

Effects of temperature on oxygen consumption in three *Gammarus* species inhabiting different climatic regions in Fars Province

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Abstract

Temperature, as well as many other environmental factors affects respiration of aquatic organisms including amphipod crustaceans. This research was conducted to evaluate inter-specific variation among 3 species of *Gammarus* in different climatic conditions in Fars Province. Samples were collected using a hand net with 1 mm mesh size, and transported in containers filled with natural water of their habitats, kept in an equal condition in the lab. Physico- chemical parameters including water temperature, dissolved oxygen, PH and CO₂ concentration were measured in site. Oxygen consumption rate of the samples were examined using a digital oxygen probe. The oxygen consumption of all samples was increased with increasing temperature. The oxygen consumption by *Gammarus zagrosensis* (low level temperature habitat) were twice in comparison with the two other species. This species showed maximum oxygen consumption of 2.95 mlg⁻¹h⁻¹ while *G. crinicaudatus* showed the minimum of 0.17 mlg⁻¹h⁻¹. Maximum and minimum Q₁₀ for *G. zagrosensis* was 2.37 in 5-10 °C and 1.04 in 15-20 °C respectively. The results showed that temperature is an important factor for the distribution of *G. zagrosensis*. However, the two other species showed more tolerance with temperature changes, which can help them in their more extensive distribution. These results suggest better abilities for *G. crinicaudatus* and *G. loeffleri* compared to *G. zagrosensis* in the current situation of global warming.

Keywords: temperature, respiration, *Gammarus zagrosensis*, *loeffleri*, *crinicaudatus*, Q₁₀