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Authors: Torres, Patricio, Oporto, Jorge A., Brieva, Lila M., and Escare, Leopoldo

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Gastrointestinal Helminths of the Cetaceans *Phocoena spinipinnis* (Burmeister, 1865) and *Cephalorhynchus eutropia* (Gray, 1846) from the Southern Coast of Chile

Patricio Torres,¹ Jorge A. Oporto,² Lila M. Brieva,² and Leopoldo Escare,² ¹ Instituto de Parasitología; ² Centro de Investigación y Manejo de Mamíferos Marinos (CIMMA) % Instituto Biología Marina, Universidad Austral de Chile, casilla 567, Valdivia, Chile

ABSTRACT: Gastrointestinal helminths of the cetaceans *Cephalorhynchus eutropia* and *Phocoena spinipinnis* accidentally entangled in gillnets off the coast of Queule, Chile, were identified from 1989 to 1990. *Pseudoterranova* sp., *Polymorphus (Polymorphus) cetaceum* and *Synthesium tursionis* occurred in both cetaceans. Additionally, *Anisakis* sp. and *Braunina cordiformis* were found in *C. eutropia*, and *Anisakis simplex* was identified from *P. spinipinnis*. The species with the highest prevalence and mean intensity of infection in *P. spinipinnis* and *C. eutropia* were *P. (P.) cetaceum* and *B. cordiformis*, respectively. The diet of both cetaceans consists mainly of fishes.

Key words: Helminth parasites, nematodes, trematodes, acanthocephala, Cetaceans, *Cephalorhynchus eutropia*, *Phocoena spinipinnis*, survey.

The gastrointestinal parasites of cetaceans in Chile have been poorly investigated. *Phocoena spinipinnis* is a coastal cetacean that is distributed in the southern part of South America, from Paita (Peru) to Cape Horn in the Pacific Ocean (Sielfeld, 1983); it is also found along the Atlantic coast from the southern region of Brazil to Tierra del Fuego (Pinedo, 1989). The gastrointestinal helminth fauna of this cetacean is unknown from the Chilean coast.

Cephalorhynchus eutropia is an endemic coastal cetacean of the southern coast of Chile (33° to 55°S latitude) (Goodall et al., 1988). The following gastrointestinal parasites were known previously from this species: *Braunina cordiformis* (Figueroa and Franjola, 1988), *Synthesium tursionis* (Figueroa, 1988), *Pseudoterranova* sp. (Oporto and Torres, 1989) and *Polymorphus (Polymorphus) cetaceum* (Figueroa and Puga, 1990).

Data on the prevalence and intensity of

infection by gastrointestinal helminths of *C. eutropia* and *P. spinipinnis*, as well as their relation with the food of these cetaceans, are presented for the first time in this report.

Forty-one cetaceans accidentally entangled in gillnets near Queule, coastal area of Valdivia (38°22'S, 73°13'W), were examined. Animals of both sexes, adults and immature ones, were examined soon after death or after being kept up to 3 mo at -20 C. Necropsy and isolation of the parasites were conducted according to Norris (1961). The gastrointestinal helminths were fixed in 5% formalin. Nematodes and acanthocephalans were cleared in lactophenol and some trematodes were stained with Malzacher's dye (Pritchard and Kruse, 1982).

The helminth species found and their prevalence and intensity of infection in *C. eutropia* and *P. spinipinnis* are shown in Table 1. Both cetaceans showed a high percentage of infection with one or more species of helminths: 83% in *P. spinipinnis* and 87% in *C. eutropia*. The highest mean intensity of infection was seen in *P. spinipinnis*. Helminth parasites were found in hosts of both sexes at different ages, but *P. (Polymorphus) cetaceum* was identified only in adult *C. eutropia*.

Anisakis simplex, *Pseudoterranova* sp., and *P. (Polymorphus) cetaceum* are recorded for the first time from *P. spinipinnis*, and *S. tursionis* is reported for the first time from this host on the Chilean coast. *Anisakis* sp. was found for the first time in *C. eutropia*.

Anisakis spp., *Pseudoterranova* sp. and *P. (Polymorphus) cetaceum* were isolated from stomachs and intestine, *S. tursionis*

TABLE 1. Prevalence and intensity of infection by helminths in two cetacean species along the coast of southern Chile.

Hosts	Helminths	N ^a /N ^b	Prevalence	Intensity (range)
<i>Phocoena spinipinnis</i>	<i>Anisakis simplex</i>	18/11	61.1	12.0 (1-57)
	<i>Pseudoterranova</i> sp.	18/11	61.1	5.3 (1-20)
	<i>Polymorphus (Polymorphus) cetaceum</i>	18/12	66.7	59.6 (1-171)
	<i>Synthesium tursionis</i>	18/3	16.7	3.3 (3-4)
	Total ^c	18/15	83.3	61.0 (1-204)
<i>Cephalorhynchus eutropia</i>	<i>Anisakis</i> sp.	23/10	43.5	6.7 (1-43)
	<i>Pseudoterranova</i> sp.	23/11	47.8	2.7 (1-8)
	<i>Polymorphus (Polymorphus) cetaceum</i>	23/4	17.4	1.5 (1-2)
	<i>Synthesium tursionis</i>	23/1	4.3	1.0 (1)
	<i>Braunina cordiformis</i>	23/14	60.9	34.6 (3-74)
	Total	23/20	87.0	29.5 (1-77)

^a Number of cetaceans examined.

^b Number of infected cetaceans.

^c Number of cetaceans infected with one or more helminth species.

was found in first and second stomach, and *B. cordiformis* in third stomach and in the duodenal ampulla. Specimens of *Pseudoterranova* sp. and the majority of the *Anisakis* spp. corresponded to third and fourth stage larvae; only five adults of *Anisakis* spp. were isolated.

Apparently, the two cetaceans do not play a significant role in spreading the anisakids, *Anisakis* spp. and *Pseudoterranova* sp., because of the low number of mature worms present in these hosts. This situation differs markedly from that observed in other marine mammals along the Chilean coast (Fernández, 1987).

Polymorphus (Polymorphus) cetaceum showed a greater prevalence and mean intensity of infection in *P. spinipinnis* than in *C. eutropia*, which is probably an incidental host, judging from the low levels of infection.

The prevalence and mean intensity of infection for *S. tursionis* were low in both cetaceans. The other species of trematode, *B. cordiformis*, was the more common one, and had a higher intensity in *C. eutropia*.

The prey (fish, cephalopods, and crustaceans) in the stomachs of *P. spinipinnis* and *C. eutropia* (Table 2) represent groups that include the main hosts of larvae of

Anisakis spp. and *Pseudoterranova decipiens* infective for marine mammals (Smith and Wootten, 1978; Smith, 1983; Oshima, 1987). High prevalence and intensity of infections by *Anisakis* sp. and *Pseudoterranova* sp. larvae have been found in the fishes *Trachurus murphyi*, *Genypterus chilensis* and *Merluccius gayi* from the coast of Valdivia (Torres et al., 1983).

The life cycles of *P. (Polymorphus) cetaceum*, *B. cordiformis* and *S. tursionis* are unknown. Amphipoda, Isopoda, and Decapoda are indicated as intermediate hosts for *Polymorphus* spp. (Buron and Golvan, 1986). Decapoda were present in the gastric contents of *C. eutropia* only. The large consumption of fish by *P. spinipinnis* and the high prevalence and intensity of infection of *P. (Polymorphus) cetaceum* in this host suggest the possibility that *C. eutropia* can be infected via these prey. Various species of the family Polymorphidae use fishes as paratenic hosts (Golvan, 1960).

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TABLE 2. Prey consumed by *Phocoena spinipinnis* and *Cephalorhynchus eutropia* along the coast of southern Chile.

Prey	<i>P. spinipinnis</i> (13) ^a				<i>C. eutropia</i> (20)			
	N ^b	%	N ^c	%	N	%	N	%
Fishes	119	99.2	12	92.3	197	68.2	14	70.0
<i>Trachurus murphyi</i>	6	5.0	5	38.5	4	1.4	2	10.0
<i>Engraulis ringens</i>	56	46.7	4	30.8	15	5.2	4	20.0
<i>Clupea bentincki</i>	9	7.5	2	15.4	41	14.2	5	25.0
<i>Cauque mauleanum</i>	1	0.8	1	7.7	0	0.0	0	0.0
<i>Genypterus chilensis</i>	3	2.5	1	7.7	8	2.8	1	5.0
<i>Merluccius gayi</i>	29	24.2	6	46.2	0	0.0	0	0.0
<i>Eleginops maclovinus</i>	1	0.8	1	7.7	0	0.0	0	0.0
<i>Cilus gilberti</i>	0	0.0	0	0.0	2	0.7	2	10.0
Other fishes	14	11.7	6	46.2	127	43.9	16	80.0
Cephalopods								
<i>Loligo gahi</i>	1	0.8	1	7.7	80	27.7	6	30.0
Crustacea								
<i>Munida subrugosa</i>	0	0.0	0	0.0	12	4.2	1	5.0

^a Number of cetaceans examined.

^b Number of consumed prey-specimens.

^c Occurrence of prey in the examined cetaceans.

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