

**STUDY OF THE CORRELATIONS BETWEEN
MORPHOLOGIC PARAMETERS, AT TWO EDIBLE SNAILS
POPULATIONS DEPENDING ON THE METABOLIC
ACTIVITY STATUS**

**STUDIUL CORELAȚIILOR DINTRE PARAMETRII
MORFOLOGICI, LA DOUĂ POPULAȚII DE MELCI ÎN
FUNCȚIE DE STAREA ACTIVITĂȚII METABOLICE**

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In the present study we calculated the correlations between the “alive” (green) weight and the biometric parameters of the shell according to the geographical area and the metabolic activity status. The biological material studied belongs to the species Helix pomatia. var. Banatica. from two different areas: Pădurea Verde and Oravița. At both studied populations. the measurements and weighing were made depending on the metabolic activity status (with operculum or without operculum). From the analysis of the correlations results that the “alive” weight has a large positive correlation with the foot weight and the depth of the shell. in both snails populations. regardless of the metabolic activity status ($r > 0.5$). In the case of snails without operculum. all the biometrical parameters of the shell have a large positive correlation with the “alive” weight (values between 0.50016 and 0.989085). Negative correlations have been observed in the case of the snails with operculum. between the alive weight and the shell height ($r = 0.00231$). and between the alive weight and shell width ($r = 0.00443$).

Key word: snails. the metabolic activity status. the biometric parameters

Introduction

Generally, in the latest time, the consumer focuses on foods with high biologic value, equilibrated nutrients, with fast digestion and with considerable dietary and culinary qualities.

Besides the meat originated from other animal species, the snail meat is considered an appreciated food, for its nutritional value, being rich in vitamins and minerals, but poor in fats. The snail meat proteins have a superior biological value because they contain 9 of the 10 essential amino acids needed for human nourishment. (1,2,4)

In the last decades, the consumption of snail meat has increased, while in nature the number of snails has decreased dramatically, due to atmosphere

pollution and different agro-technical procedures. For the protection and rebuilding of the snails populations, *helicoculture* (snails breeding) became widespread, as a branch of modern Animal breeding. (1,3)

Because the orchard (Roman) snail, *Helix pomatia* is one of the edible snails species, and because in the Banat region the *Banatica* variety is present, in this paper we studied the correlation coefficients (r) between the shell biometric parameters (shell height, shell width, shell depth, aperture height, aperture width, shell thickness), weight of the edible parts and the “alive” weight.

Materials and Methods

The studied biologic material belongs to the *Helix pomatia* species, *Banatica* variety, and it was gathered from 2 distinct geographical areas:

1. Pădurea Verde (Green Forest) area, Timișoara, Timiș county, and
2. Oravița region, Caraș-Severin county.

At the two studied populations we determined the biometric parameters depending on the metabolic activity status (snails with operculum and without operculum). In order to establish the shell biometric parameters, all the measurements were made with sliding calipers, as follows:

- Shell **Height** – between the apex and the lowest part of the shell, positioned with the aperture towards the operator;
- Shell **Width** (large diameter) – from the largest left extremity to the left one, positioned with the aperture towards the operator;
- Shell **Depth** (small diameter) - between the most prominent part of the anterior shell and the posterior one; positioned with the aperture towards the operator;
- Aperture **longitudinal diameter** (height) – between the superior and inferior parts of the shell aperture, with the apex upwards;
- Aperture **transversal diameter** (width) – between the two lateral parts of the shell aperture, with the apex upwards;
- Shell **thickness** – in the lower part of the shell aperture.

The alive weight of the animal was measured through weighing before slaughter, and the proportion of the edible part (foot weight) was established through calculation following the weighing after sacrifice and after harvesting the soft (edible) parts. (1,5)

After the determination of the studied parameters at the two snails populations, we calculated the correlations between these and the “alive” animal weight.

Results and Discussions

In Table 1 are presented the correlations between the “alive” animal weight and the biometric parameters studied at the two snail populations, depending on the metabolic activity status.

The correlation coefficient r between the studied characters is interpreted after their value as follows:

- r from 0,5 to 1- the characters are considered to have large positive correlation,
- r from 0,2 to 0.49 - the characters are considered to have average (medium) positive correlation
- r from 0 to 0,19 - the characters are considered to have small positive correlation
- r from -1 to 0 - the characters are considered to have a negative correlation.

Table 1

Correlation coefficient value between the “alive” weight and biometric parameters at the two snails populations depending on the metabolic activity status

Character	Pădurea Verde (Green Forest) Population		Oravița Population	
	Snails with operculum	Snails without operculum	Snails with operculum	Snails without operculum
Shell Height	-0.00231	0.946721	0.24475	0.915468
Shell Width	0.064671	0.947085	-0.00443	0.84716
Shell Depth	0.815148	0.922891	0.721908	0.900586
Aperture Height	0.104603	0.880741	0.3851	0.603828
Aperture Width	0.297594	0.56589	0.3851	0.836078
Shell Thickness	0.184348	0.588914	0.180922	0.500146
Edible (alive) part Weight	0.944992	0.81173	0.989085	0.840227
„alive” weight				

From Table 1 results that the “alive” weight is strongly correlated with the foot’s weight (edible part) for both snails populations. regardless of the metabolic activity status ($r = 0.81173 - 0.989085$). The values are yet higher within the population harvested from the Green Forest area ($r = 0.840227 - 0.989085$) against the snail population harvested from the Oravița region ($r = 0.81173 - 0.944992$).

Analyzing the values of correlation coefficients between the „alive” weight and foot’s (snail’s edible part) weight results that the farmer may obtain the highest sacrificing outputs in the case of snails with operculum (against snails without operculum). Higher sacrificing outputs result in an increased economic efficiency.

In the case of snails without operculum. all the biometric parameters have a large correlation with the „alive” weight (values between 0.500146 and 0.840227).

Analyzing the correlation between the “alive” weight and shell depth. results that in both populations there is a large positive correlation ($r = 0.721908 - 0.922891$). The correlation coefficients have higher values in the case of snails population harvested from the Green Forest. both the ones with operculum and the ones without.

Analyzing the metabolic activity status for this correlation. results that the highest values are registered in the case of snails without operculum $r = 0.900586$. for the population from the Green Forest. and $r = 0.922891$ for the population from Oravița region.

The lowest correlation coefficient values were obtained in the case of snails with operculum. for the correlations between ‘alive’ weight and shell height ($r = 0.00231$). and with shell width ($r = 0.00443$).

Between the “alive” weight and shell thickness. in both snail populations. in the case of snails with operculum. r has values below 0.19. these characters being considered with small correlation; in the case of snails without operculum. the correlation between these characters is large ($r > 0.5$).

Conclusions

- ✓ The “alive” snail weight is in a large positive correlation with the weight of the edible part and with the shell depth at both snails populations, regardless of the metabolic activity status.
- ✓ The correlation between “alive” snail weight, shell height and shell width is very small or even negative in the case of snails with operculum.
- ✓ In both snails populations, the correlation coefficient values between the “alive” weight and biometric parameters are higher in the case of snails without operculum than in snails with operculum.

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