Research Note

Prevalence of *Trichinella sp.* in polar bears *(Ursus maritimus)* from northeastern Greenland

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The occurrence of infections with *Trichinella sp.* in polar bears *(Ursus maritimus)* from northeastern Greenland has been studied by examination of muscle samples, mainly diaphragm, from 38 animals shot during the period 1983–1987. *Trichinella* larvae were demonstrated in 12 bears (32%) with an average of 9.2 larvae/g muscle tissue. No bears younger than three years old were infected. The prevalence of *Trichinella* among bears of the age group 3–4 years was 25% and 53% among older animals.

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The occurrence of the parasite *Trichinella sp.* in free roaming polar bears *(Ursus maritimus)* has been reported from most arctic areas (Taylor et al. 1985). Consumption of meat from such animals therefore poses a potential health threat to arctic peoples, who hunt polar bears for subsistence purposes (Williams 1946; Lentfer 1976).

In a review Taylor et al. (1985) reported that on an average 39% of polar bears were infected with *Trichinella sp.* The propagation of infections in polar bears mainly seems to be caused by cannibalism and/or scavenging on carcasses of other polar bears (Larsen & Kjos-Hansen 1983; Taylor et al. 1985).

The prevalence of infections with *Trichinella* in polar bears in Greenland has previously been reported by Madsen (1961) based on studies carried out during the late 1940s and the early 1950s. In the present paper the actual prevalence of infections among polar bears in northeastern Greenland is reported. In this area of Greenland polar bears constitute an important element of the Inuit's food (Born 1983).

Material and methods

The material included samples, each consisting of 3–10 g of tissue, from diaphragm (n = 37) and other muscle groups (n = 15) from 38 polar bears (21 males, 16 females, 1 sex unknown). The bears were shot by the Inuit in the Scoresby Sund area in northeastern Greenland (69°30'N to 74°N) between May 1983 and May 1987).

The samples were kept frozen until they were examined, using a pepsin-HCl-digestion technique (Henriksen 1981). The age of the bears was determined from reading of annual layering of the cementum of lower 1st premolar as described by Stirling et al. (1977). If teeth were not available, age was estimated from the body length measured in the field by the hunters.

Results

Detailed results are presented in Table 1. *Trichinella* larvae were demonstrated in muscle samples from twelve animals (32%) with an average of 9.2 larvae/g muscle tissue. There was no real difference in the prevalence of infection between females (6/16) and males (6/21). Prevalence increased with age. None of the 1–2 year old bears (i.e. dependent cubs) were infected. In young and juvenile animals (3–4 years of age) 25% were infected, while the corresponding figure for adult bears (5 years of age or older) was 53%.

Table 1. Occurrence of *Trichinella sp.* in diaphragm and somatic muscles of polar bears from northeastern Greenland, 1983–1987.

Id. no.	Day/month year	Locality	Sex	Age (year)	Larvae/g diaphragm	Larvae/g somatic muscle	Remarks
1303	18/5-83	Kejser Franz Joseph Fjord	m	2	0	—	
1304	18/1-84	Steward Island	f	17	12	—	
1305	21/1-84	Rømer Fjord	m	14	0	—	
1306	03/2-84	Steward Island	f	10	5	—	
1307	03/2-84	Steward Island	m	1	0	—	Cub of 1306
1308	20/2-84	Turner Island	f	4	0	—	
1309	21/2-84	Turner Island	f	8	0	—	
1310	26/2-84	Steward Island	f	9	0	—	
1311	26/2-84	Steward Island	m	2	0	—	Cub of 1310
1312	26/2-84	Steward Island	f	2	0	—	Cub of 1310
1313	26/2-84	Steward Island	m	11	0	—	
1314	27/2-84	Steward Island	m	13	3	—	
1315	27/2-84	Steward Island	m	5	0	—	
1316	28/2-84	Turner Island	f	10	6	—	
1317	28/2-84	Turner Island	m	1	0	—	Cub of 1316
1318	06/3-84	Turner Island	m	12	6	—	
1319	28/4-84	Godthaab Golf	m	8+	1	—	
1320	29/4-84	Godthaab Golf	m	12	15	—	
1321	29/4-84	Godthaab Golf	f	4	0	—	
1301	10/3-85	Kap Dalton	m	3	5	—	
1302	10/3-85	Kap Dalton	m	3	0	—	
1387	26/9-86	Steward Island	f	4	25	14	
1388	14/12-86	Kap Tobin	f	2	0	0	
1389	08/1-87	Steward Island	m	3	0	0	
1390	13/1-87	Steward Island	f	2	0	0	Cub of 1392
1391	13/1-87	Steward Island	m	2	0	0	Cub of 1392
1392	13/1-87	Steward Island	f	13	0	0	
1393	14/1-87	Steward Island	m	3	0	0	
1394	21/10-86	Steward Island	m	4	0	0	
1395	26/10-86	Steward Island	f	6	0	0	
1396	13/2-87	Scoresby Sund ice edge	m	8	—	0	
1397	13/2-87	Kap Tobin	f	3	0	0	
1398	01/4-87	Kap Tobin	f	3	23	33	
1399	—	—	—	3	0	—	
1400	05/4-87	Deichmann Fjord	f	5+	0.1	—	
1485	05/4-87	Deichmann Fjord	m	1	0	0	
1486	22/4-87	Kap Brewster	m	5+	0	0.2	
1487	21/5-87	Volquart Boons coast	m	3	0	0	

– = data or tissue not available
\+ = age estimated from body length

Discussion

The prevalence of *Trichinella* infections in polar bears revealed in this study (32%) does not differ significantly from that found in a previous study (33.8%) from the same area (Madsen 1961) or from the prevalence demonstrated in a study (32.7%) carried out in the Svalbard area (Kjos-Hansen 1984). However, Madsen (1961) and Kjos-Hansen (1984) used the compressorium technique, while the present investigations were carried out using a pepsin-HCl-digestion technique. The digestion techniques in general are ascribed higher sensitivity than that of the compressorium technique, for which reason the results are not directly comparable. On the other hand the observations demonstrate that a relatively high prevalence of *Trichinella* infection among bears originating from the northeastern part of Greenland still occurs.

The higher incidence of infections with *Trichinella* larvae in adult polar bears compared with young and juvenile animals, as demonstrated in the present survey, is consistent with observations reported by Thorshaug & Rosted (1956), who examined 41 individuals from the Svalbard area. Consequently, it seems relevant to expect that the probability of eating an infected carcass of a polar bear is positively correlated with the age of the individual bear, a hypothesis that might be ascribed importance considering the risk of transmission of *Trichinella* infections to human beings. Furthermore, the hypothesis seems to be in accordance with the one forwarded by Taylor et al. (1985), namely that scavenging on carcasses of other (old) bears and cannibalism is important for the propagation of *Trichinella* infections in polar bears.

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