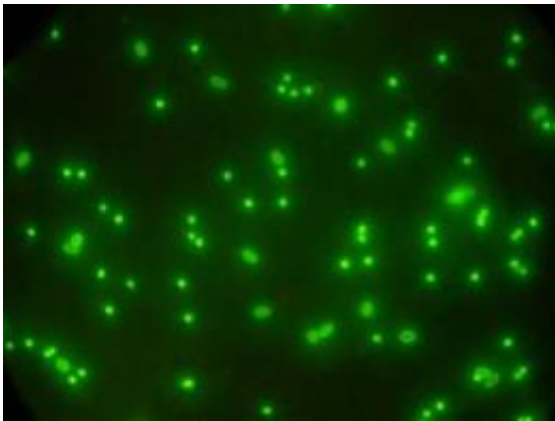


Parasitic protozoons survive waste water and drinking water treatment plants in Galicia

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These are cysts and oocysts as seen by fluorescence microscopy. Credit: Laboratorio de Parasitología (INGACAL-Xunta de Galicia)

Researchers from the Galician Institute of Food Quality have detected parasitic protozoons in the effluent discharged from waste water and drinking water treatment plants in Galicia (Spain), as well as in the water in recreational areas. The protozoons studied, which are members of the *Cryptosporidium* and *Giardia* genuses, cause intestinal upsets in cattle and immunosuppressed people.

"The presence of two resistant forms of protozoons, the oocysts from the *Cryptosporidium* genus and cysts of the *Giardia* genus, is one of the greatest public health problems in water supply, because these [parasites](#) can easily survive our water treatment systems", José Antonio Castro

Hermida, a scientist at the Galician Institute for Food Quality in the Xunta de Galicia (regional government), tells SINC.

A team led by this researcher took 232 water samples in 55 Galician towns, and confirmed the presence of these infectious life forms in [waste water](#) treatment plants, drinking water treatment plants, and recreational areas.

The results of the study, which has been published in the journal *Water Research*, reveal that *Cryptosporidium* and *Giardia* are widely distributed in the environment, and also highlight the ineffectiveness of the treatments used to reduce and deactivate these parasites.

Giardia cysts appeared in 96% of the waste water samples discharged from treatment plants, at levels of up to 6,000 per litre, while 64% of samples contained *Cryptosporidium* oocysts. These figures were 36.5% and 32.7%, respectively, in the case of drinking water treatment plants, and around 60% in recreational areas, for both protozoons.

It was also found that treatment plants located along the coastal belt discharge their effluent directly into the sea, while those located in inland areas get rid of their water straight into rivers. "This represents a significant risk to human and animal health", warns Castro Hermida.

Cryptosporidiosis and giardiasis are parasitic illnesses that cause a syndrome of poor nutrient absorption and diarrhoea in mammals and birds. This causes high morbidity and mortality rates in domestic ruminants during their first month of life, leading to significant economic losses for livestock farms. In humans, the prevalence of these two illnesses is heightened among people with AIDS and other immunosuppressant conditions.

A global problem and possible solutions

The researchers acknowledge that it is not easy to find a definitive solution to these water-borne infections, which are found all over the world. Since the parasites can overcome the normal water treatment systems used in waste water and drinking water treatment plants, there are frequent outbreaks of epidemics, even in developed countries.

"Protecting water sources, making progress on treatment and monitoring the parameters of water quality indicators in real time are some of the preventive measures that can be put in place", says Castro Hermida, "as well as drawing up control plans to monitor the levels of presence, viability and ineffectiveness of these protozoons in the waste water from drinking water and waste water treatment plants".

Cooperation between governments and the industries involved in monitoring water is also considered essential. In the United Kingdom and the USA, the [Drinking Water](#) Inspectorate (DWI) and the Environmental Protection Agency (EPA), respectively, oblige water companies to monitor the presence or absence of these two parasites.

Legislation in Spain states that action must be taken to determine the amount of *Cryptosporidium* and other organisms in the water when water turbidity exceeds 5 UNF (the unit used to measure this aspect).

However, 403,000 people were infected by this protozoon in Milwaukee (USA) in 1993, when water turbidity levels fluctuated between 0.25 and 1.70 UNF, so the researchers recommend that the presence of the two enteropathogens should be monitored at much lower turbidity levels.

More information: José Antonio Castro-Hermida, Ignacio García-Preledo, Marta González-Warleta y Mercedes Mezo. "Cryptosporidium and Giardia detection in water bodies of Galicia, Spain". *Water Research* 44(20): 5887-5896, Dec 2010.

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