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**Nowe i rzadkie w faunie Polski gatunki widelnic (*Plecoptera*) —
New and rare species of stoneflies (*Plecoptera*) in the fauna
of Poland**

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During the hydrobiological examinations of the Carpathian streams and rivers, the initiative of which was given by prof. dr K. Starmach and carried out by the Laboratory of Water Biology of the Polish Academy of Sciences in Kraków (Cracow), I had the chance to collect rich material from the river bottom macrofauna of various regions of Southern Poland. In the course of examinations I found a certain amount of species of stoneflies (*Plecoptera*) interesting from the faunistical view point. In this note I have given a list of these species with a short ecological and faunistical characteristic of each species. This group of insects, interesting and important for the biological characteristic of rivers is with us, as yet, not well elaborated and the known data refers chiefly to biology and distribution of adult forms. The given list of discovered species concerns first of all the stream Wielka Puszcza in the Beskid Mały mountains, where thorough and complex hydrobiological examinations were carried out in 1959 and 1960. Four forms only i. e. *Taeniopteryx hubaulti*, *Leuctra armata*, *L. handlirschi* and *L. niveola* were collected from other territories.

The streams Wielka Puszcza, about 9 km long, with 720—315 m level difference and an average section profile 46,1‰, is a tributary on the right side of the Sola river and joins it not far from the water reservoir below the dam in Porąbka. It is quite a typical Carpathian stream flowing through densely wooded but rather scarcely populated terrains. This stream is 4 m broad and 0,5 m maximal deep at an average water level.

Family: *Taeniopterygidae* Klapálek 1905

Brachyptera risi (Morton) 1896. Material: 1 nymph, caught in the middle course of the stream in a stony part of the stream bed at full current. Rare in Wielka Puszcza.

Species, as yet not quoted from Poland. Winkler (1957) mentions

it from the Poprad river on the Slovak part. It is wide spread in Czechoslovakia, Germany (Illies 1955) and other European countries.

Taeniopteryx hubaulti Aubert 1946. Material: 3 nymphs, caught in the Wetlina stream in the village Kalnica (the Bieszczady mountains) in Autumn 1959.

The stream Wetlina in Kalnica is a rather small river 4-5 m wide and 0,5 m deep in its lotic places, and 8-15 m wide and 1,5 m deep in its lentic places at an average water level. The stand was situated about 17 km from the river head, 590 m above sea level. Section profile 5,0 ‰.

The nymphs 4-4,5 mm long with averagely developed wing pads were collected on September 29th 1960 from the lotic region of the stream. In this place the river bed was covered with big stones and in some places the water was flowing over solid rock. Other species of stoneflies that appeared concomitantly: *Isoperla grammatica* (Poda), *Dinocras cephalotes* (Curt.), *Perla marginata* (Panz.), *P. burmeisteriana* Class., *Chloroperla tripunctata* (Scop.) and *Isoptena serricornis* (Pict.) (nymphs as a rule resemblant to *Ch. tripunctata* (Scop.) though with a considerable amount of hairs on the 2-4 segments palpus maxillaris, chiefly on the outer side of the segment 4, in which the length exceeds one half of the segment breadth). Various species of mayflies appeared also: *Epeorus assimillis* Etn., *Rhithrogena semicolorata* (Curt), *Baëtis pumilus* (Burm.), *B. scambus* Etn., *B. rhodani* (Pict.), *B. venustulus* Etn., *Habroleptoides modesta* (Hag.) and *Caenis pseudorivulorum* Kefferm.

This species has not been found in Poland, as yet. It is easily distinguished, among the remaining European species of *Taeniopteryx* Pict., by horn-like processes present in the larvae and adults in the mid-line on the front and hind margins of the dorsal segments surface of the thorax. Up till now, it has only been found in some places in Switzerland, in the French Vogeses (Aubert 1950), in Germany (Illies 1955), Czechoslovakia (Winkler 1957) and recently in Austria (Pomeisl 1958). Its stands were found in Switzerland at the highest height of 830—1250 m above sea level and in France at the lowest height of 320 m above sea level.

The ecology as well as the geographical distribution of the species in question has not, as yet, been examined in detail. According to a conformable opinion of the authors, the flight of the adults takes place in April, whereas, larvae are characteristic of the autumn biological season of flowing waters. The above mentioned stand is one situated farthest East (fig. 1). This gives evidence form appears also in the Northern part of the Carpathians. Illies (1955) considers it to be an inhabitant of streams and small mountain rivers that are corroborated with the present observations.



Fig. 1. Distribution of *Taeniopteryx hubaulti* Aubert in Europe

Family: **Nemouridae** Klapálek 1905

Protonemura auberti Illies 1954. Material: 42 nymphs, 1 im. ♂
They are quite common in the middle course of the stream Wielka Puszczka and still more numerous in its right side affluents. They are found always on the stony stream bed in the lotic parts of the stream. I found an adult specimen in the middle course of the streams on September 14 th 1959.

Species new for Polish fauna. Known in Europa from Germany as a common and numerously occurring from on the fore-Alpine territories and among the mountains. Besides, it is mentioned also from Austria, Sweden, Czechoslovakia (Illies 1955). Winkler (1957) mentions it from the High Tatra.

Protonemura meyeri (Pictet) 1841. Material: 1 nymph, sampled in the upper course of the stream Wielka Puszczka in a stony part of the stream bed, on the current.

Species as yet not mentioned from our country. Found in various

European countries. Among others known from several stands in Slovakia and in Morawy (Winkler 1957).

Protonemura nitida (Pictet) Ris 1902. Material: 4 nymphs. Found in the middle course of the stream Wielka Puszczka. Occurs rather in small numbers. In 1920 mentioned by Dziędziewicz from the mountain chain Gołobór in the vicinity of Bóbrka and from the higher parts of the Eastern Carpathians. Still earlier mentioned by the same author (1911) from Myślenice near Kraków. Earlier discoveries in the Tatra mountains (Nowicki) 1864, Dziędziewicz 1867) are not quite sure due to difficulties in discriminating this species from *P. lateralis* (Pictet) Ris 1902. It is known from Sweden, France, Germany, Austria and Czechoslovakia.

Protonemura praecox (Morton) 1894. Material: 87 nymphs. Most common in the middle course of the stream Wielka Puszczka and in its affluents. As a rule found in the lotic parts on a stony stream bed. For identification of this species and of others belonging to the genus *Protonemura* Kempny, the Raušer's key (1956 a) was applied.

In our country known, thus far, only from the mountains Karkonosze (Schoenemund 1927). Occuring all over Europe.

Amphinemura borealis (Morton) 1894. Material: 155 nymphs. Collected in the middle course and first of all in the lower course of the stream Wielka Puszczka. Living mostly on gravel parts of the stream bottom in its lentic regions. It is, until now, the second stand of this species which is rarely found in Poland. It was formerly found in the river Bajerka in the vicinity of Skoczów in the Cieszyn district (Sowa 1961). Common in Scandinavia (Brinc 1949). In recent years it has been found in several European countries. Among others it is also found in some places in Slovakia (Winkler 1957). It is generally considered to be a Northern element.

Nemoura cambrica (Stephens) 1835. Material: 3 ♂♂, 6 ♀♀ caught on April 28th 1961. The nymphs common in the upper and middle course of the stream Wielka Puszczka.

Species as yet not quoted from Poland. Its known from Middle Europa and England.

Nemoura murtoni Ris 1902. Material: 5 nymph. Sampled in the middle and lower course of the stream Wielka Puszczka on a stony bottom at full current. From Poland not reported, thus far. According to Illies (1955) it is known only from Germany, Switzerland and Austria.

Family: Leuctridae Klapálek 1905

Leuctra albida Kempny 1899. Material: 1 im. ♂, caught on August 11th 1959 in the upper course of the stream Wielka Puszczka — on the stone.

This species has not been found in Poland. It is known in Europe from Switzerland, France, England, Germany, Scandinavia (Illies 1955) and Slovakia (Winkler 1957).

Leuctra armata Kempny 1899. Material: 1 im. ♀ caught on the stream Potok Pieniński in the Pieniny mountains on July 6th 1960.

Species, as yet, not mentioned from Poland. Winkler (1957) mentioned it from the High Tatra of the Slovak part and Raušer (1956 b) from the Beskidy mountains the Czechoslovak part. It is known from the Alpine territories of middle Europe.

Leuctra aurita Navas 1919. Material: 1 m. ♀ sampled December (!) 2nd 1960 in the middle course of the stream Wielka Puszca on the surface of the water in a calm bay. The determination was doubtless because of its characteristic shape of the skeletal part of the spermatheca.

Thus far not noted from Poland. Found by Raušer (1956 b) in Czechoslovakia in the Sudety mountains and in the Beskidy mountains. Reported also by this author from the Karkonosze mountains in Czechoslovakia. It is known from several countries in Europe.

Leuctra braueri Kempny 1898. Material: 66 nymphs. Inhabiting the upper course of the stream Wielka Puszca and its affluents in its upper course. Occurs in calm parts of the stream bed mostly in gravel with a thin of mud.

A new species for the Polish fauna. The only known stand, thus far, was in Mikuliczyn in the Eastern Carpathians (Dziędziewicz 1920). At present it is located out Polish borders. According to Raušer (1956) it is quite common on the Czechoslovak side of the Sudety mountains and in the Beskidy mountains. It is known as well from other European countries and from Scandinavian.

Leuctra fusca (Linneé) 1758. Material: 41 nymphs. Quite commonly found in the middle and lower course of the stream Wielka Puszca on a gravel and stone-gravelly stream bottom. For the most part found in lentic regions.

From Poland known as the *L. fusciventris* Steph. from the vicinity of Duszniki in the Sudety mountains (Schneider 1885). Besides, it is mentioned as *L. klapáleki* Kemp. from the Eastern Carpathians (Dziędziewicz 1920). It occurs in many places in Middle Europe.

Leuctra handlirschi Kempny 1898. Material: 1 im. ♀. Sampled in an affluent of the stream Potok Pieniński in the Pieniny mountains on July 6th 1960.

Species until now from the Polish territories not mentioned. Some authors (Illies 1955) considered it to be a mountain form of the species *L. inermis*. Reported by Raušer (1956 b) from many stands in the Sudety and Beskidy mountains on the Czechoslovak side. According

to this author it is also known from the High Tatra where it was found by other investigators.

Leuctra inermis Kempny 1899. Material: 10 im ♂♂, 9 im. ♀♀. Found on plants on the bank of the stream in the middle part of the plain (valley) by the stream Wielka Puszcza on May 12th 1960.

From Poland thus far not quoted. Raušer (1956 b) found it common in the Czechoslovak Sudety. According to his opinion it also occurs in the Beskidy and Karkonosze on the Czechoslovak side, as well in some other Czechoslovak places. Winkler (1957) mentions it among others from the Poprad in Slovakia. It is widely spread in Europe. According to Raušer, there is no occurrence of it in Scandinavia.

Leuctra niveola Schmid 1947. Material: 2 nymphs; 6 mm long, with fully developed wing pads, found in the stream Siwa Woda in the Chochołowska valley in the Tatra mountains at about 1100 m above sea level on July 22nd 1958. The width of the stream 3 - 4 m, the depth to 0,4 m, water temperature 7,9 °C, air temperature 19,5 °C. The section profile in this place is 35,7‰. Nymphs were collected from under the stones on the river bottom close to the river bank, where the current was not so rapid. Besides there I also found among these samples: *Leuctra rosinae*? Kempny, *Isoperla sudetica* (Kolenati) and *Isoperla oxylepis* (Despax).

Thus far, not reported from Poland. Known only from a few places in Switzerland, Austria (Illies) 1955, Pomeisl 1958). Occurs at great heights of the Alpine territories and in the Alps. Occasionally found in early spring on snow (April). Considering the developmental stage of the specimens found the flight takes place in Summer (April - July?).

Leuctra pseudosignifera Aubert 1954. Material: 91 nymphs. 4 im. ♂♀. Common in the upper and middle course of the stream Wielka Puszcza as well in the lotic parts under the stones as in the calm regions of a gravel stream bottom. Imago on April 16th 1961.

Species, thus far not noted from Poland. It may be that the species *Leuctra signifera* Kempny mentioned by Dziędziewicz (1920) from the higher parts of the Carpathians, belongs to this species; according to Illies (1955) these two forms were often confused formerly. In Europe known from Germany, Switzerland and Austria.

Family: Perlodidae Klapálek 1912

Isoperla difformis (Klapálek) 1908. Material: 2 nymphs, collected from the stony part of the river bottom in the lower course of the stream Wielka Puszcza.

Species, thus far, not mentioned from Poland. As a rule considered to be an inhabitant of greater rivers (Illies 1955) and streams. It may

be assumed that it came to the stream Wielka Puszca from the river Soła flowing nearby. It is known from Germany and Czechoslovakia (Winkler 1957).

Isoperla görtzi Illies 1952. Material: 1 nymph; found on the gravel and sandy region of the stream bottom in the upper course of the stream Wielka Puszca. Easy to be determined by the keys of Illies (1955) and Winkler (1957) because of a bright spot between the ocella and a galea with a hairless inner margin.

From Poland thus far not mentioned. Known from Germany and Czechoslovakia.

Isoperla oxylepis (Despax) 1936. Material: 624 nymphs, 13 im. ♂, 13 im. ♀. The most numerous representative of the genus and one of the most numerous species of stoneflies in the stream Wielka Puszca. It occurs in great numbers in the middle and lower course of the stream. Inhabiting stony parts of the stream bottom, at full current.

From Poland thus far not known. Perhaps before being described by Despax, it had been identified by our investigators as *I. grammatica* Scop.

STRESZCZENIE

Autor donosi o złowieniu 21 gatunków widelnic (*Plecoptera*) bądź to nowych dla fauny Polski, bądź znanych dotychczas z niewielu stanowisk w kraju.

Widelnice złowiono głównie podczas prowadzenia w latach 1959 i 1960 kompleksowych badań hydrobiologicznych w potoku Wielka Puszca w Beskidzie Małym, organizowanych dzięki inicjatywie prof. dr Karola Starmacha, przez Zakład Biologii Wód Polskiej Akademii Nauk w Krakowie. Potok Wielka Puszca, o długości około 9 km, przy różnicy wzniesień 720—315 m n.p.m. i średnim spadku jednostkowym 46,1‰, stanowi prawdopodobny dopływ rzeki Soły, wpadając do niej tuż poniżej zbiornika zaporowego w Porąbce. Podane zostały także gatunki widelnic złowione przez autora na innych terenach a mianowicie w Bieszczadach, Pieninach i Tatrach. Przy charakteryzowaniu każdego z gatunków uwzględniono dane o jego ekologii i rozmieszczeniu geograficznym.

Gatunki nowe dla fauny Polski: *Brachyptera risi* (Mort.), *Protonemura auberti* Illies P. meyeri (Pict), *Nemoura mortoni* Ris, *N. cambrica* (Steph.) *Leuctra aurita* Nav., *L. albida* Kemp., *L. braueri* Kemp., *L. inermis* Kemp., *L. pseudosignifera* Aub., *Isoperla difformis* (Kláp.), *I. görtzi* Illies, *I. oxylepis* (Desp.), Wszystkie złowione w potoku Wielka Puszca; *Taeniopteryx hubaulti* Aub. złowiony w potoku Wetlina w Kalnicy (Bieszczady); *Leuctra armata* Kemp. i *L. handlirschi* Kemp. zebrane nad Potokiem Pienińskim w Pieninach, oraz *Leuctra niveola* Schm. znalezione w potoku Siwa Woda w Dolinie Chochołowskiej w Tatrach.

Gatunki znane z niewielu stanowisk w kraju: *Protonemura nitida* (Pict.) Ris, *P. praecox* (Mort.), *Amphinemura borealis* (Mort.), *Leuctra fusca* (Linné), wszystkie z potoku Wielka Puszca w Beskidzie Małym.

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