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**Materiały do fauny skąposzczetów (*Oligochaeta*)  
Ojcowskiego Parku Narodowego i okolicy  
— potok Prądnik-Białucha**

**Materials to the fauna of *Oligochaeta*  
of the Ojców National Park and its vicinity  
— the Prądnik-Białucha stream**

Wpłynęło 4 października 1975 r.

**Abstract** — The work presents the results of elaboration of the materials of *Oligochaeta* collected in the course of an investigation of the benthos in the Prądnik-Białucha stream. The material was collected by Dr. E. Dratnal in 1968 and 1969. In the investigated stream 32 species of *Oligochaeta* were noted, of which 14 were new for the fauna of the Kraków — Częstochowa Upland. The occurrence of *Oligochaeta* at 8 stations distributed along the course of the stream in 3 habitats is reported, the communities of species characteristic for the given habitats being discussed.

The fauna of *Oligochaeta* of the Ojców National Park which includes the southern part of the Kraków — Częstochowa Upland, is very poorly known, as indeed that of the whole Upland. In general, the existing data, mainly faunistic, are random and fragmentary. The most information on the aquatic *Oligochaeta* species from this region is given in the work of Szarski (1947) where 23 species from 7 families are listed, chiefly found in ponds and in the River Vistula in the region of Kraków. Besides, in a number of works mention is made of the occurrence of a few species in greenhouses, ponds, and artificial water bodies in the area of Kraków (Schmidt 1878, Jaworowski 1888, 1893, Moszyński, Urbański 1932, Moszyński 1933). As far as *Oligochaeta* of the Ojców National Park are concerned, the occurrence of the species *Haplotaxis gordioides* (Hartm.) in the Sąsówka stream is mentioned only in the work of Szczęsny (1968), some quantitative data on the share of the oligochaetes as a whole in the benthos of this stream being also given there. Up to the present no detailed data are available on the oligochaetes of the Prądnik stream. In earlier studies on the benthos of this stream *Oligochaeta* were treated only as a whole, the data on the



occurrence of such species as *Haplotaxis gordioides* (Hartm.) and *Lumbriculus variegatus* (Müll.) being taken into consideration (Draţnal 1972, 1976, a, 1976 b).

### Material and method

The materials elaborated in the present paper were collected in the course of an investigation of the benthos in the Prądnik stream, carried out by Dr. E. Draţnal from the Laboratory of Nature Protection of the Polish Academy of Sciences in Kraków. The aim of the work was to present the qualitative composition of *Oligochaeta* in the investigated sector of the stream on the basis of these materials, the domination relations in the basic types habitats being considered.

The characteristics of the Prądnik stream which is a left bank tributary of the River Vistula, as well as of the whole river basin, have been given in numerous works. Among others, a detailed description of the investigated stream on the basis of all earlier studies as well as the detailed characteristics of the stations where the elaborated samples of oligochaetes were collected, may be found in Draţnal's works (1972, 1976 a, 1976 b).

The material was collected at 8 stations whose distribution is given on the map (fig. 1), and the characteristics in Table I. 6 stations (0—5) lie within the territory of the Ojców National Park.

A bottom sampler, which was a modified Surber sampler (1937) with a 15-cm side length and a net of 0.3 mm mesh, was used for sampling. The surface of the sampler was 30 cm<sup>2</sup>. The collected samples were fixed in 4% formalin at the station and passed through a macroscopic selection in the laboratory. It should be stressed that the method of fixing whole samples in formalin is not satisfactory with *Oligochaeta* since many animals become damaged during fixation. This chiefly concerns the representatives of the family *Aeolosomatidae* and some *Naididae* (sub-family *Chaetogastrinae*) (Kaspzák 1975). Most probably this is why *Oligochaeta* of this family and sub-family have almost no representatives in the elaborated material.

The elaborated material, containing over 96 000 specimens, was collected in 355 samples. The time of sampling is shown in Table II. About 60% of specimens, chiefly the representatives of the family *Tubificidae*, were sexually immature. Since in general, youthful specimens of this family are impossible to discern, the majority of them were not identified as to the species. Most often these were specimens of the genera *Tubifex* Lam. and *Limnodrilus* Clap.





Ryc. 1. Mapka potoku Prądnik. A — granica Ojcowskiego Parku Narodowego; B — stanowiska; C — ujście ścieków z mleczarni w miejscowości Skąta  
 Fig. 1. Map of the Prądnik stream. A — border of the Ojców National Park; B — stations; C — the mouth of a sewer from the creamery at Skąta

The numbers of species in particular habitats of a given station are presented as corresponding number classes which represented the total number of specimens from separate collections of samples from a given habitat. In the differentiation of the longitudinal zones no objective formula was used for computing the similarity coefficient.

The author wishes to express his thanks to Dr. E. Drałna for giving him the material for elaboration.



Tabela I. Charakterystyka starowisk

x źródło (limnokren) częściowo ocembrowane  
 xx na wszystkich stanowiskach przeważają kamienie o średnicy 5-10 cm

Table I. Characteristics of the sampling stations  
 x spring (limnocren) partly timbered  
 xx 5-10 cm diameter stones prevail on all stations

Stacja Station	Położenie Geograficzne Geographical situation	Odległość Distance from the mouth	Szerokość koryta potoku Width of stream bed	Maksymalna szybkość prądu wody Maximum rate of water current	Głębokość Depth	Podłoże Substratum	Charakter doliny Character of valley
0	Pieskowa Skała źródło x spring	30.0	-	-	0.20-0.40	Kamienie z obritym mułem xx stones with very abundant silt xx	-
1	Pieskowa Skała	około 32.0 about	około 3.0 about	80-120	0.20-0.50	kamienie, miejscami kępy glonów i fragmenty dna mulistego stones, sometimes tufts of algae, a few silty pieces	
2	powyżej miejscowości Grodziąsko above	około 29.0 about	około 4.0 about	60-90	0.20-0.40	kamienie i żwir, sprowadzone kępy glonów, odcinki dna pokryte mułem stones and gravel, scattered tufts of algae, stretches covered with silt	brzeży strome zalesione banks steep, wooded
3	poniżej zwozu do miejscowości Skała below the main road to Skała	27.5	4.0-6.0	40-60	0.20-0.40	kamienie i żwir, rozległe partie muliste, szesto Spherotilus sp. Stones and gravel, extended silty parts, frequently Spherotilus sp.	wąwóz o pionowych skalnych ścianach ravine with vertical rocky walls
4	około 0.2 km powyżej uścia Saspówki about 0.2 km above the mouth of the Saspówka stream	25.0	1.0-5.0	60-120	0.15-1.00	kamienie i żwir, kępy glonów, niewielkie fragmenty dna przy brzegach muliste stones and gravel, tufts of algae, small silty parts near banks	brzeg lewy utworzony przez pionowe skały, brzeg prawy stromy i zalesiony, przy brzegu olszyny i wierzyby left bank formed by vertical rocks, right bank steep and wooded, alder forest and osier bed on the bank
5	okolica Bramy Krałowskiej vicinity of the Brama Krałowska	około 23.5 about	4.0-6.0	80-120	0.25-0.60	kamienie prawie całkowicie pokryte glonami, fragmenty dna przy brzegach muliste stones nearly covered by tufts of algae, small silty parts near banks	brzeg prawy stromy i zalesiony, brzeg le- wy skalisty, przy brzegu olszyny i wierzy- by bank steep and wooded, left bank rocky; alder forest and osier bed on the bank
6	około 0.4 km powyżej uścia potoku Korz- kiewskiego about 0.4 km above the mouth of the Korzkiewski stream	około 16.5 about	6.0	80	0.60-1.20	kamienie, duże platy glonów, muł stones, large patches of algae, silt	dolina szeroka, brzeg lewy łagodny, brzeg prawy stromy, przy brzegu olszyny broad valley, left bank gentle, right bank steep, alder forest on the bank
7	powyżej miejscowości Zielonki above	około 12.0 about	5.0-7.0	60-80	0.30-1.50	kamienie i żwir, obficie Batrachium sp., duże partie dna muliste stones and gravel, abundant Batrachium sp., large silty parts	dolina szeroka i płaska, przy brzegu ol- szyny i wierzyby valley broad and level, alder forest and osier bed on the banks



Tabela II. Wykaz poborów dokonanych na wybranych stanowiskach i siedliskach.

s - dno kamieniste; a - kamienie porośnięte glonami; m - dno muliste

Table II. List of collections taken from selected stations and habitats.

s - stony bottom; a - stones overgrown by algae; m - silty bottom

Data Date	Siedlisko Habitat	Stanowiska - Stations																						
		0	1			2			3			4			5			6			7			
			s	a	m	s	a	m	s	a	m	s	a	m	s	a	m	s	a	m	s	a	m	
28 III 1968								+	+	+														
1,12,29 IV 1968					+		+	+	+	+	+	+	+	+	+					+	+	+	+	+
28 V 1968	+	+		+			+		+	+	+		+											
5 VI 1968									+		+				+		+	+	+	+	+	+	+	+
2 VII 1968	+	+		+			+				+			+			+	+	+	+	+	+	+	+
6 VIII 1968	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
12 IX 1968	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
17 X 1968	+	+	+	+			+		+	+	+	+	+	+	+									
29 XI 1968	+	+		+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
14,16,20 I 1969	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1,3 III 1969	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
29,30 IV 1969	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6,7 VI 1969		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
10 VII 1969	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
23 VIII 1969					+		+		+															
26 IX 1969					+		+		+						+	+	+							
30 X 1969							+	+	+				+	+										
Razem - Total		10	11	7	11	9	6	15	11	6	14	9	6	10	13	6	11	11	7	10	8	4	9	

### General characteristics of the fauna of *Oligochaeta*

In the collected material 32 species of *Oligochaeta* from 6 families are represented (Table III), chiefly the families *Naididae*, 13 species, and *Tubificidae*, 11 species, only small numbers (1—3) of species belonging to the remaining four families. A decisive quantitative dominance of the species from the families *Naididae* and *Tubificidae* is also visible in the material, since of the total number of specimens about 80% belonged to them. The most frequently encountered were the representatives of the genus *Nais* Müll., and especially *N. elinquis* Müll. (particularly at station 4), *N. bretscheri* Mich. (station 6) and in a lesser degree *N. pardalis* Pig. and *N. communis* Pig. Among *Tubificidae* the most frequent were: *Aulodrilus plurisetus* (Pig.), *Tubifex tubifex* (Müll.), *Limnodrilus hoefmeisteri* Clap., *L. udekemianus* Clap., and *L. clapanedeanus* Ratzel (station 7) and *Tubifex ignotus* (Štolc) (station 3). Besides, a representative of the family *Lumbriculidae* — *Stygodrilus heringianus* Clap. — occurred often and in great numbers, especially at stations 5 and 6. Of other species only *Haplotaxis gordioides* (Hartm.),



Tabela III. Skład, występowanie i liczebność skąposzczetów (Oligochaeta) na kolejnych stanowiskach potoku Prądnik

x - gatunki nowe dla fauny Wyżyny Krakowsko-Częstochowskiej

Table III. Composition, occurrence and numbers of Oligochaeta at successive stations of the Prądnik stream

x - a new species for fauna of the Kraków-Częstochowa Upland

Klasy liczebności: Number classes:	I -	1 -	10 osobników individuals
	II -	11 -	50 "
	III -	51 -	100 "
	IV -	101 -	500 "
	V -	501 -	1000 "
	VI -	1001 -	2000 "
	VII -	2001 -	5000 "
	VIII -	<	5000 "

Gatunki - Species	Stanowiska - Stations							
	0	1	2	3	4	5	6	7
Naididae								
<i>Stylaria lacustris</i> (L.)			I					
x <i>Vejdovskyella comata</i> (Vejd.)								III
<i>Nais communis</i> Pig.		I	III		IV	II	I	I
x- <i>bretscheri</i> Mich.		I	I	I	I		VI	I
- <i>elinguis</i> Müll.		II	IV	II	VIII	V	II	III
- <i>pardalis</i> Pig.			II	I	IV	IV	IV	I
x- <i>alpina</i> Sperm.					II		IV	I
- <i>pseudobutusa</i> Pig.					I			
- <i>barbata</i> Müll.					IV	II		
x <i>Specaria josinae</i> (Vejd.)								I
<i>Ophidonais serpentina</i> (Müll.)		I			IV			
<i>Chaetogaster diaphanus</i> (Gruth.)							II	
x <i>Pristina menoni</i> (Alyer)		I			I		I	I
Tubificidae								
x <i>Aulodrilus plurisetus</i> (Pig.)			I	V	IV	IV	V	VI
x- <i>limnobioides</i> Bret.					I			
<i>Limnodrilus hoffmeisteri</i> Clap.	II	III	VI	VI	IV	IV	III	VI
- <i>udekianus</i> Clap.		I	VI	IV	I		IV	VI
- <i>claparedeanus</i> Ratzel			II		II		I	IV
x- <i>profundicola</i> (Verrill)								IV
<i>Potamothenix hammoniensis</i> (Mich.)				II				
x <i>Psammoryctes barbatus</i> (Grube)								I
<i>Tubifex tubifex</i> (Müll.)								VI
x- <i>ignotus</i> (Stolc)	IV	VI	VII	VI	VII	IV	III	I
<i>Peloscoclex ferox</i> (Bis.)				I			I	
Enchytraeidae								
x <i>Mesenchytraeus armatus</i> Lev.		I						I
x <i>Fridericia ratzeli</i> (Bis.)		I			I			
x <i>Marionina riparia</i> Bret.		I	I	II				I
Haplotaenidae								
<i>Haplotaenopsis gordicoides</i> (Hartm.)		II	I	III	II	V	I	III
Lumbriculidae								
<i>Lumbriculus variegatus</i> (Müll.)						I		
x <i>Stylodrilus heringianus</i> Clap.		III	II	II	IV	VI	VI	IV
Lumbriciidae								
<i>Eiseniella tetraedra</i> (Sav.) f. <i>typica</i>		I		I	I	I	I	
<i>Allolobophora rosea</i> (Sav.)				I				
Non det.								
<i>Fridericia</i> sp. juv.				I				
<i>Stylodrilus</i> sp. juv.					I	I		I
Tubificidae juv.	VII	VIII	VIII	VIII	VIII	VII	VI	VIII
Enchytraeidae juv.		II	II	IV	I	I	I	I
Lumbriculidae		II						
Lumbriciidae		I	I	II				
Liczba gatunków: Number of species:	2	14	13	15	19	11	16	20
Liczba prób: Number of samples:	22	37	38	66	37	57	49	49



was caught in slightly greater numbers (station 5). It should be noted that *Propappus volki* Mich. (*Enchytraeidae*), a species characteristic for clean rivers and streams and determined as psammorheophile (Lastočkin 1944, Žadin 1964, Szczepański 1954, Fomenko 1972) did not occur in the Prądnik stream. The absence of the species in this stream may be connected with its pollution.

### The *Oligochaeta* fauna of various types of habitats

On the basis of the kind of substratum and the rate of water flow 3 basic types of bottom habitats were differentiated as characteristic for the whole stream:

— stony bottom (only a few silty places) in a medium or strong current (about 30 cm/sec in the bottom zone);

— stony bottom with tufts of bushy algae in a medium or strong current;

— silty bottom in a weak current (under 15 cm/sec). All the above-mentioned habitats are distributed in a mosaic in the stream.

Among the investigated types of habitats the quantitatively richest fauna of *Oligochaeta* was found on the stony bottom in a strong and medium water current (Table IV). In this habitat the rheophile *Nais elinguis* Müll. dominated decisively, very often occurring together with numerous specimens of the limno- and pelorheophile *Tubifex tubifex* (Müll.), particularly at station 4. *Nais elinguis* Müll. also prevailed on stones covered with algae. At some stations it occurred in such a habitat together with numerous specimens of *Tubificidae* and the rheophile *Stylodrilus heringianus* Clap. (Table V). The greatest numbers of *Oligochaeta* were found on the silty bottom in a slow water current (Table VI). In this habitat chiefly the pelorheo- and limnophile species of *Tubificidae* dominated and in a lesser degree the rheophile *Stylodrilus heringianus* Clap. Only on the silty bottom at station 6 was this species only a decisive dominant. Among all dominant species none was found to be exclusive to a given type of habitat. This is mainly connected with the gradual passing from one habitat into another.

Similar qualitative and quantitative relations in the fauna of *Oligochaeta*, particularly in the system of dominants, were found by Szczęsny (1974) in the Kryniczanka stream. This author stressed the influence of sewage on the development of pelorheophile species and on the significant numerical prevalence of certain species, especially *Nais elinguis* Müll., *Tubifex tubifex* (Müll.), *Limnodrilus hoffmeisteri* Clap., and *L. udekemianus* Clap. According to Wachs (1964, 1967 a, 1967 b), in



Tabela IV. Liczebność gatunków skąposzczetów (*Oligochaeta*) na podłożu kamienistym  
D % - dominacja w całej faunie

Table IV. Number of *Oligochaeta* species on stony substrate  
D % - dominance within the total fauna

Klasy liczebności: Number classes:	I - 1 - 10	osobników individuals
	II - 11 - 50	"
	III - 51 - 100	"
	IV - 101 - 500	"
	V - 501 - 1000	"
	VI - 1001 - 1500	"
	VII - 1501 - 2000	"
	VIII - < 2000	"

Gatunki - Species	Stanowiska - Stations							D %
	1	2	3	4	5	6	7	
<i>Nais elinguis</i> Müll.	I	IV	I	VIII	IV	I		50
<i>Tubifex tubifex</i> (Müll.)	I	V		VIII	II	II	I	20
<i>Nais bretscheri</i> Mich.	I		I	I		VI	I	
<i>Stylogdrilus heringianus</i> Clap.	II		I	II	V	IV	IV	
<i>Limnodrilus hoffmeisteri</i> Clap.	I	IV	II	II	I	I	I	
<i>Nais communis</i> Pig.	I	II		IV	I		I	
<i>Haplotaxis gordioides</i> (Hartm.)	I		II	II	IV	I	I	
<i>Aulodrilus plurisetus</i> (Pig.)		I	II	IV	II	II		
<i>Ophidonais serpentina</i> (Müll.)	I			IV				
<i>Nais pardalis</i> Pig.			I	II	II	IV	I	
- alpina Sperb.				II		IV	I	
- barbata Müll.				IV	I			
<i>Limnodrilus udekemianus</i> Clap.	I	III						} >10
<i>Chaetogaster diaphanus</i> (Grath.)						I		
<i>Tubifex ignotus</i> (Stolc)			I				I	
<i>Eiseniella tetraedra</i> (Sav.) f. <i>typica</i>			I	I				
<i>Feloscolex ferox</i> (Eis.)			I			I		
<i>Nais pseudotusa</i> Pig.				I				
<i>Pristina menoni</i> (Aiyer)				I		I	I	
<i>Specaria josinae</i> (Vejd.)							I	
<i>Stylaria lacustris</i> (L.)		I						
<i>Psammoryctides barbatus</i> (Grube)							I	
<i>Limnodrilus claparedeanus</i> Ratzel						I		
<i>Lumbriculus variegatus</i> (Müll.)					I			
<i>Allolobophora rosea</i> (Sav.)			I					
Liczba gatunków: Number of species:	9	7	11	15	10	13	12	
Liczba prób: Number of samples:	13	11	26	15	30	24	22	-

submontane rivers silty bottoms are among the richest habitats with regard to the number of *Oligochaeta* species and to the number of their specimens.

### Distribution of *Oligochaeta* along the course of the stream

Earlier investigations carried out on oligochaetes suggest that the distribution of these animals in running waters does not in general show any distinct longitudinal zoning (Wachs 1967 a, Kasprzak, Szcześny 1976). This largely results from the great capacity of many species to adapt to the changing conditions of the environment. Only



Tabela V. Liczebność gatunków skąposzczetów (Oligochaeta) na podłożu kamienistym z glonami  
(objaśnienia patrz tabela IV)

Table V. Number of Oligochaeta species on stones overgrown with algae  
(for explanation see Table IV)

Gatunki - Species	Stanowiska - Stations							D %	
	1	2	3	4	5	6	7		
<i>Nais elinguis</i> Mll.	I	III		VI	III	I	I	<60	
<i>Limnodrilus udekemianus</i> Clap.		IV							
<i>Tubifex tubifex</i> (Mll.)		II		IV			I		
<i>Nais pardalis</i> Fig.				IV	I	II			
<i>Stylodrilus heringianus</i> Clap.	I		I	III		II	II		
<i>Nais barbata</i> Mll.				III	I				
- <i>bretscheri</i> Mich.				I		III	I		
<i>Haplotaxis gordioides</i> (Hartm.)	I	I	I	II	I		I		
<i>Aulodrilus plurisetus</i> (Fig.)				II					
<i>Limnodrilus hoffmeisteri</i> Clap.	I	I	I						>10
<i>Tubifex ignotus</i> (Štolo)			I				I		
<i>Nais communis</i> Fig.				I		I			
<i>Marionina riparia</i> Bret.	I						I		
<i>Mesenchytraeus armatus</i> Lev.	I						I		
<i>Eiseniella tetraedra</i> (Sav.) f. <i>typica</i>	I					I			
<i>Fridericia ratzeli</i> (Eis.)	I								
<i>Aulodrilus limnobius</i> Bret.				I					
<i>Nais alpina</i> Sperb.						I			
<i>Pristina menoni</i> (Aiyer)	I								
Liczba gatunków: Number of species:	9	5	5	11	4	7	8	-	
Liczba prób: Number of samples:	10	6	11	8	8	9	9	-	

Tabela VI. Liczebność gatunków skąposzczetów (Oligochaeta) na podłożu mulistym  
(objaśnienia patrz tabela IV)

Table VI. Number of Oligochaeta species on silt substrate  
(for explanation see Table IV)

Gatunki - Species	Stanowiska - Stations							D %	
	1	2	3	4	5	6	7		
<i>Tubifex tubifex</i> (Mll.)	V	VIII	VI	V	IV	III	IV	<20	
<i>Limnodrilus hoffmeisteri</i> Clap.	III	VI	V	IV	IV	II	VII		
<i>Aulodrilus plurisetus</i> (Fig.)			V		IV	V	VII		
<i>Limnodrilus udekemianus</i> Clap.	I	V	IV	I		IV	VI		
<i>Stylodrilus heringianus</i> Clap.	II	II	I	II	IV	VII	II		
<i>Nais elinguis</i> Mll.		III		V	I				
- <i>pardalis</i> Fig.		II			I	I			
<i>Limnodrilus calyparedeanus</i> Ratzel			II				IV		
<i>Tubifex ignotus</i> (Štolo)			IV				I		
<i>Limnodrilus profundicola</i> (Verril)							IV		
<i>Vejdovskyella comata</i> (Vejd.)							III		>10
<i>Potamotheix hammoniensis</i> (Mich.)			II						
<i>Nais communis</i> Fig.		II				I			
<i>Haplotaxis gordioides</i> (Hartm.)			II						
<i>Chaetogaster diaphanus</i> (Gruith.)						I			
<i>Marionina riparia</i> Bret.		I							
<i>Pelosclex ferox</i> (Eis.)			I						
<i>Eiseniella tetraedra</i> (Sav.) f. <i>typica</i>					I				
Liczba gatunków: Number of species:	4	8	10	5	7	8	9	-	
Liczba prób: Number of samples:	13	21	25	14	18	15	14	-	



very few species are characterized by a distinct ecological specialization. It should also be stressed that in the fauna of oligochaetes the fairly significant differences sometimes observed between the stations lying along the course of the stream, are above all connected not with the changes in the thermal conditions of the environment but with the changes brought about by the inflow of organic matter and mineral salts (S z c z ę s n y 1974, K a s p r z a k, S z c z ę s n y 1976).

In the case of the Prądnik stream, strongly polluted with sewage from the creamery in Skala and with mineral substances drained into it from meadows and fields, the zoning of the longitudinal distribution of the fauna of oligochaetes is very poorly expressed. Four faunistic zones may be identified in the Prądnik stream: zone I (the spring), zone II (stations 1—3), zone III (station 4), and zone IV (stations 5—7). The zones mentioned above are characterized by slightly different fauna of *Oligochaeta*, their distribution, it would seem being chiefly limited by the content of allochthonic organic matter. Zone I (the spring) is the most poorly settled by *Oligochaeta* only two pelorheophile and limnophile species of *Tubificidae* being found there. Zone II is characterized by the quantitative prevalence of species and specimens of the family *Tubificidae*. The *Naididae* species were less numerous in this zone. In zone III a marked increase is observed in the number of rheophile *Naididae* species, particularly of *Nais elinguis* Müll. In zone IV a great decrease again occurs in the number of representatives of *Naididae* in favour of pelorheophile species of *Tubificidae*. In this zone a distinct increase also occurs in the number of *Stylodrilus heringianus* Clap. The increase in the number of some species of *Tubificidae* in this zone is particularly distinct at station 7. Nevertheless, great numbers of specimens of these species were often collected in other zones of the investigated stream as well. It should also be stressed that at some stations in zones II and IV a considerable, difficult to explain, variability is observed in the numbers of certain species. Besides, in all zones sexually immature specimens of *Tubificidae* occur in very great numbers. The data of K a s p r z a k and S z c z ę s n y (1976) on the *Oligochaeta* of the River Raba suggest that in montane rivers certain zoning in the longitudinal distribution is shown only by *Nais alpina* Sperb. and *N. pardalis* Pig., which occur more often at stations at higher altitudes. Similar observations were made by W a c h s (1967 a).

The zones determined according to the fauna of *Oligochaeta* are not identical with the faunistic zones differentiated in the Prądnik stream by D r a t n a l (1976 a). On the basis of the occurrence and numbers of the species *Ephemeroptera*, *Trichoptera*, and *Chironomidae* this author determined the following zones: the spring and spring zone (station 1), the zone of the middle course (stations 2—5), and the zone of the lower river



course (stations 6—7). The fauna of the investigated animal groups in the zones differentiated by Dratnal (1975 a) differs both quantitatively and qualitatively.

### Recapitulation

1) In the materials collected in the course of the investigations carried out in 1968 and 1969 at 8 stations in the Prądnik-Białucha stream the occurrence of 32 species of *Oligochaeta* belonging to 6 families was noted. 14 of the species found were new to the fauna of the Kraków-Częstochowa Upland. The most frequently encountered species were from the families *Naididae* and *Tubificidae*. The commonest species were: *Nais elinguis* Müll., *Aulodrilus pluriseta* (Pig.), *Tubifex tubifex* (Müll.), *Limnodrilus hoffmeisteri* Clap., *L. udekemianus* Clap., *Stylodrilus heringianus* Clap., and in a lesser degree *Haplotaxis gordioides* (Hartm.).

2) Among the 3 investigated types of habitats, which differed from each other in the character of the bottom and the rate of flow of the water, the greatest number of species of the fauna of oligochaetes was found on a stony bottom (the rheophile *Nais elinguis* Müll. being the dominant) and on a silty bottom, where pelorheophile *Tubificidae* species and the rheophile *Stylodrilus heringianus* Clap. dominated. The qualitative composition of the fauna of *Oligochaeta* at the investigated stations, great numbers of pelorheophile species of *Tubificidae*, the mass appearance of certain species, and the absence of the psammorheophile *Proppapus volki* Mich. suggest a distinct pollution of the stream by allochthonic organic matter.

3) The investigation showed that in the Prądnik stream four faunistic zones occurred, characterized by the slightly different fauna of *Oligochaeta*. Its distribution chiefly depended on the content of the allochthonic organic matter in the substratum.

### STRESZCZENIE

Opracowano zebrane przez dra E. Dratnalą w potoku Prądnik-Białucha w latach 1968—1969 materiały skąposzczetów (*Oligochaeta*), pochodzące z 8 stanowisk rozmieszczonych wzdłuż biegu potoku. Wykazano 32 gatunki skąposzczetów, należące do 6 rodzin. Nowymi dla fauny Wyżyny Krakowsko-Częstochowskiej okazało się 14 gatunków. Najpospolitszymi gatunkami były: *Nais elinguis* Müll., *Aulodrilus pluriseta* (Pig.), *Tubifex tubifex* (Müll.), *Limnodrilus hoffmeisteri* Clap., *L. udekemianus* Clap., *Stylodrilus heringianus* Clap. oraz w mniejszym stopniu *Haplotaxis gordioides*



(Hartm.). Scharakteryzowano faunę skąposzczetów następujących siedlisk: dno kamieniste (niekiedy tylko lekko zamulone) w średnim i silnym prądzie ( $\pm$  min około 30 cm/sek. w strefie przydennej), dno kamieniste z kępami krzaczkowatych glonów w silnym i średnim prądzie, dno muliste w słabym prądzie (poniżej 15 cm/sek). Skład gatunkowy badanych siedlisk, znaczna liczebność pelofilnych gatunków *Tubificidae*, masowe pojawy niektórych gatunków (*Nais elinguis* Müll.) oraz brak psammoreofilnego *Propappus volki* Mich. wskazują na znaczne zanieczyszczenie potoku allochtoniczną materią organiczną. Nie stwierdzono występowania wyraźnej strefowości w rozmieszczeniu skąposzczetów wzdłuż biegu potoku, na co wpływ ma silne zanieczyszczenie oraz niewielka długość potoku.

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## ERRATA

Strona Page	Wiersz Line	Zamiast Instead of	Winno być Ought to be
	od góry from above		
267	4	Łukasiewicz	Łukaszewicz
269	5	$\sqrt{1} = 1.$	$\sqrt{\bar{1}} = 1.$
269	11	$\sqrt{\overline{1}} = 1.$	$\sqrt{\bar{1}} = 1.$
287	2	(1975 a)	(1976 a)
298	16	acology	ecology
298	25	<i>Macropelopia nebulosa</i> sp. Afghanistan	<i>Macropelopia</i> sp. Afghanistan
299	21	II—XII	II—XIII