Some parasites causing diarrhea in goats in Beni-Suef Governorate

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A total of 100 fecal samples from goats were coprologically examined to investigate the main cause of diarrhea. Animals were divided according to the age into 3 groups (7-35 days, 35 days - 6month and over one year). The results revealed that *Eimeria* species was the most predominant parasite (70%), the parasitic gastroenteritis (28%) and *Cryptosporidium* species (21%). Ten species of *Eimeria* were identified from the infected animals, *E. hirci, E. arloingi, E. intericata, E. ahsata , E. christenseni, E. marisca, E. crandalis, E. weybridegenesis, E. faurei and E. ovina.* Three species of parasitic gastroenteritis (*Haemonchus contortus*, *Ostertagia species* and *Trichostrongylus* species). *Cryptosporidium oocysts* were found common in young goats.

The goat is one of the most resourceful and efficient ruminants (Mussman, 1982). Moreover, it has easy handling, independence and adaptability to living free, modest feeding requirements, good tolerance to climate in different regions and effective conversion of limited resources into milk, meat and hides are desired factors favouring the goat as a stock animal for small scale farmers (Balicka-Ramisz, 1999; Harper and Penzhorn, 1999). Goat meat is much desired and is considered a delicacy in the diet of the Egyptian people. The level of off-take from goats is higher than sheep (Ndamukong *et al.,* 1987).

Parasitic affections induce severe losses of the productive parameters of goats. System of goat breeding specially by small owners did not apply any medical care for individual animals. There are field infection and reinfection of goats by different parasites. The parasites which were recorded in Egypt in goats include *Haemonchus contortus* (Hassan, 1985) and *Trichostrogylus axi* about 40% (Salem *et al.,* 1991). Parasites of gastrointestinal tract that include, *Haemoncus* and *Trichostrongylus, Bunostomum* were recorded by Shawkat *et al.* (1991) in Kafer El Sheihk.

Diarrhea is the main symptom associated with these parasitic infections especially in newly born animals. The parasitic infections lead to rapid morbidity of the affected animals that may end with their death. This condition was recorded in high level infectio by parasitic gastroentritis, coccidian and cryptosporidial infection. Coccidiosis is a wide spread serious economic disease affecting pre weaned and recently weaned kids (Foryet, 1990; Dai *et al.,* 1991; Smith and Sherman, 1994, Schafer *et al.,* 1995). Henin (1997) found Eimiria species oocysts in 85.92 % of the examined goats in Beni-Suef Governorate.

Cryptosporidium parvum was found in 100 % of newborn kids in Danish goats (Thamsborg *et al.*, 1990). Where Munoz *et al*. (1994) found *C. parvum* oocysts in feces of 6 out of 45 goat kids. In Egypt, Abou El Hassan, (1996) detected Cryptosporidium oocyst in 16.5% of 200 diarrheic goat kids.

The present study spots the light on enteric parasites as a cause of losses and mortalities in goats with special reference to those of less than 2 months old in Beni-Suef city.

Materials and methods

Samples. A total number of 100 goat diarrheic feacal samples were collected from different localities in Beni-Suef city. The animals age range from 7 days to 4 years. The fecal samples were identified by owner name, locality, age and complain. The fecal samples were transferred directly for examination to the department of Parasitology, Faculty of Vetrinary Medicine, Beni-Suef.

Examination of samples. Fecal samples were examined using concentration Floatation technique and the eggs were counted using Mac-Master technique according to the method described by Soulsby (1982) for counting of PGE eggs and coccidia oocysts per gram feces.

Modified Ziehl-Neelsen technique according to Henriksen and Pohlenz, (1981) was applied for diagnosis of Cryptosporidium oocyst.

Results and Discussion

The data in table (1) revealed that coccidian infection appear as the most common cause of diarrhea in examined goat (70%) followed by parasitic gatroentritis (28%) and the lowest percent was recorded for *Cryptosporidium* species (21%). Concerning the relation between age of examined animals and their parasitic infection, *Cryptosporidium* is the most common one in young animals (gp.1) 50% followed by different *Eimeria* species (40%) especially in animals suffered from diarrhea. No parasitic nematode eggs could be detected in the examined young goats at the early age. Concerning the animals in gp2 (35 days- 6 months age), the most common infection was by *Eimeria* spp. 85.71% followed by PGE eggs (28.57%) and *Cryptosporidium* infection 20%. In gp3 (over one year age), the main diagnosed parasite was *Eimeria* spp. (71.43%) then PGE eggs in (51.43%) and the lowest parasitic infection was by *Cryptosporidium* (5.71%). Regarding the mixed infection with these parasites, it was noticed that *Eimeria* spp. and PGE in two groups (over 35days and over 6m.) and was not found in group1 (7-35days) and higher in gp3 (over one year) 37.14%. On the other hand the study did not detect a relation between kind of parasitic affection and condition of feces except in infection by *Cryptosporidium*, it appears to be the main cause of diarrhea in young age. The most predominant species of *Eimeria* in Table (2) was *Eimeria intricata* (85.71%) followed by *E. arloingi* (74.28%) and less predominant species were *E. marisca, E. ovina and E. faurei* (14.28%). The number of oocyst per gram (opg), ranged from 750 to 1250 opg. These numbers decreased with progress in age. It was cleared from table (3), *Haemonchus contortus* was the most common nematodes appeared in these animals (71.43 %) and also had the higher number of eggs per gram of feces (epg) 650 epg, followed by *Ostertagia* sp. (35.71%) and 450epg. The less common nematodes was *Trichostrongylus* sp. at (21.43%) and 450epg. Regarding the age, *Ostertagia* sp. and *Trichostrongylus* sp. eggs appeared in early or more common in young age than *Haemonchus contortus*, this depend on the wide range host of *Ostertagia* sp. and *Trichostrongylus*, the habits of the young animals to graze any object in the environment and low level of immunity (more susceptible). It was noticed that infection by these nematodes could be mixed *Eimeria* infection in goats was (89.9%) in adults and 94.0% of kids with OPG of less than 1000. Twelve species of *Eimeria* were identified. The percentage of animals harbouring different species were; *E. alijevi and E. ninakohlyakimovae,* 99%; *E. hirci,* 83.5%, *E. arloingi*, 80.6%; *E. caprina*, 77.6%; *E. aspheronica*, 64.8%, *E. ahsata*, 63%, *E. christenseni*, 60%; *E. granulose*, 42.8%, *E. pallida*, 6.2%; *E. intricata*, 2% and *E. punctata* 0.3%. Two percent of goats harboured three species, 5.6% four, 9.5% five, 26.3% six, 25.7% seven, 23.7% eight, 6.3% nine, 0.6% ten and 0.3% eleven species (Chhabra and Pandey (1991), while Henin, (1998) found Eimeria species infect goats were *E.ninakohlyakimovae* (69.68%), *E. christenseni* (51.83%), *E. arloingi* (50.12%), *E. hirci* (20.53%), *E. caprina* (9.77%) in Beni-Suef Governorate. Balika-Ramisz (1999) found 9 species of *Eimeria, E. chrestenseni, E. ninakohlyakimovae, E. arloingi, E. jolchijev, E. alijevi, E. asphoronica, E. caprina, E. caprovina and E. hirci.* 91% of adults and 100% of kids were infected.

Faizal and Rajapakse (2001) recorded Eimeria species in 88% in Kids and 91% of young goats and 83% of adults. Seven species of *Eimeria* were identified, *E. ninakohlyakimovae* (31%), *E. alijevi* (29%), *E. arloingi* (21%), *E. christenseni* (7%) and *E. hirci* (3%). More over, Abo-Shehada and Abo-Farieha (2003) found 54% of the examined goats were infected with at least one *Eimeria* species. More young goats (< 1year) (66 %) were infected with at least one species of *Eimeria* compared to 49% adult >1-year-old goats. 8 *Eimeria* species were identified*, E. arloingi, E. caprina,E. alijevi* being the most prevalent in the adults, *E. ninakohlyakimovae, E. asphorinica and E. caprina* being the most common species amongst the kid population. In addition, *E. caprovina and E. parva* were found common in both age groups. But, Agyei *et al.* (2004) recorded *Eimeria* species in goat kids as, *E. arloingi* (20.50%), *E. ninakohlyakimovae* (17.2%), *E. caprina* (15.07%), *E. jolchijevi* (11.42%), *E. aspheronica* (8.70%), *E. pallida* (5.31%), *E. hirci* (3.20%) and *E. christenseni* (2.84%). Also, the same result reported by Jalila, *et al.,* (1998) in Malaysia and Koudela and

Table (1): Prevalence of enteric parasites causing diarrhea in goats.

Group age	Form of feces	Exam. no	Parasitic gastroenteritis		Eimeria species		Mixed infection*		Cryptosporidium spp.	
			No.	%	No.	%	No.	%	No.	%
7- 35 days	diarrheic	20	0	0	8	40	0	0	10	50
	formed	10	0	0	7	70	0	0	2	20
Total		30	0	0	15	50	0	0	12	40
35 day- 6 months	diarrheic	20	5	25	18	90	5	25	4	20
	formed	15	5	30	12	80	6	40	3	20
Total		35	10	28.57	30	85.71	11	31.43	7	20
Over one years	diarrheic	15	6	40	10	66.66	5	30	2	6.66
	formed	20	12	60	15	75	8	40	0	0
Total		35	18	51.43	25	71.43	13	37.14	2	5.71
Total		100	28	28	70	70	24	24	21	21

* Mixed infection: infection by coccidia and PGE (parasitic gastroenteritis)

Table (2): Different types of Eimeria spp. oocysts diagnosed in infected goats.

Type	Measurements Max.	Min.	Mean (um)	No. of infected oats	%	No. OPG (mean)
E. intricata	49x35	45x30	47x32	60	85.71	900
E. crandalis	26x18	22x16	24x17	44	62.85	1100
E. weybridgensis	26x18	22x16	24x17	36	51.43	850
E. marisca	20x14	18x12	19x13	10	14.28	1200
E. hirci	24x20	22x18	23x19	40	57.14	1200
E. ahsata	40x26	37x24	39x25	50	71.42	1250
E. faurei	29x21	27x20	28x21	10	14.28	850
E. ovina	32x21	30x19	31x20	10	14.28	750
E. christenseni	38x25	38x25	38x25	20	28.57	900
E. arloingi	28x19	26x17	27x18	52	74.28	1000

Table (3): Different PGE eggs diagnosed in infected goats

Parasite	Infected animal		No. of EPG (mean)	Common age of infection
	No.	%		
Haemonchus contortus	20	71.43	650	Over 6 months
Ostertagia spp.	10	35.71	450	Over 35 days
Trichstrongylus spp.	6	21.43	450	Over 35 days
Total	28	28	-	-

Bokova (1998) in Czech Republic.

Gastrointestinal nematodes eggs were found in 89% of the kids, 94% of the young goats and 84% of the adult goats, included, *Haemonchus contortus* (90%) followed by *Oesophogostomum* spp. (8.9%), *Trichostrongylus* spp. (1%), Faizal and Rajapakse, (2001), on the contrary with Hassan (1985) and Salem *et al*. (1991) 40%. *Ostertagia circumcinecta and Trichostrongylus axei* were the most common species of parasitic nematodes in goats (Torina *et al.*, 2004). But Nwosu *et al.* (1996) found that the most parasitic nematodes were *Haemonchus contortus* (90%) and *Trichostrongylus* sp. (78.3%) in Nigerian goats. Cryptosporidiosis in goats was found to be 29.1% of examined goats, Khalil (2000), while cryptosporidiosis 100% and 37.5% Thamsborg *et al.* (1990) and Hilali *et al*. (1998) in KSA respectively. Cryptosporidiosis seems to be mainly a problem in neonatal ruminants and considered to be an important agent in the etiology of the neonatal diarrhea syndrome of goat kids (Graff *et al.,* 1999).

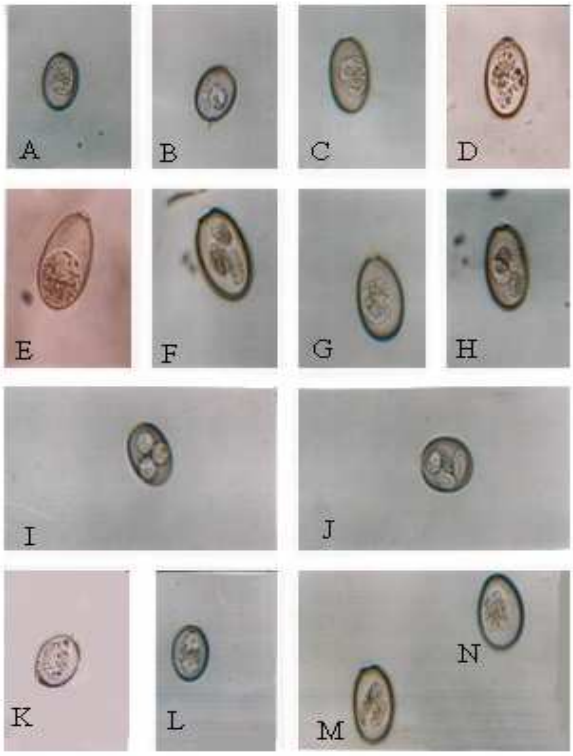

Plate (I):
a. *E. hirci* unsporulated oocyst
b. sporulated
c. *E. arloingi* unsporulated oocyst
d. sporulated
***e. E. intericata* unsporulated oocyst**
f. *sporulated*
g. *E. ahsata* unsporulated oocyst
h. sporulated
i. *E. crandalis* (sporulated)
j. *E. weybridegenesis* (sporulated)
k. *E. christenseni* (sporulated)
l. *E. marisca* (sporulated)
m. *E. ovina* (sporulated)
n. *E. faurei* (sporulated)

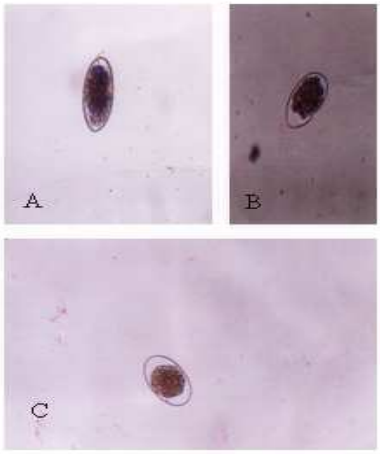

Plate (II):
a. *Haemonchus contortus* egg
b. Trichostrongylus sp. egg
c. Ostertagia sp. egg

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