

FOOD PREFERENCES AND DISEASES OF MYOXOCEPHALUS SCORPIUS
IN THE GERMAN BIGHT

by

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ABSTRACT

During research cruises with the R.V. "Victor Hansen" and R.V. "Utörn" in June and July 1988 in the German Bight a total of 310 Myoxocephalus scorpius were caught. They were measured, the stomach fullness estimated and the contents identified. Crustaceans, mainly Macropipus hol-satus and Crangon spp., were the major prey species with some fish and bivalves being taken as well.

The presence of stomach ulcers and the infestation rates with leeches were noted.

INTRODUCTION

Myoxocephalus scorpius is a common coastal fish in European waters. It has not been intensively studied because it is of no commercial importance, only forming part of the by-catch from the prawn (Crangon crangon) and other coastal fisheries. Myoxocephalus scorpius is a predator feeding mainly on crustaceans, fish and molluscs that are abundant in the region of its occurrence. KÜHL (1961) investigated the food of various fish species from the Elbe estuary, among them Myoxocephalus scorpius. He found that Crangon crangon was the main prey species followed by Carcinus maenas. In the Baltic Sea, RACIBORSKI (1984) also found that Crangon crangon was the main prey species. In this study the diet of Myoxocephalus scorpius from two stations in the German Bight was looked at.

MATERIAL AND METHODS

The Myoxocephalus scorpius were caught using a bottom trawl and a semi pelagic trawl. They were caught in front of the Eider estuary in approximately 10 m water depth, and by Helgoland in 30 - 50 m water depth. Those caught in June were measured and dissected on board, those from July were first frozen and later dissected in the laboratory. They were measured to the nearest lowest centimeter and the stomach fullness was estimated on a relative scale out of 10 before the contents were removed and identified. The stomach linings were then examined for the presence of stomach ulcers. Before dissection the fish were examined for any externally visible diseases and ectoparasites.

For the calculation of percentage presence of prey organisms only fish with food in their stomachs were considered as regurgitation of stomach contents during capture could have taken place. All fish from each station were considered for the calculation of parasite infestation rates and incidence of stomach ulcers.

RESULTS

The results obtained show that Myoxocephalus scorpius feeds predominantly on crustaceans. Macropipus holsatus was the dominant prey species on both stations, being present in over 60 % of the fish.

Crangon spp., which were the dominant prey species found by KÜHL (1961) and RACIBORSKI (1984), were only really important on the Eider station. The bivalves were taken in significant quantities only on the shallower, more inshore Eider station. Fish, however, occurred more frequently in the diet around Helgoland. Their presence in the diet on the Eider station decreased until they had virtually disappeared by July. For percentage presence composition of the diet see Tables 1 and 2.

A large number of Myoxocephalus scorpius had stomach ulcers on both stations. In front of the Eider estuary these showed an increase during the course of the study, whereas the reverse was true for the Helgoland station. Also some fish were infested by leeches. The infestation rates were low on the Eider station, between 0 % and 5,26 %. This could possibly be due to the slightly lower salinity or increased turbidity of the water. Around Helgoland the infestation rates were more than twice as high as those on the Eider station, between 12,82 % and 13,33 %. Whilst most fish were infested with one or two leeches, one was infested with twelve.

Despite the large number of fish investigated the only external disease found, one fish which was blind in its right eye.

There was also a high proportion of empty stomachs found, between 59, 59,65 % and 15.69 %. None of the examined stomachs were full. This could be due to regurgitation of food during capture or accelerated digestion due to the warm water. WESTIN (1970) and RACIBORSKI (1984) also noted that the incidence of empty stomachs increased in spring and summer.

DISCUSSION

Although crustaceans dominate in the diet of Myoxocephalus scorpius, it is to some extent an opportunistic feeder, mainly taking the dominant species present. This fact is confirmed by the results obtained by KÜHL (1961) and RACIBORSKI (1984), who both found that Crangon spp. were dominant prey species, whereas Maeropipus holsatus was the dominant prey species in this study. Both Macropipus holsatus and Crangon spp. increased in importance on the Eider station during the course of the study. This could be due to an increase in their populations due to reproduction, or because they had migrated closer inshore. The fact that on the Helgoland station their importance in the diet decreased seems to support this. Also fish virtually disappeared from the diet on the Eider station over this time whilst they increased on the Helgoland station further supporting this theory.

Bivalves also increased on the Eider station over the period of the study. This could be due to newly settled larvae growing into larger individuals and therefore becoming more visible since Myoxocephalus scorpius hunts by sight.

The causes for the large number of stomach ulcers are uncertain. They are not mentioned by KÜHL (1961), RACIBORSKI (1984) or WESTIN (1970). MÖLLER and ANDERS (1986) found granulomas in Osmerus eperlanus due to spines from the amphipods they eat. However, the stomach ulcers found in Myoxocephalus scorpius looked like small versions of the external ulcers found on dabs (Limanda limanda). Although there often were several ulcers in each stomach, they did not appear to affect the feeding as many affected fish had food in their stomachs. The ulcers could be caused by the high water temperature and lower oxygen levels in the water. On the Eider station there was an increase in the occurrence of stomach ulcers during the course of the study. There was also an increase in the water temperature at the same time. On the Helgoland station the reverse appeared to be true, the occurrence of ulcers decreased. The stomach ulcers had disappeared in October (own unpublished data) suggesting that temperature may be a factor. At this time crustaceans still dominated the diet, so it seems unlikely that their food caused the ulcers.

L I T E R A T U R E

- DETHLEFSEN, V., 1984: Diseases in North Sea fishes - Helgoländer Meeresuntersuchungen 37, 353 - 374.
- KÜHL, H., 1961: Nahrungsuntersuchungen an einigen Fischen im Elbe-Mündungsgebiet. Der Dt. Wiss. Komm. Meeresforsch. XVI 2, 90 - 104.
- MÖLLER, H., ANDERS, K., 1986: Diseases and Parasites of Marine Fishes. Kiel: MÖLLER, 365 pp.
- RACIBORSKI, K., 1984: Migrations, Reproduction, Growth and Feeding of Myoxocephalus scorpius (L) in Gdansk Bay (South Baltic). Pol. Arch. Hydrobiol. 31 2, 109 - 118
- WESTIN, L., 1970: The food ecology and the annual food cycle in the Baltic population of fourhorn sculpin, Myoxocephalus quadricornis (L.) Pises. I.F.R. Rep. No. 50.

Table 1:

PERCENTAGE PRESENCE OF ORGANISMS IN THE DIET OF MYOXOCEPHALUS SCORPIUS
IN FRONT OF THE EIDER STATION

	03.06.88	21.06.88	27.07.88
	n = 46	n = 54	n = 43
Macropipus holsatus	60,87 %	66,67 %	76,74 %
Crangon spp.	17,39 %	11,11 %	34,88 %
Hyas araneus	2,17 %		
Carcinus maenas	4,35 %		
Pagurus bernhardus		9,26 %	4,65 %
Mysis spp.		1,85 %	
Crustacean remains		12,96 %	13,95 %
Solea solea	2,17 %		
Callionymus lyra	2,17 %		
Merlangius merlangius	2,17 %		
Clupea harengus		1,85 %	
Pomatoschistus spp.			2,33 %
Fish remains	15,22 %	3,70 %	
Bivalvia	30,43 %	31,48 %	39,53 %
Polycheates	2,17 %		
Ophiura spp.	2,17 %		

Table 2:

PERCENTAGE PRESENCE OF ORGANISMS IN THE DIET OF MYOXOCEPHALUS SCORPIUS
AROUND HELGOLAND

	04.06.88	22.06.88	
	n = 11	n = 31	
Macropipus holsatus	77,78 %	64,52 %	
Pagurus bernhardus	22,22 %	16,13 %	
Corystes cassivelaunus		12,90 %	
Crangon spp.	33,33 %		
Crustaceans remains		6,45 %	
Callionymus lyra	22,22 %		
Merlangius merlangius		9,68 %	
Agonus cataphractus		3,23 %	
Fish remains	11,11 %	9,68 %	
Bivalvia		3,23 %	
Ophiura		3,23 %	
Gastropoda		3,23 %	

Table 3:

PRESENCE OF STOMACH ULCERS AND INFESTATION RATES WITH LEECHES
OF MYOXOCEPHALUS SCORPIUS

IN FRONT OF THE EIDER ESTUARY			
	03.06.88	21.06.88	27.07.88
	n = 114	n = 91	n = 51
Stomach ulcers	33,33 %	46,15 %	49,02 %
Leeches	5,26 %		

AROUND HELGOLAND

	04.06.88	22.06.88
	n = 15	n = 39
Stomach ulcers	86,67 %	48,39 %
Leeches	13,33 %	12,82 %