

Parasites in the intestinal tract



A bad feeling in the stomach
can have many causes

Parasites in the intestinal tract



Every medical care provider knows these patients:

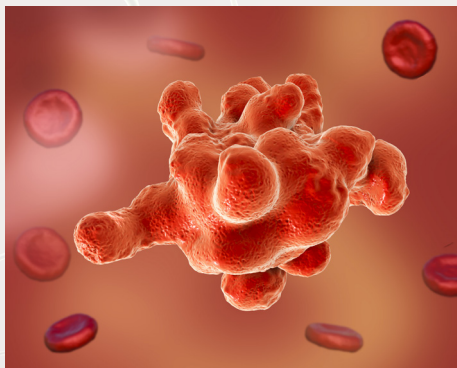
They complain about recurring stomach pains and cramps, loss of appetite, meteorism, general malaise, nausea, feeling bloated, sometimes diarrhea, sometimes constipation. There can also be other symptoms in the descriptions, such as joint swelling and pain, even rheumatic phases.

The most important parasites:

- *Blastocystis hominis*
- *Cryptosporidium spp.*
- *Cyclospora cayetanensis*
- *Dientamoeba fragilis*
- *Entamoeba histolytica*
- *Giardia lamblia*



Giardia Lamblia

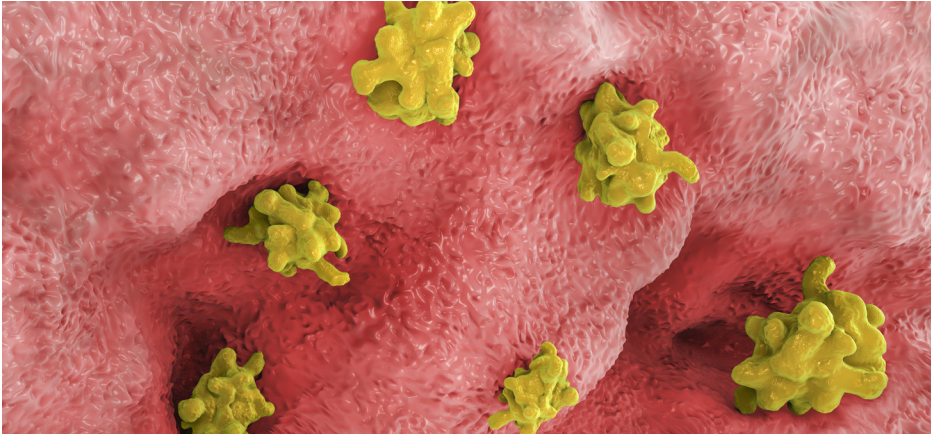


Entamoeba histolytica

A range of analyses can help further here: First, a base profile of the intestine with flora composition, pH value, digestion residues, pancreatic elastase and inflammation values. Also microbiome analysis and, if necessary, rheumatic factors can be investigated. The patient takes pro- and prebiotics and changes their diet. But this is unsuccessful, and the patient returns, still with the same symptoms. What to do?

What else is there? – **Parasites!** Parasites are no longer a thing only to be found in developing countries. Spain, Italy, and Turkey, for example, are likewise countries in which they can be found. And, even in Germany, you can come down with parasites more easily than you might imagine. Livestock and domestic animals can be carriers. Or even people who are infected and don't know it. Since 2001, there has been a reporting obligation for *Giardia lamblia* (about 4,000 cases / year) and for *cryptosporidium* (about 1,300 cases / year).¹ Up to 2/3 of these infections were caught in Germany.² Because parasitic infections often progress without symptoms, there are many more pathogen carriers. A study from the Robert Koch Institute confirms this: About 500 subjects were observed for ten months. With each case of diarrhea, tests were carried out on the persons affected as well as three healthy control persons. In 62 percent of tests of diarrhea patients and in 56 percent of the control persons, at least one pathogen was found. Some enteropathogenic protozoans were found in healthy controls more frequently than in the tests of the acutely ill subjects.³

That is not surprising: Parasites are thought to be largely eradicated in Germany. In practice, targeted diagnostics seem unnecessary. Those who want to be investigated for parasites must either do so in special laboratories (tropical institute) or work with laboratories where the microscopic examinations take a long time and are error-prone. One alternative in past years was immunoassay. However, sensitivity and specificity even with this method leaves something to be desired.⁴ Patients with no symptoms could also not be detected with sufficient reliability. Even in the cases above, with healthy patients who possibly have lived with a parasite for a long time, a negative result was not necessarily the correct result.



Entamoeba histolytica
on the inner intestinal wall

For the diagnosis of parasites, we finally have a **new and better method: Multiplex Real-time PCR (Multiplex quantitative real-time PCR)**. It is clearly faster and more reliable than the previous methods.

This means the **Multiplex Real-time PCR**:

- **provides reliable analysis, even with minimal attack**
- **no false positives with non-pathogens**
- **the test can be sent out with regular mail**
- **reliable results with asymptomatic patients and also following treatment**

For these reasons, the **Multiplex Real-time PCR** is the method of choice when it comes to reliable and timely recognition of parasitic enteritis pathogens in daily medical practice.

Acute diarrhea – the new PCR analysis helps here too

This new examination methods of the **Multiplex Real-time PCR** are now available to complement the diagnosis of acute gastroenteritis, and it can be used in the daily medical practice. Adenovirus, astrovirus, norovirus, rotavirus, sapovirus – if you know what you are dealing with in a timely manner, you can react appropriately and stop the spreading, which happens particularly quickly with viruses.

And let's not forget: Irritable bowel syndrome

It happens often that a mistaken diagnosis of irritable bowel syndrome is in fact an unrecognized case of parasites. It is therefore absolutely worthwhile to check for parasites before this conclusive diagnosis is made.

Entamoeba histolytica – undeveloped infections of these amoebae can transform into the **dangerous magna form** at any time, colonizing the bowel cells, entering into the blood stream, and affecting organs. Above all, the liver becomes a target organ, where **abscess** can form (particularly in men). If the cause is not recognized and treated in a timely manner, the illness can lead to **death**.

Giardia lamblia damages the mucous membrane of the small intestine so severely in the long-term that only severely decreased enzyme production can take place there. The result is often particularly high **carbohydrate intolerance**. In case of massive infection, **pancreatitis** or **cholangitis** can develop.

Blastocystis hominis can likewise effect changes in the intestinal villi, which in the longterm will lead to a **disruption of absorption**. Moreover, B. hominis can create para- and post-infection **arthralgias, arthritis**, and possibly even **eosinophilia**. With immunosuppressed or AIDS patients, an infection with these parasites can lead to **death**.

Cryptosporidium can have life-threatening long-term consequences for **AIDS patients** and **small children** (6 to 24 months). Unfortunately, cryptosporidium in these patients cannot even be eradicated with medication.

What to do if evidence of a parasitic pathogen is found? Medications are available (see table on page 6), but they can have serious side effects, and many strains of protozoa are in the meantime resistant to medications. But, this should be acted on as quickly as possible, because many parasites can cause serious secondary illnesses the longer they remain untreated.

For this reason, alternatives of pharmacological treatment are in high demand. And they exist! Researchers have found effective methods in medicine local to the distribution ranges of these parasites. Many native spice plants are also interesting candidates for successful and low-risk treatment of parasites. Particularly interesting in this regard are essential oils (see table).

Blastocystis hominis	Oregano - Oil ⁵
Giardia lamblia	Oils of different thyme types - cloves, peppermint, Mexican oregano ⁶ , and Japanese currant tree ⁷
Entamoeba histolytica	<i>Lactobacillus casei</i> and <i>Enterococcus faecium</i> reduces infection up to 80%, suitable for prevention ⁸ , in case of liver abscess, root extract of the fragrant Goosefoots (<i>Chenopodium</i>) ⁹
Further anti-parasite plant oils and extracts	<i>Adenophyllum aurantium</i> ¹⁰ , <i>Pterocarpus angolensis</i> ¹¹ , <i>Ruta chalepensis</i> , <i>Mexican oregano</i> ¹² , <i>thyme</i> ¹³ , <i>coriander oil</i> ¹⁴
as well as	<i>short-chain fatty acids and 1 - monoglyceride, which has anti-microbial effectiveness</i> ¹⁵
The best results can be achieved with combinations of these options.	

Parasites - an overview

Pathogen/illness	Transmission/prevention
<i>Blastocystis hominis</i>	
Morphologically variable, small cysts, anaerobic, 40% of the strains resistant against metronidazole, long seen as apathogenic	fecal-oral, contaminated drinking water or foodstuffs, also animal-person transmission possible, livestock / dogs are reservoirs
<i>Giardia lamblia</i> (also <i>intestinalis</i> or <i>duodenales</i>) earlier <i>Lambliia intestinalis</i>	
In the human environment infectious for 1 - 3 months, parasitic flagellates, adheres to microvilli, mostly limited to the small intestine, phagocytizes intestinal contents, forms cysts, very low infection dose (10 to 25 cysts)	fecal-oral, contaminated drinking water or foodstuffs, via flies, dogs and cattle are reservoirs, cysts resistant to disinfecting materials, chlorine ineffective, dryness and cooking kills it
<i>Cryptosporidium spp.</i>	
forms cysts	fecal-oral, contaminated drinking water or foodstuffs, via flies, dogs and cattle are reservoirs, cysts resistant to disinfecting materials, chlorine ineffective, dryness and cooking kills
<i>Entamoeba histolytica</i>	
amoeba, forms cysts that can remain infectious for months	fecal-oral path, sexual transmission also known, contaminated water, unwashed fruit, vegetables, ice cream / sorbet
Forms: <i>Magna</i> (with symptoms) <i>Minuta</i> (without symptoms)	Cooking and dryness kills it, cysts resistant to chlorine, filtering possible
<i>Dientamoeba fragilis</i>	
Amoeba, cyst states unknown, facultative pathogen, elimination over months	unknown, for prevention avoid contact with human and ape feces
<i>Cyclospora cayatanensis</i>	
Intracellular parasite in intestinal epithelial cells, life cycle unknown, forms cysts, often chronic, cysts - elimination normally 14 days, immuno-incompetent patients up to 12 weeks	fecal-oral, contaminated drinking or bathing water as well as foodstuffs, livestock and domestic animals can be reservoirs (e.g. dogs), cysts are resistant to disinfecting materials or chlorine, heating kills it

References

- 1 Epidemiologisches Bulletin 2001 – 2016 http://www.rki.de/DE/Content/Infekt/EpidBull/epid_bull_node.html
- 2 Steckbriefe seltener und importierter Infektionskrankheiten, Robert Koch-Institut, Berlin 2011, ISBN 9783896062406 S. 126, 127
- 3 http://www.rki.de/DE/Content/Forsch/NRZ_KL_Netzwerke/Netzwerk-projekt_Enteropathogene.html
- 4 AWMF Leitlinie Diagnostik und Therapie bei Amöbenruhr Version Juli 2016 verantw. Deutsche Gesellschaft für Tropenmedizin und Internationale Gesundheit (DTG)
- 5 Force M, Sparks WS, Ronzio RA Inhibition of enteric parasites by emulsified oil of oregano in vivo. *Phytother Res.* 2000 May;14(3):2134
- 6 Machado M, Sousa Mdo C, Salgueiro L, Cavaleiro C. Effects of essential oils on the growth of *Giardia lamblia* trophozoites. *Nat Prod Commun.* 2010 Jan;5(1):13741
- 7 Gadelha AP, Vidal F, Castro TM, Lopes CS, Albarello N, Coelho MG, Figueiredo SF, MonteiroLeal LH. Susceptibility of *Giardia lamblia* to *Hovenia dulcis* extracts. *Parasitol Res.* 2005 Nov;97(5):399407. Epub 2005 Sep 7
- 8 Sarjapuram N, Mekala N, Singh M, Tatu U The Potential of *Lactobacillus casei* and *Enterococcus faecium* Combination as a Preventive Probiotic Against *Entamoeba*. *Probiotics Antimicrob Proteins.* 2016 Oct 5
- 9 Avila Blanco ME, Rodríguez MG, Moreno Duque JL, Muñoz Ortega M, Venturajuárez J. Amoebicidal Activity of Essential Oil of *Dysphania ambrosioides* (L.) Mosyakin & Clemants in an Amoebic Liver Abscess Hamster Model. *Evid Based Complement Alternat Med.* 2014;2014:930208. doi: 10.1155/2014/930208
- 10 Herrera Martínez M, Hernández Ramírez VI, Hernández Carlos B, Chávez Munguía B, Calderón Oropeza MA, Talamás Rohana P. Antiamoebic Activity of *Adenophyllum aurantium* (L.) Strother and Its Effect on the Actin Cytoskeleton of *Entamoeba histolytica*. *Front Pharmacol.* 2016 Jun 27;7:169. doi: 10.3389/fphar.2016.00169. eCollection 2016
- 11 Samie A, Housein A, Lall N, Meyer JJ. Crude extracts of, and purified compounds from, *Pterocarpus angolensis*, and the essential oil of *Lippia javanica*: their invitro cytotoxicities and activities against selected bacteria and *Entamoeba histolytica*. *Ann Trop Med Parasitol.* 2009 Jul;103(5):42739. doi: 10.1179/136485909X435111
- 12 Quintanilla Licea R, Mata Cárdenas BD, Vargas Villarreal J, Bazaldúa Rodríguez AF, Kavimngeles Hernández I, Garza González JN, Hernández García ME. Antiprotozoal activity against *Entamoeba histolytica* of plants used in northeast Mexican traditional medicine. *Bioactive compounds from Lippia graveolens and Ruta chalepensis.* *Molecules.* 2014 Dec 15;19(12):2104465. doi: 10.3390/molecules191221044
- 13 Behnia M, Haghighi A, Komeylizadeh H, Tabaei SJ, Abadi A. Inhibitory effects of Iranian *Thymus vulgaris* extracts on in vitro growth of *Entamoeba histolytica*. *Korean J Parasitol.* 2008 Sep;46(3):1536. doi: 10.3347/kjp.2008.46.3.153
- 14 Vagma Djallalzada Das antiphlogistische und antimikrobielle Potential von Korianderöl und dessen Fraktionen InauguralDissertation Medizinischen Fakultät der Albert Ludwigs Universität Freiburg i.Br. 2007
- 15 Jon J. Kabara, Dennis M. Swieczkowski, Anthony J. Conley, Joseph P. Truant Fatty Acids and Derivatives as Antimicrobial Agents *Antimicrobial Agents And Chemotherapy*, Vol 2 No 1 July 1972, p. 2328 American Society for Microbiology
- 16 Mehlhorn, Heinz: Die Parasiten des Menschen 7. Auflage, Springer Spektrum Verlag, Berlin, Heidelberg 2012

<input type="checkbox"/>	A178	Profile Parasites (6 Parameters) PCR NEW	Fe
		<i>Giardia lamblia</i> , <i>Entamoeba histolytica</i> , <i>Cryptosporidium</i> spp., <i>Cyclospora cayetanensis</i> , <i>Blastocystis hominis</i> , <i>Dientamoeba fragilis</i>	
<input type="checkbox"/>	A179	Profile Viral Enteritis PCR NEW	Fe
		Noro viruses GI + GII, rota viruses, adeno viruses, astro viruses, sapo viruses	
<input type="checkbox"/>	A712B	Microbiome MIDI NEW	Fe
		Microbiome Mini + yeasts + frequent parasites including evaluation and therapy recommendations	
<input type="checkbox"/>	A712C	Microbiome Maxi NEW	Fe
		Microbiome Mini with additional consideration of further phyla, methane bacteria, many additional bacteria genus and species. Includes yeasts and parasites. including evaluation and therapy recommendations	

Do you want to have your patients checked for parasites and / or viruses?
Do you have any further questions about the topic or about the tests?

Please give us a call, we will gladly assist you!

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