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**Morfometryczna charakterystyka brzanki (*Barbus petenyi* Heckel) z Górnej Wisły — Morfometric characteristics of *Barbus petenyi* Heckel from the upper region of Wisła (Vistula)**

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*Barbus petenyi* Heckel (synonym: *Barbus meridionalis petenyi* Berg) is a common fish in the upper and middle course of the carpathian affluences of Wisła (Vistula) and in the upper region of Wisła to Drogomyśl. It is also known to be in the Olza river, which is an affluence of the Odra river near the area of Cieszyn (Heckel, Kner 1858). Balon (1952) did not find it there now. Nowicki (1889) noticed it to be in the Wisła near Kraków, where now only sporadic is found after floods during which time it drifts from the carpathian rivers. Wałęcki (1864) wrote about the finding of specimen near Warszawa (Warsaw).

*B. petenyi* is seldom longer than 30 cm and heavier than 250 g, the body is elongated with a cylinder shape; it is covered with spotted blackish-brown stains on the head, the back and sides of the body. According to the data of Heckel (1858) the length of the head is about  $\frac{1}{4}$ th. the length of the body, the width of the head between the gill cover is  $\frac{2}{3}$  —  $\frac{3}{4}$  the height of the body. The length of the body is 5,25 — 5,5 times longer than the height of the fish. The filaments on the upper jaw extend upward behind the margin of the eyes. On the profile of the head, behind the convex nostrils, you can see a saddle-like opening, behind which the front of the head has a proportional raise. The last ray in the dorsal fin has only a little cut-out. The anal fin is long and extends to the of the tail fin.

The Barbel live in the lower regions of the trout but sometimes they come up stream. They are bottom-fish. They spawn during May and June.

The species *Barbus petenyi*, described by Heckel (1848). Next, Berg (1914), found several characteristics features, which are also

the same as the *B. meridionalis* Risso. Due to these fish having several similar characteristics, he decided that the *B. petenyi* is a north-east sub-species of the *B. meridionalis* Risso. Karaman (1924, after Hankó 1932) accepted this identification, by describing the fish of Macedonia. Berg recorded this identification in 1932, took the data of the distribution of this fish from literature and did not back it up with his own experiences. The name given by Berg was taken by Oliva without discussion (for example paper 1960).

The protection of the species of Heckel (*Barbus petenyi*), began with the Hungarian investigator Hankó in 1932. He considered, within his rights, that *B. petenyi* is a biotype characteristic for the Pontic-pannonic Basin. However, this species has morphological features something similar to *B. meridionalis*, but it could not possibly come from it. *B. meridionalis* is a characteristic species of the Mediterranean Sea basin, and it lives on the East coast of Spain and South France, Italy, and on the west coast of the Balkan peninsula (Dalmatia). It could not have migrated to the Pannonic basin, because the basin has not been combined with the Mediterranean Sea basin for many years. Only in the Miocene time were the two basins connected by a narrow canal through France, which led to the Sarmatic Sea, which is now covering the Pontic-pannonic area and it was also flowing through a narrow bay from the North side of the Carpathian to the West. If the *B. petenyi* had migrated from the Med. Sea to the Pontic basin, it would have had the same distribution as the Sarmatic Sea and it would have been located in the far West of Europe. (For example like Barbel (*Barbus barbus* L.) and Nose Carp (*Chondrostoma nasus* L.) and other species. But it is limited in distribution as far as the West to the line of Vienna and Graz, it was in the basin of the river Sava and not in Dalmatia, it is distributed in the East to the river Moldavia, to the North as far as the river Wisla and Dniester. Not long ago it was also found in the river Niemen after Sabaniev (1959).

Thienemann's (1950) conclusion was the same as Hankó's: *B. petenyi* is an old Pontic species, which was probably developed on the same parallel as *Barbus meridionalis*, but limited in distributions to the Pontic-pannonic basin. The taxonomical changing of it to the sub-species of a South Barbel (*B. meridionalis*) is neither necessary nor indispensable, on the contrary, one can come to a wrong conclusion of its origin. It could not derive from the South Barbel. So long as one would make a comparison of these two forms, we would keep the old name. (However, we should not prejudge the subject).

When we put attention to the above data, the exact morphological and biological characteristics of this interesting species, which is common in our country, especially in the middle and lower trout

regions of the Carpathian river. The detailed description of *B. petenyi*, which are existing in our water reservoirs can be examined to the knowing of this species, which is considered by some as a good species, but to others as a sub-species.

Staff (1950) made an interesting hypothesis about the coming over of the *B. petenyi*, from the Danube basin to Wisła basin through the Poprad river, which owing to a back erosion in the south part of the Tatra Mountains joined to the Hernad river, an effluence of the Danube. But there is no explanation for the existence of this fish in the other rivers to the North of the Carpathians. It can only be explained in such a way that the existence of this Barbel in the Wisła basin was due to the two rivers being sufficiently used many years ago.



Fig. 1. The distribution of *Barbus petenyi* Heckel in the upper region of Wisła (Vistula) river, according to the catchings of May 22—24 1957. The number in parenthesis mean height of the sea-level of the Adriatic Sea.

The distribution of *B. petenyi* in the upper reaches of the Wisła is shown in fig. 1. The distribution was made on the date of catching the fish, which was on the 22, 23, and 24th, of May 1957, by using

a 220 volt 4,5 amper electro-aggregate. The fish were caught in 10 different stands. They were not found in the first three stands, which were located above the weir in Oblaziec. Perhaps the high weir was the first obstacle hendering the migration of the fish up stream, because not far from it great numbers could be found. They caught 18 specimens about 50 m below the weir (Attention should be put to the fact that the electro-aggregate did not catch all the fish). The bottom of the river near the weir in Oblaziec is rocky, the width is about 12 m, depth 0,7 m, in some places there were holes about 1.2 m deep, the speed of current was about 1,8 m per. sec., the right bank of the river was steep with forestry growing on it, the left bank was flat with *Salix* willows growing on it.

22 fishes were caught from a stand in Polana. The bottom of the river was rocky, the width 16 m, the depth 0,3—0,9 m, the speed of current 0,4—0,6 m per. sec. and *Salix* willows were growing on the banks.

12 fishes were caught from the stand in Nierodzim. The river was about 30 m wide and 0,3 — 1,2 m deep, the bottom was rocky, the current speed was about 0,6 m per. sec.,

22 fishes were caught from the stand in Harbutowice. The river was about 35 m wide, 0,3 — 1,2 m deep, the bottom was rocky the current speed was about 0,25 m per. sec., *Salix* willows were growing on the bank.

15 fishes were caught near the weir in Kiczyce. The river was about 30 m wide, 0,2 — 1,2 m deep, the bottom was of rock-pebbles, the current about 0,2 m per. sec. There were trees growing on the banks.

Only 3 fishes were caught in Ochaby. The river was more narrow in this place because of it's regulation, it has a pebble bottom, *Salix* willows were thickly populated on the banks. The widht of the current was about 12 m, the depth 0,2 — 1,2 m, the current about 0,5 m per. sec.

One fish was caught in Drogomyśl. It is a regulated river, about 20 m wide, with a pebble bottom, the banks are steep with trees growing on them, the water was turbid, the depth 0,3 — 3,0 m.

*B. petenyi* were abundant in 5 stands from Oblaziec to Ochaby. Brown Trout (*Salmo trutta morpha fario* L.), Bullhead (*Cottus gobio* L.), Minnow (*Phoxinus phoxinus* L.), Loach (*Nemacheilus barbatulata* L.) were frequently found in the same stands from the weir in Kiczyce; down the river from the weir in Kiczyce: Chub (*Leuciscus cephalus* L.), Chub (*Leuciscus leuciscus* L.), Nose Carp (*Chondrostoma nasus* L.), Roach (*Rutilus rutilus* L.) and other were frequently found.

*B. petenyi* occupied an area about 26 km long in the upper reaches of the Wisła. It is a common fish of this part. The catching did not give



the exact data as to its quantity, because many more specimens of the fish were seen from a bridge and foot-bridge while quietly standing by, nevertheless it makes clear the distribution of this fish. It is frequently found in the descent of the river of 8,7% to about 4,0%, this means from Oblaziec to the weir in Kiczycze below Skoczów. The river from Nierodzin to Kiczycze has a transitory character from the mountain to sub-mountain rivers, the bottom was covered with round stones and scores of pebbles, which became more abundant when nearing the weir in Kiczycze and obviously occupied the area from Kiczycze to Drogomyśl. The water was clear, only near Skoczów, for a little district it has characteristics of  $\alpha$  — mesosaprobic, which soon change to a region in  $\beta$  — mesosaprobic, reaching to Kiczycze, about 6 km below Skoczów.

Zarnecki and Kolder (1956) noted the catching of *B. petenyi* in the upper region of the Wisła river in 1954. Before the reservoir in Goczałkowice had been filled in the fish went down the Wisła river to the position of Wisła Mała near Strumień. The total of 218 specimens were caught at that time: 168 in Nierodzin, 44 in Kiczycze, 4 in Drogomyśl, 4 in Strumień, 1 in Wisła Mała. Most abundant were caught in the trout region, because 77,1% of the specimens caught were from this region. After the reservoir was filled the Barbus was drawn back from both upper stands and its range is now limited to Drogomyśl, which is the bed of back waters from the reservoir in Goczałkowice.

Among the fish caught 29 specimens were taken, by chance, on which, E. Rosół took measurements of the plastic features and later converting into meristic features based on the system used in the Laboratory of Water Biology of the Polish Academy of Sciences. Among the chosen fish 8 were male and 21 female. The results of the measurements are shown in the Table I.

The male fish were 4 years old, the length of their bodies were 125 — 148 mm, the weight 30,5 — 52,0 g. In proportion to the length of the body the head took up 23,2 — 26,8%, averaging of the whole, the height of the body 22,0 — 25,4%, averaging 23,3% of the whole, width of the body 12,8 — 15,5% averaging 14,5% of the whole. The body is wide oval, the head proportionally big, and takes up  $\frac{1}{4}$  of the length of the body.

Among the 21 female fish found 4 were three years old, 12 four years old, 5 five years old. The length of the bodies of the three year old female fish varied from 126 — 194 mm, the weight 33,5 — 140,5 g. The length of the four year old female fish were 162 — 197 mm, the

weigh 77,5 — 113,0 g. The length of the five year old female fish were 174 — 218 mm, the weigh 96,0 — 215 g.

Even from so little material the variation of growth can be seen in single specimens. Of the total collected material (21 female fish) the average length of the body was 180,9 mm, varying from 126 — 218 mm. The length of the head averaged 25,3% of the total length of the body, varying from 23,6 — 26,3%. The greatest height of the body averaged 16,4%, averaging from 14,3 — 19,7%.

The limited measured material did not allow us to make a precise comparison of the measurements and weights of the bodies of the male and female fish. It can be clearly seen on the table that fish of the same age is more matured and heavier than the male fish. If we compare 8 four year old male fish taken from among the smallest (the number 12, 13, 16 — 21) the average measurements of the body of the latter is 179, 1 mm, in comparison to 134,5 mm of the former, the average weight of the female 102 g in comparison to the average weight 38,0 g of the male fish. The differences of the occasionally collected material are very clear, more attention should be put to it, because it shows the dimorphism of the sex.

The height of the body of the female fish is 1,7% and male fish 0,9% in proportion to the length of the body. The height of the anal fin of the male fish is 15,2% of the female fish 19,1% of the length of the body. The length of the base of the anal fin of the male fish is 6,9% of the female 8,0% of the length of the body. The other differences are not so distinct but still they can be seen. To make it possible for comparisons of the fish of the other rivers we give all the measurements we have in table I, even though there were no exact conclusions due to limited material.

The variations of the converted features (meristic) were given both for male and female fish because there were no important differences.

The number of rays of the dorsal fin was III/9 on all specimens, Heckel and Kner (1958) and Siebold (1863) gave for D-III/8; Berg (1949) and Staff (1950) gave for D-IV/8. The number of rays in the anal fin was III/5-6, Heckel and Kner gave III/5, Siebold gave III/5; Berg and Staff III/5. In pectoral fin were I/14-17, in ventral fin II/8-10 rays.

The number of scales on the lateral line varied from 51 to 56 averaging 53,5. Heckel and Kner gave 55 — 60 scales on the lateral line, Siebold 58 — 60, Berg (48) 52 — 55 (60), Staff 52 — 55. The number of vertebrae in backbone were 40 — 42, more frequent 41.

The number of vertebrae:	40	41	42
n	11	17	1
M =	40,3 — 0,13;		
0 =	0,7;		
V =	1,74%		

The number of the appendices on the first gill was 8 — 11:

The number of the appendices on the first gill:	8	9	10	11
n	7	15	5	2
M =	9,1 — 0,16;			
0 =	0,84;			
V =	9,23%			

The characteristics of the Barbel in the upper region of Wisła river are as a whole similar to the description by Heckel and Kner (1858) but not so close to the description given by Berg (1949) and Staff (1950).

#### STRESZCZENIE

Brzanka (*Barbus petenyi* Heckel) występuje w górnym i średnim biegu karpackich dopływów Wisły oraz w Górnej Wiśle aż po Drogomyśl. Podawana była ponadto z rzeki Olzy (dopływ Odry) w okolicach Cieszyna. Jakkolwiek Berg (1914), a z nim wielu innych autorów, redukuje gatunek opisany przez Heckla od podgatunku brzana południowej (*Barbus meridionalis* Risso), to jednak pozostawiono dawną nazwę, kierując się danymi Hankó (1932), Thienemanna (1950) i Staffa (1950). Takie ujęcie wydaje się lepsze, jak długo dokładne studia porównawcze pomiędzy brzaną południową i brzanką nie uzasadnią zmiany nazwy.

Przedstawiono występowanie brzanki w Górnej Wiśle (rys.) oraz charakterystykę morfometryczną wykonaną na 29 sztukach wybranych losowo z połowu. Pomiarzy zestawione w tabeli wskazują na istnienie różnic pomiędzy samcami i samicami. Samce tego samego wieku są mniejsze i lżejsze, posiadają mniejszy stosunek wysokości do długości ciała, mniejszą podstawę i wysokość płetwy analnej, różnią się też kilku innymi drobniejszymi cechami. Cechy przeliczalne, jak również w ogóle cechy brzanki z Górnej Wisły odpowiadają lepiej charakterystyce podanej u Heckla i Knera (1858) niż u Berga (1949) i Staffa (1950).

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