MODIFICATION OF THE YOLK SAC IN CARP LARVAE DEPENDING ON THE VARIETY OF ENVIRONMENTAL TEMPERATURES

Balacci S., Balan I., Buzan V.
Institute of Physiology and Sanocreatology, Republic of Moldova
e-mail: sergiobalacci@gmail.com

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The purpose of the research is to highlight the effects of moderate intensity temperature stress on the consumption of nutrients of the yolk sac of fish larvae. The temperature values that could be applied in order to stimulate the growth of adaptive capacities and the resistance of carp larvae to the unfavorable action of the environment were determined. As final results is presented the possibility of using the environmental factors applied to fish as a model for the application of ecological factors on homeothermic animals, in particular, on agricultural animals.

The10 days study was carried out on carp larvae (Cyprinus carpio) divided into 3 groups (aged 1, 2 and 3 days), consists of 4 experimental sublots, in which temperatures of 9, 12, 15 and 20ºC were applied. The batch in which the water temperature was 20ºC (identical to the water temperature during incubation) served as a control. The experiment was carried out in 3 liters vessels, 500 larvae per liter density. The adaptation period to the tested temperatures was 1 hour. Starting from day 3, the carp larvae were fed abundantly with live zooplankton. The yolk sac parameters (length and height) were monitored on the 1st, 3rd, 5th, 7th and 10th day after applying the thermal factor. The dimensions of the yolk sac were determined using a microscope equipped with a lens to evaluate the linear size of the studied object.

The obtained data demonstrate that the thermal variations of the water act differently on the absorption rate of the yolk sac in carp larvae aged 1 day. The lower the temperature, the slower it is absorbed. At the temperature of 9°C, the length of the yolk sac in the larvae subjected to the action of the temperature for 10 days decreased compared to it in the larvae subjected to the action for 1 day by 0,46mm (15,49%) and constituted 2,51±0,08mm versus 2,97±0,08mm. At the temperature of 12°C, the yolk sac length decreased by 1,04mm (64,26%) and was 1,87±0,07mm compared to 2,91±0,05mm. When the larvae are exposed to higher temperatures (15 and 20°C) the yolk sac is completely absorbed.

The same tendency is manifested in the larvae of group II. The size of the yolk sac in 2-day-old larvae subjected to the action of the thermal factor is smaller compared to the size of the yolk sac in 1-day-old larvae at all temperatures studied and throughout their application. The yolk sac at the larvae subjected to the action of the temperature of 9°C for 10 days decreased relative to it at the larvae subjected to the action for 1 day by 0,89mm (32,84%), at the temperature of 12°C it shrank by 1,77mm (68,34%). At the same time, at higher temperatures (15 and 20°C) the yolk sac is fully absorbed. Moreover, it should be noted that at 15°C the yolk sac is absent in the sublot in which the temperature was applied for 7 days compared to it in the 1-day-old larvae whose length was 1,62±0,11mm. When applying temperatures of 20°C for 5 days (which corresponds to the age of the larvae of 7 days), the yolk sac is practically not noted and corresponds to the data of the specialized literature. It is worth mentioning that the absorption rate of the yolk sac in group II is higher compared to the absorption rate in the 1-day-old carp larvae experiment.

The yolk sac at carp larvae of group III is preserved during all periods of application of the temperature of 9°C. At the temperature of 12, 15 and 20°C it is recorded only up to the duration of the application of the stressogenic factor of 3 days.

Thus, it can be mentioned that the application of low temperature on carp larvae leads to the retention of their development with the preservation of the yolk sac for a period of up to 10-12 days from birth. These results are more evident when applying the temperatures of 9 and 12°C in the groups where larvae at the beginning of the experiment were 1 day and 2 days old. So, by applying the thermal factor it is possible to direct the duration of the development period of carp larvae.