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Parasitology

PARASITIC FAUNA OF THE GREY GURNARD *Trigla gurnardus* (L.)
FROM SHETLAND ISLANDS FISHING GROUNDS

PARAZYTOFAUNA KURKA SZAREGO *Trigla gurnardus* (L.)
Z ŁOWISK WYSP SZETLANDZKICH

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Complete parasitological analysis of the grey gurnard *Trigla gurnardus* (L.) had been carried out on Shetland Islands fishing grounds. Material was collected at random from commercial catches in March 1976.

Generally, the presence of 14 species of parasites was ascertained (*Protozoa* – 1; *Cestoda* – 1; *Trematoda* – 7, *Nematoda* – 3, *Crustacea-Copepoda* – 1, and *Fungi* – 1 species). Frequency of their prevalence, as well as intensity and incidence were determined. Ten species were found first time as occurring on the grey gurnard.

INTRODUCTION

Grey gurnard *Trigla gurnardus* (L.) is one of the most common fishes out of the family *Triglidae*. It is widely distributed along coasts of Europe, from Murmansk to the Black Sea. The species belonging to family *Triglidae* are little known from the parasitological standpoint. Most papers concern the parasitic fauna of the red gurnard *Trigla lucerna* (L.), and grey gurnard. But these works have rather accidental character not giving complete picture. Most frequently the authors describe single parasites belonging to the different taxonomical groups. For instance, Margaritov (1965) describes *Contracoecum fabri*

(Rudolphi, 1819) on the red gurnard from Black Sea. Similarly, Pogoreltseva (1952) describes two species of nematods from *Trigla hirundo* (L.) coming from the Black Sea too. Agraval (1964) described trematod *Helicometrica indica* n.sp. from intestine of the grey gurnard. Most attention had been paid to the parasitic *Copepoda*. One of more extensive works concerning several species of *Lernaeopodidae* occurring on gurnards from European waters is Nunes-Ruivo's (1957) paper. Parker (1965) worked out crustaceans from the genus *Caligus* for the same area.

The aim of this work was to get possibly fully acquainted with parasitic fauna of *Trigla gurnardus* from the particular fishing area. Such surveys may gain real meaning for the practical purposes in the future, in view of continuous increasing of exploitation of species that were slightly utilized for human consumption up to date.

MATERIAL AND METHOD

There were examined 100 specimens of grey gurnard – *Trigla gurnardus* which have been caught in North Sea near Shetland Islands. Material was collected during fishing operations when 5–10 fishes have been taken from particular haul. Dimensions of examined fishes were in the limits – length (longitudo corporis) – 22(27–41)48 cm, and weight 160–1100 grams. Material has been freezed, and later, in the laboratory its examination was carried out.

Skin, fins, oral cavity, gill cavity, muscles, body cavity, and alimentary canal were examined. The parasites were preserved in 75% alcohol, and physiological saline with 4% of formaldehyde. Tapeworms and trematods have been partially flattened. The stable preparations were mounted after staining in Canada balsam; nematods were mounted in glycerine.

RESULTS

Microsporidia

Three yellowish cysts (1 and 2) were found in two fishes. They were clearly visible, their dimensions were 10 × 4 mm. They were located in the muscles of belly lobes. Distinctive changes were noted in the tissue surrounding the cysts. Muscle tissue around them was liquefied and had spongy consistence.

Platyhelminthes

Cestoda

Grillotia erinaceus (van Beneden, 1858) – Fig. 1

Only one tapeworm in the form of encysted larva – *plerocercoidus* was found in the examined samples. It was located in the body cavity in stomach vicinity. It could not be excluded that it was accidental infestation.

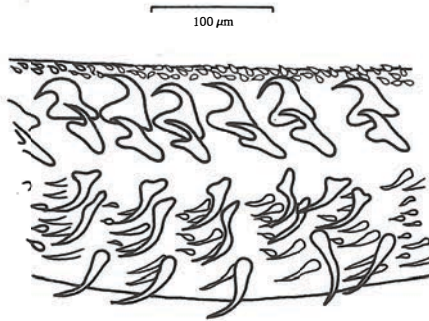


Fig. 1. Fragment of proboscis of
Grillotia erinaceus

Trematoda

Bucephalopsis gracitescens (Rudolphi, 1819) – Fig. 2

The species rare in the examined material, it was ascertained in 4% of cases with intensity of 1–3 parasites per fish. Trematods were occurring in the intestines, and in only one case in stomach. All juvenile individuals.

Rhipidocotyle galeata (Rudolphi, 1818) – Fig. 3

It was occurring in the intestine much more frequently the *Bucephalopsis*. Incidence reached 16%; there were encountered up to 7 parasites in one fish. Mean number of parasites per fish was over 4 times higher than in the case of preceding species.

Lepidapedon sp.

Only one time 3 specimens were found in one fish. Parasites were highly macerated as a result of freezing. During preparations they have undergone almost complete disintegration, and were difficult to recognize in details.

Steringophorus furciger (Olson, 1868) – Fig. 4

There were encountered 19 parasites in 4 fishes with maximal infestation of one fish by 11 parasites.

Hemiurus levinseni Odhner, 1905 – Fig. 5

It belongs to the most frequently occurring parasites of the grey gurnard. It was found in 31% cases with intensity of 1–5 trematods per fish. Occurs mainly in stomach (68 fishes), while in the intestine of 4 fishes only.

Hemiurus luehei Odhner, 1905 – Fig. 6

Occurs more rarely than preceding species (incidence only 9% with intensity of 1–4 trematods) mostly in the intestine, but met in the stomach also.

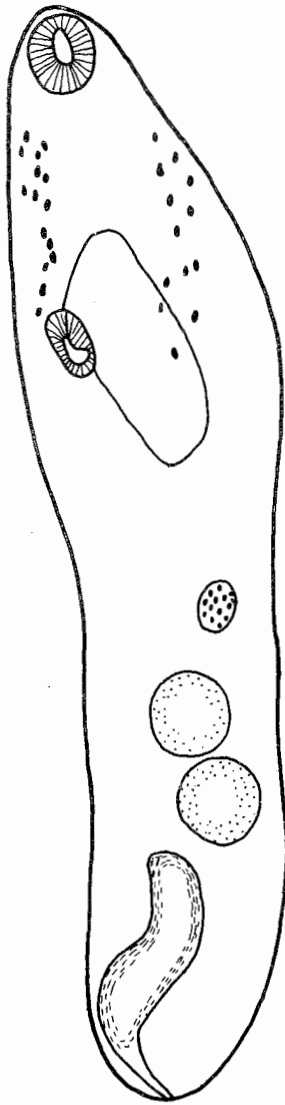


Fig. 2. *Bucephalopsis gracilescens*

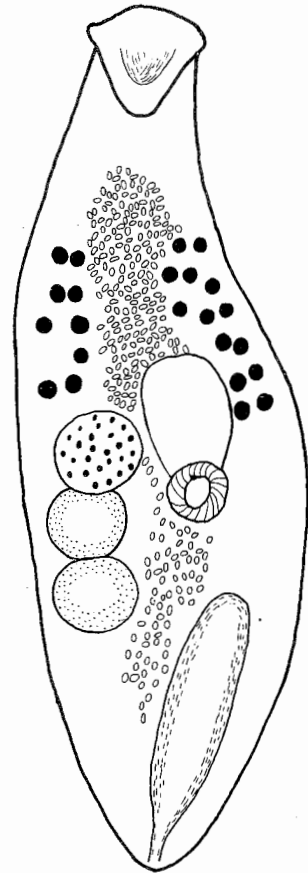
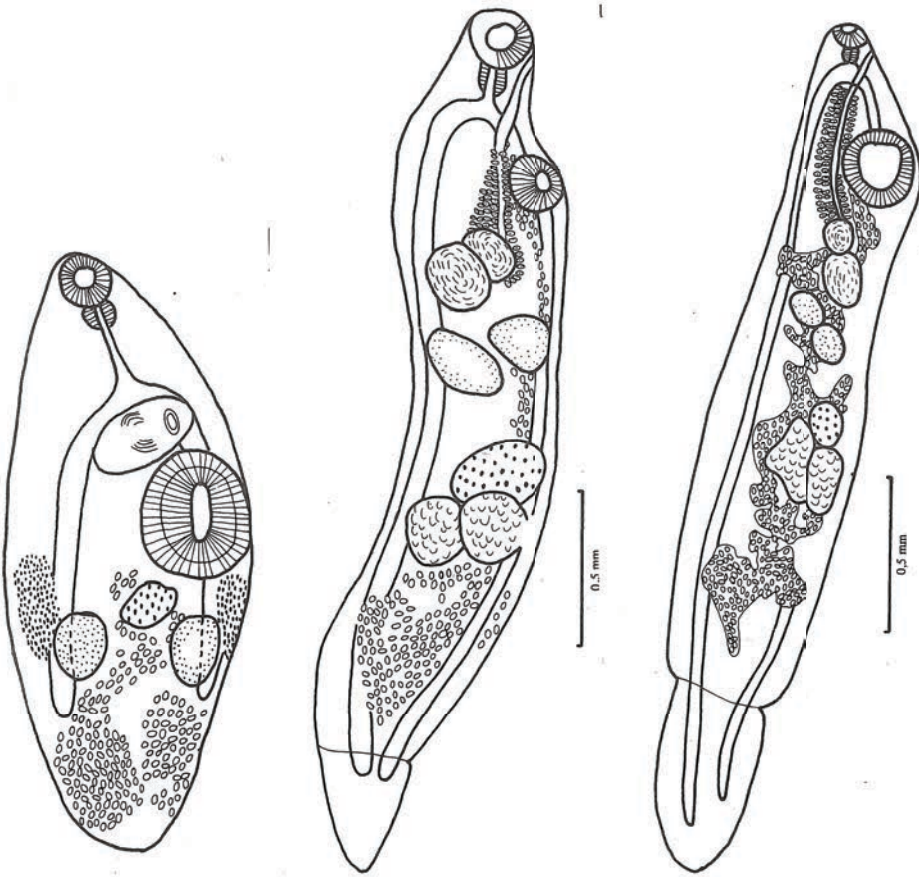


Fig. 3. *Rhipidocotyle galeata*

Fig. 4. *Steringophorus furcifer*Fig. 5. *Hemiurus levinseni*Fig. 6. *Hemiurus luehei**Derogenes varicus* (Müller, 1784) – Fig. 7

It is also common parasite of grey gurnard. It has been encountered in 19 fishes, in number of 1–5 specimens per one fish. It is occurring in the stomach exclusively.

*Nematoda**Thynnascaris adunca* (Rudolphi, 1802) – Fig. 8
(syn. *Contracoecum aduncum* (Rud., 1802))

The nematod belonging to common parasites of many species of fishes. In examined grey gurnards it was occurring at 70%. Those were larvae representing III and IV stage, almost exclusively found in the intestine, only few in the stomach. One adult specimen (female) was rather incidently met in the gill cavity. Number of parasites per one fish amounted up to 107 individuals. Stage III outnumbered 2.5 times stage IV.

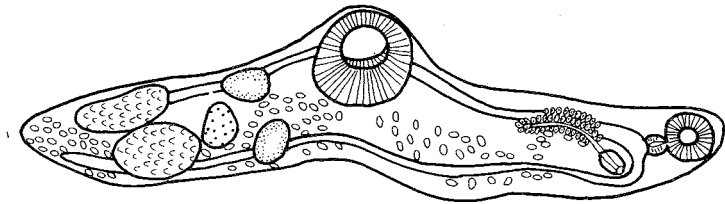


Fig. 7. *Derogenes varicus*

Anisakis simplex (Rudolphi, 1809) – Fig. 9

The species most frequently noted in the examined material. All surveyed fishes were infested by this parasite, and all parasites were in the larval stage III. They have occurred in the stomach walls, and in the body cavity, less frequently on the liver, on stomach, and gonads. Three specimens were met under peritoneum of body cavity. Intensity of infestation was 9–163 of nematods per fish. Mean intensity of population was 64.18. Totally, 6418 parasites were collected.

Capillaria sp.

In 7 fishes there were found fragments of 5–16 cm length being in a bad shape. It made closer identification impossible.

Copepoda parasitica

Brachiella obes (Krøyer, 1837) – Fig. 10

They were found on 10 fishes, maximally up to 6 individuals per one fish, attached to the gill arch appendages. They were sporadically met in the oral cavity. Females exclusively.

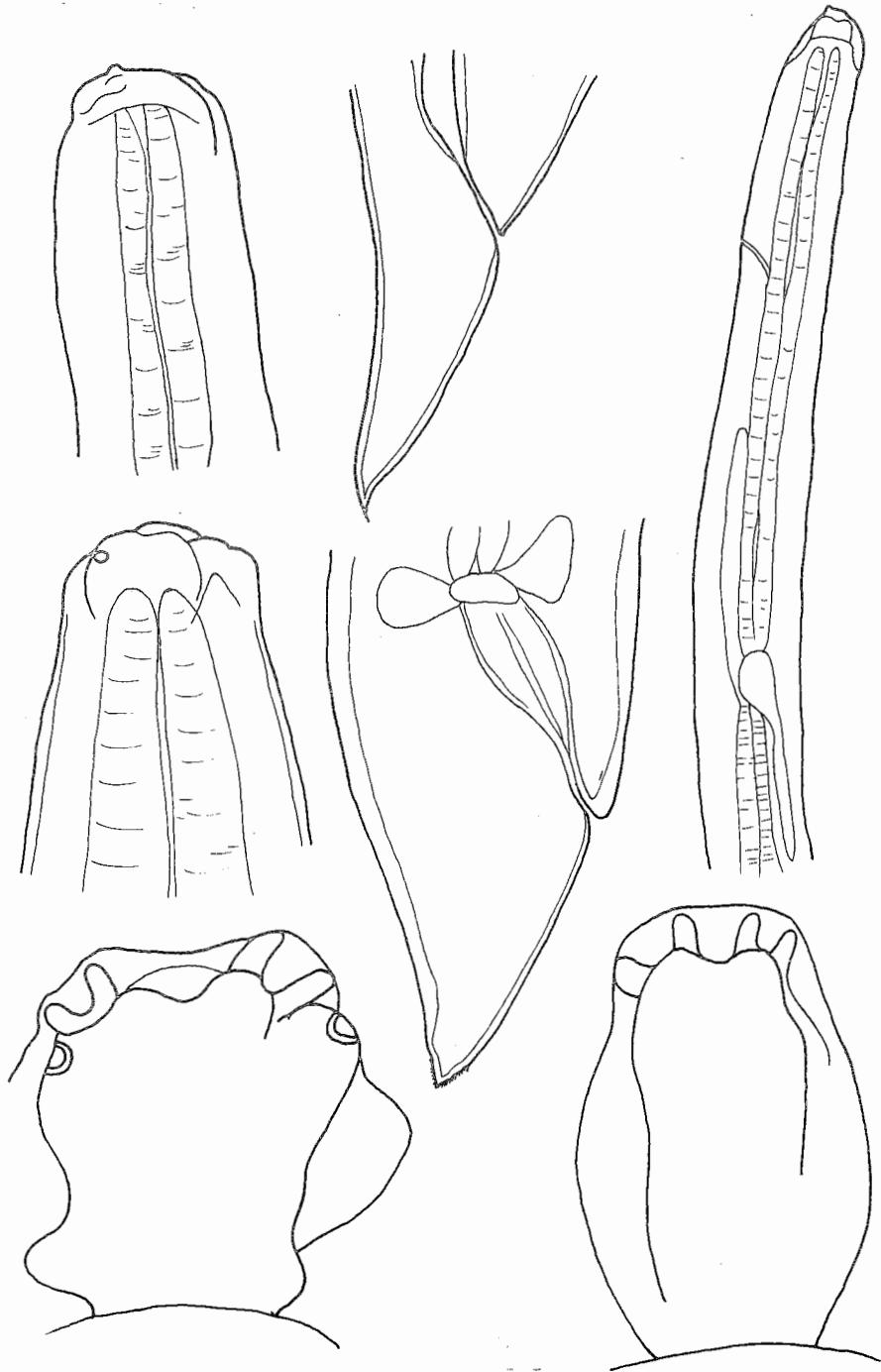


Fig. 8. *Thynnascaris adunca*. III-rd stage of larvae: a – anterior part, b – tail part, c – intestine; IV-th stage of larvae: d – anterior part, e – posterior part, f–g – labia of adult, f – dorsal view, g – latero-ventral view



Fig. 9. *Anisakis simplex*. III-rd stage larva: a – anterior part, b – posterior part, c – intestine

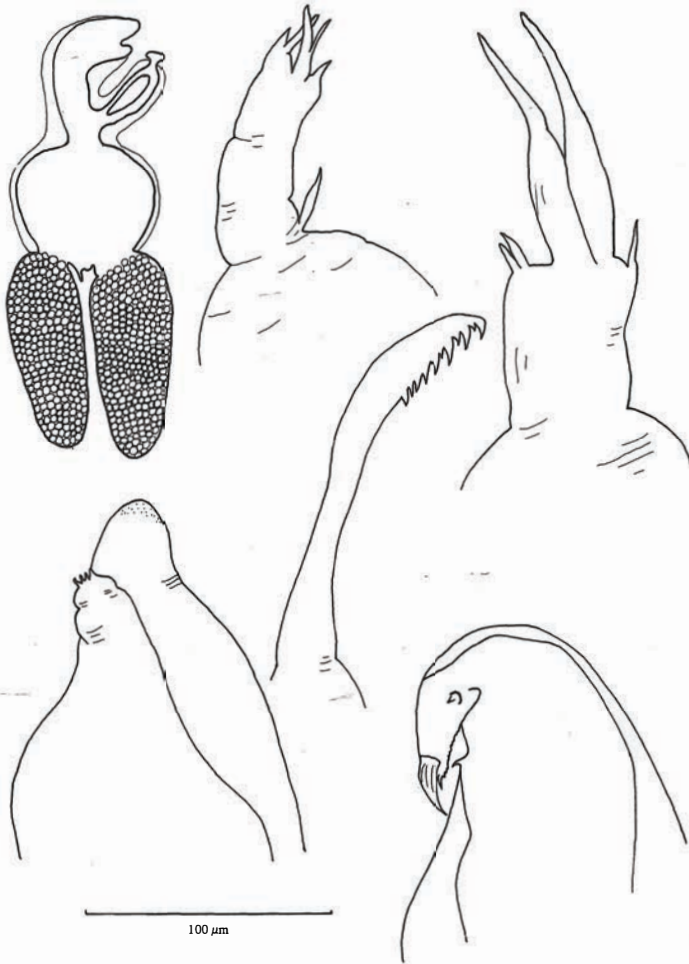


Fig. 10. *Brachiella obesa*. a—a total view of parasite, b — the 1st antenna, c — the 1st maxilla, d — the 2nd antenna, e — mandible, f — maxilliped

Fungi

Ichthyophonus hoferi (Plehn et Muslov, 1911)

Found at 88 fishes on the outside walls of intestines in the form of 2–3 mm cysts.

DISCUSSION

Totally, 14 species of parasites were found at grey gurnard, namely, 1 sp. of *Protozoa*, 1 sp. of *Cestoda*, 7 sp. of *Trematoda*, 3 sp. of *Nematoda*, 1 sp. of *Crustacea*, and 1 sp. of *Fungi*.

The least invasion rate show *Microsporidia*, *Grillotia erinaceus*, and *Lepidapedon* sp., and they could be treated as incidental parasites. But on the other hand, Ruszkowski (1934) considers *Trigla* sp. as second host of the intermediate tapeworm *Grillotia erinaceus*.

Trematods from *Lepidapedon* genus were noted on the different species of fishes from waters adjoining North Atlantic. Among others, Šulman and Šulman-Albova (1953) report about occurrence of this genus on 4 species of fishes (*Eleginus navaga*, *Gadus morhua*, *Boreogadus saida*, and *Gymnacanthus ventralis*) from White Sea, while Polianskij (1955) reports about it for only *Gymnacanthus tricuspis* from the Barents Sea.

Bucephalopsis gracitescens, *Sterigophorus furciger*, *Hemiurus luehei*, and *Capillaria* sp. were the rare parasites in the surveyed material. Their mean intensity of infestation of fish population, as well as incidence were relatively low.

Out of encountered species of trematods, the *Sterigophorus furciger* and *Bucephalopsis gracitescens* were relatively frequently reported from Atlantic Ocean. They have been found in Barents Sea (Polianskij, 1955), in Japan Sea, and Okhotsk Sea (Žukov, 1960). Along the coasts of Great Britain, Sweden, and Shetlands, *St. furciger* occurs mainly on fishes from families *Pleuronectidae* and *Cottidae*, as well as on eels, and members of *Liparidae* family (Koval, 1957), while *Bucephalopsis gracitescens* most frequently noted on fishes from *Gadidae*, *Lophidae*, and *Belonidae* family (Skrjabin and Gusanskaya, 1962). *Hemiurus luehei* is much more seldom reported in the literature. It occurs in Northeast Atlantic, North Sea and Baltic Sea, mainly in clupeoid fishes. Closer description of this species occurrence on *Salmonidae* is given by Ślusarski (1958).

Further four species: *Rhipidocotyle galeata*, *Hemiurus levinseni*, *Derogenes varicus*, and *Brachiella obesa* could be counted among more common parasites of the grey gurnard. Their incidence varied in limits 10–31% (Table 1). *Hemiurus levinseni* was most frequently noted among *Trematoda*. It is reported from a number of fish species (*Gadus morhua*, = *G. callarias*, *Eleginus saida*, *Moxycephalus scorpius*, *Clupea harengus*, *Phycis blennoides* and others (from coasts of the Northern Europe) Skrijabin and Gušanskaja, 1954; Poljanskij, 1955; Šulman and Šulman-Albova, 1953; Dollfus, 1953).

Similarly, so frequently cited in a literature are *Derogenes varicus*, and *Rhipidocotyle galeata*. Dollfus (1953) reports occurrence of first species on the grey gurnard from English coasts, while second is noted by Skrijabin and Gušanskaja (1962).

The larvae of nematods *Thynnascaris adunca* and *Anisakis simplex* may be regarded as very common parasites of the grey gurnard. Because of the pathogenicity of *Anisakis* for humans (J. Grabda, 1976a) necessary precautionary measures should be undertaken in the use of grey gurnard for consumption.

CONCLUSIONS

1. Parasitic fauna of the grey gurnard is differentiated qualitatively and quantitatively.
2. With regard to number of species the most numerous group is *Trematoda* – 7 species. On the other hand the strongest infestation was caused by *Nematoda* (on the average – 84 nematods per fish).
3. Such parasites as *Microsporidia*, *Grillotia erinaceus*, *Lepidapedon sp.* should be regarded as rather incidental.
4. The only parasite pathogenic for man is frequently occurring *Anisakis simplex*. With respect to ubiquitous occurrence of its larvae (in gonads, liver, and muscles especially), in the case of use of the gray for human consumption, all necessary prophylactic measures proposed in a literature should be applied.
5. Parasites: *Microsporidia*, *Bucephalopsis gracitescens*, *Lepidopedon sp.*, *Steringophorus furciger*, *Hemiurus levinsenii*, *Hem. huehei*, *Thynnascaris adunca*, *Anisakis simplex*, *Capillaria sp.*, and *Ichthyophonus hoferi* were not reported as occurring on grey gurnard up to date.

REFERENCES

- Agrawal V., 1964: On a Trematode, *Halicometra indica* n.sp. from the intestine of the Gurnard Fish, *Trigla gurnardus*.— Proc. helminth. Soc. 31, 2:216–318.
- Dollfus R.Ph. 1953: Parasites animaux de la Morue Atlantico-Arctique *Gadus callarias* L. (= *morhua* L.). Encyclopédie biologique, XLIII, Paris.
- Grabda J., 1974: Z inwazjologii *Anisakis simplex*. [From *Anisakis simplex* invasiology]. Annales Acad. Medicae Stetinensis, Suppl. 10:39–45.
- Grabda J., 1974a: The dynamics of the nematode larvae, *Anisakis simplex* (Rud.) invasion in the south-western Baltic herring (*Clupea harengus* L.).— Acta Ichthyol. et Piscat., IV, 1: 3–21.
- Grabda J., 1976: Studies on the life cycle and morphogenesis of *Anisakis simplex* (Rudolphi, 1809) (Nematoda: Anisakidae) cultured in vitro.— Acta Ichthyol. et Piscat., VI, 1: 119–141.
- Grabda J., 1976a: The occurrence of anisakid nematode larvae in baltic cod (*Gadus morhua callarias* L.) and the dynamics of their invasion.— Acta Ichthyol. et Piscat., VI, 1:3–22.
- Ruszkowski J.S., 1934: Etudes sur le cycle écolitif et sur la structure des cestodes de mer. III-e partie. Le cycle évolutif du Tétrahynque *Grillotia erinaceus* (Van Beneden, 1850).— Mém. Acad. pol. Sci. Ser. B:1–9.
- Janiszewska J., 1937: Das dritte und das vierte Larvalstadium von *Centraecocum* (Rud.) aus dem Darne der Flunder, *Pleuronectes flossus* L.— Bull. intern. Acad. pol. Sci., Ser. B:11–18.
- Margaritov N M., 1965: Nov paraziten nematod za Černo More.— Trudy Zool. Inst. Acad. Nauk SSSR, 35:137–139.
- Markowski S., 1933: Die Eingeweidewürmer der Fische des polnischen Balticums.— Archives d'Hydrobiologie et d'Ichthyologie, VII:1–58.
- Nunes-Ruivo L., 1957: Lernaeopodidae (Copepoda) parasites des trigles.— Rev. Portug. Zool. e Biol. Ger., 1, 1: 80–107.
- Parker R.R., 1965: A review and redescription of *Caligus gurnardi* Krøyer, 1863 (Copepoda Caligidae).— Crustaceana, 9, 1:93–103.

- Pogoreltseva T.P., 1952: Materjali do parazitofauni rib pivnicno-shidnej častini Černogo Morja. – Praci Inst. Zool. Acad. Nauk. Ukrainsk. SSR, 8:100–120.
- Poljanskij J., 1955: Materialy po parazitologii ryb severnych morej SSSR. Parazity ryb Barenčova morja. – Trudy Zool. Inst. Acad. Nauk SSSR, 19:5–170.
- Skrjabin K.I., i Gušanskaja L.H., 1954: Podotrjad Hemiurata (Markevitsch, 1951) Skrjabin et Guschanskaja, 1954 – in: K.I. Skrjabin: Trematody životnyh i čeloveka, IX:227–650.
- Skrjabin K.I. i Gušanskaja L.H., 1962: Otrjad Bucephalidida (Odening, 1960), Skrjabin et Guschanskaja, 1962. – in: K.I. Skrjabin: Trematody životnyh i čeloveka, XX:167–553.
- Skrjabin K.I. i Koval V.P., 1957: Semejstvo Fellodistomatidas Nicoll, 1913. – in: K.I. Skrjabin: Trematody životnyh i čeloveka, XIII:165:450.
- Ślusarski W., 1958: Formy ostateczne Digenea z ryb łososiowatych (Salmonidze) dorzeczca Wisły i pd. Bałtyku. [The adult Digenes from Salmonidae of the basin of the Vistula and of the South Baltic]. – Acta Paras.pol. 6: 447–728.
- Šulman S.S. i Šulman-Albova R.E., 1953: Parazity ryb Belogo Morja. Izdat. A.N. SSSR:1–197.
- Žukov E.V., 1960: Endoparaziticeske červi ryb Japonskogo morja i Južno-Kuril'skogo melkovodja. – Trudy Zool. A.N. SSSR, 28:3–166.

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PARAZYTOFAUNA KURKA SZAREGO *TRIGLA GURNARDUS* (L.)
Z ŁOWISK WYSP SZETLANDZKICH

Streszczenie

Przebadano 100 osobników kurka szarego *Trigla gurnardus* (L.) z Morza Północnego na łowiskach Wysp Szetlandzkich. Materiał pobierano z połowów przemysłowych w marcu 1976 biorąc do badania po kilka osobników z poszczególnych zaciągów. Były to osobniki o długości (l.c./l.t.) 22/27–41/48 cm i ciężarze 160–1100 g.

Materiał zamrażano i następnie po powrocie do pracowni badano. Wykonano pełne badanie parazytologiczne. Badano skórę, płetwy, jamę gębową, jamę skrzelową, mięśnie, jamę ciała i przewód pokarmowy.

Ogółem stwierdzono obecność 14 gatunków pasożytów: 1-Protozoa (*Microsporidia* sp.), 1-Cestoda (*Grillotia erinaceus*), 7-Trematoda (*Bucephalopsis gracilescens*, *Rhipidocotyle galeata*, *Lepidapedon* sp., *Steringophorus furciger*, *Hemiurus levinseni*, *H. luehei*, *Derogenes varicans*), 3-Nematoda (*Thynnascaris adunca*, *Anisakis simplex*, *Capillaria* sp.), 1-Copepoda parasitica (*Branchiella obesa*) i 1-Fungi (*Ichthyophonus hoferi*).

Po raz pierwszy stwierdzono występowanie u *Trigla gurnardus* następujących pasożytów: *Microsporidia*, *Bucephalopsis gracilescens*, *Lepidapedon* sp., *Steringophorus furciger*, *Hemiurus levinseni*, *Hemiurus luehei*, *Thynnascaris adunca*, *Anisakis simplex*, *Capillaria* sp., *Ichthyophonus hoferi*.

Z wymienionych patogeniczny dla człowieka *Anisakis simplex*.

Х. Дунец

ПАРАЗИТОФАУНА СЕРОГО ПЕТУШКА *TRIGLA GURNARDUS* L.
ВЫЛОВЛЕННОГО В РАЙОНЕ ШЕТЛАНДСКИХ ОСТРОВОВ

Резюме

Исследовали 100 особей серого петушка *Trigla gurnardus* L. выловленного в северном море в районе Шетландских Островов. Экспериментальный материал получали из промысловых уловов в марте 1976 года отбирая по несколько экземпляров из каждого траления. Были это особи длиной (l.c./l.t.) 22/27-41/48 см и весом 160-1100 гр. Материал замораживали и далее после возвращения в лабораторию проводили полное паразитологическое исследование. Исследовали кожу, плавники, ротовую и жаберную полости и пищевой тракт. В общем обнаружили 14 видов паразитов: 1-Protozoa *Microsporidia* sp., 1-Cestoda *Grillotia erinaceus*, 7-Trematoda *Bucephalopsis gracilescens*, *Rhipidocotyle galeata*, *Lepidapedon* sp., *Staringophorus furciger*, *Hemiurus lavinseni*, *H. luehei*, *Derogenes varicans*, 3-Nematoda *Thynnascaris adunca*, *Anisakis simplex*, *Capillaris* sp., 1-Copepoda *parasitica* *Branchiella obesa*, 1-Fungi *Ichthyophanus hoferi*.

Впервые обнаружили наличие у *Trigla gurnardus* следующих паразитов: *Microsporidia*, *Bucephalopsis gracilescens*, *Lepidapedon* sp., *Staringophorus furciger*, *Hemiurus levinseni*, *Hemiurus luehei*, *Thynnascaris adunca*, *Anisakis simplex*, *Capillaria* sp., *Ichthyophonus hoferi*. Из них *Anisakis simplex* является патогенным для человека.

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