

The First Record of *Piscicola fasciata* Kollar, 1842 (Hirudinea: Piscicolidae) from Serbia, with Recommendations for Sampling

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Abstract: Between early December 2016 and late February 2017, we examined catfish (*Silurus glanis*) in Serbia to find the fish leech *Piscicola fasciata* Kollar, 1842. On December 26, 2016, we collected eight specimens from the head area of one catfish. As far as we know, this is the first published record of *P. fasciata* in Serbia and for the middle section of the Danube River. The finding of this fish leech species in Serbia resulted from a targeted search with the cooperation of a local angler. Since *P. fasciata* cannot be detected with traditional leech sampling methods, we provide recommendations on how this species may be successfully sampled and monitored in cooperation with recreational anglers.

Key words: elusive species, fish leech, *Piscicola fasciata*, catfish, *Silurus glanis*, Serbia

Introduction

The detection and monitoring of species and their populations, and the mapping of their distribution range are important elements in studying ecological and conservation requirements (e.g. CARO & O'DOHERTY 1999, MARTIN et al. 2007). However, some species (e.g. elusive species) are difficult to sample due to their morphological and behavioural characteristics, and (or) are difficult to locate (THOMPSON 2004); this may often be related to the lack of appropriate sampling methods. Consequently, in the case of these species, it is difficult to estimate their population sizes and their ecological requirements, which are crucial elements in establishing conservation practices (e.g. BRUSSARD 1991).

The fish leech species *Piscicola fasciata* Kollar, 1842 is a semi-constant parasite on the catfish, (*Silurus glanis* L., 1758) (BIELECKI et al. 2011); occasionally, single individuals have been found on the zope (*Abramis ballerus* L., 1758), the vimba (*Vimba*

vimba L., 1758), and the nase (*Chondrostoma nasus* L., 1758) (LUKIN 1976). *P. fasciata* detaches from the host only for the reproduction/egg-laying period (NESEMANN & NEUBERT 1999). This species of fish leech is distributed in Central and Eastern Europe in the tributaries of the Caspian Sea, Black Sea, Sea of Azov and Baltic Sea (SKET 1968, NESEMANN 1997, NESEMANN & NEUBERT 1999, BIELECKI 1997, BIELECKI et al. 2011). Despite its relatively wide distribution range, *P. fasciata* is considered to be rare because of sporadic records over a relatively long time span, ranging from the end of the 19th century (ÖRLEY 1886) up to this study (Table 1).

The southernmost finds of *P. fasciata* in Europe were recorded by SKET (1968) near Zagreb (Croatia) in the Sava River and by CRISTEA & MANOLELI (1977) in the Danube River delta (Romania, Fig. 1). The absence of *P. fasciata* was apparent on the new checklist of leech fauna in Serbia (GROSSER et al.

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Table 1. Detailed information about records of *Piscicola fasciata* Kollar, 1842 in Central and Eastern Europe gained from previously published studies. Records are listed chronologically.

| Water | Geographic location | No of leech per catfish | Date of records | Source |
|----------------|------------------------------------|-------------------------|---|-------------------------------|
| Tisza | Csongrád (Hungary) | 3/1 | NA | ÖRLEY (1886) |
| Thaya | NA (Czech Republic) | several/more than one | Spring, year NA | LUCKÝ & DYK (1964) |
| Nida | Pińczów and Stary Korczyn (Poland) | 57/2 | September, 1968 | PAWŁOWSKI & JAŹDŹEWSKA (1970) |
| Mierzawa | Pińczów (Poland) | 43/2 | September, 1969 | PAWŁOWSKI & JAŹDŹEWSKA (1970) |
| Danube | Delta (Romania) | 13/1 | 15.07.1974 | CRISTEA & MANOLELI (1977) |
| Duna Dolna | Kotliny Kłodzkiej (Poland) | 1/1 | 25.05.1976 | BIELECKI (1977) |
| Biebrza | Osowiec (Poland) | 3/1 | 24.05.1977 | BIELECKI (1978) |
| Bug | Podlasie (Poland) | 43/NA | 09.01, 15.09, 01.12.1982; 20.11.1983 | DANILKIEWICZ (1981) |
| Krzna | NA (Poland) | | 15.02.1984 | BIELECKI (1997) |
| Biebrza | Osowiec (Poland) | 40/1 | 27.02.1985 | BIELECKI (1997) |
| Thaya | Hohenau (Austria) | 1/1 | 08.03.1991 | NESEMANN (1994) |
| Thaya | Bernhardtshal-Hohenau (Austria) | many/1 | Summer 1991 | NESEMANN (1994) |
| Thaya | Hohenau (Austria) | 5/1 | 10.10.1993 | NESEMANN (1994) |
| Danube | Haid (Austria) | 1/1 | 28.09-01.10.1993 | NESEMANN (1994) |
| Danube | Osterhofen (Germany) | 1/1 | 28.09-01.10.1993 | NESEMANN (1994) |
| Danube | Pleinting (Germany) | 1/1 | 28.09-01.10.1993 | NESEMANN (1994) |
| Latorica | Brehov (Slovakia) | 34/1 | 04.07.2003 | KOŠEL & KOŠČO (2006) |
| Schweriner See | Paulsdamm (Germany) | 1/1 | March, 2005 | JUEG (2013) |
| Don | Staraya Kalitva (Russia) | 3/1 | 22.11.2011 | PODBEREZNY et al. (2015) |
| Volga | Teplichny (Russia) | 29/1 | 17.01.2015 | PODBEREZNY et al. (2015) |
| Danube | Bogojevo (Serbia) | 9/1 | 26.12.2016 | Present study |

2014). Previous studies suggested that the distribution of this leech species is related to the distribution of catfish (KOŠEL & KOŠČO 2004). Therefore, our aim was to conduct a purposeful search of *P. fasciata* in Serbia in cooperation with a local angler. Furthermore, based on available literature, we present details of previous findings on the distribution range of this species, and we offer recommendations for sampling.

Materials and Methods

In the period between December 1, 2016, and February 28, 2017, we had the opportunity to examine catfish for *P. fasciata*. In these three months, the angler caught 33 catfish near Bogojevo (NW Serbia), where the water depth of the Danube varied between approximately 8 and 13 m. The sizes of the catfish ranged from 67 cm (2.4 kg) to 198 cm (41.0 kg). In this study, we examined catfish exclusively. The specimens of *P. fasciata* were preserved in 70% alcohol. The identification was carried out according to NESEMANN (1997) and NESEMANN & NEUBERT

(1999). From previously published studies, the records of *P. fasciata* with available detailed information were presented in Table 1 and Fig. 1, while those with no available details were excluded from Table 1 but were listed in the text and marked in Fig. 1.

Results

On December 26, 2016, eight adult specimens of *Piscicola fasciata* were collected from the head area of a catfish (length 107 cm; weight 9.5 kg). This catfish was caught north of Bogojevo, at a section of the Danube called Staklara (N 45°33'30.96"; E 19°0'50.76", Fig. 1). The leech individuals had body length (distance between the bases of the suckers) 18–27 mm, body width 1.5–3 mm and diameter of the posterior sucker 4–8 mm.

Discussion

Besides the fact that this is the first observation of *P. fasciata* in Serbia, this record is particularly interesting because it is also the first data for the mid-



Fig. 1. Distribution range of the catfish specialist fish leech *Piscicola fasciata* Kollar, 1842 in Central and Eastern Europe based on previously published reference material and the present study. Circles with grey fill indicate findings from previous studies and the black-filled square shows the record in the present study. The name of the water body followed by the name of the locality (in parentheses) are given.

dle section of the Danube (ranging from the Devín Gate, Austrian–Slovakian border, to the Iron Gate, Serbian–Romanian border, see TUBIĆ et al. 2013). Most of previous records of *P. fasciata* are from rivers in Poland and Russia, and in the upper section of the Danube in Austria and Germany (Table 1, Fig. 1). With no details available, *P. fasciata* has been reported from the rivers Soła and Vistula in Poland (ZAĆWILILCHOWSKA 1965, MIKULSKI & TARWID 1951), Dysna and Pripjaty in Belarus (LSKIEWICZ 1925, 1934, PAWŁOWSKI 1947), Don and Volga in Russia (BLANCHARD 1893, PLOTNIKOV 1909, JOHANSSON 1935, ZENKEVIČ 1968, DONCOV 1969, LUKIN 1976), Danube in Austria (NESEMANN 1997), Sava in Croatia (SKET 1968), Emajõgi in Estonia (HERTER 1968), Ural in Kazakhstan (JOHANSSON 1935, LUKIN 1976), Dnieper in Ukraine (ŠPET 1928) and Mtkvari in Georgia (BLANCHARD 1893) (Fig. 1). Finally, one record originates from Lake Druzno in Poland (KARASSOWSKA & MIKULSKI 1960). The supposed sporadic distribution of this fish leech species may be a consequence of data deficiency that arises from the inadequacy of the leech sampling methods usually applied. When *P. fasciata* has been found, it has been detected with unusual leech sampling methods, e.g. from catfish caught (sold) by fishermen or sold at markets (Soós 1964a, SKET 1968, NESEMANN 1994).

Previously, Soós (1964b) has suggested that sampling *P. fasciata* might be more successful if conducted on catfish caught by fishermen. Based on this previous suggestion and our experience (this study), we aim to make recommendations for a sampling method that can be easily and inexpensively applied in most countries where *P. fasciata* occurs. Since industrial fishing by fishermen is not allowed in some Central European countries (e.g. Hungary), we prefer that leech experts should cooperate with recreational anglers. Cooperation with anglers has many advantages. The presence of recreational anglers is relatively high in the community, and they are organized into societies with their magazines, online forums and websites. With these features, leech experts can easily establish and maintain contact with anglers. E.g., we contacted a major anglers' society in Hungary in February 2017 and, after a few days, we received a positive response with confirmation that anglers often observe leeches attached to the head region of catfish caught in the Tisza River in winter. Establishing contact with anglers at a national level may bring unexpected results in recording *P. fasciata* that could increase our knowledge of the distribution and ecological requirements of this fish leech species. By applying this method in the countries where *P. fasciata* is assumed to be distributed, a detailed, large-scale monitoring scheme could be developed. If this un-

sual leech sampling method brings more finds of *P. fasciata*, experts will have a more stable basis when the species is assigned conservation status or conservation practices are eventually needed.

In conclusion, we suggest that *P. fasciata* might occur more frequently than previously assumed. We presume that data deficiency arises because of non-appropriate sampling methods. Therefore, we suggest that cooperation between leech experts and recreational anglers that may increase recorded finds could improve our knowledge of the distribution range and ecological needs of *P. fasciata*.

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