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# RESEARCHES CONCERNING THE MAIN BODY SIZES CORRELATION AT ROPSA CARP BREED

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***Abstract***

*Genetic progress per generation depends on heritability, number of considered traits and also the correlations among them, especially the genetic ones. Concerning fish breeding programmes, one of the major problems is the selection for the body shape and weight, which affect the meat production. We have studied how body weight is correlated with the main traits, which determine body shape in Ropşa carp breed (body length, maximum body height and maximum height/length ratio). The experiment was carried out for three years. From the genetic point of view, at 137 days age, body weight was positively correlated with body length and with maximum body height but negatively with the maximum body height/length ratio, showing the existence of some antagonistic relations between the two traits. Over the next two years of life, we found the same tendencies as at the first age. The obtained results have consequences for the selection response expected when selecting on body weight.*

**Key words:** main body sizes, correlations, Ropsa breed

## INTRODUCTION

For the study of quantitative traits, the knowledge of degree of interdependence between two traits is of a large interest. When two traits are dependent one beside the other, it is needed to be quantified this interdependence and to be assigned its meaning. It can be distignified with the correlation coefficients (Popescu-Vifor, 1978, 1985).

## MATERIALS AND METHODS

The biological stuff used for this experiment has been provided by the Nucet ”Fish culture Research Station”, from Dambovita district. It represents a sample of Ropsa carp breed individuals (Bércseny, 1983). The research has been made on five lots of one summer age spawn, belonging to five families. One family is constituted by two females and one male. Every each lot was made of fifty individuals. The individuals were measured, consequently, three years. At the end of each summer of growing, it has been actuated the weight, length and maximum body height. The relation between maximum height and body length (H/l), has been actuated, too (Lustun, 1985; Popa, Jecu, 2002).

In order to determinate the correlation coefficient between two traits, it has been used the classical formula of correlation, which is the ratio between covariation of the two traits and the geometric average of the two traits' variants (Drăgănescu, Grosu, 2003; Petre, Negruțiu, Pipernea, 1975; Tacu, 1968). The fenotypical, genotypical or environmental correlations, have been estimated by using the variance and covariance components. Any correlation is considered to be the relation between covariance and the geometric average of variances (Kirpitchikov, 1999).

**RESULTS AND DISCUSSIONS**

In one summer age Ropsa carp population, the correlations between the studied traits are positive, except for the H/l relation. The body weight is strongly positive correlated with the maximum height and body length. The same statement can be made about the correlations between the maximum height and body length. The H/l relation is negative correlated with the body weight and length, and positive, with the maximum height (Nicolae, 2004).

*Table 1*

Fenotypical, genotypical and environmental correlations between the studied traits at one summer age Ropsa breed

| Pair of the traits | $r_F \pm Sr_F$ | $r_G \pm Sr_G$ | $r_M$ |
|---|---|---|---|
| Body weight x<br>- maximum body height | 0,916±0,142 | 0,992±0,018 | 0,901 |
| - body lenght | 0,982±0,067 | 0,996±0,010 | 0,979 |
| - H/l relation | -0,218±0,345 | -0,222±0,895 | -0,222 |
| Maximum body height x<br>- body length | 0,930±0,130 | 0,786±0,454 | 0,962 |
| - H/l relation | 0,131±0,350 | 0,071±0,987 | 0,158 |
| Body length x<br>- H/l relation | -0,252±0,342 | -0,511±0,714 | -0,162 |

At one year and a summer age, H/l relation is negative correlated with the body weight (-0,115) and with the body length (-0,522) (table 2).

*Table 2*

Fenotypical, genotypical and environmental correlations between the studied traits at one year and a summer age

| Pair of the traits | $r_F \pm Sr_F$ | $r_G \pm Sr_G$ | $r_M$ |
|---|---|---|---|
| Body weight x<br>- maximum body height | 0,941±0,119 | 0,995±0,011 | 0,928 |
| - body length | 0,933±0,127 | 0,978±0,048 | 0,923 |
| - H/l relation | 0,241±0,343 | -0,115±0,819 | 0,323 |
| Maximum body height x<br>- body length | 0,893±0,159 | 0,884±0,243 | 0,896 |
| - H/l relation | 0,443±0,317 | 0,034±0,823 | 0,539 |
| Body length x<br>- H/l relation | 0,006±0,354 | -0,522±0,585 | 0,137 |

The rest of correlations have positive values. Unlike the one summer age case, the H/l relation is positive correlated with the two traits considered, fenotypical and environmental, respectively.
At two years and a summer age, all correlations was strongly positive, having values above 0,490 (table 3).

*Table 3*

Fenotypical, genotypical and environmental correlations between the studied traits at two years and a summer age Ropsa breed

| Pair of the traits | $r_F \pm Sr_F$ | $r_G \pm Sr_G$ | $r_M$ |
|---|---|---|---|
| Body weight x<br>- maximum body height | 0,958±0,101 | 0,839±0,324 | 0,989 |
| - body length | 0,956±0,104 | 0,802±0,390 | 0,995 |
| - H/l relation | 0,558±0,293 | 0,735±0,488 | 0,494 |
| Maximum body height x<br>- body length | 0,996±0,030 | 0,997±0,006 | 0,996 |
| - H/l relation | 0,602±0,282 | 0,598±0,678 | 0,597 |
| Body length x<br>- H/l relation | 0,533±0,299 | 0,552±0,733 | 0,521 |

The tendency for a strong positive correlation between body weight and maximum height or body length, and also, between maximum body height and body length, was constantly, during the entire growing period. For the one summer age and for one year and a summer age, the H/l relation is negative correlated with the body weight and length. At two years and a summer age, the genotypic correlations were strongly positive (+0,552 respectively, +0,735).

**CONCLUSIONS**

The outcome of the interdependence study in some morphological traits at Ropsa breed was:
1. The body weight, maximum height and the body length was correlated strongly positive, during the three years of growing.
2. For the same population, we can expect -in its ontogenesis- to appear some differences regarding the genetic parameters of considered traits, because of the different pairs of genes, which act in different ways at some ages.
3. A possible explanation about the differences obtained by us could be the outcome of “sample” effect, associated to the samples which on the experiment have been made.

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