

## DIMENSIONAL STRUCTURE FEATURES OF THE POPULATION OF *SUCCINEA PUTRIS* (GASTROPODA, PULMONATA)

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**Abstract:** The character of changes in the dimensional structure shows that the life cycle length of *Succinea putris* individuals in the investigated population is of 25 months. Released in August young molluscs reach maturity in summer of the next year, and the maximum size of molluscs is attained in the third year of life.

**Keywords:** Belarus, dimensional structure, life cycle, Minsk region, *Succinea putris*

### Introduction:

The interest of biology in *Succinea putris* (L.) (Succineidae) is due to the fact that this is one of the most common species of molluscs inhabiting humid ecosystems. This species of molluscs which dwells among the leaves of plants, can undertake daily migration and move under water. Being the intermediate host of the bird parasite *Leucochloridium paradoxum* Carus 1835, the amber snail contributes to its spread among wild and domestic birds.

At present there is an active investigation as regards different aspects of biology of *Succinea putris*, such as the span of the life cycle (Datkauskienė 2005), the type of fertilization (Dillen 2009), mollusc fertility (Dillen et al. 2010).

As the results of these studies are based on the observation for molluscs in laboratory conditions, it is necessary to determine the

conformity between the different phases of the life cycle observed in laboratory conditions and in conditions of natural populations of the amber snail.

In conducting this study we assumed that the changes in the population's dimensional structure enable one to judge about changes in its age structure.

### Materials and methods:

Measurements of the dimensional structure were held in 2010 on the example of the three populations of *Succinea putris* located on the territory of the city of Borisov (Minsk region). The collection of the material was carried out in the bushes and on the sites composed of the American maple (*Acer negundo* L. 1753), located within the flood plain of the Berezina and the Sha.

To characterize the dimensional structure of the amber snail's population the height of shell was used. The measurements were performed within an interval of one month, in the period from April through October. The processing data was carried out

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with the help of computer software packages Libre Office Calc and Statistica 6.0.

The variational series which were received during month observations were divided into 10 class intervals corresponding to 10 dimensional groups. The value of the class intervals was selected so that the resulted classes could fit the entire range of *Succinea putris* (Tab. 1).

**Table no. 1** The value of the class intervals of the shell height of *Succinea putris*

No. of the interval	The value of the interval (mm)
1	2-4
2	4-8
3	8-10
4	10-12
5	12-14
6	14-16
7	16-18
8	18-20
9	20-22
10	22-24

## Results and discussion:

Following the studies it was found out that the individuals of *Succinea putris* are active from April to October.

The dynamics of changes in the dimensional structure of the observed populations shows that in spring molluscs awaken from hibernation with the height ranging from 6 mm to 14 mm, and with the shell height of 18 mm (Fig. 1).

Throughout the whole period of activity the share of young molluscs in the population is much higher than the adults', and in the end of summer adult molluscs disappear from the population completely.

Judging by the changes in the prevailing dimensional groups, one can trace the growth of individuals. The sequential change of the prevalent size of groups occurs within 1-2 months on average, which can be interpreted as the process of growth of the several individuals pertaining to the population.

Thus, in April and May individuals with 6 mm shell height dominate in the population, whereas in July regarding the *Succinea putris* population the dominant group specimens feature 10 mm shell height of (Fig. 1).

Our findings are consistent with Datkauskiene's data (Datkauskiene 2005). Thus, according to Datkauskiene the juvenile output of *Succinea putris* takes place in September and October, after which young molluscs enter into a state of hibernation and resume their activity in March-April.

In the investigated populations young individuals appear in August. This can be determined by the prevalence of 2 mm shell height molluscs during this period. In April the following year they come out of hibernation time when 6 mm shell height individuals are dominant in the population (Fig. 1). By July molluscs reach maturity, since according to Dillen (2009) individuals of *Succinea putris* can be considered mature if their shell height exceeds 9 mm.

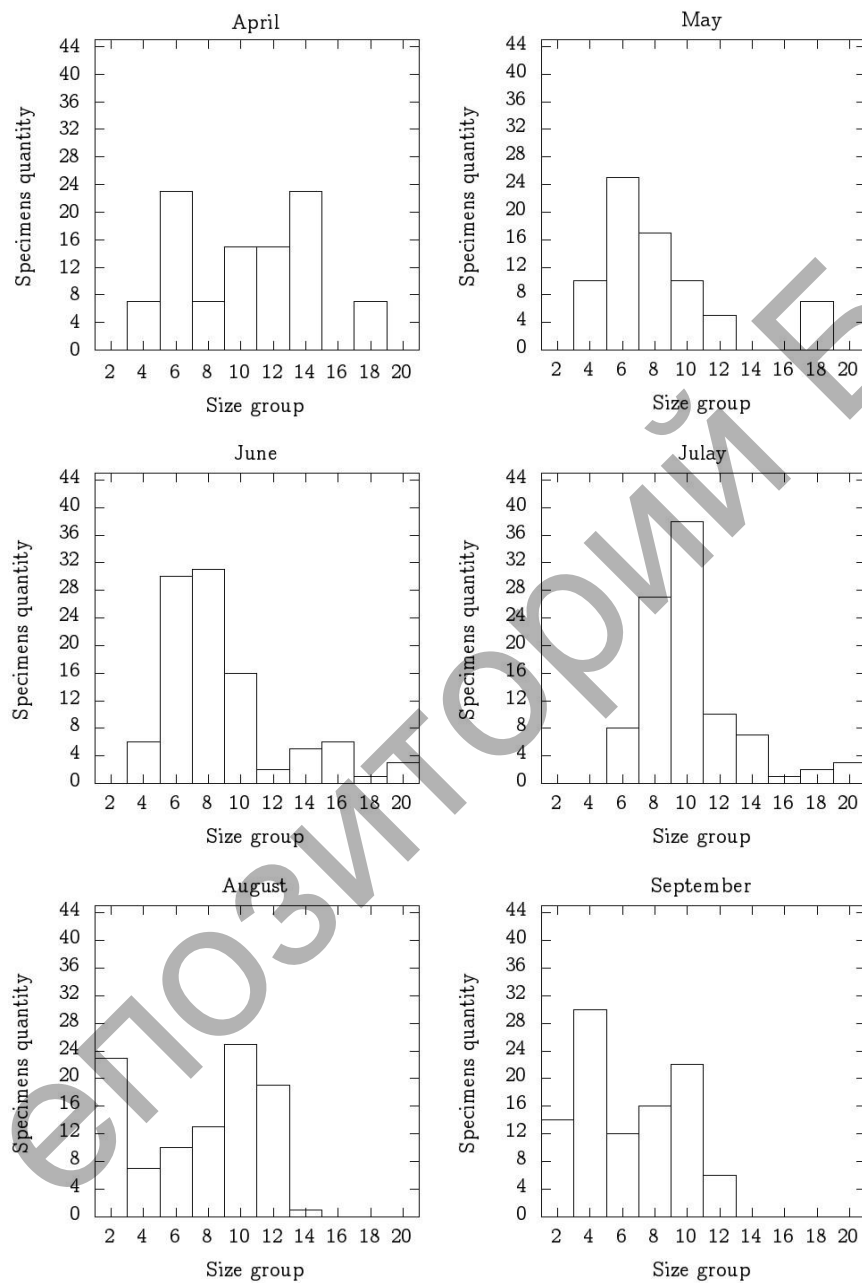
Assuming that the coupling of molluscs occurs immediately after they reach sexual maturity and juveniles hatch in 10-20 days (Datkauskiene 2005), the hatching of individuals of the next generation will occur in August.

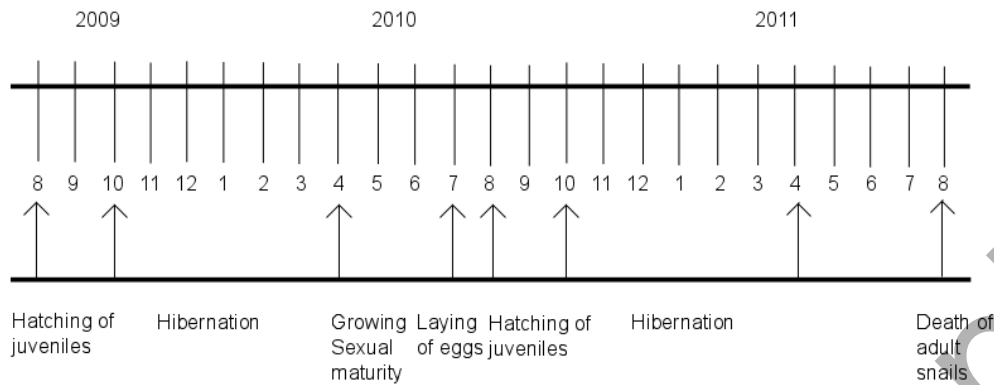
Mature molluscs enter hibernation state for the second time and in April they constitute the prevailing group of individuals featuring a shell size of 14 mm. It should be added that in the investigated populations the share of molluscs whose shell size exceeds 10 mm is insignificant. It is connected with the fact that, most likely during the second hibernation or immediately after it, the majority of individuals die because of the strong pressure of environmental factors. The complete disappearance of molluscs in their third year of life takes place in August.

Thus, based on Datkauskiene's data (Datkauskiene 2005) obtained from the study of the life cycle of *Succinea putris* in laboratory conditions, as well as on the results of the dimensional structure study of molluscs population in Borisov, we are able

to present the following scheme of *Succinea putris* life cycle in Figure 2.

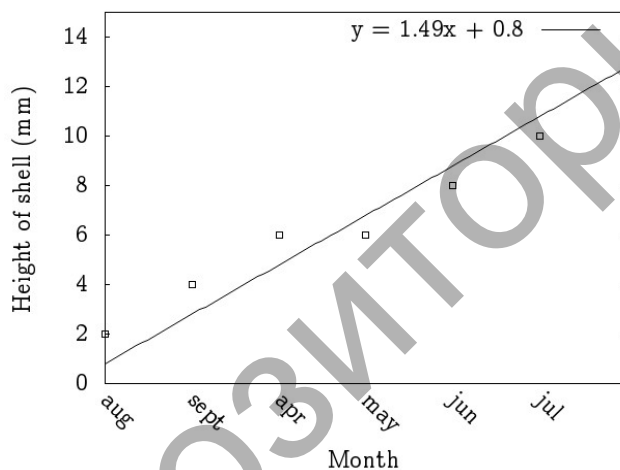
**Figure no. 1** Change of size structure of the studied populations of *Succinea putris* during the observation period



**Figure no. 2** The life cycle of *Succinea putris* scheme

In addition, changes in the prevailing dimensional groups in the investigated population allow to build a regression line

describing the growth of *Succinea putris* individuals (Fig. 3).

**Figure no. 3** Growth of *Succinea putris* individuals regression plot

### Conclusions:

Thus *Succinea putris* individuals are active from April to October. Taking into consideration the sequence of the change of the size groups of *Succinea putris* population we have calculated the growth rate of individuals, as well as the length of the life cycle. The nature of changes in the size structure shows that the life cycle length of *Succinea putris* in the investigated population is 25 months. Released in August

young molluscs reach maturity in the summer of the next year, when the shell height reaches 10 mm. The maximum size of molluscs is reached in the third year of life.

### Acknowledgments:

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**Rezumat:**

CARACTERISTICILE  
DIMENSIUNILOR STRUCTURALE  
ALE POPULAȚIEI DE  
*SUCCINEA PUTRIS*  
(GASTROPODA, PULMONATA)

Caracterul modificărilor în dimensiunile structurale indică faptul că lungimea ciclului de viață la indivizii de *Succinea putris* din populația studiată este de 25 de luni. Eliberate în luna august moluștele tinere ating maturitatea în vara anului următor, iar dimensiunile maxime sunt atinse în al treilea an de viață.

**References:**

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