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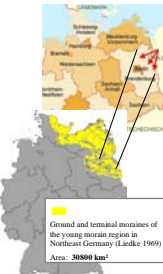
Occurrence of Leeches (Hirudinea) in different Types of Water Bodies in Northeast Germany (Brandenburg)

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Objective

In Germany, only in Sachsen-Anhalt (Clemens Grosser) and Mecklenburg-Vorpommern (Uwe Jueg) the leech fauna (Hirudinea) has been intensively studied. The leech fauna of Northeast Brandenburg was nearly unknown. Since 1965/66, when Kalbe studied the occurrence of leeches in the Havel region of Brandenburg, only Täuscher (1997) published records of leeches in the region of Berlin. Furthermore, leeches have been included in the Priority list of species by the German Federal Agency for Nature Conservation to enable their better investigation and protection. Here we present our first collecting data focused on leeches in pondlike temporary kettle holes compared to other types of water bodies, and a preliminary checklist of Hirudinea in Brandenburg.

Study area



The studied water bodies are located in the young morain region of Northeast Brandenburg (Barnim, Uckermark, Märkisch-Oderland) characterised by sub-continental climate and negative climatic water balance.

Methods

Leeches were collected in 2006/07 by hand and sieving in littoral and riparian zones of standing and running waters respectively. Species were determined following Neubert & Neseemann (1999). Some specimens were reexamined by Uwe Jueg.

Neubert, E. & Neseemann, H. (1999): Annelida, Clitellata. Branchiobdellida, Acanthobdellida, Hirudinea - Süßwasserfauna von Mitteleuropa 6/2. Spektrum Akad. Verlag, Heidelberg.

24 leech species are known for Brandenburg (Tab. 1). 16 of them were found in the studied area of Northeast Brandenburg (Tab. 2). It is expected that not all species living in Brandenburg were detected. So the occurrence of piscicolid species is nearly unknown. The species-richest leech fauna we found in permanent water bodies, especially in the stream „Schwärze“ (Eberswalde), in the eutrophic lake „Grimnitzsee“ (Joachimsthal) and in a big pond (Hohenfinow) compared with temporary kettle holes.

In Brandenburg for some leech species a preference of different habitat types could be proposed (Tab. 1+ 2):

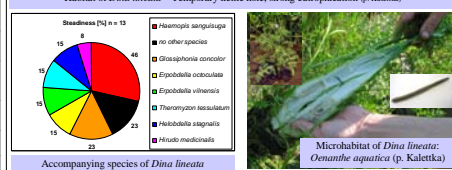
- 4 species are common in all habitat types (*Haemopsis sanguisuga*, *Erpobdella octoculata*, *Helobdella stagnalis* and *Glossiphonia concolor*).
- 4 species were found only in permanent standing waters (*Alboglossiphonia striata* + *A. hyalina*, *Glossiphonia paludosa* + *G. verrucata*)
- 3 species are known so far only from running waters (*Glossiphonia nebulosa*, *Capsiobdella fadejewi*, *Piscicola borowieci*)
- 5 species were never found in small standing waters like ponds and kettle holes (*Glossiphonia nebulosa* + *G. paludosa* + *G. verrucata*, *Haemopsis elegans*, *Erpobdella monostrata*). *Erpobdella vilnensis* occurred only in 2 kettle holes with total mud clearance, Piscicolidae were not investigated

Tab. 1: Checklist of leeches in state Brandenburg

Species group/Taxon	Streams	Rivers	Ponds	Kettle holes	Lakes
Glossiphoniidae Vallant, 1890					
<i>Alboglossiphonia</i> Lukin, 1976					
<i>A. heteroclitata</i> (Linnaeus, 1761)	T	J	W		J, K, W
<i>A. hyalina</i> (O. F. Müller, 1774)			W		J, W
<i>A. striata</i> (Apáthy, 1888)			W		J
<i>Glossiphonia</i> Johnson, 1816					
<i>G. complanata</i> (Linnaeus, 1758)	J, T, W	J	J		J, W
<i>G. concolor</i> (Apáthy, 1888)	J	J, P	J, W	W	J, W
<i>G. nebulosa</i> Kalbe, 1964	K	J, K			
<i>G. paludosa</i> (Carena, 1824)					K
<i>G. verrucata</i> (Fr. Müller, 1844)					K
<i>Helobdella</i> R. Blanchard, 1896					
<i>H. stagnalis</i> (Linnaeus, 1758)	J, T	J	J, W	W	J, K, W
<i>Hemiclepsis</i> Vejvodsky, 1884					
<i>H. marginata</i> (O. F. Müller, 1774)	J, K	J	W		J, K, W
<i>Placobdella</i> R. Blanchard, 1893					
<i>P. costata</i> (Fr. Müller, 1846)	G, T	G, P	G		G
<i>Theromyzon</i> Philippi, 1867					
<i>Th. tessellatum</i> (O. F. Müller, 1774)	J, K, W		J, W	W	J, W
Piscicolidae Johnston, 1865					
<i>Capsiobdella</i> Epshtein, 1966					
<i>C. fadejewi</i> (Epshtein, 1961)		J			
<i>Piscicola</i> De Blainville, 1818					
<i>P. borowieci</i> Bielecki, 1997	J				
<i>P. geometra</i> (Linnaeus, 1758)	J, K	J			J, K, W
Haemopidae R. Richardson, 1969					
<i>Haemopsis</i> Savigny, 1822					
<i>H. elegans</i> Moquin-Tandon, 1846	J				G
<i>H. sanguisuga</i> (Linnaeus, 1758)	T, J, K, W	J	J, K, W	W	J, K, W
Hirudiniidae Whitman, 1886					
<i>Hirudo</i> Linnaeus, 1758					
<i>H. medicinalis</i> Linnaeus, 1758	J		J	W	
Erpobdellidae R. Blanchard, 1894					
<i>Dina</i> R. Blanchard, 1892					
<i>D. lineata</i> (O. F. Müller, 1774)	T, W		K, W	W	J
<i>Erpobdella</i> De Blainville, 1818					
<i>E. monostrata</i> (Lindenfeld et Pietruszynski, 1890)	J, K, W	J			J, W
<i>E. nigricollis</i> (Brandes, 1900)	J, K, W	J	J, K, W		J, W
<i>E. octoculata</i> (Linnaeus, 1758)	T, J, K, W	J	J, W	W	J, K, W
<i>E. testacea</i> Savigny, 1822	T, W	J	J		J, W
<i>E. vilnensis</i> Liskiewicz, 1925	J, W	J, P		W	J, W

Tab. 2: List of leeches in the studied area of Northeast Brandenburg

Habitat type	Steadiness of the species [%]														Species number of the habitat type	
	<i>Haemopsis sanguisuga</i>	<i>Erpobdella octoculata</i>	<i>Theromyzon tessellatum</i>	<i>Helobdella stagnalis</i>	<i>Glossiphonia concolor</i>	<i>Dina lineata</i>	<i>Hirudo medicinalis</i>	<i>Erpobdella vilnensis</i>	<i>Erpobdella nigricollis</i>	<i>Erpobdella monostrata</i>	<i>Erpobdella testacea</i>	<i>Glossiphonia complanata</i>	<i>Glossiphonia heteroclitata</i>	<i>Alboglossiphonia striata</i>		<i>Alboglossiphonia hyalina</i>
Forest kettle hole (n=2)	100	50														2
Grasland kettle hole (n=4)	50						25									2
Infield kettle hole, total mud clearance (n=5)	17					33		17								3
Infield kettle hole, shallow mud clearance (n=5)	8		8	8		17										4
Infield kettle hole, no mud clearance, episodic to periodic (n=12)	17	8				25										3
Infield kettle hole, no mud clearance, semipermanent (n=12)	83	42	25	17	8	17	17									7
Ponds, permanent (n=4)	50	75	25	25	50	25			25			25	25	25	25	11
Lakes, permanent (n=8)	100	38	38	13				25	75	13	13	38	13	25	38	12
Streams, permanent (n=6)	17	83	33	17	33			50	67	17	17	83				10

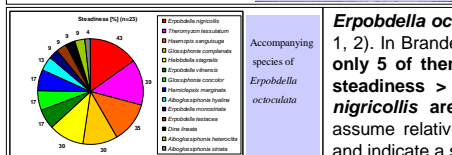


In temporary infield kettle holes only 7 leech species were found. The longer the dry period of kettle holes, the smaller the species number (Tab. 2).

The characteristic species of kettle holes is *Dina lineata*. In most of them *Dina lineata* was the only one which is good adapted to extreme conditions (wet-dry-circle, strong eutrophication). 6 from 7 accompanying species occurred only with low steadiness. *Dina lineata* was even found after total mud clearance of kettle holes. Apparently *Dina lineata* is able to both, survive in sediment and vegetation and reproduce quickly at pioneer sites.

Unexpectedly, populations of the endangered *Hirudo medicinalis* (FFH, app. V) were found in three semipermanent kettle holes of the agricultural landscape in Märkisch-Oderland.

In field kettle holes only 2 of 7 species occurred after total mud clearance (*Haemopsis sanguisuga* and *Dina lineata*) and 4 of 7 species after shallow mud clearance respectively. So far *Erpobdella vilnensis* was not observed in ponds and kettle holes, but surprisingly reproduced in kettle holes after total mud clearance (Tab. 2).



Erpobdella octoculata is a common species in all water body types (Tab. 1, 2). In Brandenburg 14 accompanying species have been observed, but only 5 of them occur with a steadiness > 30 %, *E. nigricollis* with a steadiness > 40 %. It could be revealed, that *E. octoculata* and *E. nigricollis* are ecologically closely connected. Our results allow to assume relatively similar ecological requirements for a guild of 6 species and indicate a stable availability of prey resources for these species.

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