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Parasitology

ON A CASE OF A MASS INVASION OF CESTODE *GYMNORHYNCHUS*
(*GYMNORHYNCHUS*) *GIGAS* (CUVIER, 1817) LARVAE IN MUSCLES
OF *BRAMA RAII* (BLOCH, 1791)

PRZYPADK MASOWEJ INWAZJI LARW TASIEMCÓW *GYMNORHYNCHUS*
(*GYMNORHYNCHUS*) *GIGAS* (CUVIER, 1817)
W MIĘŚNIACH BRAMY – *BRAMA RAII* (BLOCH, 1791)

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The author discusses a mass invasion of cestodes *Gymnorhynchus* (*Gymnorhynchus*) *gigas* in muscles of *Brama raii* caught off the North-west African coast.

INTRODUCTION

In 1974, a mass parasitic invasion was found in a batch of *Brama raii* (Bloch, 1791) supplied by the Deep-Sea Fisheries Company "Gryf", Szczecin. The specimens examined were obtained from the August 74 by-catch of MT "Kulbak" fishing on sardines off the North-west African coast (Fig. 1), the coordinates of the actual fishing ground being 26.50–27.01°N and 13.46–13.44°W. The fish specimens from the by-catch were gutted and beheaded, then deep-frozen in plates contained in 24-kg cartons.

The parasites occurring in the flesh were found to be larvae of a cestode from the family *Tetrarhynchidae*. The mass character of the invasion made the author to deal with the problem and start the investigations. The detailed examination revealed that it was the blastocystis-type larvae of a tetrarhynchid that had caused the invasion (Fig. 2). Their adult forms occur in elasmobranchs – sharks' and skates' intestines.

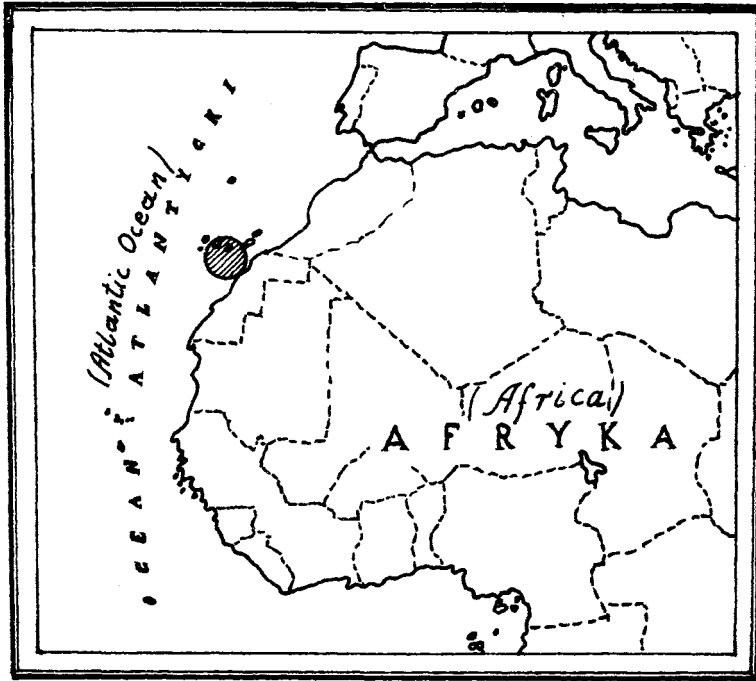


Fig. 1. A map showing the location of the *Brama rai* catch affected.

MATERIAL AND METHODS

33 *Brama rai* carcasses obtained from different batches (cartons) were examined within the period of 24 October – 10 November 1974. The size range, i.e., the length and height of the carcasses examined was 27–46 cm and 13–26 cm, respectively. Comparing the sizes measured with intact representatives of the species, the total length range was determined as 31–55 cm.

Having thawed and skinned the fishes, small bits of flesh were gently pulled out and comminuted. The parasites were taken out, placed in the physiologic solution and the four probosces were extruded by pressing the parasite or injecting its body cavity with the solution. The parasites such prepared were photographed macroscopically and then preserved in 75% ethyl alcohol. Later on, alum carmine-stained microscopic mounts were made of all the parasite individuals found.

DESCRIPTION OF INVASION

31 out of 33 fish individuals examined, i.e., 93.9% were parasitized; the two parasite-free specimens were the smallest ones in the batch, their carcass lengths amounting to 27

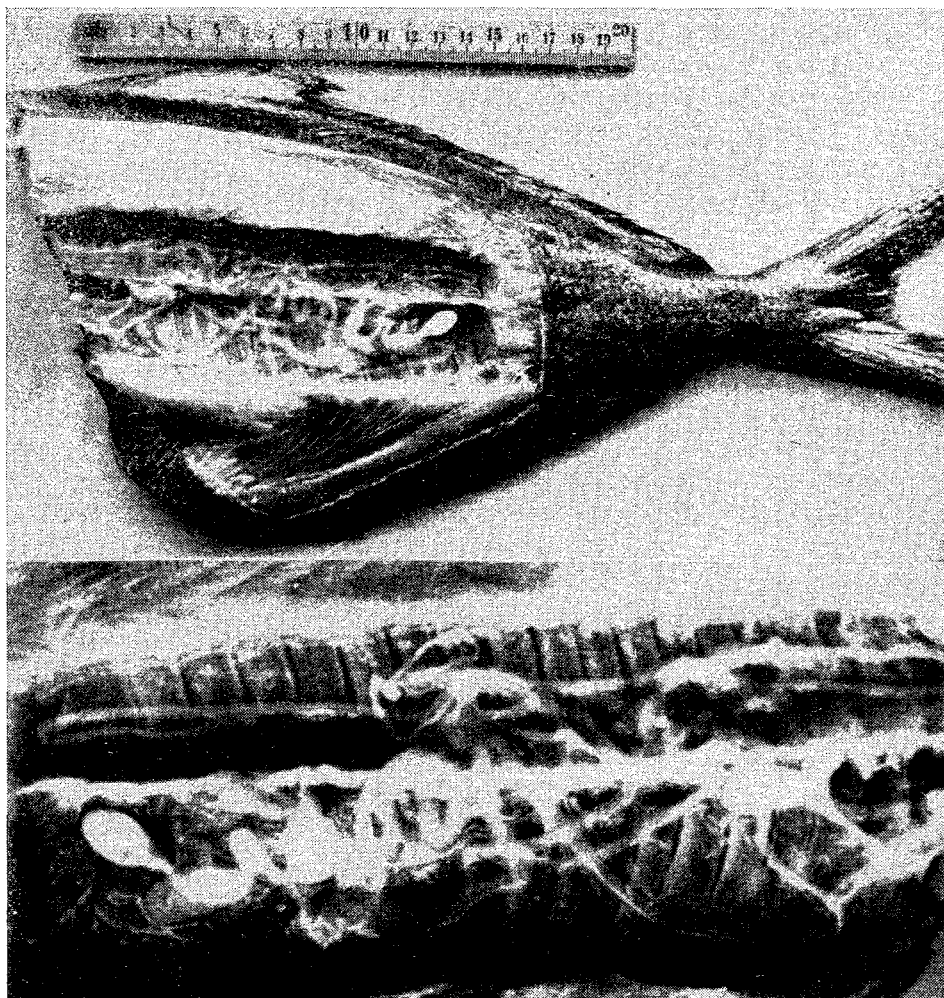


Fig. 2. *Gymnorhynchus (Gymnorhynchus) gigas* in *Brama raii*:

- a) general view of the fish
- b) close-up of a parasitized section

Photo author

and 28 cm. Presumably they were the youngest ones taking some parasite-free food. *Brama raii* feeds at first on various crustaceans, then – changing its food with growth – on molluscs, small clupeids and scombrids.

In total, 172 parasite individuals were found. Most of them (170 ones) were the endoparasites – cestode larvae, the remaining two being ectoparasitic *Isopoda parasitica* found on skin. The endoparasites observed in muscles were identified as *Gymnorhynchus (Gymnorhynchus) gigas*. As it can be seen on the photographs (Figs. 3 and 4) the parasite

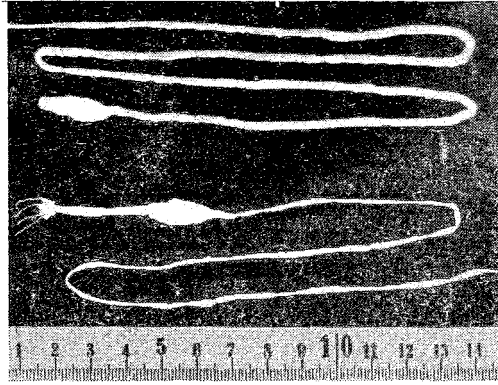


Fig. 3. *Gymnorhynchus (Gymnorhynchus) gigas - plerocercus*:
 a) with a closed blister
 b) with a scolex and probosces extruded

Photo author

total length (tail and blister with scolex) ranged within 45–50 cm, while the blister itself ranged within 1.5–2 cm.

The head with four probosces extruded was of about 5 cm length, i.e., thrice as long as the blister itself. The probosces were of 14–18 mm total length (spiny and naked parts), the spiny part length and the proboscis thickness ranging within 5–8 mm and 0.2–0.4 mm, respectively. A garland of large hooks surrounding the proboscis separates its spiny and naked parts (Fig. 5, 6). The hooks on the remaining part of the proboscis are placed on either side called here the outer and inner ones. The outer side shows a band of longitudinally arranged 2 rows of hooks, their tips directed toward each other. The head part at the base of the proboscis reveals 4 characteristic bothria of 4–6 mm length. 4 probosces withdrawing muscles and canals they retract into are clearly seen.

The maximum and minimum invasion intensity were 17 and 1 parasite per fish, respectively. Moreover, the majority of the parasites, i.e., ca 72% were observed to concentrate in muscles of a lower part of the body, the vertebral column being assumed a division limit. This fact could be explained by the proximity of the invaded part to the peritoneal cavity and intestines; also more loosely arranged muscle tissue there compared to compact and tendon-rich caudal and dorsal parts containing only the remaining 28% of the parasites could be



Fig. 4. Blastocystis of a *Gymnorhynchus (Gymnorhynchus) gigas* larva

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Fig. 5. *Gymnorhynchus (Gymnorhynchus) gigas* scolex. 4 bothria and probosces visible
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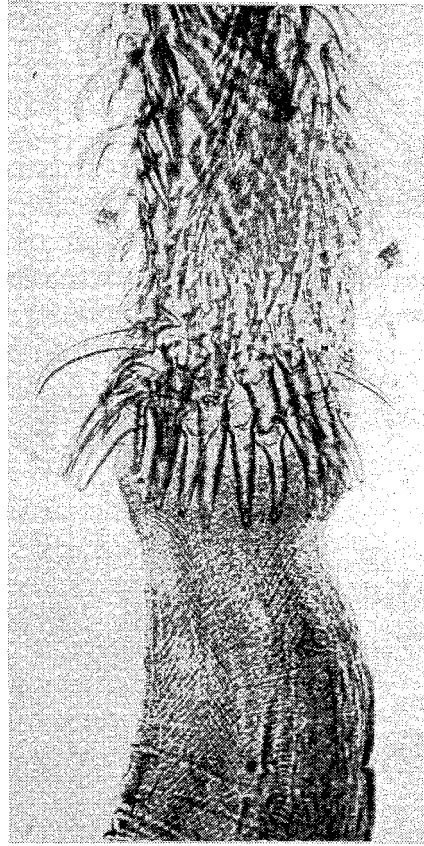


Fig. 6. *Gymnorhynchus (Gymnorhynchus) gigas* – a proboscis with a garland of hooks separating the naked and armed parts
Photo author

responsible for the parasites distribution discerned. Moreover, maximum numbers of the parasites were noted in larger fish specimens, for example 17 parasites in 41 cm-long fish carcass or 10 parasites in a fish of a similar size. The mean invasion intensity was 5.5 parasite individuals per fish. Most of the parasites could be seen grouped in the proximity to the vertebral column (Fig. 2B), while the blisters containing scolexes with probosces were caudally directed. The entangled larva's tail was found throughout the fish muscle tissue piercing it along its length and breadth many times. Even in the cross-section obtained on beheading, the larval tails could be observed cut off, showing their characteristic arrangement in the fish body.

DISCUSSION

The larvae found were identified as *Gymnorhynchus* (*Gymnorhynchus*) *gigas* (Cuvier, 1817) according to the description given by Dollfus (1942). Within the genus *Gymnorhynchus* this author distinguishes two sub-genera: *Gymnorhynchus* and *Molicola* Dollfus, 1935 differing in their proboscis armament. The outer side of the proboscis in the sub-genus *Gymnorhynchus* shows a double chain of hooks arranged in a herring-bone pattern, while the sub-genus *Molicola* created by Dollfus has a longitudinal band of numerous small ones in the same position. The two sub-genera possess an open garland of large hooks in the border area between the naked and armed parts.

On the other hand, Yamaguti (1959) recognizes the two subgenera assuming the respective presence and absence in *Molicola* and *Gymnorhynchus* of a garland of large hooks separating the naked and spiny parts of the proboscis. The presence of these hooks was found in every parasite specimen examined. Moreover, when comparing the parasites of this genus found in the liver of *Mola mola*, the large hooks discussed above were also observed. Because of that, the Dollfus's division was adopted as a more correct one.

FINAL REMARKS

When dealing with such a mass invasion, an attention should be paid to a decline in economic value of the catch affected and difficulties in processing the spoiled fish. Large amounts of larvae contained in fish flesh cause a clear deterioration of its consumptive value by loosening the tissue. Although the parasite larvae are not pathogenic to humans, the sanitary regulations do not allow a disgust-causing product to be sold- the information concerning the mass parasitic invasion in fishes resulted in their withdrawal from the market. It should be stressed that had such a mass invasion had been found earlier, on board, the gutting, beheading, packing, freezing and distribution costs incurred could have been avoided and the fish affected could have been immediately processed to a fish meal.

Translated: mgr Teresa Radziejewska

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PRZYPADEK MASOWEJ INWAZJI TASIEMCÓW
GYMNORHYNCHUS (GYMNORHYNCHUS) GIGAS (CUVIER, 1817)
W MIĘŚNIACH *BRAMY – BRAMA RAII (Bloch, 1791)*

Streszczenie

W okresie od 24 października do 10 listopada 1974 roku zbadano partię tuszek rybich z gatunku *Brama raii* (Bloch, 1791) pochodzących z przyłowów na Atlantyku w okolicach wysp Kanaryjskich.

U ryb tych stwierdzono masową inwazję larw tasiemców *Gymnorhynchus (Gymnorhynchus) gigas*. Na przebadane 33 ryby aż 31 (93,9%) było zarażonych tym pasożytem. Ogółem znaleziono 170 szt. pasożytów. Stwierdzono charakterystyczne ułożenie pasożytów w mięśniach ryb oraz zależność intensywności inwazji od wielkości ryb.

M. Сейда

МАССОВАЯ ИНВАЗИЯ ЛЕНТОЧНЫХ ЧЕРВЕЙ *GYMNORHYNCHUS (GYMNORHYNCHUS) GIGAS*
(CUVIER, 1817) В МЫШЦАХ *БРАМУ-БРАМА РАИИ (BLOCH, 1791)*

Р е з ю м е

В период с 24 октября по 10 ноября 1974 года исследовали партию обезглавленной рыбы вида *Brama raii* (Bloch, 1791) из прилова в районе Канарских островов.

У этих рыб обнаружена массовая инвазия личинок ленточных червей *Gymnorhynchus (Gymnorhynchus) gigas*. Из 33 исследуемых рыб 31 (93,9%) была заражена этим паразитом. В общем обнаружено 170 экз. паразитов. Установлено характерное размещение паразитов в мышцах рыб и зависимость интенсивности инвазии от размеров рыбы.

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