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Parasitology

COLOBOMATUS GYMNOSCOPELI SP.N. (COPEPODA: PHILICHTHYIDAE),
A PARASITE OF LATERAL LINE SENSORY CANALS
OF *GYMNOSCOPELUS APHYA* GÜNTHER, 1873 (MYCTOPHIDAE)
FROM THE ANTARCTIC WATERS

COLOBOMATUS GYMNOSCOPELI SP.N. (COPEPODA: PHILICHTHYIDAE)
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GYMNOSCOPELUS APHYA GÜNTHER, 1873 (MYCTOPHIDAE)
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A new species, *Colobomatus gymnoscopei* is described; data on its location in the host species, *Gymnoscopelus aphyra* (Myctophidae), invasion incidence, intensity, and geographical distribution in the Antarctic waters are given.

The host specificity of the *Colobomatus* Hesse, 1873 species is discussed.

INTRODUCTION

Parasitic copepods of the family *Philichthyidae* are small animals measuring several millimeters and dwelling in the lateral line sensory canal system of marine fishes. Females are strongly altered and show a considerable degree of morphological generic variation, whereas dwarfed males are little changed compared to free-living forms and their

morphology is based on a plan common for all genera within the family *Philichthyidae*. Therefore Delamare-Deboutteville (1962) included the following genera to that family: *Philichthys*, *Sphaerifer*, *Lepophilus*, *Colobomatus*, *Lernaeascus*, *Sarcotaces*, and *Ichthyotaces*.

Yamaguti (1963), on the other hand, based his classification on the female body structure, leaving the first four genera only in the family discussed. He created a new family, *Lernaeascidae*, for the genus *Lernaeascus* and included the two families in the order *Philichthyidea* established by himself. The two remaining genera, *Sarcotaces* and *Ichthyotaces* are in his classification incorporated into a new order, *Sarcotacidea* with the family *Sarcotacidae*.

Studies by Izawa (1973, 1975) on the development of *Sarcotaces pacificus* and *Colobomatus pupa* cast a new light on the systematic position of the family *Philichthyidae* sensu Delamare-Deboutteville (1962). The author's cultures yielded 5 naupliar stages as well as the 1st free-living copepodite, the latter presumably invading fishes. The similarity between analogous stages of the two species corroborates, in Izawa's opinion, Delamare-Deboutteville's contention that both *Colobomatus* and *Sarcotaces* are members of the same family.

Moreover, structures of copepodite mouth parts in both *Sarcotaces* and *Colobomatus* are characteristic of *Poecilostoma* and similar to mouth parts of *Chondracanthidae*. Therefore, Izawa classifies the family *Philichthyidae* – as a closely related one to *Chondracanthidae* – within the *Cyclopoida Poecilostoma*.

The family *Philichthyidae* consists of about 40 species, of which 31 hitherto described species belong to the genus *Colobomatus* Hesse, 1873. Typical of those species is a very narrow host specificity: apart from but a few, each copepod species invades a different fish species so that the host species can serve as an additional character identifying the parasite, as already pointed out by Delamare-Deboutteville (1962).

Due to their small dimensions and location in closed canals of lateral line, the parasites can very easily be overlooked during dissection of fish for parasitologic purposes, this being presumably the reason for a relatively poor knowledge of this parasitic group.

The materials described herein were collected by the junior author who, when studying lanternfishes, observed the presence of parasites in cephalic sensory canals. When subject to a detailed examination, those parasites proved to belong to a new species, *Colobomatus gymnoscopeli* sp.n., the description of which is given below.

MATERIAL AND METHODS

The individuals of *Gymnoscopelus aphyia* Günther, 1873 (= *Lampanyctus nicholsi* Gilbert, 1911 = *Gymnoscopelus nicholsi* (Gilbert, 1911)) were caught on three Antarctic fishing grounds: off South Georgia (54°50'S, 34°45'W), Drake Passage (64°34'S, 64°50'W and 62°08'S, 62°15'W), and off the South Sandwich Islands (59°43'S, 31°58'W).

The fishes were obtained from pelagic fishing effected by a commercial krill trawl, often beyond the continental shelf, no individual being found in hauls from depths less than 30 m. In deeper layers, on the other hand, i.e., down to 300 m at night and to 600 m in the daytime, those fishes were more abundant than in overlying waters.

All samples were collected in the Antarctic waters, i.e., south of the Antarctic Convergence (Antarctic Polar Front). Individuals belonging to age groups 1–7, except for the group 3, missing in the material studied, were examined; fishes older than 7+ were missing, too. On the whole 142 individuals of *G. aphyra* were examined.

Additionally, in order to check if some other hosts could be found, other myctophid representatives from the same areas were examined:

<i>Protomyctophum tenisoni</i>	80 individuals
<i>P. anderssoni</i>	30 „
<i>P. bolini</i>	55 „
<i>Electrona antarctica</i>	102 „
<i>E. carlsbergi</i>	80 „
<i>Gymnoscopelus (Nasolychnus) fraseri</i>	80 „
<i>G. (Gymnoscopelus) opisthopterus</i>	7 „
<i>G. (Gymnoscopelus) braueri</i>	56
<i>G. (Gymnoscopelus) bolini</i>	3

Total 493 individuals

No *Colobomatus* parasites were found in the species listed above.

The fishes examined were caught in 1976 and 1977 during the 1st and 2nd Polish Antarctic Expeditions.

Cephalic sensory canals were examined in detail under a microscope to detect parasites' location; having removed the parasites found, fish heads with opened canals were rinsed in water, as a result of which a few additional males were obtained. Owing to their small size they are likely to be overlooked in mucus-filled canals. Dissections were performed on formalin-preserved fishes, therefore some details of the parasites' morphology were difficult to see.

A total number of 178 *Colobomatus gymnoscopeli* females and 12 males were found.

DESCRIPTION OF *COLOBOMATUS GYMNOSCOPELI* SP.N.

Syntypes: Six mature females and six males are held in senior author's collection.

Type locality: South Georgia, 54°50' S, 34°45' W.

Host: *Gymnoscopelus aphyra* Günther, 1873 (*Osteichthyes*, *Iniomi (Scopeliformes)*, *Myctophoidae*, *Myctophidae*) after Hureau and Monod, 1973) (Fig. 1).

Parasites were found only in adults older than 3 years.

Location on host: sensory canal system of fish lateral line, cephalic infraorbital and — more seldom — supraorbital canals. In one case a female was found in fish eye socket (Fig. 2).

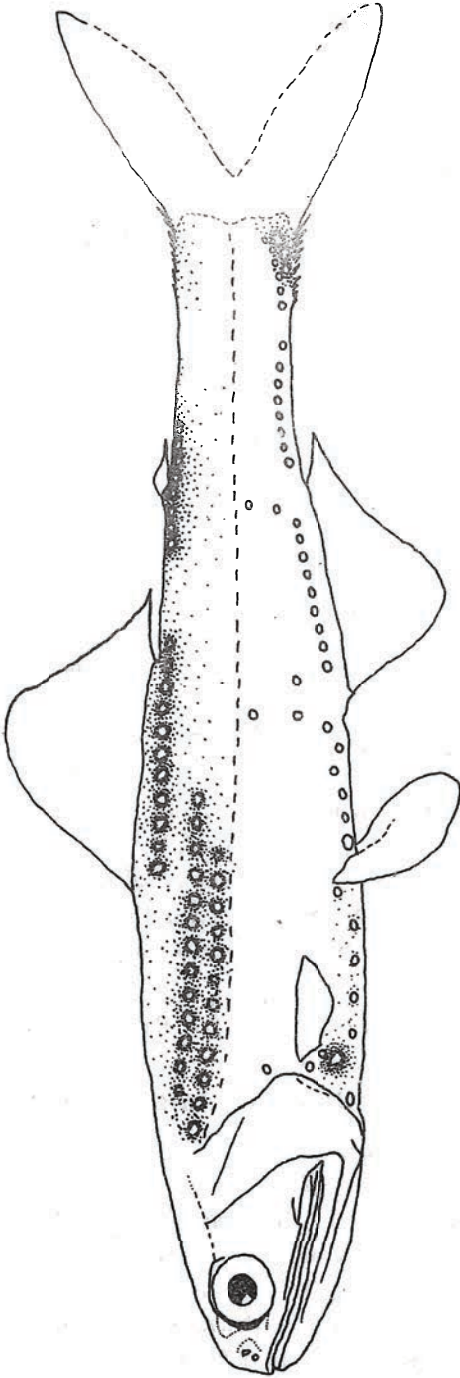


Fig. 1. *Gymnoscopelus aphyus* Günter, 1873. Female, 152 mm in standard length; South Sandwich Is.

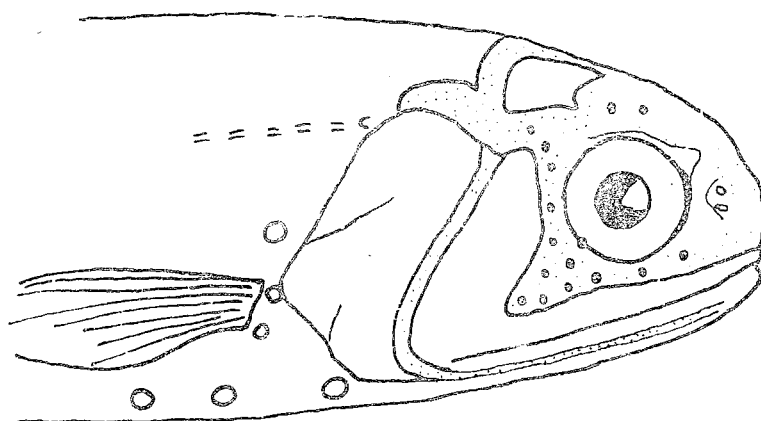


Fig. 2. Location of *Colobomatus gymnoscopeli* in cephalic sensory canals of *Gymnoscopelus aphyus*. Canals marked with small dots, parasites with bigger dots.

Parasites' ventral side always directed toward fish body. Most frequently, females were found in the widening part of the canal behind the eye, their heads directed to the eye; sometimes the position was reversed or parallel to the fish eye.

Locality: Antarctic — the Drake Passage region, South Georgia and South Sandwich (Fig. 3).

Degree of infestation (calculated from *C. gymnoscopeli* females found).

Invasion incidence was very high ranging within 60.4 – 100% depending on the area. Invasion intensity: 1–3 parasites in one fish individual; most often a female was found on each side of fish head (Table 1).

Table 1

Incidence and intensity of *Colobomatus gymnoscopeli* sp.n. females in the areas studied

	Drake Passage	South Georgia	South Sandwich	Total
No. of fishes examined	67	32	43	142
No. of fishes with 1 parasite	23	9	17	49 (34.5%)
No. of fishes with 2 parasites	31	23	9	63 (44.3%)
No. of fishes with 3 parasites	1	0	0	1 (0.7%)
No. of fishes infested	55	32	26	113
Invasion incidence	82.08%	100%	64.4%	79.5%

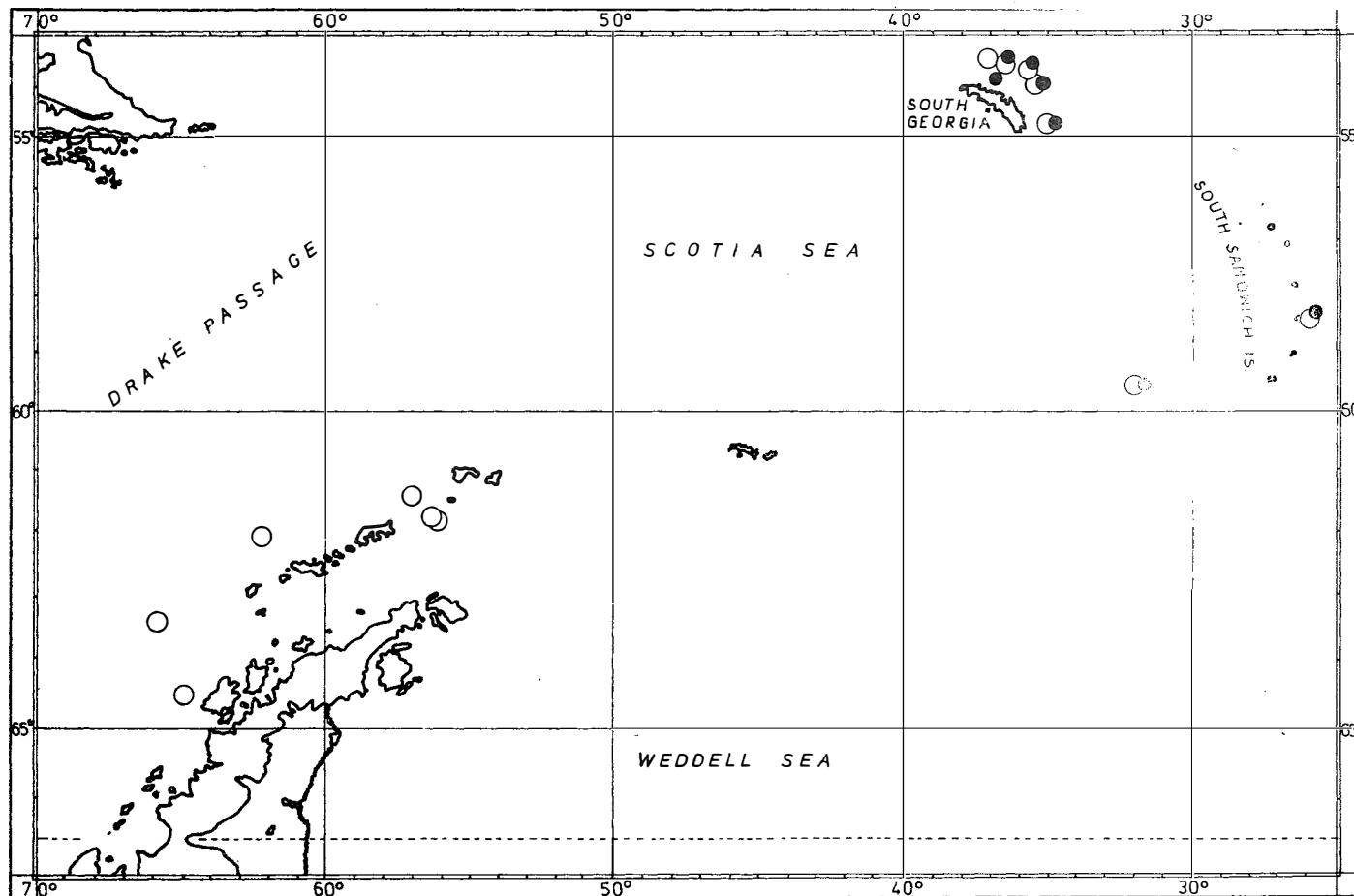


Fig. 3. Location of *Gymnoscopelus aphyra* catches from the 1st and 2nd Polish Antarctic Expeditions. Open circle indicates individuals larger than 79 mm, small solid dot indicates individuals less than 80 mm

Description of female (Figs. 4–5, 9–12)

Total length 2.3–4.16 mm; body length without furca and cephalic appendages 1.83–3.5 mm.

Body clearly segmented. In keeping with the *Colobomatus* body structure, 10 segments can be distinguished (Delamare-Deboutteville, 1962). Head fused with the first thoracic segment. On the top of head there is one pair of large, club-shaped cephalic lobes set fan-like. Next two thoracic segments (the second and third ones) form a kind of „neck“. The 4th and 5th segments fused into an egg-like widened thoracic part measuring 0.72–1.5 mm in length and 0.66–1.38 mm in width. On this part of thorax 2 pairs of dorso-lateral lobes of equal size are placed. 6th thoracic segment of much smaller diameter (0.41–0.66 mm). Abdomen consists of 5 segments, the first being genital. Two pairs of processes are placed on it: a pair of long, latero-ventral lobes and a pair of much smaller latero-dorsal lobes above the ventral ones. Egg sacs resting on female's dorsal side by dorsal processes. Egg sacs are very large; they extend, particularly so in large females, from initial thoracic lobes to the 4th abdominal segment. They are filled with a high number of spherical or somewhat oval eggs measuring 0.11 x 0.11 mm or 0.11–0.12 x 0.10 mm. Egg sacs usually fall off the female's body and lie loosely near it; it is quite often that singular eggs are seen scattered in the canals.

Abdominal segments gradually and slightly taper to the posterior body end. Two large lobes of caudal furca are seen on the last abdominal segment. At the end of each lobe two fine setae are visible, one seta each being placed on external sides of the lobes.

Formalin-preserved females are whitish or light-cream with brown intestine showing trough. The stomach part of intestine in the enlarged thoracic segment, when abundantly filled with food, forms an ample sac with crenulated walls.

Oviducts filled with eggs occupy the enlarged part of thorax and extend to the 4th abdominal segment.

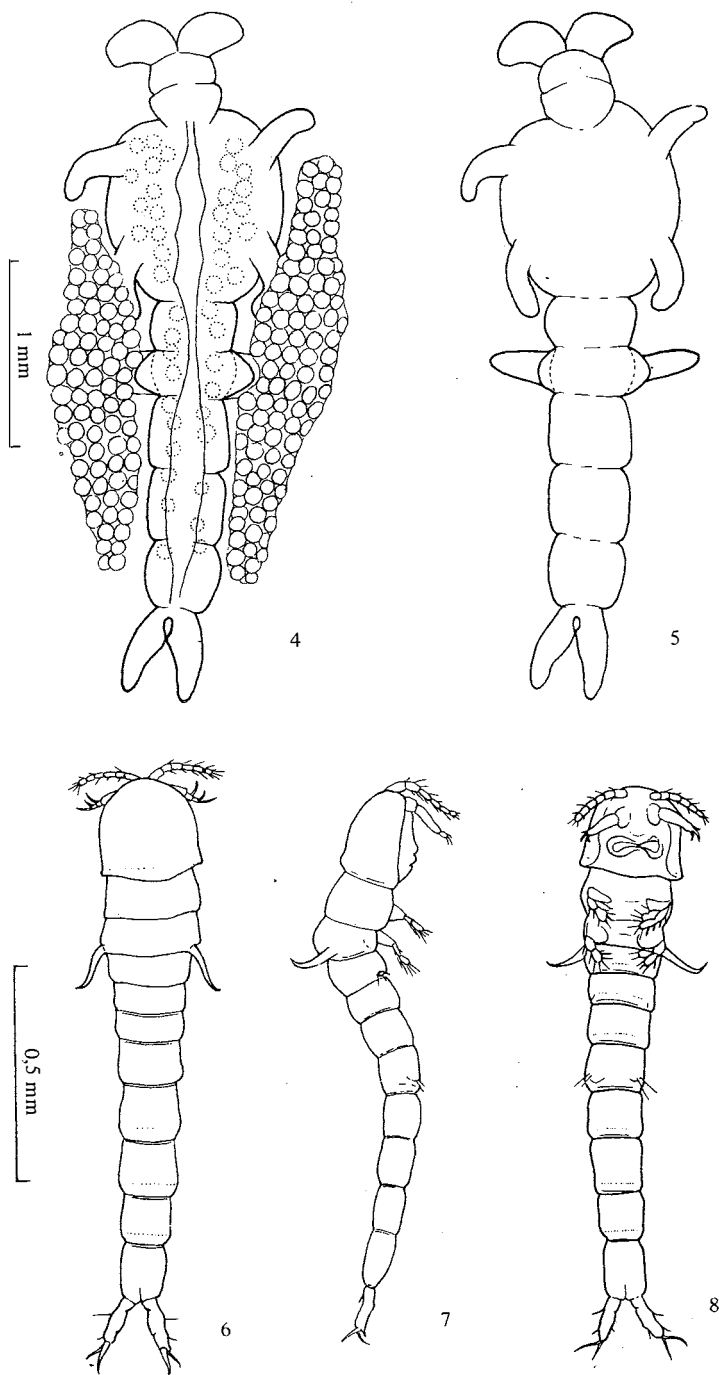
Cephalic and thoracic lobes, processes on genital segment as well as furcal lobes are very delicate, covered by a thin cuticle of a rugged surface with fine papillae; lobes ends blunt and rounded.

A pair of 1st antennae on the ventral side of head. They are four-jointed and covered with setae. 2nd pair of antennae missing altogether.

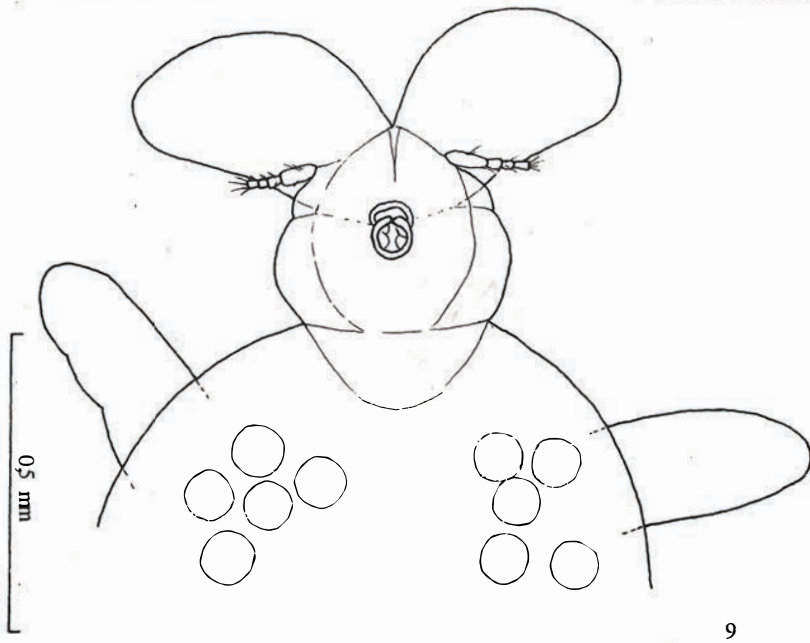
Buccal capsule on the second thoracic segment ventral side is formed by a strongly chitinised ring-like stroma supported dorsally by rods. Inside the mouth opening there are two pairs of mouth appendages: mandibles and maxillae. A mandible consists of a large base and two tweezers-like processes on top of it. Maxillae are 2-jointed; chewing surface of a small joint covered with fine setae; this joint is set on a large base together with a large centrally-directed bristle. Thoracic legs missing.

Description of male (Figs. 6–8, 13–19)

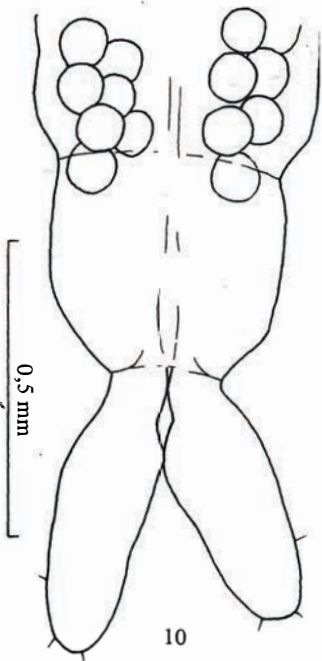
Total length (with furca) 1.27–1.34 mm; length without furca 1.17–1.22 mm; cephalothorax width 0.21–0.22 mm; width of terminal abdominal segment 0.1 mm, length of furca 0.10–0.12 mm.



Figs. 4–8. *Colobomates gymnoscopeli* sp.n. 4 – Female with egg sacs in dorsal view. 5 – The same individual without egg sacs. 6 – Male in dorsal view. 7 – Male in lateral view. 8 – Male in ventral view.

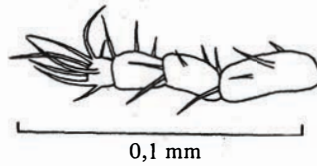


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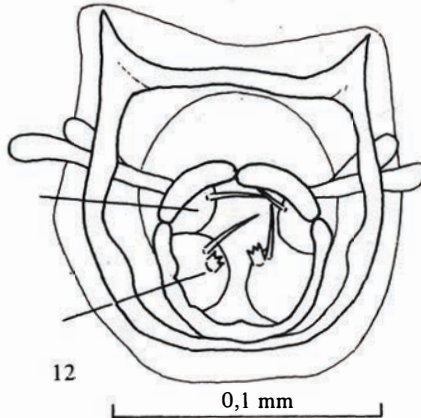


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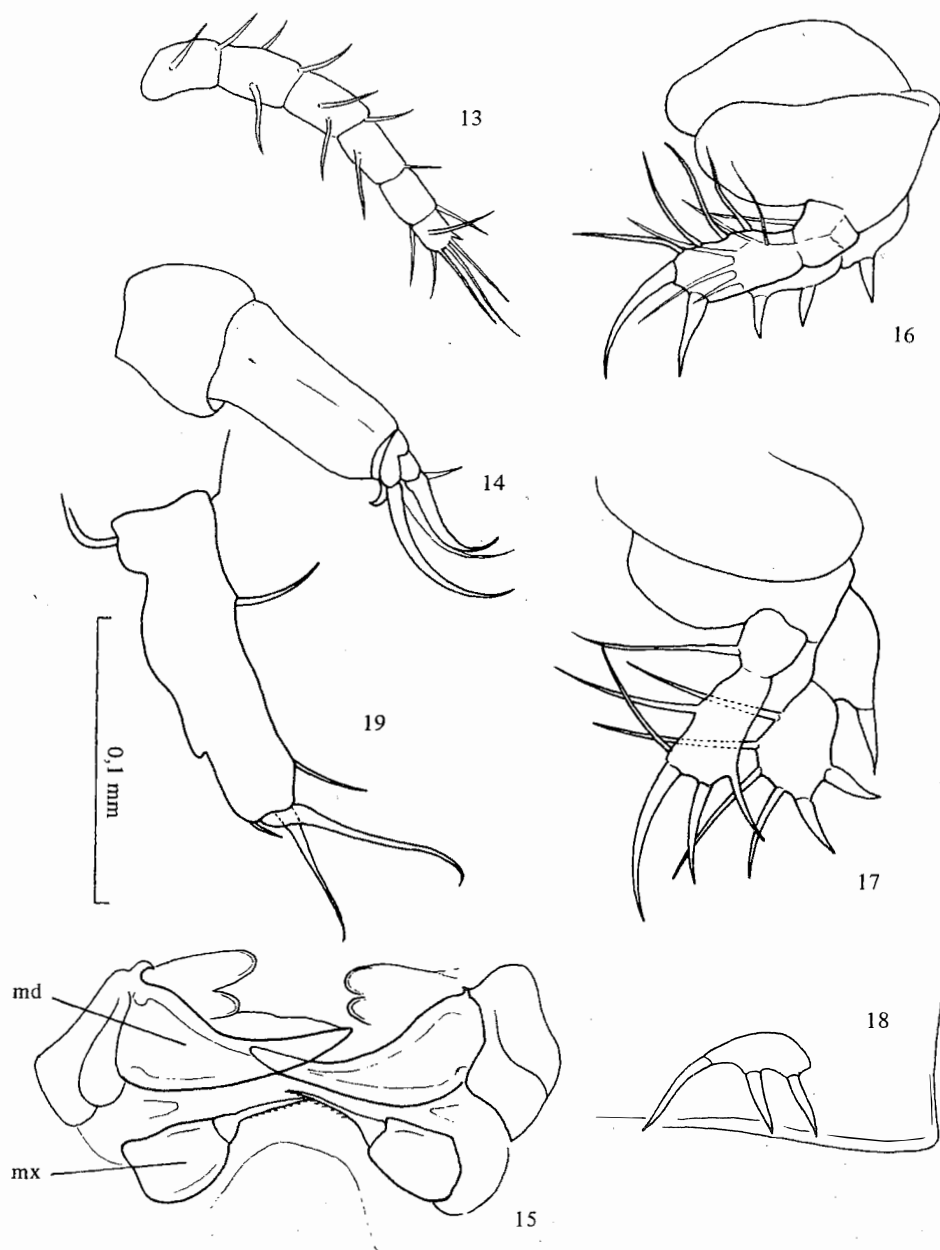
0,1 mm



12

0,1 mm

Figs. 9–12. *Colobomatus gymnoscopeli* sp.n. Female. 9 – Anterior body part in ventral view. 10 – Terminal part of abdomen with furca, in dorsal view. 11 – Right antenna in ventral view. 12 – Buccal capsule in ventral view (md = mandibula, mx = maxilla).



Figs. 13–19. *Colobomatus gymnoscopei* sp.n. Male. 13 – Left 1st antenna. 14 – Left 2nd antenna. 15 – Mouth parts. 16 – Left thoracic leg I. 17 – Left thoracic leg II. 18 – Left thoracic leg III. 19 – Left furcal lobe (md = mandible, mx = maxilla) Figs 13–19 drawn in the same scale, in ventral view.

Male body is colourless, transparent, clearly segmented, the segments gradually tapering. The body consists of cephalothorax incorporating the first thoracic segment, and of 10 free segments. The first five of those segments belong to thorax, the remaining five forming abdomen terminated with caudal furca.

A pair of rigid horn-like processes on the second free segment. They are attached to sides of the posterior edge of the segment and directed posteriorly and toward the dorsal surface of the segment. Due to their presence, the *Philichthyidae* males are very characteristic. Where the processes are attached to male body, the latter is characteristically curved dorsally to form a kind of "hump", particularly well-visible on a side view.

On the cephalothorax ventral side, two pairs of anterior antennae and mouth with two pairs of appendages, mandibles and maxillae, are observed. Typical biramous appendages are placed on the first and second free thoracic segments.

The 1st antennae are 6-jointed with thin, elongated, gradually shortening joints. Each joint is covered with the following number of setae: 2,3,3,2,2,5, respectively, beginning from the base.

The 2nd antennae are somewhat shorter, but much more stouter than those of the 1st pair, 5-jointed. The basal joint is short and broad, the second joint massive, slightly narrower but much longer than the basal one; 3 terminal joints are small and armed with a large curved hook each. Apart from large spines at the tip of each antenna, a small hook-like spine and seta are visible as well. Clearly, the 2nd antennae are attachment organs.

Mandibles consist of a single joint each and are a pair of strong "teeth" with their wide base and blunt, narrowing, centrally-directed ends. Behind the mandibles are 2-jointed maxillae, their terminal joints being elongated to form a spine, their proximal edge being covered with short setae.

Legs of the 1st and 2nd pairs are biramous. Protopodite 2-jointed, as are exo- and endopodites, armed with spines and setae as shown below:

	Exopodite				Endopodite			
	1st joint		2nd joint		1st joint		2nd joint	
	sp	se	sp	se	sp	se	sp	se
1st leg	1	0	3	4	0	1	2	4
2nd „	1	0	3	3	0	1	3	2

sp = spines

se = setae

On the ventral side of the third free segment there is one pair of legs reduced to one joint with 3 setae each.

At the posterior edges of the first abdominal segment there are two small bristles.

Each furcal lobe is armed with 5 bristles of which two biggest are placed on the end of the lobe. One of them is directed dorsally and another ventrally.

DISCUSSION

The *Colobomatus* are identified to species basing on morphology of females which, apart from the general characters typical of the genus, show a particularly wide variability in the structure of body processes. The *C.gymnoscopeli* female observed here differs from the remaining species in that it possesses a pair of large, club-like widening cephalic lobes set fan-like on the top of head. The other diagnostic character is the presence of two pairs of genital processes, one pair on the dorsal, the other on the ventral side. All the lobes have simple rounded terminal edges. Egg sacs very large, thoracic legs missing.

Males have so far been known in 6 species, namely: *Colobomatus agassizi*, *C.canthari*, *C.embiotocae*, *C.grubei*, *C.pupa*, and *C.sciaenae*. They are of the identical body structure, typical of the genus, the difference between lying presumably in their processes. Descriptions of males, however, are not sufficient enough to detect taxonomic differences between them.

So far, the most comprehensive and detailed descriptions exist for males of *C.embiotocae* (Noble, 1969) and *C.pupa* (Izawa, 1974), therefore both these species are referred to when analysing *C.gymnoscopeli* males. Similarly to *C.embiotocae*, the latter have 6- and 5-jointed 1st and 2nd antennae, respectively. Slight differences only exist in the number of setae. Thoracic appendages of the 1st and 2nd pair are very similar in the two species. Exo- and endopodite are identically armed in the two species, *C.gymnoscopeli* protopodite being 2-jointed instead of being 3-jointed as in *C.embiotocae*. Numbers of setae and spines on *C.pupa* thoracic appendages are markedly different from those in the species described, which cannot be fortuitous. Thoracic appendages of the 3rd pair reduced to papillae are armed in 3 spines only in both. *C.gymnoscopeli* and *C.pupa*, while 5 spines are seen in *C.embiotocae*.

The most striking difference is found in the mouth parts. In *C.gymnoscopeli* maxillipeds are missing as is also the case in *C.pupa*, those appendages being, however, found in *C.embiotocae* (Noble, 1969); moreover, the first two species possess uniramous 2-jointed mandibles as opposed to biramous ones in *C.embiotocae*.

HOST SPECIFICITY

As mentioned in the Introduction, the *Colobomatus* species display a very narrow host specificity (Table 2). Representatives of the genus infest the teleost fishes, (*Teleostei*), except for *C.lamnae* found in a shark, *Lamna cornubica*, belonging to a taxonomically remote sub-class of elasmobranchs (*Elasmobranchii*). Delamare-Deboutteville (1962) even suspected that an error in labelling could have been made.

Table 2

The *Colobomatus* species and their hosts

N o	Parasite species	Host species	Family	Geographic range	Author
1	2	3	4	5	6
1.	<i>Colobomatus lamnae</i> Hesse, 1873	<i>Lamna cornubica</i> (Gmel.)	<i>Lamnidae</i>	Brest, Finistère	Delamare-Deboutteville, 1962
2.	<i>C. agassizi</i> (Richiardi, 1877)	<i>Charax puntazzo</i> L.	<i>Characidae</i>	Mediterranean, Adriatic	" "
3.	<i>C. baraldii</i> (Richiardi, 1877)	<i>Sparus aurata</i> (L.)	<i>Sparidae</i>	Mediterranean	" "
4.	<i>C. benazzi</i> Delamare et Ruivo, 1952	<i>Sparus pagrus</i> L.	"	"	" "
5.	<i>C. bergyltae</i> Hesse, 1876	<i>Labrus bergylta</i> Ascan.	<i>Labridae</i>	Brest, Finistère	" "
6.	<i>C. canthari</i> (Rich.) Delamare et Ruivo, 1952	<i>Cantharus lineatus</i> Bernhard	<i>Sparidae</i>	Mediterranean	" "
7.	<i>C. collettei</i> Cressey, 1977	<i>Hemiramphus robustus</i> Günther	<i>Hemiramphidae</i>	Pacific	Cressey, 1977
8.	<i>C. denticis</i> (Richiardi, 1877)	<i>Dentex vulgaris</i> Cuv. Val.	"	"	Delamare-Deboutteville, 1962
9.	<i>C. doderleini</i> (Richiardi, 1883)	<i>Labrus merula</i> L.	<i>Labridae</i>	"	" "
10.	<i>C. edwardsi</i> (Richiardi, 1876)	<i>Serranus cabrilla</i> L.	<i>Serranidae</i>	Mediterranean	" "
11.	<i>C. embiotocae</i> Noble, Collar et Wilkes. 1969	<i>Cymathogaster aggregata</i> Gibbons	<i>Embiotocidae</i>	Pacific, off California	Noble et al., 1969

cd.tab. 2

1	2	3	4	5	6
		<i>Amphistichus argenteus</i> Agass.	<i>Embiotocidae</i>	Pacific, off California	Noble et al., 1969
		<i>A. koelzi</i> (Hubbs)	"	" "	" "
		<i>Embiotoca lateralis</i> Agass.	"	" "	" "
		<i>Hyperprosopon anale</i> Agass.	"	" "	Iverson, 1972
		<i>H. argenteum</i> Gibb.	"	" "	Noble et al., 1969
		<i>Hypsurus caryi</i> (Agass.)	"	" "	" "
		<i>Micrometrus minimus</i> (Gibb.)	"	" "	" "
		<i>Rhacochilus toxotes</i> Agass.	"	" "	" "
		<i>Rh. vacca</i> (Girard)	"	" "	" "
		<i>Zalembeus rosaceus</i> (Jord. et Gilb.)	"	" "	Iverson, 1972
12.	<i>C. exilis</i> Izawa, 1974	<i>Caprodon schlegeli</i> (Günther)	<i>Serranidae</i>	Japan	Izawa, 1974
13.	<i>C. fiatolae</i> (Richiardi, 1880)	<i>Stromateus fiatola</i> L.	<i>Stromateidae</i>	Mediterranean	Delamare-Deboutteville, 1962
14.	<i>C. fusiformis</i> Izawa, 1974	<i>Heniochus monoceros</i> Cuv. et Val.	<i>Chaetodontidae</i>	Japan	Izawa, 1974
15.	<i>C. goodingi</i> Cressey et Collette, 1970	<i>Ablennes hians</i> (Val.)	<i>Belonidae</i>	Atlantic, Pacific, Indian Oc.	Cressey and Collette, 1970
		<i>Strongylurus notata</i> (Poey)	"	" "	" "
		<i>S. marina</i> (Walb.)	"	" "	" "

1	2	3	4	5	6
		<i>S. timucu</i> (Walb.)	<i>Belonidae</i>	Atlantic, Pacific, Indian Oc.	Cressey and Collette, 1970
		<i>S. exilis</i> (Girard)	"	" "	" "
		<i>Tylosurus acus</i> (Lacép.)	"	" "	" "
		<i>T. crocodilus</i> (Peron et Lesueur)	"	" "	" "
16.	<i>C. grubei</i> (Richiardi, 1877)	<i>Diplodus annularis</i> (L.)	<i>Sparidae</i>	Mediterranean	Delamare-Deboutte- ville, 1962
17.	<i>C. gymnoscopeli</i> sp. n.	<i>Gymnoscopelus aphyia</i> Günther	<i>Myctophidae</i>	Antarctic	Grabda, Linkowski (present study)
18.	<i>C. haeckeli</i> (Richiardi, 1877)	<i>Brama rayi</i> Bl. Schn.	<i>Bramidae</i>	Mediterranean	Delamare-Deboutte- ville, 1962
19.	<i>C. labracis</i> Delamare et Ruivo, 1952	<i>Dicentrarchus lupus</i> (L.)	<i>Serranidae</i>	"	" "
20.	<i>C. lichiae</i> (Richiardi, 1877)	<i>Hypacanthus amia</i> (L.)	<i>Carangidae</i>	"	" "
		<i>Seriola dumerilii</i> (Risso)	"	"	" "
21.	<i>C. minimus</i> (Richiardi, 1877)	<i>Paracentropristis</i> <i>hepatus</i> (L.)	<i>Serranidae</i>	"	" "
22.	<i>C. muraenae</i> (Richiardi, 1877)	<i>Muraena helena</i> L.	<i>Muraenidae</i>	"	" "

cd. tab. 2

1	2	3	4	5	6
23.	<i>C. mylionus</i> Fukui, 1965	<i>Mylio macrocephalus</i> (Basilewsky)	<i>Sparidae</i>	Japan	Fukui, 1965
24.	<i>C. oblatae</i> (Rich.) Delamare et Ruivo, 1952	<i>Oblata melanura</i> (L.)	„	Mediterranean	Delamare-Deboutte- ville, 1962
25.	<i>C. pagelli</i> (Richiardi, 1877)	<i>Pagellus mormyrus</i> Cuv. <i>Pagellus erithrinus</i> Cuv.	„ „	„ „	„ „
26.	<i>C. pagri</i> (Rich., 1877)	<i>Pagrus pagrus</i> (Cuv. et Val.)	„	„	„
27.	<i>C. pupa</i> Izawa, 1974	<i>Pseudupeneus spilurus</i> (Bleeker)	<i>Mullidae</i>	Japan	Izawa, 1974
28.	<i>C. richiardi</i> (Valle, 1880)	<i>Salpa salpa</i> (Cuv.)	<i>Sparidae</i>	Adriatic	Delamare-Deboutte- ville, 1962
29.	<i>C. sciaenae</i> (Richiardi, 1876)	<i>Johnius umbra</i> (Bonap.)	<i>Sciaenidae</i>	Mediterranean	„
30.	<i>C. sieboldi</i> (Richiardi, 1877)	<i>Boops boops</i> (L.)	<i>Sparidae</i>	„	„
31.	<i>C. springeri</i> Cressey, 1977	<i>Cryptotrema corallinum</i> Gilbert	<i>Clinidae</i>	Pacific	Cressey, 1977
32.	<i>C. steenstrupi</i> (Richiardi, 1876)	<i>Mullus barbatus</i> L. <i>Mullus surmuletus</i> L.	<i>Mullidae</i> „	Mediterranean Adriatic Mediterranean	Delamare-Deboutte- ville, 1962

The remaining 30 species known to date were found mainly in perciform fishes (*Perciformes*) infested by 26 species, *Beloniformes* by 2 species, the *Anguilliformes*, and *Cypriniformes* yielding one species each.

Gymnoscopelus aphyra, the host of the newly described species discussed here, belong to the *Scopeliformes*. Thus, this is the first time that a *Colobomatus* species has been found in lanternfishes.

In most cases, each *Colobomatus* species parasitises one fish species, more seldom two related species. *C. embiotocae* is an exception in this respect since it is specific of the family *Embiotocidae*, having been found in 11 species of this family. Another exception is *C. goodingi* recorded from 7 belonid species. The highest number of *Colobomatus* species, 11, was found in sparids: 12 species of this family revealed the presence of parasites. (Table 3).

Table 3

Numbers of the *Colobomatus* species and their hosts in respective families and orders

Order	Family	No. of hosts species	No. of parasit. species
<i>Squaliformes</i>	<i>Lamnidae</i>	1	1
<i>Anguilliformes</i>	<i>Muraenidae</i>	1	1
<i>Scopeliformes</i>	<i>Myctophidae</i>	1	1
<i>Cypriniformes</i>	<i>Characidae</i>	1	1
<i>Beloniformes</i>	<i>Belonidae</i>	7	1
"	<i>Hemiramphidae</i>	1	1
<i>Perciformes</i>	<i>Serranidae</i>	4	4
"	<i>Carangidae</i>	2	1
"	<i>Bramidae</i>	1	1
"	<i>Sparidae</i>	12	11
"	<i>Sciaenidae</i>	1	1
"	<i>Mullidae</i>	3	2
"	<i>Embiotocidae</i>	11	1
"	<i>Labridae</i>	2	2
"	<i>Stromateidae</i>	1	1
"	<i>Chaetodontidae</i>	1	1
"	<i>Clinidae</i>	1	1

When studying Antarctic lanternfishes (*Myctophidae*), 9 species other than *Gymnoscopelus aphyra* were examined, all being caught in the same fishing regions, and no representatives of the genus *Colobomatus* were found (cf. "Materials and methods").

Geographic range of the genus *Colobomatus* is very broad. The species were found in fishes of the North Atlantic, Mediterranean and Adriatic Seas, in the Pacific off the California coast as well as in the Japanese waters. So far, they have been recorded in warm waters of the temperate zone as well as in tropical and sub-tropical regions, for

instance *C. goodingi* occurring in all the oceans between the 80°F (= 26.7°C) isotherms (Cressey and Collette, 1970). In the Antarctic, within the South Atlantic (South Georgia and South Sandwich) and partly Pacific (Drake Passage) sectors the genus *Colobomatus* was revealed for the first time.

SUMMARY OF RESULTS

Colobomatus gymnoscopeli sp.n. is a species new for science, specific of *Gymnoscopelus aphyia* (Myctophidae), and the only species of the genus found so far in the Scopeliform fishes.

This is also the first finding of the genus *Colobomatus* in the Antarctic waters.

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COLOBOMATUS GYMNOSCOPELI SP.N. (COPEPODA: PHILICHTHYIDAE)
PASOŻYT KANAŁÓW NARZĄDÓW ZMYŚŁOWYCH LINII NABOCZNEJ
GYMNOSCOPELUS APHYA GÜNTHER, 1873 (MYCTOPHIDAE) Z WÓD ANTARKTYCZNYCH

Streszczenie

W wodach Antarktyki (Cieśnina Drake'a, Płd. Georgia i Płd. Sandwich) znaleziono nowy gatunek pasożytniczego widłonoga *Colobomatus gymnoscopeli* sp.n. (Philichthyidae), pasożytującego w kanałach zmysłowych głowy ryb świetlikowatych *Gymnoscopelus aphyia* (Myctophidae).

Zbadano ogółem 142 ryby i stwierdzono ekstensywność inwazji 60,4%–100%, intensywność inwazji 1–3, najczęściej 2 samice u jednej ryby znajdujące się po jednej na obu bokach głowy ryby. Podano szczegółowy opis samic i samców pasożytów.

Ponadto zbadano 493 ryby należące do 9 gatunków rodziny *Myctophidae*, pochodzące z tych samych rejonów połowowych. *C.gymnoscopeli* znaleziono tylko na *Gymnoscopelus aphyia*, co wskazuje na bardzo wąską specyficzność gatunkową znalezionego pasożyta, podobnie jak to ma miejsce u innych gatunków rodzaju *Colobomatus*, których zestawienie podano w Tabeli 2.

Colobomatus gymnoscopeli jest pierwszym gatunkiem tego rodzaju stwierdzonym w rybach świetlikowatych rzędu *Scopeliformes*, jak również jest to pierwsze stwierdzenie rodzaju w wodach antarktycznych.

Badane ryby pochodzą z połowów I i II Polskiej Ekspedycji Antarktycznej w latach 1976 i 1977.

Я. Грабда, Т. Линковски

COLOBOMATUS GYMNOSCOPELI SP.N. COPEPODA: PHILICHTHYIDAE
ПАРАЗИТ КАНАЛОВ ОРГАНОВ ЧУВСТВ БОКОВОЙ ЛИНИИ
GYMNOSCOPELUS APHYA GÜNTHER, 1873 MYCTOPHIDAE
ИЗ АНТАРКТИЧЕСКИХ ВОД

Р е з ю м е

В водах Антарктики (пролив Дрейка, о-в Ю. Георгия, Ю. Сандвичевы острова) обнаружен новый вид паразитирующего веслоногого рачка *Colobomatus gymnoscopeli* sp. n. (Philichthyidae), атакующего сенсорные каналы головы рыб *Gymnoscopelus aphyia* (Myctophidae).

Были исследованы 142 рыбы, у которых экстенсивность инвазии составляла 60,4%–100%, интенсивность инвазии 1–3, чаще всего это были 2 самки, находящиеся по одной по обеим сторонам головы каждой рыбы. Приводится подробное описание самок и самцов паразитов.

Кроме того, исследовали 493 рыбы, относящиеся к 9 видам семейства *Myctophidae*, выловленные в одних и тех же районах.

C. gymnoscopeli обнаружили только на *Gymnoscopelus aphyia* что указывает на довольно ограниченную видовую специфику этого паразита. Подобная картина наблюдается и у других видов рода *Colobomatus*, указатель которых приводится в табл. II.

Colobomatus gymnoscorpei является первым видом, обнаруженным у рыб из отряда *Scorpeiformes*. Этот род в антарктических водах также был обнаружен впервые.

Исследуемые рыбы взяты из уловов I и II Польской Антарктической Экспедиции, которые состоялись в 1976 и 1977 гг.

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