Endoscopy gender determination and reproductive hormone profiles of Painted Terrapins (Batagur borneoensis) subjected to ex situ incubation

ABSTRACT

Chelonian exhibit temperature dependent sex determination, and ex situ incubation of eggs in conservation hatcheries may render a gender bias. The gender of juvenile Painted terrapins (Batagur borneoensis) produced at a conservation hatchery in Malaysia was determined by endoscopy of the gonads. Circulating reproductive hormones (testosterone, progesterone and estradiol) were profiled for 31 juveniles and nine captive-reared non-breeding adult terrapins. Endoscopy revealed a gender bias of 96.8% (30/31) females. Testosterone levels in the juvenile females (2.49 ± 1.29) were significantly lower than that of the adult females (12.20 ± 4.29), and lower than values in the juvenile male (9.36) and adult males (27.60, 35.62). The progesterone levels in the juvenile females (107.12 ± 68.68) were significantly higher than that of the adult females (51.13 ± 24.67), but lower than values in the juvenile male (33.27) and adult males (3.43, 8.51). Estrogen levels were significantly lower in the juvenile females (1.57 ± 1.35) compared to the adult females (77.46 ± 53.45). Negative correlations were observed between levels of progesterone and testosterone, and progesterone and estrogen. A positive correlation was noted between estrogen and testosterone. The present study constitutes the first attempt to determine the gender and reproductive hormone profiles of juvenile Painted terrapins produced by ex situ incubation, and captive non-breeding adults. Endoscopy of the gonads is a useful techniques for gender determination among juvenile turtles, while the use of testosterone as a gender biomarker warrants further investigation.

Keyword: Batagur borneoensis; Endoscopy; Gender determination; Reproductive hormone