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DYNAMICS OF CONDITION FACTOR OF VENDACE (*COREGONUS ALBULA L.*) IN THE LAKE PARAVANI

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Abstract

The dynamics of condition factor among both sexual groups of vendace has been studied for the first time. Condition factor of males and females were compared. The reason of differences is discussed. It was shown, that decrease of condition factor during last years is related with climate changes and global warming.

Key words: *Coregonus albula*. condition factor. Lake Paravani.

Introduction

Lake Paravani is the largest by its surface area among lakes of Georgia (37.5 km²). It is situated in the Southern Part of Georgia on Javakheti upland on the 2080 m a.s.l. Volume of the lake is 90,8 mln m³. Lake usually freezes in the second half of the December, while ice layer reaches its maximal thickness in March, very seldom it can be observed in the second half of February. In various years ice layer equaled to 57-73 cm, 80-90 cm, in very cold winter season it was even 1-1.2 m. Melting starts in the third decade of April. At the end of April or in the early May lake tends to be totally free from the ice cover [Barach, 1964, Apkhazava, 1975].

In 30s of 20th century vendace (*Coregonus albula* L.) was introduced in Paravani Lake from the Lagoda Lake (Volkhov hatchery). It was easily adapted to new environment and soon became object for commercial fishing [Demetrashvili, 1960, Japoshvili, 2002]. Data for condition factor for *Coregonus albula* is very poor and insufficient [Demetrashvili, 1960, Japoshvili, 2004, Kokhia, 1961. Peskova, 1960].

Materials and Methods

We have studied dynamics of condition factor for male and female *Coregonus albula* of Paravani Lake during 1999-2005. To calculate condition factor we have used Fulton's equation:

$$K=(W/L^3)\times 100$$

K is condition factor, W is the weight of the whole fish weight, L is total length of fish [Nikolskii, 1974, Murphy, Willis, 1996]

Age determinations were based on scales [Pravdin, 1966].

Results and Discussion

During the study males and females of vendace in Paravani Lake were represented by 4 age groups. Studies and calculations have shown that condition factor for females under the age group of 1+ reaches its peak in September. This indicator is increasing between May and September (from 0.65% to 0.81%), later on the indicator reduces and reaches the index observed in May (Fig. 1)

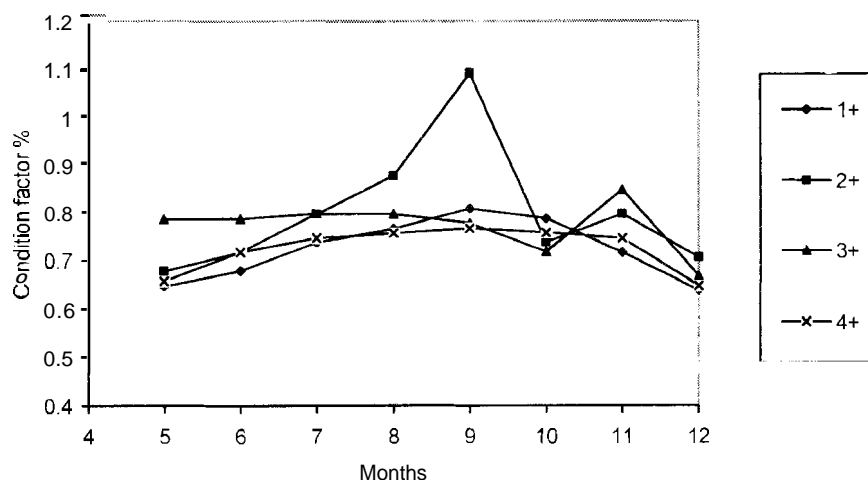


Fig. 1. Dynamics of condition factor of vendace females in Lake Paravani over the months.

In females under the age group of 2+, condition factor rises intensively and reaches its maximum in September -1.09%, while in October the curve is reduced and equals to 0.74%, however before the hatching it is risen a little bit achieving 0.80%, and falling again in December to 0.71%.

Female age group 3+ was observed in the period between May and September. They have shown condition factor of the same value approximately. It is well reflected on the curve that is almost linear. At the beginning of October coefficient equals to 0.72%, in November it reaches 0.85%, while in December it decreases to 0.67%.

In females of the age group 4+ condition factor tends to be 0.66% in May. In summer it rises to 0.77% and in December, following the hatching period the index decreases and equals to 0.65%.

Alteration of condition factor has been studied in males likewise (Fig. 2). Studies have shown that condition factor of males of age group 1+ reaches 0.58% in May, in July it rises to 0.78%, later on the value gradually falls down to 0.70% in September. In November the index increases for a while, equalling to 0.75% and decreases in December to 0.62%. In age group of 2+ coefficient is 0.60% in May. In summer period it increases dramatically and achieves to 0.84% in September. In October condition factor falls to 0.70%. At this period of time the curves are intercrossed for the age groups 1+ and 2+ in males. At the beginning of November it rises and reaches 0.78%, while in December it falls again and equals to 0.64%.

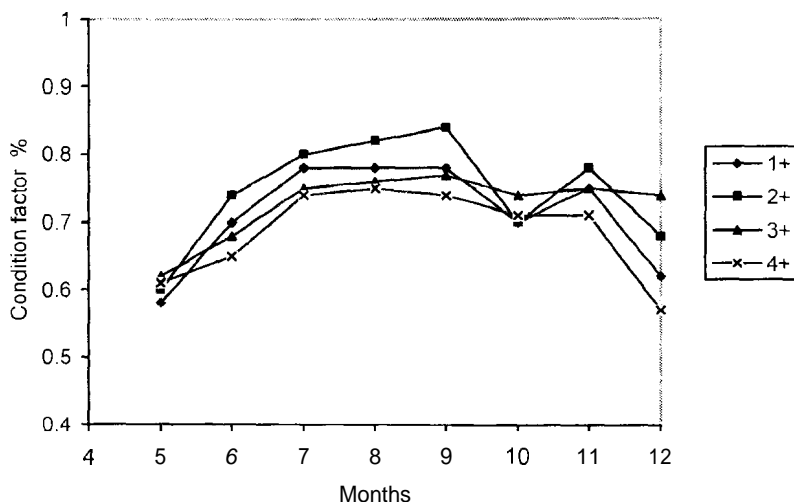


Fig. 2. Dynamics of condition factor of vendace males over the months in Lake Paravani.

Different results were found in males of the age group of 3+ and 4+. In both groups condition factor is rising from May to August. In the following months coefficient falls for the age group 4+, while 3+ age group preserves uniformity and the curve is almost linear.

Conclusions

Studies of females revealed that between May and August-September females of the age group of 1+ and 2+ are characterized with Intensified diet. In addition in the age group 2+, before hatching, condition factor is decreased. It should be caused by falling of feeding late due to the preparatory stage for hatching. This phenomenon for *Coregonus albula* is observed in other European lakes as well. In October-December species under the age group of 2+ and 3+ reflect similarity in nutrition curves caused by active involvement of those age groups in the hatching. Our studies have shown that in comparison with female species condition factor in males is less altered monthly. We suppose that condition factor is more exposed to seasonal changes due to generative synthesis in females

We have recorded pretty low indices of the condition factor, which can be caused by several reasons, including: illegal catches intensified in the last period. As for discrepancy of our figures with previous data we suggest that differences are caused by altered terms of hatching, Ice-cover formation, and warming of the lake as a result of global warming.

References:

- Apkhazava I. *Lakes of Georgia*. Tbilisi. "Metsniereba", 1975.
- Barach G. *Lakes of Georgia and their importance for fisheries*. Tbilisi. "Sabchota Sakartvelo", 1964.
- Demetrashvili M. *For study of biology of lake Paravani vendace*. Bulletin of the Georgian Academy of sciences. **XXV**, N.1. 65-70. 1960.
- Japoshvili B. *Results of visual observation on gonadogenesis of Vendace (Coregonus albula L.) in conditions of Paravani Lake*. Bull. of the Georgian Academy of sciences, **166**, 3, 591-594, 2002
- Japoshvili B. *Some Biological and morphometric characteristics of a vendace (Coregonus albula L.) of the Lake Paravani*. Proceedings of the Georgian academy of Sciences, Biological series B, **2**, 1-2, 97-100, 2004.
- Kokhia A. *Materials of diet of fishes of Paravani Lake*. Proceedings of the institute of zoology. Georgian Academy of Sciences, **XVIII**, 85-94, 1961.
- Murphy B.R., Willis D. W. *Fisheries Techniques*. Second edition, American Fisheries society. Bethesda, Maryland, USA, XX, pp732, 1996.
- Nikolski G. *Ecology of Fishes*. Moscow, "Visshaya Shkola", 1974.
- Peskova O. *Biology of vendace from Paravani and Sagamo lakes*. Proceedings of scientific-research fishery station of Georgia, vol. **V**, 3-37, 1960.
- Pravdin I. *Leading on fish study*. M.. "Pishchevaya promishlennost", 373, 1966.

ევროპული ჯაფალას (*Coregonus albula* L.) ნაკვეთობის კოეფიციენტის დინამიკა შარავნის ტბაში

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რეზიუმე

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