FOLIA PARASITOLOGICA 33: 301–304, 1986.

PRELIMINARY COMMUNICATION ON CRYPTOSPORIDIOSIS OF PIGS IN VIET-NAM

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Abstract. Feces were collected from 17 pigs (aged 4–8 weeks) in several farms situated within the region of Hanoi. By coproscopy of the samples, eggs of *Ascaris suum* and *Oesophagostomum dentatum* were detected as well as oocysts of *Eimeria scabra*, *E. debliecki*, *E. perminuta* and *E. suis*, and in addition to it, cryptosporidia to an extend indicating a considerable incidence of this parasitic protozoan in the country.

Species of the genus *Cryptosporidium* (*Eimeriina*, *Apicomplexa*), as a rule occupying the microvillous layer of intestinal epithelium, represent the smallest coccidia known up to this time. Though almost eighty years elapsed since cryptosporidia have been described, their facultative pathogenicity for animals and humans has not been recognized until recently.

Experimental transmissibility from host to host and high levels of serum antibodies in various hosts (Tzipori and Campbell 1981) made it evident that cryptosporidiosis is an infection displaying the attributes of a zoonosis (Tzipori et al. 1980, Current et al. 1983).

Spontaneous cryptosporidiosis in pigs has been reported in the U.S.A. (Kennedy et al. 1977), Australia (Links 1982), and in West Germany (Schmidt and Nienhoff 1982). The paucity of such reports implies that cryptosporidiosis in pigs is comparatively seldom to be encountered.

Moon and Bemrick (1981), and Tzipori et al. (1981, 1982) succeeded in transferring cryptosporidiosis from cattle to pigs, and, Moon et al. (1982) likewise from man to pigs. Heine et al. (1984) pointed out that besides oral also tracheal and conjunctival pathways may account for the infestation.

Our present communication is based on feces examination from pigs bred in Viet-Nam. The results infered that cryptosporidia alone or concurrently with other coccidia might effect a new zoonosis of pigs.

MATERIALS AND METHODS

Examined were feces from 17 pigs aged 4—8 weeks, bred extensively in the proximity of dwelling-houses in the district of Hanoi where they were free to roam about.

Fresh samples were suspended in 2.5 % potassium dichromate and stored at 4 °C. Transported to Czechoslovakia, they were processed by flotation in Sheater saccharide solution (sucrose 500 g, phenol 6.5 g, water 320 ml). Samples containing oocysts were resuspended in a newly prepared solution of 2.5 % potassium dichromate, and kept to allow oocysts to sporulate. Subsequently we classified them applying the criteria outlined by Vetterling (1965). To facilitate detection of cryptosporidia, we employed both the concentration method with Sheater solution and the method of differentially staining fecal smears, described recently by Miláček and Vítovec (1985).

RESULTS

The results of coproscopy, listed in Table 1, illustrate the prevalence of cryptosporidia (23.5 %) and other coccidia (41.1 %) in Vietnamese pigs.

Results achieved by the concentration method we employed were qualitatively comform with results obtained by staining fecal smears.

In every sample we detected cryptosporidia, oocysts of at least one *Eimeria* species were also present.

Table 1. Results of feces examination from 17 pigs

Sample number	Parasites detected		
	Flotation		Smears
	Protozoa	Helminths	
1	*E. debliecki*	—	—
2	—	—	—
3	—	—	—
4	*E. debliecki* *Cryptosporidium* sp.	—	*Cryptosporidium* sp.
5	—	—	—
6	—	*Ascaris suum*	—
7	*E. debliecki* *Cryptosporidium* sp.	—	*Cryptosporidium* sp.
8	—	—	—
9	*E. scabra, E. perminuta*	*Oesophagostomum dentatum*	—
10	*E. scabra, E. suis*	*Ascaris suum*	—
11	—	—	—
12	—	—	—
13	*E. debliecki, E. perminuta* *Cryptosporidium* sp.	—	*Cryptosporidium* sp.
14	—	—	—
15	*E. debliecki, E. scabra* *Cryptosporidium* sp.	—	*Cryptosporidium* sp.
16	—	—	—
17	—	—	—

DISCUSSION

It is evident that in Viet-Nam a substantial proportion of pigs is likely to be infested by cryptosporidia and other coccidia. The pathogenic effect of *Eimeria* species has been proved by Rommel and Ipczynski (1967) and Boch and Wiesenhütter (1963) who experimentally infected pigs by *E. scabra* and *E. debliecki* respectively.

As for cryptosporidiosis, its dominant symptom is diarrhoea, particularly in young animals. In calves, cryptosporidiosis presents a major problem since the infection develops coincidentally with neonatal diarrhoea, usually between day 7 and 12 of life (Pavlásek 1982).

The material to our disposal originated merely from pigs aged 4—8 weeks, while spontaneous cryptosporidiosis has been reported in older porkers only (Links 1982, Schmidt and Nienhoff 1982, Kennedy et al. 1977), and, cryptosporidiosis of newborn piglets has been induced but experimentally (Moon and Bemrick 1981, Tzipori et al. 1982).

The implication of the scarce reports is that spontaneous cryptosporidiosis in pigs presents a rare phenomenon. On the other hand, the permanently imminent propagation of cryptosporidiosis within the herd cannot be discarded. As reported by Bergeland and Henry (1982) and Sanford (1983), the more pigs and farms they examined the progressively more cases of cryptosporidiosis they registered.

Cryptosporidiosis is a cosmopolitan zoonosis. From one animal species a number of other host species can acquire infection and develop clinical symptoms (Tzipori 1983). Mutual transmission of cryptosporidia between different mammals is well known while it remains to be settled whether there exists transmission from birds, snakes and fishes to mammals and vice versa.

In the early eighties, a rapidly increasing number of cryptosporidial infection in humans was recorded, and, cryptosporidiosis became recognized as a new anthropozoonosis. The first ones to formulate this view were Anderson et al. (1982), Reese et al. (1982), and Current et al. (1983) who diagnosed cryptosporidiosis in persons who attended on scouring calves.

Most cases of cryptosporidiosis in humans were recorded in Europe and the U.S.A. Recently, Hojlyng et al. (1984) in Liberia and Mata et al. (1984) in Costa Rica reported cryptosporidiosis in humans manifesting a higher prevalence than in Europe, particularly in children of less one year (Jokipii et al. 1983, Casemore and Jackson 1983). Considering the anthropozoonotic character of the infection, we can assume that animals in these countries are also infected by cryptosporidia.

The spontaneous cryptosporidiosis of pigs we diagnosed in Viet-Nam appears to be the first one affecting domestic animals in underdeveloped countries. We consider it a motivation for further studies of cryptosporidiosis in tropical and subtropical zones.

ПРЕДВАРИТЕЛЬНОЕ СООБЩЕНИЕ О *CRYPTOSPORIDIOSIS* У СВИНЕЙ ВО ВЬЕТНАМЕ

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Резюме. Помет был собран у 17 свиней (4—8 недельного возраста) в нескольких фермах, расположенных в пределах района Ханоя. При копроскопии образцов, яиц *Ascaris suum* и *Oesophagostomum dentatum* были обнаружены также и ооцисты у *Eimeria scabra*, *E. debliecki*, *E. perminuta* и *E. suis*, и вдобавок к тому криптоспоридиа, указывающих на значительную сферу распространения этих паразитических простейших в стране.

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Received 11 June 1985

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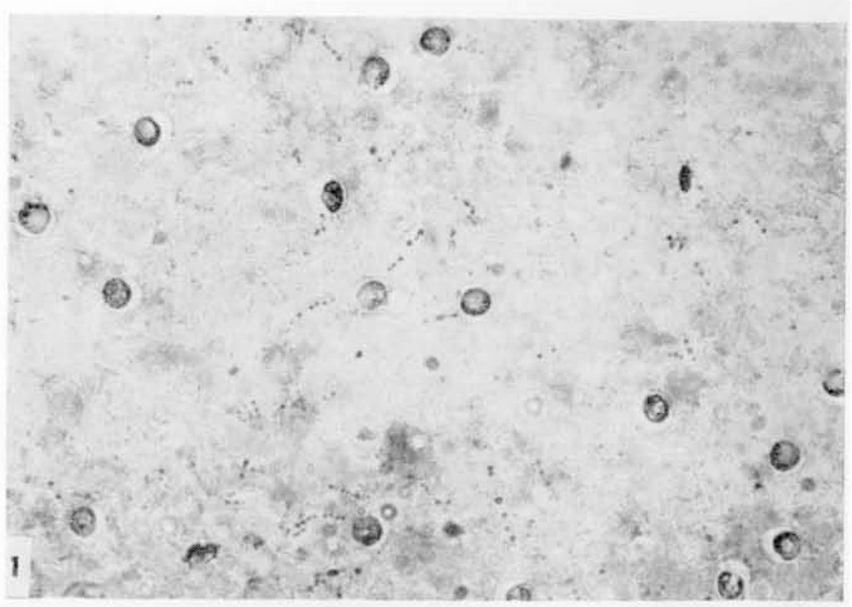

Fig. 1. Oocysts of cryptosporidia in a smear stained by aniline—phenol—methyl violet, and tartazine (× 900). **Fig. 2.** Oocyst of *Eimeria scabra* and eggs of *Ascaris suum* (native, × 450).