

Population dynamics of *Rana macrocnemis* Boulenger, 1885 at Uludağ, Western Turkey

(Anura: Ranidae)

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Abstract. In a study on the population dynamics of the Uludağ Frog, *Rana macrocnemis* Boulenger, 1885 at Uludağ, 4,952 individuals were marked with toe-clipping, visible implant elastomer and vi alpha tags between 2006 and 2008. 47.1% of the population consisted of males, 39.0% of females and 13.8% of juveniles, and a male-biased sex ratio was observed. According to the formula of Jolly-Seber, the mean population size was calculated for individual study plots as 1,535 in Kirazlıyayla, 1,578 in Sarıalan, 1,481 in the Hotels District, 823 in Lake Kilimli, 742 in Lake Kara, 675 in Lake Aynalı, 658 in Lake Koğukdere, and 151 in Lake Heybeli. The total population size was estimated at 7,643 individuals (3,113 in forest, 4,530 in the subalpine belt) in 1.30 ha areas (0.14 ha in forest, 1.16 ha in the subalpine belt) in study plots of Uludağ ranging between 1,476 to 2,450 m a.s.l. The capture probability ranged from 0.21 to 0.93 and the survival rate ranged from 0.57 to 0.98 among the populations, and the mean population density was calculated as 0.19-2.52 individuals/m². The age in the population varied between 2 and 11 years, and the median age was calculated as 4 in males, 4.5 in females. The sexual maturity age ranged from 2nd to 6th years depending on altitude (from 1,476 to 2,450 m). It was found that the breeding period commenced in early April upon the melting of the snow and extended until the end of June, depending on altitude. The mean number of eggs in an egg mass was calculated to be 987±326. Spawned eggs hatched in 7 to 32 days depending on weather conditions and metamorphosis was completed in 46 to 130 days.

Key words. *Rana macrocnemis*, population dynamics, life cycle, skeletochronology, breeding ecology, Uludağ, Turkey.

Introduction

The Uludağ Frog, *Rana macrocnemis* Boulenger, 1885, is included in the “least concern” (LC) category in the IUCN Red List, but it is reported that the populations are tending to decrease (KUZMIN et al. 2008). In Russia and Iran, it has been reported as a species that is in need of conservation (TARKHNISHVILI & GOKHELASHVILI 1999a). It is also included in the Red Data Book of Turkmenistan, since it is threatened or extinct on the ridges of the Kopet-Dagh in Turkmenistan (KUZMIN et al. 2008, AMPHIBIAWEB 2009). Several studies have been carried out on its taxonomy (e.g. BARAN 1969, VEITH et al. 2003a, b) and there are some observations on the feeding habits (e.g. KALKAN 2000, UĞURTAŞ et al. 2004) and age structure (ÇAKIR 2005) of the Anatolian population. Information about the morphology, distribution, life history, reproduction, feeding habits, predators and parasites, population structure and dynamics of the Caucasian populations of the species was compiled by TARKHNISHVILI & GOKHELASHVILI (1999a).

In this study, it was aimed (1) to determine the distribution of the Uludağ population of *R. macrocnemis* and co-existing amphibian species, (2) to calculate its population size, density,