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A MINI-REVIEW OF THE ZOONOTIC SIGNIFICANCE OF ENTEROCYTOZON BIENEUSI

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Abstract:

Enterocytozoon bieneusi is a microsporidian parasite that has gained increasing public health relevance due to its zoonotic potential. This parasite primarily targets the intestinal epithelial cells of humans and various animal hosts, including livestock and wildlife. The zoonotic transmission of *E. bieneusi* poses a significant concern for both human and animal health, making it crucial to understand its epidemiology and genetic diversity. This review synthesizes current knowledge on the parasite, with a focus on its zoonotic implications, transmission patterns, and genetic variation across different host species. A systematic search of the Google Scholar database was conducted, and 20 relevant articles were included in the final analysis, providing a global perspective on *E. bieneusi*. The findings emphasize the widespread nature of this parasite and its potential to cross species barriers, underscoring the importance of surveillance and research to better understand its role in public health.

Keywords: Enterocytozoon, zoonotic importance, epidemiology.

• Introduction

Microsporidia is a group of intracellular parasites responsible for microsporidiosis in humans and animals. Of the approximately 1600 species, 17 can infect humans, with *Enterocytozoon bieneusi* being the most significant zoonotic species. This parasite spreads mainly via the fecal-oral route and can infect a wide range of hosts, including humans, animals, poultry, and wildlife. *E. bieneusi* causes gastroenteric symptoms, such as chronic diarrhea, malabsorption, and abdominal pain, particularly in immunocompromised individuals. It can be contracted through food, water, or other sources, and the identification of numerous genotypes capable of infecting both humans and domestic animals underscores the zoonotic nature of microsporidiosis.

• Material and method

For the purpose of conducting this review, the integrated articles were obtained through a systematic search of the Google Scholar database. A total of 300 publications were identified, and after the titles and abstracts reviewed, 35 papers were selected for full-text reading. According to the inclusion and exclusion criteria, 20 studies were finally considered to summarize the relevant data and to assess the zoonotic potential of *E. bieneusi*.

• Results and discussions

Prevalence of *E. bieneusi* genotypes in animals

Location	Host	Sample type	Method	No. examined	No. Positive (%)	Genotype
Germany	cat	feces	PCR	60	3 (5)	K, L
	cattle	feces	PCR	60	7(12)	F, I, J (3), M, N
	pig	feces	PCR	50	5(10)	F(3), G, H, O
	llama	feces	PCR	1	1(100)	P
China	pig	feces	PCR	94	88(94)	EbpA, EbpC, EbpD, Henan-I
USA	beaver	feces	PCR	85	13(16)	D, EbpC, WL15
	fox	feces	PCR	67	9(14)	D, EbpC, WL11, WL15
	muskrat	feces	PCR	239	20(9)	D, EbpC, WL15
	raccoon	feces	PCR	55	15(28)	D, EbpC, WL15
	otter	feces	PCR	19	2 (11)	EbpC
Peru	guinea pig	feces	PCR	8	7(88)	Peru16
Czech Republic	pig	feces	PCR	79	74(94)	D

Enterocytozoon bieneusi has been found in a wide range of hosts, including wild and domestic mammals, birds and reptiles. Actually, various genotypes infecting animals can infect humans, supporting that zoonotic transmission may be common. Analyzing the 20 publications on the zoonotic impact of *E. bieneusi*, the data on the prevalence of genotypes in animals and humans have been summarized in two tables. Zoonotic transmission has been historically supported by the observation of identical genotypes in both animals and humans. In line with this, Cama et al. reported on a child infected with an unusual genotype (Peru 16), who had close contact with infected household guinea pigs. In Peru, other genotypes isolated from human stool samples include D, EbpC, Type IV, WL11, Peru6, and WL15.

Prevalence of *E. bieneusi* genotypes in humans

Location	Sample type	Method	No. examined	No. Positive (%)	Genotype
Germany	feces	PCR	26	2 (8)	C, Q
Cameroon	feces	PCR	758	22 (3)	D, Type IV CAF1
	feces	PCR	181	8(5)	Type IV
Gabon	feces	PCR	822	25(3)	D, CAF1, TypeIV
Thailand	feces	PCR	180	6 (3,3)	D, EbpC
	feces	PCR	90	5 (6)	D
	feces	PCR	33	24(73)	D, EbpC, O, PigEBITS7
Peru	feces	PCR	13937	212 (2)	D, EbpC, Peru10, Type IV, WL11, Peru6
	feces	PCR	388	31(8)	D, EbpC, Peru16, Type IV, WL11,

• Conclusions

- The most commonly identified genotype in both humans and animals, is genotype D.
- The presence of identical genotypes in both human and animal hosts suggests frequent transmission between species.
- Further research into the transmission routes and genotypic diversity of *E. bieneusi* is essential to enhance prevention efforts and control strategies.