

Study of Circadian Activity in the Crayfish *Pontastacus Leptodactylus* during Their Multimonth Maintenance in the River Water Flow

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Abstract—By the method of non-invasive on-line recording and processing of photoplethysmograms of testaceous invertebrates, the circadian rhythm of cardioactivity was studied in crayfish *Pontastacus leptodactylus* by recording for several month of the heart rate (HR) and stress-index (characteristics of variational pulsometry). The crayfish were kept in the natural running water in regime of the natural illumination alternation (the first group) or at constant artificial illumination of low intensity (the second group). The circadian rhythm was more frequent and more pronounced in crayfish of the first group. The criteria were established to determine the appearance and stabilization of the nocturnal, active rhythm phase: an increase of HR by more than 30% as compared with the daytime rest period and duration of such increase for at least 2.5 h. The stress-index has been shown to be a reliable parameter of the beginning of the nocturnal phase of cardioactivity, while preservation of the typical circadian rhythm can be considered as a bioindicator in the biomonitoring systems of the quality of surface waters.

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Key words: crayfish, circadian rhythm, cardioactivity, illumination regime.