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# MERISTIC AND BIOMETRIC FEATURES OF LAKE MINNOW *EUPALLASELLA PERENURUS* (PALLAS, 1814) IN A SMALL PEAT EXCAVATION (POLESIE LUBELSKIE REGION)

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**Summary.** The studies were conducted in May 2006 in a small water body situated in forests in the area of Sumin Lake. The aim of the studies was the estimation of taxonomic features of the population of *Eupallasella perenurus*. Comparative analysis referred to biometric features as well as to meristic ones. The studies encompassed 60 individuals of *E. perenurus*. The study results confirmed very high variability of this species in wide range of its occurrence. However, they did not reflect so clear a variability among the population of lake minnow from Polesie. All fish lived right after being caught.

**Key words:** lake minnow, meristic and biometric features, small peat excavation

## INTRODUCTION

Lake (or swamp) minnow *Eupallasella perenurus* (Pallas 1814), a small cyprinid fish, is considered to be one of the most threatened representatives of the Polish fresh-water ichthyofauna [Witkowski 1992, Witkowski *et al*., 1999, Kusznierz 1995, 2001, Kusznierz *et al*. 2002, Wolnicki 2005].

The range of *E. perenurus* is vast and extends from the River Odra basin [Schulz 1913, Thienemann 1926] in the west to the basins of River Kolyma [Nowikov 1966] and Amur as well as Sachalin [Kluchareva 1964] and Hokkaido [Shimazu 1992] in the east. The northern range does not cross the subpolar circle and southern boundary of its range is marked by the area of Korea, the basins of Bajkał and Bałchasz Lakes, as well as the basins of the River Volga and Dnieper [Berg 1949].

Polish populations of *E. perenurus* inhabit exclusively small and shallow muddy water bodies, overgrown with submerged and emerged vegetation, either natural or man-made, most often pools left after peat cutting [Kusznierz *et al*. 2002, 2005, Wolnicki 2005], always highly vulnerable to drying off or total destruction.

This species within its range of occurrence shows great variations. The variability of colouring and body shapes is very high, depending on climatic and habitat conditions.

On the basis of measurable and numerable features, in the 50s and 60s of the 20th century six subspecies were distinguished in the area of Poland: *Phoxinus percnurus percnurus* (Pallas, 1811), *Phoxinus percnurus gdaniensis* (Berg, 1932), *Phoxinus percnurus dybowskii* (Lorec et Wolski, 1910), *Phoxinus percnurus occidentalis* (Kaj, 1954), *Phoxinus percnurus stagnalis* (Warpachowski, 1886), *Phoxinus czekanowskii posnaniensis* [Kaj 1953, Kulamowicz and Jeżdżewska 1960, Kulamowicz and Klimkiewicz 1962, Kulamowicz 1962, 1963, Brylińska 1986]. Next, as a result of revision of lake minnow subspecies occurring in Poland, only one form was distinguished: *P. percnurus percnurus* (Pallas) [Gąsowska and Rembiszewski 1967]. Eventually, Kotteland [1997] put the variable and significantly inconsistent names of this species in order, and pointed out the correct name of the species – *Eupallasella perenurus* (Pallas, 1814).

## STUDY AREA, MATERIAL AND METHODS

The studies were conducted in May, 2006, in a peat bog excavation situated in Polesie Lubelskie in the area of Sumin Lake. It is a small water body located in forests of slightly eutrophic water type [Kolejko *et al*. 2005].

Presence of fish in the examined water bodies was checked with the use of Chinese traps, equipped with bait [Kolejko *et al*. 2005], designed specifically for catching *E. perenurus* in Siberia. Single or multiple attempts to trap fish were made.

The comparative analysis encompassed 60 individuals of *E. perenurus*. 24 measurements of biometric and 5 of meristic features were made (Tab. 1). The measurements of biometric features were under the binocular with the use of a slide calliper with accuracy to 0.1 mm. Moreover, every individual was weighted with accuracy to 0.01 g. Among measurements characterizing the meristic features the following ones were taken: the number of hard and soft rays in fins, the number of scales on lateral line, and the number of rows of scales above and under that line. Condition index was calculated according to the Fulton formula.

## RESULTS

Average total length of *E. peremurus* was 62.4 mm, ranging from 48.1 mm to 79.2 mm. However, the average body length was 56.1 mm, with the average weight of 3.2 g. Condition index for the studied populations was relatively high and its average value was 1.8. The values of remaining measurable features, relative and true ones, are given in the table (Tab. 1).

When characterizing the meristic features of the population of *E. perenurus* the occurrence of hard rays should be emphasized. Most of the examined individuals had 2 or 3 hard rays in dorsal (D) and anal (A) fins, and one ray each in abdominal (V) and pectoral (P) fins. Most of the studied fish had from 10 to 14 soft rays in pectoral fin, in the remaining fins – from 6 to 7 soft rays.

The number of scales in lateral line ranging from 71 to 80, above lateral line 16 to 20 rows of scales were found, below it – from 10 to 11 rows.

Table. 1. Biometric data for lake minnow from small peat excavation in Sumin Lake region
Tabela 1. Cechy biometryczne strzebli błotnej z torfianki w rejonie jeziora Sumin

| Measurement<br>Pomiar | True values<br>Wartości bezwzględne<br>mm | | | Relative values<br>Wartości względne<br>% | | |
|---|---|---|---|---|---|---|
| | min-max | *x* | SD | min-max | *x* | SD |
| Headlength (*Longitudo capitis lateralis*) | 11.1-14.2 | 12.12 | 0.41 | 20.1-25.3 | 23.2 | 0.83 |
| Snout length (*Spatium praeorbitale*) | 2.1-5.3 | 3.1 | 0.23 | 4.1-6.69 | 5.52 | 3.24 |
| Eye diameter (*Diaemeter oculi*) | 2.7-4.9 | 3.3 | 0.19 | 6.19-7.09 | 5.88 | 2.11 |
| Postorbital length (*Spatium postorbitale*) | 4.9-10.1 | 7.91 | 0.27 | 11.0-14.6 | 14 | 5.45 |
| Head hight (*Altitudo capitalis*) | 4.6-9.9 | 6.53 | 0.42 | 10.4-14.3 | 11.6 | 6.34 |
| Head width (*Latitudo capitis*) | 5.1-9.2 | 6.91 | 0.21 | 11.5-13.3 | 12.3 | 2.45 |
| Total length (*Longitudo totalis*) | 48.1-79.2 | 62.4 | 2.78 | 108.8-114.6 | 111.2 | 2.11 |
| Tail length (*Longitudo caudalis*) | 47.6-77.1 | 61.1 | 2.67 | 107.6-111.5 | 108.9 | 1.98 |
| Body length (*Longitudo corporis*) | 44.2-69.1 | 56.1 | 2.5 | | | |
| Predorsal length (*Longitudo praedosale*) | 26.1-41.1 | 32.2 | 1.12 | 59.6-62.3 | 57.4 | 3.23 |
| Postdorsal length (*Longituda postdorsalis*) | 11.9-23.0 | 16.1 | 0.99 | 26.9-33.2 | 28.6 | 2.56 |
| Maximum body hight (*Altitudo corporis maxima*) | 11.0-16.2 | 12.2 | 0.8 | 24.8-26.7 | 21.7 | 4.34 |
| Minimum body hight (*Altitudo corporis minima*) | 5.9-8.1 | 6.11 | 0.34 | 11.7-13.3 | 10.89 | 3.17 |
| Maximum width (*Latitudo corporis maxima*) | 5.1-11.2 | 8.8 | 0.43 | 11.5-16.2 | 15.6 | 9.12 |
| Minimum width (*Latitudo corporis minima*) | 3.1-7.6 | 4.5 | 0.33 | 7.1-10.9 | 8.1 | 24.79 |
| Preanal length (*Longitudo praeanalis*) | 3.4-5.3 | 3.89 | 1.55 | 7.6-7.9 | 6.9 | 4.32 |
| Caudal trunk length (*Longitudo pedunculi*) | 6.9-13.1 | 7.3 | 0.65 | 15.6-18.9 | 13.11 | 8.23 |
| Caudal fin length (*Longitudo pinnae caudalis C*) | 3.9-7.9 | 4.2 | 0.83 | 8.8-11.3 | 7.4 | 7.89 |
| Pectoral fin length (*Longitudo pinnae P*) | 4.2-9.2 | 6.81 | 0.54 | 9.5-13.2 | 12.1 | 9.34 |
| Abdominal fin length (*Longitudo pinnae V*) | 3.9-8.1 | 5.11 | 0.43 | 8.8-11.7 | 9.1 | 13.44 |
| Dorsal fin hight (*Altitudo D*) | 6.0-11.9 | 8.34 | 0.47 | 13.5-17.3 | 14.2 | 11.23 |
| Anal fin hight (*Altitudo A*) | 4.9-8.1 | 6.4 | 0.32 | 11.1-11.7 | 11.4 | 3.45 |
| Distance P - V (*Distantia P - V*) | 12.1-21.3 | 16.1 | 0.67 | 27.1-30.4 | 28.5 | 8.92 |
| Distance V - A (*Distantia V -A*) | 6.8-12.1 | 10 | 0.71 | 15.3-17.5 | 18.1 | 7.45 |

x – average – średnia, SD – standard deviation – odchylenie standardowe

## DISCUSSION

The obtained results confirm that E. perenurus in wide range of its occurrence (Asia, Europe) shows great variations [Berg 1949, Kaj 1953, Kulamowicz and Jeżdżewska 1960, Kulamowicz and Klimkiewicz 1962, Kulamowicz 1962, 1963,]. The comparison of biometric and meristic features of lake minnow of a peat bog excavation in the area of Sumin Lake with the reference to populations occurring in other regions of Poland also confirm the tendency for the species variation [Kulamowicz 1963, Gąsowska and Rembiszewski 1967]. Such tendency was not observed in the area of Polesie Lubelskie. The population inhabiting the studied peat bog excavation in the area of Sumin Lake was slightly different form populations occurring in peat bog excavations in the basins of the River Tyśmienica and Świnka [Kulamowicz 1962, Danilkiewicz 1968] due to the similarity of habitat conditions.

## CONCLUSION

High variability of *E. perenurus* in wide range of its occurrence is probably associated with high diversity of the habitats it occurs.

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## CECHY MERYSTYCZNE I BIOMETRYCZNE STRZEBLI BŁOTNEJ (*EUPALLASELLA PERENURUS* PALLAS, 1814) MAŁEJ TORFIANKI NA POLESIU LUBELSKIM

**Streszczenie.** Badania przeprowadzono w maju 2006 roku w małym śródleśnym zbiorniku w rejonie jeziora Sumin. Celem badań była ocena cech taksonomicznych populacji *Eupallasella percnurus*. Analizie porównawczej poddano zarówno cechy biometryczne, jak i merystyczne. Badania przeprowadzono na 60 osobnikach *E. perenurus*. Wyniki badań potwierdzają bardzo dużą zmienność tego gatunku w szerokim zasięgu jego występowania. Nie wskazują jednak na tak wyraźne zróżnicowanie w obrębie poleskich populacji tego gatunku. Wszystkie wyłowione ryby przeżyły.

**Słowa kluczowe:** strzebla błotna, cechy merystyczne i biometryczne, torfianki