefanovska*, Ani Vorkocić*, Darko Despotović*, Budimir Plavčić*, Gianluca Maracci*

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8 World Organization for Animal Health (OIE)

Abstract
Trichinella spp. are zoonotic parasites of great public health importance. The European lake, widely traded in commercial markets, is also known for its high prevalence of *Antitakis* spp. larvae infestation. Epidemiological data about human antisickidosis are still scarce in France, but 37 cases have been reported in a national survey conducted between 2010 and 2014 in Parasitology laboratories of university hospitals and collective food poisoning is probably underrated. These cases underline the importance of raising awareness of this disease in the general population and reminding the importance of cooking/freezing fish before raw consumption in case of homemade dishes.

Keywords: *Antitakis*, Antisickidosis, foodborne parasitic disease

PS – poster session

European Union Reference Laboratory for Parasites: Istituto Superiore di Sanità, Rome, Italy

Abstract

In several Southeastern European (SEE) countries, trichinellosis stands out as a significant foodborne zoonotic disease. New epidemiological data for 2019-2023 suggests a notable decrease in both human cases and the incidence of infected domestic pigs within SEE countries. Typically, untreated pork from backyard settings serves as a common source of human trichinellosis in Serbia, Bulgaria, and Romania. Unstated wild boars constitute a crucial source of *Trichinella spiralis* infection in SEE, with these additional species, namely *T. britovi*, *T. nativa*, and *T. pseudospiralis*, also reported in these countries. The prevalence of *Trichinella*-positive wild boars remains consistent over the years, emphasizing the importance of educating hunters and consumers of wild game meat about the risks associated with consuming untested meat.

Ministry of Science, Technological Development and Innovation of the Republic of Serbia, Grant No. 451-03-66/2024-03/200019

Keywords: *Trichinella* infection, Trichinellosis, Prevalence, SEE

PS – poster session

Session: [PS2] Food and Waterborne Parasitology (Journal of the EFP) Plenary Session

Parasitological contamination of arable soil in selected regions of Poland – preliminary research

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Abstract

The hygienic status of arable soils in developed countries has been unknown. In the presented study, preliminary investigation was undertaken to determine the contamination of arable fields in Poland with eggs of parasitic nematodes.

[SE1] Alien and invasive host species and parasites

The study was conducted from autumn 2021 to spring 2022 in 5 provinces: Dolnośląskie (DS), Mazowieckie (MZ), Podlaskie (PL), Pomorskie (PM) and Zachodniopomorskie (ZP). A total of 133 soil samples were collected. Parasitological examination of soil samples was carried out using the PN-Z-190006 method, with confirmed high sensitivity. Parasite eggs were found in a total of 67 samples, of which 56 samples contained eggs of roundworms of the genus *Acaris* (an average of 3.29 eggs/100g of soil), 23 contained eggs of whipworms (an average of 1.22 eggs/100g), and 3 contained eggs of *Toxocara* (1 egg/100 g). The percentage of positive samples collected in autumn (53.57%) was higher than the percentage of positive samples collected in spring (48.05%), and this difference was statistically significant (Chi2 test $p=0.002$). Similarly, the average number of eggs of all three parasite species together in positive samples collected in autumn (3.43 eggs/100g) was higher than the average number of eggs in samples collected in spring (2.90 eggs/100 g). This difference was statistically significant (test Mann-Whitney $p=0.003834$). Differences in the percentage of positive samples were also found depending on the region of origin of the samples. The highest percentage of positive samples was found in the PM (85.19%), which is characterized by a 2-5 times higher pig population per 100 ha of agricultural land than in other provinces. The differences in the percentage of positive samples between the PM and other provinces were statistically significant.

The conducted research confirms relatively frequent contamination of arable soils with eggs of parasitic intestinal nematodes, although the concentration of these eggs in the soil is generally low.

Keywords: parasite eggs, soil analysis, *Acaris* spp., *Trichuris*

spp., *Toxocara* spp.

PS – poster session