

FAUNA OF LEECHES (*HIRUDINEA*) IN POSTGLACIAL TARNs IN THE DOBIEGNIIEWSKIE LAKELAND

Lucjan Agapow, Jarosław Nadobnik

The Eugeniusz Piasecki University School of Physical Education in Poznań, Faculty of Physical Culture
Gorzów Wielkopolski, Poland, e-mail: nadobnik@neostrada.pl

Summary. As regards their faunas, the tarns in the Dobiegniewskie Lakeland are still in need of further research into. Likewise, not much data is available on the fauna of leeches in reservoirs of that type in Poland. The area concerned is to a large extent arable, while its soil is of good quality. The objective behind the research was to determine the leech species composition in the tarns and to find out whether the occurrence of the species was dependent on various environmental factors, and – ultimately – to show that such reservoirs play an important role in agrarian biocoenosis. All told, there were 16 tarns studied. They were located in arable fields in the lakeland. The material was collected from the vegetation and from objects immersed in the water, and by means of a mesh scoop to collect samples from deeper sites. The collected samples were put into glass containers and preserved with a 4% formaldehyde solution. A total of 1121 leech individuals were collected, and 14 species were determined, including *Piscicola geometra* and *Dina lineata*. On our penetration of the area we noticed that some of the tarns had been drained agriculturally, which we considered ill-advised as they normally are breeding sites for many species of insects and amphibians, and wildfowl sanctuaries. Tarns are a habitat for many species of invertebrate fauna and should be included in the research programmes of other specialists. The reservoirs we studied were differentiated as regards their size and occurrence of aquatic flora; they need to be classified. A call to protect tarns and abandon their liquidation through drainage is well justified.

Key words: leeches, *Hirudinea*, postglacial tarns

INTRODUCTION

As regards their faunas, the tarns in the Dobiegniewskie Lakeland are still in need of further research into. Likewise, not much data is available on the fauna of leeches in reservoirs of that type in Poland. Certain data can be found in works by Sander [1951], Serafińska [1958], Radkiewicz [1978], Agapow and Bukowska [1979], and Agapow [1982]. However, the data are considerably dated. Hence, it seemed worthwhile that more attention be paid to that type of water habitats, and while the Dobiegniewskie Lakeland was subject to environmental evaluation in the years 2001 and 2006, its water habitat was researched too. The area concerned is to a large extent arable, while its soil is of good quality. The objective behind the research was to determine the leech species composition in the tarns and to find out whether the occurrence of the species was dependent on various environmental factors, and – ultimately – to show that such reservoirs play an important role in agrarian biocoenosis.

MATERIALS AND METHODS

All told, there were 16 tarns studied. They were located in arable fields in the lakeland (Fig. 1). Some of the tarns dry off in summertime. The tarns we studied are small water reservoirs, oval in shape, with no surface water inflow, and, as such, corresponded to the definition after Majdanowski (10954) A majority of them are surrounded by bushes and arborescent vegetation. The fringes abound in reed, narrowleaf and broadleaf cattail, sedge and irides. The aquatic vegetation comprises water milfoil, hornwort and filiform algae, while the water surface is frequently covered with duckweed.



Fig. 1. The area under research – The Dobiegniewskie Lakeland
Rys. 1. Teren badań – Pojezierze Dobiegniewskie

The material was collected from the vegetation and from objects immersed in the water, and by means of a mesh scoop to collect samples from deeper sites. The collected samples were put into glass containers and preserved with a 4% formaldehyde solution.

RESULTS AND DISCUSSION

A total of 1121 leech individuals were collected, and 14 species were determined, including *Piscicola geometra* and *Dina Lineata*. The percentage share of individual leeches is presented in Tab. 1. A surprisingly high share is disclosed by *Dina Lineata*, which was found in three tarns. The sites where the presence of this species was confirmed had hard and sandy beds, with a shallow mud layer. This species had not been found by Sandner [1951], Serafińska [1958] and Radkiewicz [1978]. The reservoirs in which we came across that species had a very high colour indicator of 110 mg dm^{-3} Pt, their pH was 6.95, while the oxygen content varied between 4.00 and 4.46 mg dm^{-3} , and sulphate and chloride levels were low. *D. lineata*, as was demonstrated experimentally by Kalbe [1966], shows a high resistance to oxygen shortages. Site 10 showed the highest level of calcium, *i.e.* 127.9 mg dm^{-3} , and that site was most frequented by the species *Helobdella stagnalis*. The presence of *Hirudo medicinalis* is worth mentioning. This is not accidental, as this leech species was also found in four tarns in the Myśliborskie Lakeland in the vicinity of the town of Barlinek [Agapow 1982].

Table 1. A collective specification of leech species in the studied tarns
 Tabela 1. Specyfikacja gatunków pijawek w badanych oczkach wodnych

Species Gatunki	Tarn No. – Nr oczka																Total Ogółem	%
	1	2	3	4	5	6	7*	8	9*	10*	11*	12*	13	14	15	16		
<i>Glossiphonia complanata</i>	2	4			1		1	9	4			17	12	4	6	1	61	5.4%
<i>Glossiphonia concolor</i>								1				9	2				12	1.1%
<i>Glossiphonia heteroclita</i>					2				2				2	9	1		16	1.4%
<i>Hemiclepsis marginata</i>							3	3							1		7	0.6%
<i>Theromyzon tessulatum</i>			1		1				2		1	1	8		2		16	1.4%
<i>Helobdella stagnalis</i>	36	4	86	13	1	11	1		6	153	2		3	12	22	2	352	31.4%
<i>Pisticola geometra</i>															17		17	1.5%
<i>Hirud medicinalis</i>				1								1	8	2		5	17	1.5%
<i>Haemopsis sanguisuga</i>								4		1	6	1	3	1			16	1.4%
<i>Erpobdella nigricollis</i>			3				2	4					27	15		7	58	5.2%
<i>Erpobdella octoculata</i>		1	1		2	14	20	44	63			16	19	12		27	219	19.5%
<i>Erpobdella testacea</i>	4	1	88		8							4	2	1	2	3	113	10.1%
<i>Erpobdella monostriata</i>			3		2												5	0.4%
<i>Dina lineata</i>	176				1								35				212	18.9%
																	1121	100%

* Physical and chemical water properties have been studied

* Badano fizyczne i chemiczne właściwości wody



Phot. 1. One of the tarns studied
 Fot. 1. Jedno z badanych oczek wodnych

On our penetration of the area we noticed that some of the tarns had been drained agriculturally, which we considered ill-advised as they normally are breeding sites for many species of insects and amphibians, and wildfowl sanctuaries.

On recapping our results it can be stated that the tarns, despite their summertime dry-off periods and winter frost penetration, do still have a fairly varied and rich leech faunas. Remarkable is the fact that *D. lineata*, *P. geometra* and *H. medicinalis* are present there. The occurrence of the former has been noticed in that type of reservoirs for the first time.

Our research shows a considerable concurrence with the findings by others [Pawłowski 1936a, b, Bennike 1943, Wojtas 1959, Mann 1962], inasmuch as impact of certain physical and chemical factors is concerned.



Phot. 2. A drying off seasonal tarn
Fot. 2. Wysychanie sezonowego oczka wodnego



Phot. 3. A waning tarn
Fot. 3. Malejące oczko wodne

CONCLUSIONS

1. Tarns are a habitat for many species of invertebrate fauna and should be included in the research programmes of other specialists.
2. The reservoirs we studied were differentiated as regards their size and occurrence of aquatic flora; they need to be classified.
3. A call to protect tarns and abandon their liquidation through drainage is well justified.

REFERENCES

- Agapowa L. i Bukowska R.: 1979. Leeches fauna of postglacial tarns in Gorzów Region. Mat. XII Zjazdu PT Zool., Poznań, pp. 6-7 (in Polish).
- Agapow L., 1982: Conditions of life and occurrence of leeches (*Hirudinea*) in the Myślibórz Lake district. Monogr. AWF Poznań 150, pp. 164 (in Polish).
- Bennike S. A. B., 1943: Contributions to the ecology and biology of the Danish freshwater leeches (*Hirudinea*). Folia Limnol. Scand., Kobenhavn, 2, pp. 109.
- Kalbe L., 1966: Zur Ökologie und Saprobiewertung der *Hirudinea* im Havelgebiet. Int. Ges. Hydrobiol., 51, 2, 243-277.
- Majdanowski S.: 1954. Lakes of Poland. Prz. Geograf., 26, 2.
- Mann K.H., 1962: The oecology of the British freshwater leeches. J. Anim. Ecol., 98-119.
- Pawłowski L.K., 1936a: Freshwater fauna of Poland (*Hirudinea*). Leeches (*Hirudinea*). Warszawa, pp. 176.
- Pawłowski L.K., 1936b: Zur Oekologie der Hirudineenfauna der Wigryseen. Arch. Hydrobiol. Ryb., 10, 1-47.
- Radkiewicz J., 1978: Leeches (*Hirudinea*) of Lubuskie district. Wyd. Uczelniane WSP w Zielonej Górze, pp. 59.
- Sandner H., 1951: Study of leeches fauna. Acta. Zool. Oecol. Univ. Lodzensis, pp. 40.
- Serafińska J., 1958: Materials concerning leeches fauna do (*Hirudinea*) Polski. Fragm. Faun., 8, 3, 17-64 (in Polish).
- Wojtas F., 1959: Leeches (*Hirudinea*) of Grabia rider. Pr. Łódz. TN, 58, 62.

FAUNA PIJAWEK (*HIRUDINEA*) OCZEK POŁODOWCOWYCH
NA POJEZIERZU DOBIEGNIEWSKIM

Streszczenie. Oczka połodowcowe na terenie Pojezierza Dobiegniewskiego pod względem faunistycznym są słabo zbadane. Celowe było więc zainteresowanie się tego typu siedliskami fauny wodnej. Badania przeprowadzono w latach 2001-2006 przy okazji waloryzacji przyrodniczej Pojezierza Dobiegniewskiego. W części jest to obszar o znacznym areale pól uprawnych, o glebach wysokiej klasy. Celem badań było określenie składu gatunkowego fauny pijawek oczek połodowcowych i możliwość uchwycenia zależności występowania ich od różnych czynników środowiskowych oraz wykazania, że te zbiorniki odgrywają ważną rolę w biocenozie agrarnej. Ogółem przebadano 16 oczek połodowcowych położonych wśród pól uprawnych Pojezierza

Dobiegnewskiego. Materiał zbierano z roślin i przedmiotów zanurzonych w wodzie oraz używano siatki czerpakowej do poboru materiału z głębszych miejsc. Zebrane okazy umieszczano w pojemnikach szklanych i konserwowano w 4% roztworze formaldehydu. W zebranym materiale obejmującym łącznie 1121 okazów pijawek, oznaczono 14 gatunków, w tym *Piscicola geometra* i *Dina lineata*. Na szczególną uwagę zasługuje obecność *Hirudo medicinalis*. Fakt ten nie jest przypadkowy, ponieważ pijawka ta została stwierdzona również w czterech oczkach polodowcowych na Pojezierzu Myśliborskim w okolicach Barlinka. Podczas penetracji terenu zauważyliśmy, że część oczek poddana została zabiegom melioracyjnym, co uważamy za zabieg nierozważny, z tego względu, że oczka polodowcowe są siedliskiem wielu gatunków fauny bezkręgowej i należy je objąć dalszymi badaniami również przez innych specjalistów. Badane przez nas zbiorniki są zróżnicowane pod względem wielkości i występowaniem flory wodnej, istnieje konieczność dokonania ich klasyfikacji. Uzasadniony jest postulat ochrony oczek polodowcowych i zaniechania ich likwidacji przez meliorację, gdyż są miejscem rozrodu wielu gatunków fauny owadów i płazów oraz ostoją dla ptaków wodnych.

Słowa kluczowe: pijawki (*Hirudinea*), oczka polodowcowe