

# TOLERANCE OF A COLONIAL ORGANISM TO INCREASED ENVIRONMENTAL TEMPERATURE DEPENDING ON ITS SIZE: THE EXAMPLE OF THE COLONIAL HYDROID *DYNAMENA PUMILA* (L., 1758)

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**Abstract.** It has been experimentally established that larger colonies of *Dynamena pumila* (Hydrozoa, Cnidaria) grown in the laboratory, including 10–11 young shoots, are less resistant to increases in water temperature to the upper temperature limit of this species (25 °C) than the same smaller colonies with one or two shoots. As the temperature rises, some of the hydrants temporarily degrade, and colonies with a large number of shoots experience a greater food shortage, since they have more growth zones that require a continuous influx of cells and food. The state of the colonies was determined by pulsations of the tops of the stolons, which were recorded using time-lapse microvideo photography. Colonies were grown in aquariums with sea water at  $T = 14$  °C. During the first day after the temperature increased from 14 to 25 °C, growth pulsations became more frequent without changing the characteristic sequence of stages of expansion and contraction of the stolon apex. On the second day and further, growth pulsations varied more and more in frequency and amplitude until growth stopped. A rapid decrease in water temperature after five days of thermal shock to 15–16 °C and subsequent maintenance for five days did not lead to the restoration of pulsations in the majority of colonies, although in our previous similar experiment performed on small colonies, restoration was evident already on the third day of maintenance at 15–16 °C and was expressed in the resumption of stolon growth, stabilization of the frequency, amplitude and sequence of phases of growth pulsations. The results of the experiments confirmed that by recording the pulsation indicators of the growth tips of hydroids, it is possible to detect the reaction of the colonial organism to external influences immediately, i.e. within one to two hours after the start of exposure, and this reaction, according to its main characteristics, is constant, without changing over the next few days.

**Keywords:** climate change, thermoshock, growth pulsations, colonial organism, modular structure, Hydrozoa, Cnidaria

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