

Spermatogenesis in the agama *Trapelus lessonae* (Agamidae: Reptilia) in the Central Zagros Mountains, Iran

by Farhang Torki

Abstract. Spermatogenesis in a population of the agama *Trapelus lessonae* was studied in the Zagros Mountains, Iran, at 1900 m a.s.l. The species spends at least five months (October to February) in hibernation. Based on histological studies, three phases of the life cycle can be distinguished: (1) an active phase that occurs after hibernation, (2) a resting phase that occurs before hibernation, and (3) a transitional phase that occurs between the two other phases. The number of spermatocyte layers decreases continuously from March to August. As active spermatogenesis and mating are synchronous, the species can be assigned to those with an associated reproductive cycle.

Kurzfassung. Im Zagrosgebirge, Iran, wurde in einer auf 1900 m NN vorkommenden Population der Agame *Trapelus lessonae* die Spermatogenese untersucht. Die Art verbringt mindestens fünf Monate (Oktober bis Februar) im Winterschlaf. Anhang histologischer Befunde konnten drei Phasen des Lebenszyklus unterschieden werden: (1) aktive Phase, die unmittelbar nach dem Winterschlaf auftritt; (2) Ruhephase, die vor dem Winterschlaf auftritt, und (3) Übergangsphase, die zwischen diesen beiden Phasen zu liegen kommt. Die Anzahl der Spermatozytenschichten verringert sich von März bis August kontinuierlich. Da aktive Spermatogenese und Paarung synchron erfolgen, ist die Art dem Typus des assoziierten Fortpflanzungszyklus zuzurechnen.

Key words. Hibernation, mountainous area, spermatogenesis, spermatocyte, reproduction.

Introduction

Lizards present three general types of reproductive cycles: continuous, dissociated, and associated (POUGH et al. 1998). Continuous reproductive cycles are typical of tropical habitats without seasons, and both mating and spermatogenesis occur almost throughout the year (e.g. SHERBROOKE 1975, VIEIRA et al. 2001, HERNANDEZ-GALLEGOS et al. 2002). Dissociated reproductive cycles are common in the temperate zone; the mating period is brief and sperm storage takes place in the female or male reproductive ducts until fertilization can occur (FOX 1963, SEVER & HAMLETT 2002, 2004). In associated reproductive cycles, gametogenesis is closely related to mating, a pattern common in species inhabiting predictable environments in the temperate zone (DIAZ et al. 1994, HUANG 1997), but which has also been observed in seasonal tropical regions (CENSKY 1995). In temperate-zone lizards with associated reproductive cycles, the male testicular cycle is divided into two well-defined phases: (a) the regenerative phase that occurs in the spring and is characterised by sustained sperm production, and (b) the degenerative phase that begins in late summer, when a break in spermatogenesis is observed (FITCH 1970, LOFTS 1987, CASTILLA & BAUWENS 1990). Similarly, tropical species in seasonal habitats also display, if less pronounced, a regenerative phase during