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RELATION BETWEEN BODY WEIGHT AND BODY LENGTH OF THE WELS OR WALLER (SILURUS GLANIS L.) IN THE TISZA REACHES AT TISZAFÜRED

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Abstract

On the basis of the data, collected about 220 wels individuals in the period between 1974 and 1978, concerning the relation between weight and length the following connection was given:

$$\lg W = -5.1532 + 3.0006 \cdot \lg L,$$

where the body weight (W) is given in g, the body length (L: standard length) in mm. Comparing this with the data representing the average in Hungary, it is to be established that the welses in the Tisza begin with a smaller weight but the tempo of the increase in their weight is better than the average.

Introduction

In case of fish populations it may be very important to know the allometric relation between body weight and body length. From the point of view of production it is not all the same, either, what the average body weight of the single populations is in case of an identical body length. The aim of the investigation, carried out on the mandate of the Hatchery and Research Institute for Pisciculture, Szarvas, was to become acquainted with the condition of the welses in the Tisza.

Material and Method of the investigation

We have used to the investigation the data of 220 wels individuals. The fishes were caught in the Tisza reaches at Tiszafüred, between 1974—1978. Their body length (measured from the tip of the nose till the beginning of the caudal fin) changed between 350 and 1740 mm, their body weight fell between 300 and 42150 g.

I have expressed the relation of length and weight with the formula suggested by Tesch (1968):

$$W = a \cdot L_b$$

resp. with the connection, given by the logarithmic form of this:

$$\lg W = \lg a + b \cdot \lg L$$

W is the body weight of the fish, L is the body length and "a" and "b" are the parameters of the equation.

I have calculated the values of the condition factor (CF) according to Hile (1936), on the basis of the connection:

$$CF = \frac{W}{L^3}$$

Results

After performing the linearity investigation with the logarithms of data, I fitted a line to the points, with the least square method (Fig. 1). The equation of the received line is:

$$\lg W\ 2 - 5.1532 + 3.0006 \cdot \lg L$$

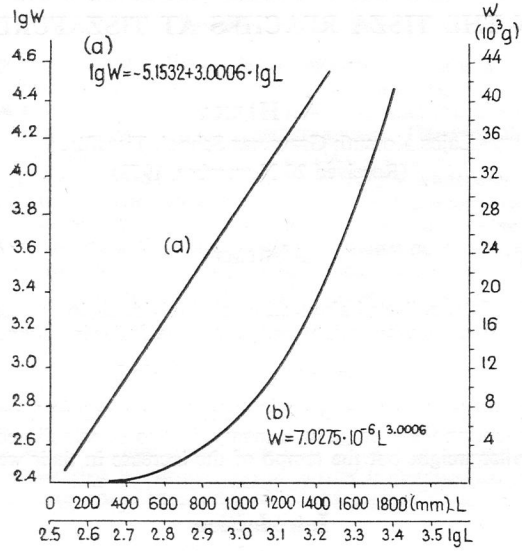

Fig. 1. Allometric relation between body weight and body length W = body weight ing L = body length in mm.

From the equation the body weights, belonging to the single body lengths, can be calculated and compared with Antos's (1970) data (Table 1).

Table *1. Connection between the body length and body weight of the wels*

Body length in mm	Body weight in g	
	Hungary	The river Tisza
500	1 300	880
800	400	3 600
1100	10 000	9 400
1450	20 000	21 500
1750	35 000	37 700

Antos does not publish the exact origin of his data but these supposedly represent the average in Hungary.

It turns out of the Table that the body weight of the rather small individuals, which form the bulk of the catching in the Tisza, remains below the average. They begin, therefore, with a smaller weight but the tempo of their growing in weight is faster than that of the average.

The weight data of Antos are probably strongly rounded values. Thus, the CF values, calculated of these, are also approximative (Table 2). With the increase in body length, they perceptibly decrease, while the condition of the welses in the Tisza is balanced enough.

Table 2. *Condition of the average welses in Hungary and in the Tisza*

Body length (mm)	10^5 CF	
	Hungary	Tisza
500	1.040	0.704
800	0.781	0.703
1100	0.751	0.706
1450	0.656	0.705
1750	0.653	0.703
	.....	

From the point of view of meat production it is decisive, after all, in how much time the given body weight was achieved by fishes. This question, however, will only be replied to by the growth investigation, as a function of time.

References

ANTOS, Z. (1970): A harcsa horgászata (Angling of wels). — Budapest.

HARKA, Á. (1975): Investigation of the relation between body length and body weight of the pike-perch (*Lucioperca lucioperca* L.) in the Tisza stretch at Tiszafüred. — Tiscia (Szeged) *10*, 77—80.

HILE, R. (1936): Age and growth of the cisco, *Leucichthys artedi* (Le Sueur), in the lakes and the north-eastern highlands. — Wisconsin. Bull. Bur. Fish. U.S. *19*, 211—317.

SVÁB, J. (1973): Biometriai módszerek a kutatásban (Biometric methods in research). — Budapest

TESCH, F. W. (1968): Age and Growth. In: RICKER, W. E.: Method for Assessment of Fish Production in Fresh Waters. — Oxford and Edinburgh.

A harcsa (Silurus glanis L.) testsúly-testhossz viszonya a Tisza folyó tiszafüredi szakaszán

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Kivonat

Halpopulációk esetében igen fontos adat a testsúly és a testhossz allometrikus viszonyának ismerete. Szerző 1974 és 1978 közötti időszakban 220 harcsapéldányt mért meg s ennek alapján a súly és a hossz viszonyára a következő összefüggést mutatta ki:

$$1 \text{ g } W = 5{,}1532 + 3{,}0006 . \lg L$$

ahol a testhossz (W) g-ban a testhossz (L standarthossz) mm-ben szerepel. Összehasonlítva a magyarországi átlagot képviselő adatokkal megállapítható, hogy a tiszai harcsa példányok kisebb súllyal indulnak, de súlynövekedésük üteme az átlagosnál jobb. A halhústermelés szempontjából azonban az a döntő, hogy az adott testsúlyt mennyi idő alatt érik el a halpéldányok. Erre azonban csak az idő függvényében végzett növekedésvizsgálat fog választ adni.

СООТНОШЕНИЕ ВЕС ТЕЛА-ДЛИНА ТЕЛА ЩУКИ (SILURUS GLANIS L.) НА УЧАСТКЕ ТИСЫ У ТИСАФЮРЕДА

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Резюме

В случае рыбных популяций важным показателем является аллометрическое отношение между весом и длиной тела. В период с 1974 по 1978 гг. автор провёл измерения 220 щук и на основе этих измерений составил следующую формулу соотношения веса и длины тела:

$$\mathrm{I\,g\,w} = 5{,}1532 + 3{,}0006.\ \mathrm{Ig\,L}$$

где вес тела (w) выражен в г,а

длина (йй станд.длина) — в мм.

При сравненнии полученных автором данных измерений со средними по Венгрии, установлено, что экземпляры щук в Тисе отличаются меньшим начальным весом, но темп прироста живого веса у них выше среднего. С точки зрения рыбопроизводства основным моментом является то, за какое время экземпляры рыбы способны достичь определённого веса. Ответ на этот вопрос даст анализ прироста в зависимости от времени.

Odnosi težine i dužine soma (Silurus glanis L.) na deonici Tise kod Tiszafüred

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Abstrakt

Poznavanje alometrijskih odnosa težine i dužine tela ribljih populacija je od velikog značaja. Autor je u periodu 1974—1978 premerio 220 jedinki i na osnovu odnosa težine i dužine utvrdio sledeću zavisnost:

$$1\ \mathrm{g\,W} = 5{,}1532 - 3{,}0006.\ 1\mathrm{g\,L}$$

gde je težina (W) data u gramovima a dužina (L standardna dužina) u mm. Uporedjujući sa prosecima iz Madjarsje može se utvrditi da i pored toga što somovi iz Tise u početku imaju manju težinu tempo porasta u težini im je bolji od proseka. Medjutim sa stanovišta proizvodnje ribljeg mesa odlučujuće je za koje se vreme dostiže data težina pojedinih jedinki. Na ovo pitanje će dati odgovor ispitivanja porasta u funkciji vremena.