Some life history aspects of *Garra rufa* (Heckel, 1843) in the Kangir River, Western Iran

(Osteichthyes: Cyprinidae)

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**Abstract.** The present study investigated the age, growth and reproduction of *G. rufa* by regular monthly collections throughout one year from September 2007 to August 2008 in the Kangir River (Western Iran). Based on scale readings, the maximum ages of the population observed were 5+ years, both sexes growing allometrically ($b=2.90$; $b=2.92$). The overall sex ratio was balanced, but males were predominant in smaller sizes, and females in larger sizes. Monthly examination of the GSI indicated that the reproduction of *G. rufa* in the river occurred around April-May, with the highest average value of 4.21 for males in April and of 7.85 for females in May. Absolute fecundity varied from a minimum of 1,680 eggs for age 2+ to a maximum of 13,927 eggs for age 5+. The absolute fecundity and egg diameter to fish size (length and weight) were positively correlated. The individuals studied here are on average smaller and have a lower weight than individuals studied in springs in southern Iran. The difference is explained by the severe ecological conditions in the river ecosystem, causing a lower growth rate and higher natural selection.

**Key words.** *Garra rufa*, age and growth, reproduction, Kangir River, Iran, Middle East.

**Introduction**

The genus *Garra* is represented in Iran by four species: *G. persica* (Berg, 1913), *G. rossica* (Nikolsky, 1900), *G. variabilis* (Heckel, 1843) and *G. rufa* (Heckel, 1843) (*COAD* 1995, *ABDOLI* 2000). *G. rufa* is widely distributed in the Middle East; its distribution encompassing the Jordan, Orontes, Tigris-Euphrates river basins, and also some coastal rivers in southern Turkey, northern Syria and western Iran. Although it is found in different habitats such as rivers, lakes, small ponds and small muddy streams (*Berg* 1964, *COAD* 1995, *ABDOLI* 2000), it is predominantly adapted to life in swift-flowing waters. A sucking-disc enables the fish to live in mountain streams even in strong currents. Compared with other species of Cyprinidae, little is known about its population biology and reproduction. *ABDOLI* (2000) provided some information on the morphology and biology of this species based on a limited data set, and *ESMAEILI & EBRAMI* (2006) provided length-weight relationships. *BARDAKÇI* et al. (2001) studied the reproduction biology in Turkey, and *YAZDANPANAH* (2005) and *ESMAEILI* et al. (2005) some reproductive characteristics in southern Iran.

We studied the life history of *G. rufa* in western Iran, and are also able to compare the results with those from other parts of its distribution area.