

JERZY ROKICKI

Department of Zoology, Institute of Biology, University of Gdańsk,
ul. Czołgistów 46, 81-378 Gdynia, Poland

The ectoparasites (*Crustacea* and *Monogenea*) of *Brama raii* the shelf of North-West Africa

Monogenea i skorupiaki pasożytnicze *Brama raii*
północno-zachodniej Afryki

Abstract

ROKICKI J. 1981. The ectoparasites (*Crustacea* and *Monogenea*) of *Brama raii* from the shelf of North-West Africa. *Acta parasit. pol.*, 28, 85-90.

Examination of 2100 specimens of *Brama raii* revealed 6 species of ectoparasites, inhabiting the body surface, or the gill chamber. The highest incidence of infestation showed the copepod *Caligus pelamydis* (79.1%), then the monogenean *Winkenthughesia bramae* (24.6%) and *Gotocotyla acanthura* (23.4%), the lowest — *Isopoda: Nerocila cephalotes* (3.0%), *Lironeca* sp. (5.8%) and *Anilocra capensis* (0.04%). *B. raii* is a new host record for *N. cephalotes* and, perhaps, for *A. capensis*.

Brama raii occurs along the west coast of Africa, being common in the Mediterranean Sea, and it reaches the Iceland and the coast of Norway in the North Sea.

The *Monogenea* of this fish species were reported by DIESING 1850, PARONA and PERUGIA 1896, WILLIAMS 1959, SZUKS et al. 1975; the parasitic *Copepoda* — by BARNARD 1948, 1955 and STOCK 1959. Some unidentified parasitic *Isopoda* occurring on *B. raii* have been also recorded (KRZYWORĄCZKA, unpublished information). In the catches carried out by Polish fishing vessels this fish occurs rather seldom. The research vessel "Wieczno" in fishing on the shelf of North-West Africa between 5 February — 4 March 1970, achieved only 0.1% of *Brama raii* in a single haul. Similar results were obtained from catches carried out by "Kanaryjka" in autumn 1976 and in the summer-autumn season of 1977: this fish occurred rarely and amounted to a small proportion of the bycatch. The material presented in this paper was collected on the fishes from the latter catch.

Material and methods

Brama raii was caught in the fishing grounds of Cap Blanc (17°38'—17°30'W and 20°14'—20°43'N) at the depth of 90–120 m. The ectoparasites were collected partly from fresh, and partly from frozen fish specimens. The body surface of 2100, mainly fresh, specimens was examined. As well as the gill chambers and buccal cavities of 264 specimens, mainly frozen were also inspected for parasites. The total length of all the examined fishes was measured. *Copepoda* and *Isopoda* were fixed in 4% formalin, *Monogenea* in 75% alcohol.

Results

Monogenea

Winkenthughesia bramae (Parona et Perugia, 1896) Bychowsky, 1957

Location: gill filaments.

Incidence and intensity of infestation: cf. Table I.

The analysis of the occurrence of *W. bramae* in dependence on the fish length (Fig. 2) show that the specimens 36-40 cm long were infected most often (40%). With the increase of fish length, the number of infected specimens drops to attain 12.5% (fish length range of 46-50 cm).

Table I
The ectoparasites of *Brama raii* from the shelf the North-West Africa

Parasite	No. of fishes		Incidence %	Intensity	Number of specimens
	examined	infested			
<i>Monogenea</i>					
<i>Winkenthughesia bramae</i>	264	65	24.6	3.9	1-32
<i>Gotocotyla acanthura</i>	264	62	23.4	3.6	1-15
<i>Copepoda</i>					
<i>Caligus pelamydis</i>	264	209	79.1	11.2	1-186
<i>Isopoda</i>					
<i>Anilocra capensis</i>	2100	1	0.04	1	1
<i>Nerocila cephalotes</i>	2100	57(115)*	3(5.4)*	1.05	1-2
<i>Lironeca</i> sp.	264	11	5.8	1.09	1-2

*Fish specimens free from parasites but showing characteristic erosions of caudal fin.

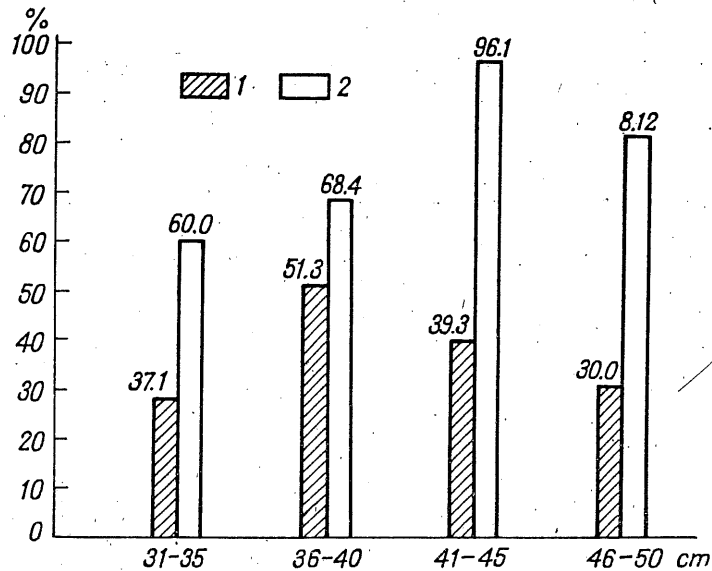


Fig. 1. The relations between the occurrence of ectoparasites and the total length of fish body:
1 - *Monogenea*, 2 - *Copepoda*

W. bramae
1896 from
parasites on
of Scotland,
shelf of No
to those des
sions of ce

Fig. 2. The

Maxi

Re

PARONA and
WILLIAMS (1957)
SZUKS et al. (1957)
Present ma

Gotoc

Locat

Incide

The p

The s

and PERI

Calig

Loca

Incid

The

length (

W. bramae seems to be a rare parasite. It was reported by PARONA and PERUGIA 1896 from *B. raii* in the Mediterranean Sea, by WILLIAMS 1959 who found three parasites on one specimen of *B. raii* (out of 10 examined) caught at the west coast of Scotland, and by SZUKS et al. 1975 on 19 *B. raii* (out of 28 examined) from the shelf of North-West Africa. The present specimens were morphologically similar to those described by the above-mentioned authors. Some differences in the dimensions of certain anatomical elements are shown in Table II.

1, 1896) Bychowsky, 1957

Table I.
in dependence on the fish length
were infected most often (40%).
infected specimens drops to attain

of the North-West Africa

es	Incidence %	Intensity	Number of specimens
65	24.6	3.9	1-32
62	23.4	3.6	1-15
09)	79.1	11.2	1-186
1	0.04	1	1
115)*	3(5.4)*	1.05	1-2
11	5.8	1.09	1-2

characteristic erosions of caudal fin.

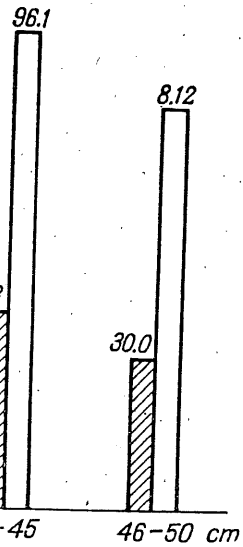


Fig. 2. The relations between the occurrence of *Monogenea* and the total length of fish body: 1 - *Gotocotyla acanthura*, 2 - *Winkenthughesia bramae*

Table II

Maximum dimensions and some other characters of *Winkenthughesia bramae* (in mm)

References	Body		Length of the peduncle	No. of genital hooklets
	length	width		
PARONA and PERUGIA (1896)	19.0	3.00	0.014-0.42.	32
WILLIAMS (1959)	17.05	3.51	0.28-0.37	34
SZUKS et al. (1975)	9.292	1.346	0.315	-
Present material	20.00	2.75	0.30-0.54	32-35

Gotocotyla acanthura (Parona et Perugia, 1896) Meserve, 1938

Location: gill filaments.

Incidence and intensity of infestation: cf. Table I.

The proportional share of infected fishes was similar in all size groups (Fig. 2).

The species is also known from *Brama raii* of the Mediterranean Sea (PARONA and PERUGIA 1896) and from the shelf of North-West Africa (SZUKS et al. 1975).

Copepoda

Caligus pelamydis Krøyer, 1866

Location: gill covers, rarely gill reakers and filaments.

Incidence and intensity of infestation: cf. Table I.

The incidence of infestation was found to grow with the decrease of the fish length (Fig. 1). The specimens 41-45 cm long were infected most often.

tes and the total length of fish body:
epoda

The morphology of the specimens under study corresponds with the description of this species given by SCOTT and SCOTT 1913 and MARKEVIČ 1956, but not exactly with the drawing made by YAMAGUTI 1963. The differences concern the shape of genital segment and the length of the setae of IVth pair of the legs. The males: females ratio was 1:7.

This species occurs on many fish species, including *B. raii* (STOCK 1959) in the Atlantic, the North, Mediterranean and Black, Seas, the Pacific Ocean (California and Hawaii), and in the waters of Australia and New Zealand as well.

Isopoda

Nerocila cephalotes Schioedte et Meinert, 1881

Location: fins, especially the caudal fin (Fig. 3). Some specimens had characteristic erosions at the base of the caudal fin, indicating the temporary dwelling of this parasite.

Incidence and intensity of infestation: cf. Table I.

These parasites were found on various fish species along the west coast of Africa, beginning from the Cape of Good Hope, and in the Mediterranean Sea.

The morphological characters of specimens under study correspond with the description given by SCHIOEDTE and MEINERT 1884 and MONOD 1924, although the gravid females collected from *B. raii* are a little longer than those reported by the quoted authors from the other fish species. In the material under study there were specimens resembling both forms: α and β , described by MONOD 1924. The present material only slightly differs from *N. maculata* Edwards, 1840. Moreover, the original descriptions of *N. cephalotes* and *N. maculata* Edwards, 1840. Moreover, the original descriptions of *N. cephalotes* and *N. maculata*, given by SCHIOEDTE and MEINERT 1884, and by Edwards 1840, respectively evidence their close resemblance, and the morphological features proposed by TRILLES 1975 as specific discriminants do not seem to be sufficient for distinguishing these two species. Therefore some doubts arise as to their real distinctness.

Anilocra capensis Leach, 1818

Location: pectoral fin.

Incidence and intensity of infestation: cf. Table I.

This species was recorded from many fish species on the shelf of North-West

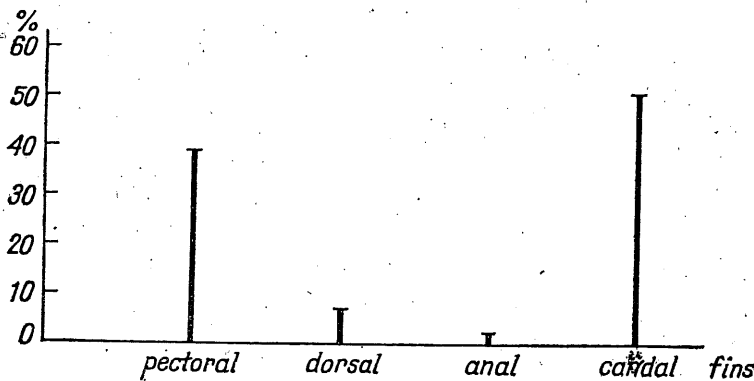


Fig. 3. The incidence of infestation of *Brama raii* with *Nerocila cephalotes* located on particular fins

Africa, species to *B.*

Lirc

Loc

Inci

Onl

collecte

In

cephal

as well

thughe

only. S

and F

Hatsch

the she

fish sp

Copepc

the ma

being 1

I w

to the d

part in

crews o

BARNAR

Soi

BARNAR

BYHOW

Mc

DIESING

KRZYW

Pra

MARKE

MONOD

fr.,

PARONA

Br

SCHIOEI

po

SCOTT

STOCK

SZUKS

noi

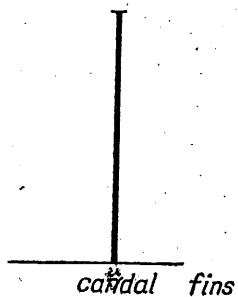
corresponds with the description MARKEVIČ 1956, but not exactly. Differences concern the shape of the legs. The males: females

living *B. raii* (STOCK 1959) in the Pacific Ocean (California) and New Zealand as well.

1
The specimens had characteristic the temporary dwelling of this

I.
along the west coast of Africa, the Mediterranean Sea. The present study correspond with the findings of MONOD 1924, although longer than those reported by the material under study there described by MONOD 1924. The species *Hatschekia acuta* Edwards, 1840. Moreover, *H. aculata*, given by SCHIOEDTTE, the evidence their close resemblance to *H. acuta* EDWARDS 1840 as specific discrimination of these two species. Therefore

e I.
on the shelf of North-West



phalotes located on particular fins

Africa, but not from *B. raii*. In the material under study only one specimen of this species was found, which strongly suggests that it has been accidentally transferred to *B. raii* from another fish species.

Lironeca sp.

Location: gill chamber.

Incidence and intensity of infestation: cf. Table I.

Only young males with the length of 6.5–11 mm and the width of 2–3 mm were collected. The antennae of 1st pair consist of 8 segments.

Discussion

In the available literature there are no reports on the occurrence of *Nerocila cephalotes*, and probably of *Anilocra capensis* on *Brama raii*. These two species as well as *Caligus pelamydis* show a wide host specificity in contrast with *Winkenthughesia bramae* and *Gotocotylo acanthura* which seem to be specific to *B. raii* only. South Africa BARNARD 1948, 1955 examining *B. raii* caught in Fish Hoek and False Bay at the level of the Republic of South Africa, recorded the copepod *Hatschekia acuta* Barnard, 1948 a parasite which has not been so far reported from the shelf of the North-West Africa. *Brama raii* is probably one of the heaviest infected fish species inhabiting that shelf. In the present study most often recorded were *Copepoda*, especially on the fishes 41–50 cm long (Fig. 1), then *Monogenea*, with the maximum of infestation on the specimens 36–40 cm long, the lowest incidence being noted for *Isopoda*.

Acknowledgements

I wish to express my gratitude to the Managers of Deep Sea Fishing Company "Gryf", especially to the directors, Mr. J. Baj and Mr. M. Jędrzejczyk, Directors, who made it possible for me to take part in the cruise to the shelf of North-West Africa. I am also deeply grateful to the Captains and crews of the vessels m/t "Kanaryjka", and m/t "Barakuda" for their kind help and friendliness.

REFERENCES

- BARNARD K. H. 1948. New records and descriptions of new species of parasitic *Copepoda* from South Africa. *Ann. Mag. nat. Hist.*, 12, 242–254.
- BARNARD K. H. 1955. South African parasitic *Copepoda*. *Ann. S. Afr. Mus.*, 41, 223–312.
- BYHOWSKI B. E. 1957. Monogenetičeskie soslaščiki ih sistema i filogenija. Izd. Akad. Nauk SSSR, Moskva–Leningrad, 509 pp.
- DIESING K. M. 1850. Systema helminthum. Vol. 1, Vindobonae, 679 pp.
- KRZYWORĄCZKA W. 1971. Charakterystyka *Brama rayi* (Bloch, 1791) Bloch et Schneider, 1801. Praca dyplomowa, WSR Szczecin.
- MARKEVIČ A. P. 1956. Parazitičeskie veslonogie ryb SSSR. Izd. Akad. Nauk USSR, Kiev, 259 pp.
- MONOD Th. 1924. *Isopoda*. In: Parasitologia Mauritanica. *Bull. Com. Étud. hist. scient. Afr. occid. fr.*, 365–445.
- PARONA C., PERUGIA A. 1896. Sopra due nuove specie di trematodi parassiti delle branchie del *Brama rayi*. *Atti Soc. ligust. Sci. nat. geogr.*, 7, 135–138.
- SCHIOEDTTE J. C., MEINERT F. 1884. Symbolae ad monographium cymothoarum crustaceorum isopodum familiae. II. *Anilocridae*. *Naturhist. Tidsskr.*, 14, 60–64.
- SCOTT T., SCOTT A. 1913. The British parasitic *Copepoda*. Vol. I, II, Ray Soc., London, 257 pp.
- STOCK J. H. 1959. New host and distribution records of parasitic *Copepoda*. *Bull. aquat. Biol.*, 1, 43.
- SZUKS H., KAMMAN U., BRANDT K. 1975. Zur Parasitierung von *Brama raii* Bloch, 1791 aus dem nordwestafrikanischen Schelfgebiet. *Wissenschaftliche Zeitschrift, Güstrow*, 2, 199–213.

- TRILLES J. P. 1975. Les *Cymothoidae* (*Isopoda*, *Flabellifera*) des collections du Muséum national d'Histoire naturelle de Paris. II. Les *Anilocridae* Schioedte et Meinert, 1881. Genres *Anilocra* Leach, 1818, et *Nerocila* Leach, 1818. *Bull. Mus. natn. Hist. nat., Paris, zool.*, 200, 303-346.
- WILLIAMS H. H. 1959. *Winkenthughesia bramae* (Parona and Perugia, 1896), a rare monogenetic trematode and a new record for the British Isles. *Ann. Mag. nat. Hist.*, 2, 551-559.
- YAMAGUTI S. 1963. Systema helminthum. Vol. IV. *Monogenea* and *Aspidocotylea*. Interc. Publ., New York and London, 699 pp.
- YAMAGUTI S. 1963. Parasitic *Copepoda* and *Branchiura* of fishes. Interc. Publ., New York; London and Sydney, 1104 pp.

STRESZCZENIE

Autor zbadał pod kątem występowania pasożytów skórnych 2100 okazów *Brama raii* z szelfu pn.-zach. Afryki. Z tego zbioru 264 ryby były badane z uwzględnieniem jamy skrzelowej i gębowej. Analiza zebranego materiału wykazała wysoką ekstensywność zarażenia przez pasożytnicze widłonogi (*Copepoda*) *Caligus pelamydis* (79,1%), mniejszą przez przywry monogenetyczne (*Monogenea*), *Winkenthughesia bramae* (24,6%) i *Gotocotyla acanthura* (23,4%) i niewielką przez pasożytnicze równonogi (*Isopoda*) *Nerocila cephalotes* (3%), *Anilocra capensis* (0,04%) i *Lironeca* sp. (5,8%). Analiza literatury wykazała, że *B. raii* jest nowym żywicielem dla *N. cephalotes* i przypuszczalnie *A. capensis*. Praca zawiera również analizę zależności pomiędzy ekstensywnością zarażenia a długością ryb, a także poszerza znajomość podstawowych cech morfologicznych *W. bramae*.