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Parasitology

ON SOME PROBLEMS RELATED TO THE OCCURRENCE
OF *PSEUDOBENEDENIA NOTOTHENIAE* JOHNSTON, 1931
(*MONOGENEA*, *CAPSALIDAE*, *TROCHOPODINAE*)
OFF THE SOUTH SHETLANDS

NIEKTÓRE ZAGADNIENIA ZWIĄZANE Z WYSTĘPOWANIEM
PSEUDOBENEDENIA NOTOTHENIAE JOHNSTON, 1931
(*MONOGENEA*, *CAPSALIDAE*, *TROCHOPODINAE*)
W REJONIE POŁUDNIOWYCH SZETLANDÓW

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Parasites of six *Notothenia* species were studied in 1979 at the Polish Academy of Sciences' H. Arctowski Station on the South Shetlands. Only two fish species, namely, *Notothenia coriiceps neglecta* and *N.rossi marmorata*, showed the presence of external parasites, *Pseudobenedenia nototheniae* Johnston, 1931.

A number of observations have been made on the parasite's morphology. Evidence in support of Gibson (1976) who regards *P.lauriei* Szidat, 1965 as synonymous with *P.nototheniae* Johnston, 1931 is given.

Introduction

Pseudobenedenia nototheniae Johnston, 1931 has been so far found to occur on several fish species of the genus *Notothenia*, namely on *N.microlepidota*, *N.microcephala*,

N.rossi, and *N.neglecta*. When studying *N.coriiiceps neglecta*, Szidat (1965) described a new species, *P.lauriei*. Gibson (1976), basing on his own studies, concluded that *P.lauriei* Szidat, 1965 was synonymous with *P.nototheniae* Johnston, 1931.

The research carried out at the Polish Academy of Sciences' H. Arctowski Station on the South Shetlands in 1979 included the parasitic fauna of numerous fish species of several families; among them there were six *Notothenia* species. The parasites found occurred mainly on *N.coriiiceps neglecta*. Since Szidat's materials had been obtained from the same fish species caught in the same geographic area off the South Shetlands, a possibility emerged to collect detailed data and check the justification of Gibson's (Gibson, 1976) decision to regard *P.lauriei* Szidat, 1965 and *P.nototheniae* Johnston, 1931 as synonyms. Such was the aim of the present work.

MATERIALS AND METHODS

Notothenia coriiceps neglecta, *N.rossi marmorata*, *N.gibberifrons*, *N.nudifrons*, *N.nybelini*, and *N.squamifrons atlantica*, yielded 248, 50, 40, 29, 3, and 2 individuals, respectively, to be examined. The first species' parasites were collected throughout the year, at least 20 individuals being examined each month. The remaining species were being caught throughout the year, too, but not on any systematic basis. Apart from the *Notothenia* species listed above, 17 other species belonging to the superfamily *Notothenioidei* were examined. Those included, i.e., *Trematomus bernacchii* (38 individuals), *T.hansoni* (28), *T.newnesi* (28), *Parachaenichthys charcoti* (2), *Harpagifer bispinis* (1), *Chaenocephalus aceratus* (21), and *Ch.gunnari* (23). Those species were also being caught throughout the year, but not on any systematic basis.

Out of all the species examined, only two (*N.corriiceps neglecta* and *N.rossi marmorata*) yielded parasites attached to the skin (250 and 1 specimens in the first and the other species, respectively), the remaining species being parasite-free.

The parasites were mounted for microscopic examination according to the generally used procedures, acidic, borax, and alum carmine staining being employed.

RESULTS

Observations on morphologic details of all the parasitic specimens collected proved them to belong to one species, *Pseudobenedenia nototheniae*, Johnston, 1931 (Fig. 1).

Description of the species

Body shape oval, more elongated in juveniles than in older individuals. Body length 3.90–11.5 mm; width 1.8–6.4 mm. Posterior body end (Fig. 2) provided with adhesive

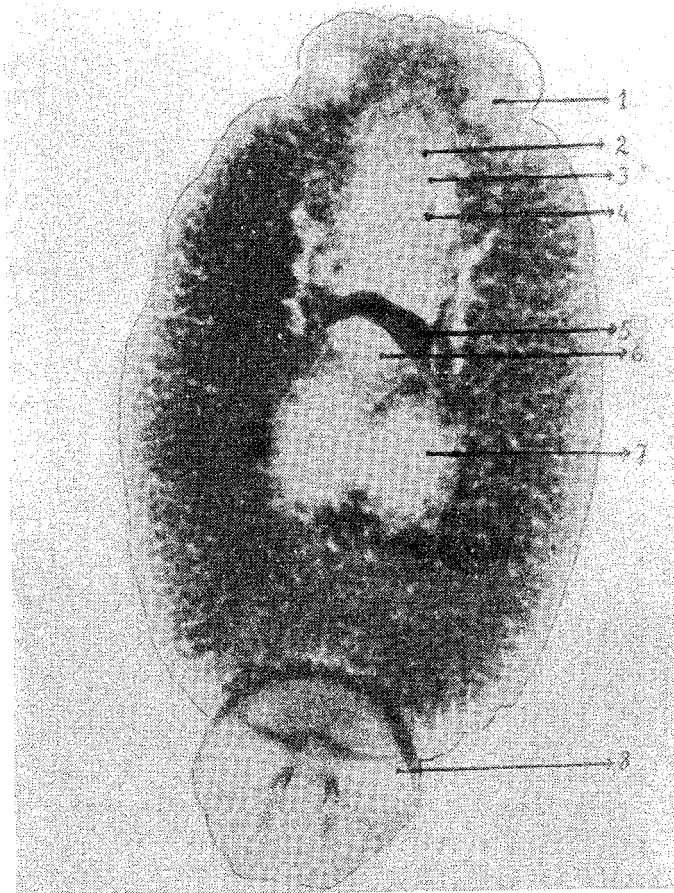


Fig. 1. 1. mouth glands, 2. pharynx, 3. cirrus sac, 4. uterus with egg, 5. main vitellar sac, 6. ovary, 7. testes, 8. adhesive plate with hooks (prohaptor)

organ (plate), clearly separated from the rest of the body and measuring 1.3–3.0 mm x 1.2–3.1 mm. The plate contains 3 pairs of hooks: anterior hooks measuring 0.25–0.45 mm, central hooks measuring 0.35–0.7 mm, and posterior hooks measuring 100–175 μ m. The membrane surrounding the edge of the plate contains 14 equidistantly distributed marginal hooks 10–11 μ m long. Muscle fibres inside the plate divide it into 6 chambers, the anterior one being the largest.

Paired testes measuring 0.5–1.85 mm x 0.4–1.45 mm are clearly lobated in adults, with a well-marked perforation; immature forms have oval testes without perforation. The vas deferens runs irregularly and forms several loops in the genital area. The cirrus sac is well developed, containing a well-visible prostatic reservoir, ejaculation duct, and prostatic glands.

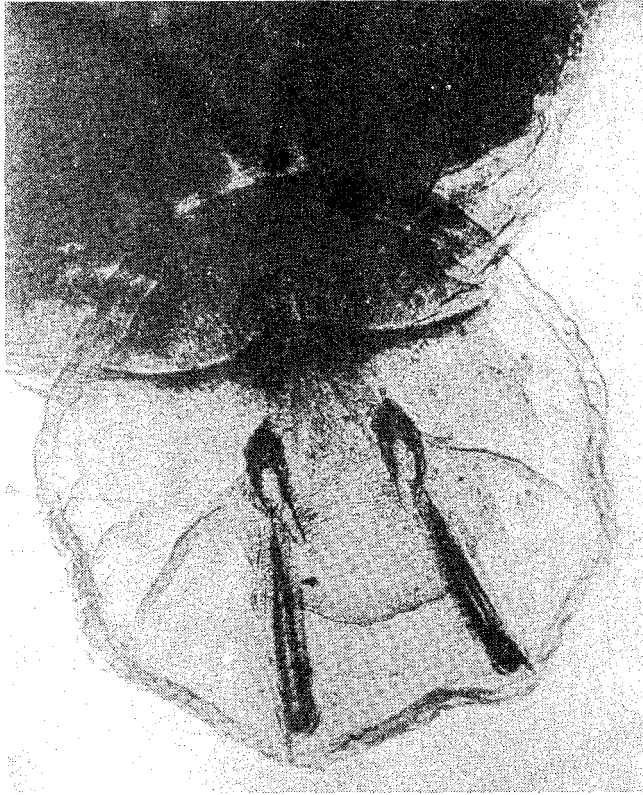


Fig. 2. Adhesive plate with three pairs of hooks.

Single ovary lies just in front of testes and measures 0.22–0.8 mm x 0.26–0.9 mm. Mature forms have in their uteri only one, fully developed, egg 220–230 μ m long.

Anterior part of the so-called mouth area is divided into 2 mouth lobes by an indentation, each lobe being equipped with a single mouth gland.

All the morphologic details given above as well as the topography of internal organs are typical for the species *Pseudobenedenia nototheniae* Johnston, 1931.

DISCUSSION

As described in the literature, several fish species of the genus *Notothenia* serve as hosts for *P. nototheniae* Johnston, 1931. Johnston (1931, 1937) described this parasitic species from *N. microlepidota* caught off the Antipods Island and from *N. magellanica* off the Macquarie Island; Johnston and Mawson (1953) found it in *N. microlepidota* off the Auckland Island. Dollfus and Euzet (1965) recorded *P. nototheniae* in *N. rossii* caught off

the Kerguelen Islands; subsequently Williams et al. (1973) and Gibson (1976) found the species discussed in *N. neglecta* off the South Orkney Islands and in *N. rossi* off the Kerguelens, respectively. Szidat (1965) described a new species, *P. lauriei* found in *N. coriiceps neglecta* caught off the South Shetlands. According to that author, *P. nototheniae* Johnston, 1931 and *P. lauriei* Szidat, 1965 differed in the following characters:

- a) the presence of an indentation between the mouth lobes in *P. lauriei* and the absence of this character in *P. nototheniae*,
- b) a shift of the so-called genital area to the left in *P. lauriei* relative to the position of that area in *P. nototheniae*,
- c) the absence of testicular lobes in *P. lauriei*.

Gibson (1976) felt that the above characteristics were partly incorrect and insufficient to separate a new species, the more so that Szidat had probably described his species from a single specimen only, and regarded *P. lauriei* to be synonymous with *P. nototheniae* Johnston, 1931.

Our observations on morphological characters of the parasite found in *N. coriiceps neglecta* are very similar to those given by Szidat (1965) for *P. lauriei*. Moreover, identical is the host species and the geographical region of the capture, off the South Shetlands. Our observations are also in agreement with descriptions, published by various authors, of *P. nototheniae* Johnston, 1931 found in various notothenioid fishes caught in different Antarctic regions. All that points out to the fact that the host species mentioned have housed one parasitic species only, *P. nototheniae* Johnston, 1931. Our sample materials were collected systematically over the year, which allowed to isolate and observe and observe various developmental stages of the parasite. The ranges of dimensions of various morphological structures typical of the species could be ascertained. The data collected in this way prove the incorrect adoption by Szidat of criteria evidencing the validity of *P. lauriei* as a new species. The lack of testicular lobes and the genital area shift to the left are variable characters related to the parasite's development. Our materials reveal that testicular lobes and perforation of the testes appear in older, sexually mature forms. Younger stages have oval testes lacking perforation, such as those probably observed by Szidat. The third character serving as a basis to erect a new species *P. lauriei* 1965 was the indentation between the mouth lobes, not observed by Johnston in *P. nototheniae* but described by other authors; the indentation was found in the present materials as well. All that leads to the conclusion that Gibson (1976) was right in regarding *P. lauriei* as synonymous with *P. nototheniae* Johnston, 1931.

In the present materials, *P. nototheniae* Johnston, 1931 was found to occur on skin of two fish species: *N. coriiceps neglecta* and *N. rossi marmorata*, 1 specimen only being found in the latter. Since *N. rossi marmorata* was being caught throughout the year, but not systematically, it is difficult to say if it is a permanent host for *P. nototheniae* Johnston, 1931.

According to Lawler (1981), *P. nototheniae* Johnston, 1931 has three hosts: *N. magellanica*, *N. microlepidota*, and *N. rossi*. However, other authors recorded the

parasite in numerous other species of the superfamily *Notothenioidei*. Hargis and Dillon (1968) found the parasite to occur on the body surface of *Trematomus bernachii*, while Gibson (1976) recorded it from *T.sp.*, *Parachaenichthys georgianus*, *Champsocephalus gunnari*, and *Harpagifer bispinis*. These facts would indicate a very weak host-specificity of *P. nototheniae*. Our studies do not confirm this finding as the parasite was found almost exclusively in *N. coriiceps neglecta*, in spite of the fact that all the above-mentioned fish species were examined by the present authors.

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NIEKTÓRE ZAGADNIENIA ZWIĄZANE Z WYSTĘPOWANIEM *PSEUDOBENEDENIA NOTOTHENIAE* JOHNSTON, 1931 (*MONOGENEA*, *CAPSALIDAE*, *TROCHOPODINAE*) W REJONIE POŁUDNIOWYCH SZETLANDÓW

STRESZCZENIE

W czasie badań prowadzonych na stacji PAN im. H. Arctowskiego na Południowych Szetlandach w 1979 roku, wykonano badania parazytologiczne wielu gatunków ryb należących do nadrodziny

Notothernioidei. Wyizolowane pasożyty pochodziły prawie wyłącznie z *Notothernia coriiceps neglecta* i stanowiły jeden gatunek – *Pseudobenedenia nototherniae* Johnston, 1931. Szidat (1965), dysponując tym samym gatunkiem ryby opisał nowy gatunek *Pseudobenedenia lauriei*. Gibson (1976) uznał *Pseudobenedenia lauriei* Szidat, 1965 za synonim *Pseudobenedenia nototherniae* Johnston, 1931, dysponując różnym od Szidata gatunkiem ryby, pochodzącej również z innego rejonu Antarktyki. Badania własne oparto o ten sam co Szidat gatunek ryby, pochodzący również z tego samego rejonu Południowych Sztetlandów, a więc zaistniała możliwość dokładnego rozważenia stanowiska systematycznego *Pseudobenedenia lauriei* Szidat, 1965.

Obserwacje własne potwierdziły słuszność zaliczenia przez Gibsona (1976) gatunku *Pseudobenedenia lauriei* Szidat, 1965 jako synonimu *Pseudobenedenia nototherniae* Johnston, 1931.

Лютницка А., Здзитовецки К.

НЕКОТОРЫЕ ВОПРОСЫ СВЯЗАННЫЕ С НАЛИЧИЕМ PSEUDOBENEDENIA
NOTOTHERNIAE JOHNSTON, 1931 (MONOGENEA, CAPSALIDAE, TROCHOPODINE)
В РАЙОНЕ ЮЖНЫХ ШЕТЛАНДОВ

Р е з ю м е

Во время паразитологических исследований, производимых в 1979 г. на Станции Польской Академии Наук им. Г. Арктовского, расположенной на территории Южных Шетландов, испытывались многие виды рыбы из семейства *Notothernioidei*. Выделенные паразиты почти исключительно найдены у *Notothernia coriiceps neglecta*. Они представляли собой один вид – *Pseudobenedenia nototherniae* Johnston, 1931. Szidat (1965) описал новый вид паразита *Pseudobenedenia lauriei*, выделенный из того же вида рыбы. На основании исследований другого вида рыбы, происходящего из других районов Антарктики Gibson (1976) *Pseudobenedenia lauriei* Szidat (1965) признал синонимом *Pseudobenedenia nototherniae* Johnston, 1931. В настоящих исследованиях пользовались таким же, как Szidat видом рыбы, происходящей также из того же района Южных Шетландов, что способствовало подробному рассуждению систематической принадлежности *Pseudobenedenia lauriei* Szidat, 1965.

Наблюдения проведенные авторами подтвердили мнения Gibson'a (1976), что вид *Pseudobenedenia lauriei* Szidat, 1965 представляет собой синоним *Pseudobenedenia nototherniae* Johnston, 1931.

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