ID: 431

Seasonal and sexual variation in the length–weight relationship of narrow–clawed (*Pontastacus leptodactylus* Eschscholtz, 1823) crayfish in Eğirdir Lake

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Abstract

The length–weight relationship (*LWR*) is a fundamental aspect of fish biology and fisheries science, providing critical insights into various biological and ecological evolutions, such as growth analysis, stock assessment, health and condition, feeding habits etc… Therefore, accurately determining it is extremely important. The study was conducted in Lake Eğirdir in 2015 to determine the length-weight relationship of Turkey's most important crayfish stock. Seasonal sampling was performed using 200 fyke nets with different mesh sizes. The *LWR* was determined according to Le Cren (1951), and a t-test following Pauly (1984) was used to assess whether the b value differed from 3. The data were analyzed using the R package "ggFishPlots (v 0.3.1)" (Vihtakari, 2025). In the study, 4,035 crayfish with a total length ranging from 35.12 to 155.11 mm and a total weight between 1.20 and 130.80 g were evaluated. The sample comprised 56.90% (2,295) female and 43.10% (1,738) male crayfish, with a D:E ratio of 1.32. The evaluations revealed that female crayfish exhibited negative allometric growth in spring, summer, and autumn, while displaying isometric growth in winter. Male crayfish, on the other hand, showed positive allometric growth in spring, autumn, and winter, but isometric growth in summer. As a result, it was determined that the growth characteristics of crayfish varied by sex and season. In studies utilizing LWR parameters, it is believed that sampling during only one period of the year may lead to misleading results. Therefore, monthly or seasonal sampling would provide more accurate assessments.

Key Words: *Allometric growth, Isometric growth, Growth types, LWR*