

## Reproduction in the San Lucan Alligator Lizard, *Elgaria paucicarinata* (Anguidae) from Baja California Sur, Mexico

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*Elgaria paucicarinata* is restricted to the Cape Region of Baja California Sur (Grismer 2002). While Lais (1976) summarized the biology of this species and Grismer (2002) collected hatchlings during August, information on the reproductive biology is unknown. The purpose of this report is to present information on the reproductive cycles from a histological examination of gonadal material and provide the first clutch sizes for this species.

Eighteen male (mean snout-vent length, SVL = 94 mm  $\pm$  11 SD, range = 75–116 mm) and nine female *E. paucicarinata* (mean SVL = 91 mm  $\pm$  9 SD, range = 75–105 mm) from the Museum of Vertebrate Zoology, Berkeley (MVZ), Natural History Museum of Los Angeles County, Los Angeles (LACM), La Sierra University, Riverside (LSUHC) and the San Diego Society of Natural History, San Diego (SDSNH) were examined (see Appendix).

The left testis and left ovary were removed from males and females respectively. Gonads were embedded in paraffin, sectioned at 5  $\mu$ m, and stained with Harris' hematoxylin followed by eosin counterstain. Oviductal eggs or enlarged follicles (> 4 mm length) were counted but were not examined histologically. An unpaired *t*-test was performed to compare male and female mean body sizes.

Differences between male and female mean body sizes (SVL) were not significant ( $t = 0.84$ ,  $df = 25$ ,  $P = 0.41$ ). Testicular histology of *E. paucicarinata* was similar to that of *E. multicarinata* and *E. kingii* (Goldberg 1972, 1975). Stages of the testicular cycle are presented in Table 1. Testes of *E. paucicarinata* in recrudescence (May–August) contained spermatogonia and primary spermatocytes. Spermatids were occasionally observed but no sperm were present. Testes undergoing spermiogenesis (August, October and November) contained rows of metamorphosing spermatids lining the lumina of the seminiferous tubules (Table 1). The single regressed testis from April contained primarily spermatogonia. A few rows of metamorphosing spermatids remained in some seminiferous tubules but the germinal epithelium was exhausted.

The seasonal ovarian cycle is presented in Table 2. Oviductal females were collected in March (LACM 15131, SVL = 87 mm, 6 eggs) and April (MVZ 45368, SVL = 98 mm, 8 eggs). A female collected in October (LACM 25059, SVL = 8 mm) had 6 enlarged follicles > 4 mm, with yolk deposition underway in a seventh follicle which measured 3 mm in length. A clutch of seven eggs would likely have been produced the following spring. Mean clutch size ( $n = 3$ )

Table 1. Seasonal testicular cycle of *Elgaria paucicarinata*.

Month	<i>n</i>	Regression	Recrudescence	Spermiogenesis
April	1	1	0	0
May	3	0	3	0
June	2	0	2	0
July	2	0	2	0
August	4	0	2	2
October	5	0	0	5
November	1	0	0	1

Table 2. Seasonal ovarian cycle of *Elgaria paucicarinata*.

Month	<i>n</i>	No yolk deposition	Enlarged follicles (> 4 mm length)	Oviductal eggs
March	1	0	0	1
April	1	0	0	1
July	3	3	0	0
August	2	2	0	0
October	2	1	1	0

is  $7.0 \pm 1.0$  SD (range = 6–8). These are the first clutch sizes recorded for *E. paucicarinata*. Females with inactive ovaries (i.e., no yolk deposition) were collected in July, August and October (Table 2).

The reproductive cycle of *E. paucicarinata* is similar to that of *E. kingii* (Goldberg 1975) which has an autumn period of spermiogenesis. Fall spermiogenesis appears to be unusual for North American lizards (Goldberg 1975). By producing sperm and presumably mating in autumn, both *E. paucicarinata* and *E. kingii* initiate yolk deposition during October followed by ovulation in spring. The timing of the reproductive cycles of *E. paucicarinata* and *E. kingii* differ markedly from those of *E. coerulea* (Vitt 1973), *E. multicarinata* (Goldberg 1972) and *E. panamintina* (Goldberg and Beaman 2003), all of which undergo spermiogenesis in the spring. The timing of the breeding cycle in *E. paucicarinata* and *E. kingii* probably coincides with monsoonal moisture patterns that pass through their ranges from July to early October.

#### Acknowledgments

We thank D. Kizirian (LACM), B. Hollingsworth (SDSNH), L. Grismer (LSUHC), Riverside, California, and D. Wake (MVZ) for permission to examine specimens.

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Accepted for publication 19 January 2004.

#### Appendix

Specimens of *Elgaria paucicarinata* examined from the Museum of Vertebrate Zoology (MVZ), Natural History Museum of Los Angeles County (LACM), La Sierra University Herpetology Collection (LSUHC) and San Diego Society of Natural History (SDSNH).  
MVZ 45367, 45368, 50078, 50079; LACM 15131, 25027, 25028, 25059, 74274, 92711, 92712, 92714-92716, 92718-92720, 99441, 109374, 109377, 126985; SDSNH 45008, 45009, 45097, 45100, 45101; LSUHC 2445.