Occurrence of *Pseudodactylogyrus anguillae* (Yin & Sproston, 1948) and *P. bini* (Kikuchi, 1929), parasites of eel, *Anguilla anguilla* L., in Austria
(Monogenea: Dactylogyridae)

M. Gelnar*, T. Scholz**, I. Matejusová*, R. Konecny***

Abstract
First records of *Pseudodactylogyrus anguillae* and *P. bini* (Monogenea), parasites of eels, from Austria are reported.

Key words: *Anguilla anguilla*, parasites, Monogenea, *Pseudodactylogyrus anguillae*, *Pseudodactylogyrus bini*, first record, Austria.

Zusammenfassung
Die Aalparasiten *Pseudodactylogyrus anguillae* und *Pseudodactylogyrus bini* (Monogenea) konnten erstmalig für Österreich nachgewiesen werden.

Introduction

The dactylogyrid monogeneans *Pseudodactylogyrus anguillae* (Yin & Sproston, 1948) and *P. bini* (Kikuchi, 1929) are specific parasites of eels (*Anguilla* spp.), originally described from *Anguilla japonica* Temming & Schlegel, 1848 (Kikuchi 1929, Yin & Sproston 1948). According to Gussev (1985), both species initially occurred in *A. japonica* and *A. reinhardtii* Steindachner, 1867, in Japan, China, and Australia. However, recent data by Kennedy (1993) and Cone & Marcogliese (1995) cast doubts about this assumption with some indications that at least *P. anguillae* may be autochthon in Europe and North America. Due to the fact that both monogeneans are rather pathogenic to their hosts and can cause mortality of heavily infected eels, they have attracted the attention of fish parasitologists and veterinarians since their appearance in Europe. *Pseudodactylogyrus* species have hitherto been reported from eels (*Anguilla anguilla* L.) in the Soviet Union, Germany, Poland, Denmark, Sweden, England, France, Spain, Portugal, Italy, and Hungary (Koie 1988a, b, 1991, Malmberg 1989, Reimer 1987, Kennedy & Fitch 1990, Lambert & al. 1985, Le Brun & al. 1986, Saroglia & al. 1985, Saraiya 1995, Mellergaard & al. 1986, Nie & Kennedy 1991, Sanchez & al. 1992, Dzika &...
Fig. 1 - 8: Hard parts of *Pseudodactylogyrus bini* (1, 3, 5, 7) and *P. anguillae* (2, 4, 6, 8). (1, 2) haptoral parts; (3, 4) vaginal armament; (5, 6) copulatory organ; (7, 8) marginal hook.

al. 1995, Golovin 1977, Molnár 1983, 1984). Most detailed studies, which covered epidemiology, host-parasite relationships, ecology, immunology of infected hosts, etc., have been published by Buchmann (1988a, b, c, 1989, 1990, 1993), Buchmann & Bjerregaard (1990), and Buchmann & al. (1987) in Denmark. This paper briefly surveys the occurrence of *P. anguillae* and *P. bini* in Austria, from where this pathogenic parasite has not been reported until now.

**Material and method**

As a basis for the present study, monogeneans were collected from 9 eels (42 - 79 cm) from the Ischler Ache, a brook in the lake district in Upper Austria (13. October 1994) and from 141 eels (total length 10 - 69 cm) from the Neusiedler See, a shallow lake 100 km SE of Vienna (during April, August and October 1995). In all cases only gills of the left side of the gill apparatus of the host fish were examined.

Tab. 1: Measurements of hard parts of *P. anguillae* and *P. bini* (in µm) from Neusiedler See.

<table>
<thead>
<tr>
<th></th>
<th><em>P. anguillae</em> (n = 50)</th>
<th><em>P. bini</em> (n = 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>inner length of anchor</td>
<td>100 - 126</td>
<td>67 - 80</td>
</tr>
<tr>
<td>outer length of anchor</td>
<td>64 - 82</td>
<td>36 - 48</td>
</tr>
<tr>
<td>length of point</td>
<td>28 - 50</td>
<td>22 - 35</td>
</tr>
<tr>
<td>length of inner root</td>
<td>52 - 73</td>
<td>35 - 48</td>
</tr>
<tr>
<td>length of reflexed part of inner root</td>
<td>39 - 52</td>
<td>24 - 35</td>
</tr>
<tr>
<td>length of outer root</td>
<td>7 - 15</td>
<td>9 - 14</td>
</tr>
<tr>
<td>total length of marginal hook</td>
<td>15 - 19</td>
<td>16 - 20</td>
</tr>
<tr>
<td>length of connective bar</td>
<td>9 - 16</td>
<td>9 - 13</td>
</tr>
<tr>
<td>width of connective bar</td>
<td>50 - 64</td>
<td>42 - 54</td>
</tr>
<tr>
<td>length of copulatory organ</td>
<td>91 - 139</td>
<td>98 - 155</td>
</tr>
<tr>
<td>length of supporting part of copulatory organ</td>
<td>29 - 47</td>
<td>39 - 60</td>
</tr>
<tr>
<td>length of copulatory tube</td>
<td>191 - 254</td>
<td>191 - 250</td>
</tr>
<tr>
<td>length of vaginal armament</td>
<td>33 - 42</td>
<td>25 - 41</td>
</tr>
</tbody>
</table>
Results

Examination of eels revealed the presence of both monogenean species *P. anguillae* and *P. bini* (Fig. 1, Tab. 1). In the Neusiedler See, 83 of 141 eels examined were infected with *P. bini*, mean intensity of infection being 6 (SD 7.3; range: 1 - 52 worms). In the Neusiedler See 94 of 141 host fish were infected with *P. anguillae*, mean intensity being 7 (SD 8.9; range: 1 - 57 worms). In the Ischler Ache 7 of 9 eels were infected with *P. bini*, mean intensity being 125 (SD 147.7; range: 3 - 363). No specimens of *P. anguillae* were found parasitizing eels of the Ischler Ache.

In Central Europe, *Pseudodactylogyrus* species have been found in eels from Hungary (MOLNÁR 1983, 1984) and the Čzech Republic (Dr. Radim Ergens, Institute of Parasitology, Czech Acad. Sci., České Budějovice, unpublished data). The present findings demonstrate that these parasites occur also in natural lakes and brooks.

Acknowledgements

The authors are indebted to Prof. Dr. A. Herzig, director of the Biological Station in Illmitz, and to Dr. A. Jagsch, director of the Fisheries Institute in Scharfling, for enabling parasitological examination of eels, and wish to thank Dr. B. Skoriková for providing necessary literature and Dr. H. Sattmann for critical discussion of the manuscript.

References


Buchmann, K. 1989: Relationship between host size of *Anguilla anguilla* and the infection level of the monogeneans *Pseudodactylogyrus* spp. – Journal of Fish Biology 35: 599-601.


KOIE, M. 1988a: Parasites in European eels Anguilla anguilla from Danish freshwater, brakish and marine localities. – Ophelia 19: 92-118.

KOIE, M. 1988b: Parasites in eels, Anguilla anguilla (L.), from eutrophic Lake Esrum (Denmark). – Acta Parasitologica Polonica 33: 89-100.


