EXPERIMENTAL INFECTION OF EUROPEAN SEA BASS (*DICENTRARCHUS LABRAX*) WITH *ANISAKIS SIMPLEX* THIRD-STAGE LARVAE (NEMATODA : ASCARIDOIDEA)

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Abstract

Infective larvae of *Anisakis simplex* were experimentally administrated to a cage reared European sea bass (*Dicentrarchus labrax*). First positive findings were noticed five days after the first forced feeding with the third – stage larvae. The larvae showed high viability and vigor, even if they were isolated from an unusual and accidental fish host and from a non-predilected site.

Keywords : Dicentrarchus labrax, Anisakis simplex, experimental infection

Introduction

A. simplex matures in the stomach of whale, while its infective third–stage larvae can be found in the viscera and occasionally the flesh of over 70 species of fish. The species is highly pathogenic to men, wherever raw, marinated, (under) cooked fish meat is consummated.

Materials and methods

A cage-reared European sea bass from the fish farm were held in two tanks of 5 m^3 in running sea water (temperature 20°C, salinity 35‰). Third-stage larvae of *A. simplex* were isolated from Atlantic horse-mackerel (*Trachurus trachurus*) an thoroughly washed in 0.9 % NaCl solution. Before the administration, larvae were measured under the light microscope. After acclimatization period of two weeks, fish were anaesthetized with benzocain and forced fed with the plastic catheter. From 20 to 30 larvae were administrated in one feeding, which was performed on the day 1, 3, 5. and 10. In the mean time, fish were fed on standard commercial diet. Twenty- four hours after the feeding, a random fish sample was taken, and autopsied. In the second tank, the control group of fish was held, and fed only on commercial diet.

Results

After the first and second feeding (day 1. and 3, respectively), fish showed nematodes in stomach, but not in the intestine or under visceral serosis. Stomach was almost empty, with only a small amount of transparent mucus, without erosions on the mucosa. The pyloric caeca were filled with the large amount of tick, yellowish content. The same was found in the intestine. Fish autopsied one hour after the forced feeding, were found to contain live, vigorously moving larvae.

The day after the last forced feeding (day 10), all of the remaining fish were autopsied, and found with the live larvae under different parts of visceral serosis.

The larvae isolated from infected fish were alive and showed no difference in the body length.

The relation between the mean weight of the fish and isolated larvae from viscera, is given in figure 1. That correlation is – 0,161.

The localization and the number of isolated larvae is shown in table 1.

The autopsied control group showed no larvae.

Discussion

The attempts to transmit experimentally infective stage of Ascaroid nematods has been studied to elucidate questions regarding their migration patterns during life cycle. Køie (1) succeeded to transmit *Contracaecum osculatum* to various fish species, exposing them to ensheated third-stage larvae, infected copepods or via infected intermediate fish host. She concluded that larvae migrating into wall of the pyloric caeca reached mesentery, and those penetrating the intestinal wall, reached liver via the blood vessels. Smith et al. (2) infected rainbow trout (*Oncorhyncus mykiss*) with *C. osculatum* and *Pseudoterranova decipiens* and monitored the development of the larvae, concluding that they grew within 270 days 10.2 (mean value) in length. When Moser et al. (3) tried to infect striped bass (*Morone saxatilis*) with *A. simplex* larvae, he obtained only two from six positive bass, with the number of one to four larvae per fish, respectively.

The present study indicates that even European sea bass is not a usual host of *A. simplex*, the infection is possible, while the migrations from the stomach to different sites takes 5-10 days post infection.

The unusual site of localization of the larvae and their high viability, indicate the huge adaptation possibilities of this nematode, even the growth of larvae was not noticed, because of very short period which they passed in fish body.

The largest number found in mesenteric fat suggest that the fat acts only as a way trough which the passing is made, in attempt to reach other more convenient site.

The correlation between the number of isolated larvae and the fish weight is negative and insignificant, meaning that the success in penetration of the gastrointestinal tract in this case does not depend on fish size.

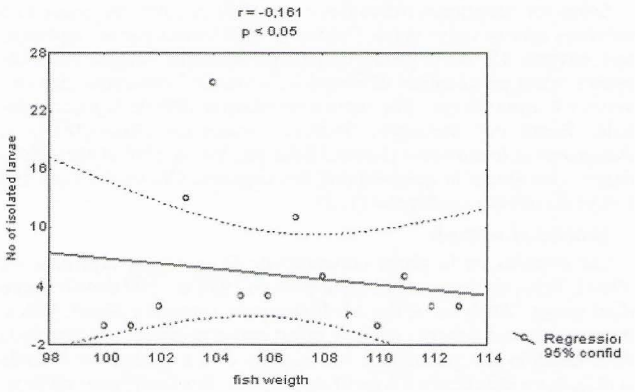

Figure 1. Regression scatterplot of correlation between the mean weight of fish and number of isolated *A. simplex* larvae.

Table 1. The localization and the number of isolated larvae of *A. simplex* from European sea bass.

Localization	No
mesenteric fat	52
stomach serosis	7
esophagus serosis	5
mesentherium	5
liver serosis	1
pyloric caeca serosis	1
swim bladder	1

References

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