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THE OCCURRENCE OF *EUBRACHIELLA ANTARCTICA*
(QUIDOR, 1906) ON THE ANTARCTIC FISH *CHAMPSOCEPHALUS*
GUNNARI (LÖNNBERG, 1905)

ABSTRACT

Infestation of antarctic fish, *Champscephalus gunnari* by parasitic copepod *Eubrachiella antarctica* was studied. Frequently the parasitic occurrence on various parts of host's body is analyzed. An attempt is made here to relate the degree of infestation of *Ch. gunnari* to body length, age of the underinvestigated fish and season of capture.

INTRODUCTION

Champscephalus gunnari lives mostly in pelagic. Before and during the spawning season, it occurs on the bottom layers of fiord, or on the island's shelves. After the spawning seasons, fish re-inhabit the deep water again.

There are few data on the occurrence of various copepods on antarctic fish; only Kock and Möller (1977), Siegel (1980), Sosiński and Janusz (1986), Rokicki and Skóra (1986) and Rokicki and Zdzitowiecki (1991), give information about the incidence and intensity of infestation of some Channichthyidae and Nototheniidae fish.

The aim of this work is to complete the information about the parasitic copepod *Eubrachiella antarctica* from *Champscephalus gunnari* with regard to age and length of host's body.

MATERIAL AND METHODS

Investigated *Ch. gunnari* from South Georgia (54°39'S-38°19'W), were caught as follows:

From November 1981 to March 1982 -1578 fish
in November 1983 -1787 fish
in February 1988 -425 fish

From Elephant Island region (61°10'S-56°06'W), there were 2205 investigated fish. All were caught in February 1987. Sites of catching of *Ch. gunnari* were illustrated in Fig. 1. After the fish had been thawed on land, parasites were collected from the body surface, fins, buccal and gill cavities and upon the gills. The *E. antarctica* specimens were collected and preserved in 70% ethanol.

RESULTS

Champscephalus gunnari were captured in two areas: South Georgia and Elephant Island.

South Georgia. For the general number 1578 of *Champscephalus gunnari* investigated during the season 1981/1982, 81 were infested which is 5.1% of the total. The fish were up to 51 cm in length. The infested fish lengths ranged from 24-42 cm, with most high incidence between 24 and 31 cm (Table 1).

Three and four years old fish constitute the greatest number of the investigated ones and they have also been found to be the most infested (Table 2).

During 1983 season, 1466 fish were investigated, 102 were found to be infested, which is 7% of the whole.

The incidence of infestation is greatest for fish length range 24-27 cm, being 18.1% (Table 3). As well 3 years old fish, show the highest incidence of infestation 18.7% (Table 4).

In the 1988 season, 425 fish were investigated, and 96 ones were found to be infested, which is 22.2% of total. The highest incidence was 37.5% and occurred in length range 28-31 cm (Table 5), from which 2 years old constitute 26.4% (Table 6).

Elephant Island. For the general number 2791 of investigated *Ch. gunnari* in the season 1987, 125 were found to be infested. The most infested fish (32.3%), were of length range 36-39 cm (Table 7), and 4 years old.

The location of *E. antarctica* on *Ch. gunnari* was considered (Table 9). The highest incidence of infestation was observed on fins, especially tail and pectoral fins, and the least observation was in buccal and gill cavity.

DISCUSSION

Works which deal with the dynamics of the occurrence of *Eubrachiella antarctica* in *Champscephalus gunnari* (Kock and Möller, 1977; Siegel, 1980) or *E. gaini* (Sosiński and Janusz, 1986), show meaningfully great differences in

the incidence of infestation of these fish which come from places distant from their habitat.

The authors believe that the differing amounts of infestation are result of existence of local populations of *Ch. gunnari*. The copepod could be a biological tag here.

This work presents the incidence and intensity of infestation of *Ch. gunnari* by *E. antarctica* depending on the age and length of the host.

The incidence for South Georgia was lowest in 1981/1982 season (5.1%), to rise to 7% in 1983, and to 22.6% in 1988. Although during the season 1981/1982 the greatest incidence of infestation was four years old fish, it changed to be prevailing in three and two years old ones during the seasons 1983 and 1988 (Table 2, 3, 5). A similar situation occurs when we discuss the infestation as depending on fish length (Table 6, 7, 9).

The fish caught from Elephant Island in 1987 reveal an incidence of 5.6% (Table 4), which is similar to the infestation for these fish from South Georgia in season 1981/1982 (5.1%) (Table 2). For both of the capture areas mentioned above, the greatest infestation was in four years old fish.

Kock and Möller's (1977) investigation was based on fishing from 1975/1976, and showed a comparatively low incidence of infestation of *Ch. gunnari* in South Georgia, and higher for South Orkney. Siegel (1980) investigated *Ch. gunnari* from the season 1977/1978. The incidence of infestation of *E. antarctica* was related to the length of fish. The smaller fish showed lower incidence of infestation.

Sosiński and Janusz (1986) investigated the structure of infestation of *Ch. gunnari* by *E. gaini* from season 1977/1978.

For the Elephant Island they found the incidence of 13.2%, and for South Georgia it was 17.0%.

It should be mentioned that the material investigated by Sosiński and Janusz (1986) was gathered directly from the fish after capturing, while our materials was gathered from *Ch. gunnari* which were refrigerated for several months. This fact could lower the incidence of infestation.

The present results show different infestation of *Ch. gunnari* from South Georgia in different seasons of capturing. The changes in the incidence of infestation, however, are connected with the displacement peak of infestation from older fish to younger ones (Table 6, 9). So, the method of using the incidence of infestation by *E. antarctica* as biological tag of separate population of *Ch. gunnari* requires at the same time the analysis of the age and length structure of the examined fish.

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WYSTĘPOWANIE *EUBRACHIELLA ANTARCTICA* (QUIDOR, 1906) U ANTARKTYCZNEJ RYBY *CHAMPSOCEPHALUS GUNNARI* (LÖNNBERG, 1905)

Streszczenie

Praca dotyczy infestacji antarktycznej ryby *Champscephalus gunnari* przez pasożytniczego widłonoga *Eubrachiella antarctica*. Poddano analizie częstość występowania pasożyta w zależności od lokalizacji na rybie. Przedstawiono również stopień infestacji przez widłonoga w zależności od wieku, długości i miejsca połowu żywiciela.

Tab. 1 Infestation of *Champocephalus gunnari* by *E. antarctica* in dependence of fish length (South Georgia 1981/1982)

Length classes (cm)	Number of fish		Incidence %	Intensity (ind.)
	Examined	Infested		
0 -23	313	-	-	-
24 -27	248	25	10.1	1.1
28 -31	365	38	10.4	1.0
32 -35	305	12	3.9	1.1
36 -39	185	5	2.7	1.2
40 -43	110	1	0.9	1.0
44 -47	40	-	-	-
48 -51	9	-	-	-

Tab. 2 Infestation of *Champocephalus gunnari* by *E. antarctica* in dependence of fish age (South Georgia 1981/1982).

Age (year)	Number of fish		Incidence %	Intensity (ind.)
	Examined	Infested		
1	-	-	-	-
2	10	8	-	1.0
3	592	27	4.8	1.1
4	512	31	6.0	1.1
5	384	7	1.8	1.2
6	30	5	16.6	1.2
7	28	3	10.7	1.1
8	26	-	-	-
9	16	-	-	-
10	7	-	-	-

Tab. 3 Infestation of *Champscephalus gunnari* by *E. antarctica* in dependence of fish length (South Georgia 1983).

Length classes (cm)	Number of fish		Incidence %	Intensity (ind.)
	Examined	Infested		
0 -23	128	24	13.1	1.0
24 -27	166	30	18.1	1.0
28 -31	275	35	12.7	1.1
32 -35	196	6	3.1	1.0
36 -39	251	5	2.0	1.2
40 -43	197	2	1.0	1.2
44 -47	140	-	-	-
48 -51	49	-	-	-

Tab. 4 Infestation of *Champscephalus gunnari* by *E. antarctica* in dependence of fish age (South Georgia 1983).

Age (year)	Number of fish		Incidence %	Intensity (ind.)
	Examined	Infested		
1	2	-	-	-
2	157	1	0.6	1.0
3	347	65	18.7	1.1
4	363	316	8.5	1.2
5	237	1	0.4	1.2
6	126	2	1.6	1.0
7	79	1	1.3	1.0
8	68	1	1.5	1.0
9	36	-	-	-
10	51	-	-	-

Tab. 5 Infestation of *Champocephalus gunnari* by *E. antarctica* in dependence of fish length from (South Georgia 1988).

Length classes (cm)	Number of fish		Incidence %	Intensity (ind.)
	Examined	Infested		
0 -23	13	2	15.3	1.5
24 -27	131	19	14.5	1.1
28 -31	128	48	37.5	1.5
32 -35	135	21	15.6	1.8
36 -39	14	4	28.6	1.5
40 -43	3	1	33.3	1.0
44 -47	1	1	100.0	1.0
48 -51	0	-	-	-

Tab. 6 Infestation of *Champocephalus gunnari* by *E. antarctica* in dependence of fish age (South Georgia 1988).

Age (year)	Number of fish		Incidence %	Intensity (ind.)
	Examined	Infested		
1	12	2	16.7	1.0
2	125	53	26.4	1.1
3	263	52	19.8	1.8
4	20	6	30.0	1.8
5	3	1	33.3	2.0
6	-	5	-	-
7	-	3	-	-
8	1	-	-	-
9	-	-	-	-
10	1	-	-	-

Tab. 7 Infestation of *Champscephalus gunnari* by *E. antarctica* in dependence of fish length (Elephant Island 1987).

Length classes (cm)	Number of fish		Incidence %	Intensity (ind.)
	Examined	Infested		
0 -23	105	11	10.5	1.4
24 -27	1571	23	1.5	1.6
28 -31	132	7	5.3	1.0
32 -35	292	43	14.7	1.3
36 -39	65	21	32.3	1.9
40 -43	16	4	25.0	1.0
44 -47	17	11	64.7	4.5
48 -51	7	5	71.5	2.2

Tab. 8 Infestation of *Champscephalus gunnari* by *E. antarctica* in dependence of fish age (Elephant Island 1987).

Age (year)	Number of fish		Incidence %	Intensity (ind.)
	Examined	Infested		
1	75	9	12.0	1.5
2	1647	29	1.8	2.3
3	317	38	12.0	1.2
4	109	26	23.8	1.5
5	28	2	7.1	2.5
6	3	1	33.3	3.0
7	3	2	66.7	1.0
8	7	6	85.7	2.0
9	5	5	100.0	2.8
10	11	-	-	-
11	10	7	70.0	2.6

Tab. 9 Location of *Eubrachiella antarctica* on *Notothenia gibberifrons* from different seasons of catch.

Parasite	Location of attachment								Season
	Fins						Buccal & gill cavity	Skin	
	C	D	P	V	A				
Number	26	5	42	1	2		3	2	1981/82
%	32.0	6.1	51.8	1.2	2.5		3.7	2.5	
Number	31	8	56	1	4		2	2	1983
%	30.0	7.7	54.3	3.0	3.8		1.9	1.9	
Number	55	23	26	3	19		2	-	1986/87
%	14.9	6.3	72.3	0.8	5.2		0.5	-	

C = caudal fin . D = dorsal fin . P = pectoral fin . V = ventral fin . A = anal fin

