

ON THE SIZE AT MATURITY IN THE MALE FRESHWATER TURTLES, *Kachuga tecta* AND *K. smithii* IN JAMMU

Anil K. Verma and D.N. Sahi

Introduction

The emydid turtles constitute the largest family of living turtles encompassing 25 genera and more than 80 species world over (Bellairs, 1969). This family is represented by 10 genera and 16 species in India (Das, 1985) of which 6 species belong to the genus *Kachuga*.

Kachuga tecta and *K. smithii* are abundant of the freshwater turtles distributed in Jammu. However, no information on their size at maturity particularly in males is available. Present work was therefore, undertaken for generating information on size at maturity in these turtle species in Jammu. The data generated in this behalf would be useful to the biologists for the comparative studies with several other emydid turtle from elsewhere.

Methodology

The study was conducted between 1988-1992 in Gho-Manhasan, a distribution of stream in Jammu fed by the Chenab river. The turtle were collected brought to laboratory, maintained there and sexed based on secondary sexual characters (Duda *et al.* 1993). Linear measurements of the animal were taken with the help of a flexible steel-tape. Tail measurements were taken with the help of a divider. Measurements were recorded to the nearest millimeter.

In order to assess the minimum size in males at which the two species under investigation reach maturity, the dissections of the specimens pertaining to the different sizes, carapace length 56-140 mm were performed during the peak breeding period (July-September) whence the females are maximally gravid (Gupta, 1979) and receptive for the advances of the male. Therefore, the minimum carapace length of the turtle at which testes showed spermatogenic activity, was considered as the minimum maturity size of the turtle.

Observation and Discussion

In females this was found to be 142 mm in *K. tecta* and 160 mm in *K. smithii* (Gupta, 1979). The minimum carapace length at maturity in case of males was >60 mm for *K. tecta* and >56 mm for *K. smithii*.

A perusal of literature on the aspect of maturity in turtles reveals two divergent views, while one class of workers hold the view that the reproductive maturity is age related (Risley, 1938) in *Sternotherus odoratus*, the other view regards the attainment of maturity to be primarily size and not age related (Hildebrand, 1932; Cagle, 1944, 1948). The latter opinion has generated from the observations that the different populations of the species could show different rates of growth and hence at the same size could differ markedly in their ages.

The studies of Gupta (1979) on the female reproductive cycles

in *K. tecta* and *K. smithii* from Jammu, and Moll (1979) on further south populations of these turtles from India have shown that the turtles grow upto a certain size in accordance with their age (the age of hatchlings being 35-40 mm in both) beyond which their size increases but only very slowly, adding barely a mm or so during each year of its growth; the latter growth rate being much slower in comparison to the earlier one. In view of such an observation, the possibility of their male counterparts studied during the present investigation showing a similar pattern of growth cannot be ruled out.

In such an eventuality the males of *K. tecta* and *K. smithii* would attain a certain carapace or plastron length in a short period of time after their hatching, whereafter, the increments in their lengths would be much slower and smaller. This would, therefore lead one to the conclusion that in *K. tecta* and *K. smithii* in particular, and in turtles in general (Cagle, 1944, 1948, 1954; Mahmoud, 1967; Gibbons, 1970; Ernst, 1971; Ernst and Ernst, 1972; Wilbur, 1975; Gupta, 1979 and Verma, 1992) the attainment of maturity in male turtles is a function more related to the size than the age of the turtle. Although the minimum size at which the sexual maturity is attained could be indirectly a reflection of age, yet for want of a clear-cut criterion, the size or age at which these turtles mature continues to be a matter of opinion and therefore, arbitrary.

Estimation of the age of turtles at which they mature from the counting of abdomen scutes-annuli (growth rings) as suggested by Sexton (1959) become difficult because, the annuli tended to become smooth and difficult to count particularly, after their number increased beyond three. Assuming that each annulus represented the end of the previous year's growth, then with the fading out of the annuli above three rings per scute would make age determination extremely arbitrary.

References

- Bellairs, A.D.A. (1969) *The Life of Reptiles II*. Universe Books, New York.
- Cagle, F.R. (1944) Sexual maturity in the female of the turtle *Pseudemys scripta elegans*. *Copeia* : 149-152.
- Cagle, F. R. (1948) Sexual maturity in the male turtle, *Pseudemys scripta troostii*. *Copeia* : 108-111.
- Cagle, F. R. (1954) Observations on the life cycles of painted turtles (genus *Chrysemys*). *Am. Midl. Nat.* 52: 225-235.
- Das, I. (1985) *Indian turtles: A field guide*. World Wildlife Fund, India. Eastern Region, Calcutta.
- Duda, P.L., Verma, A.K. and Sahi, D.N. (1993) Sex-ratios in freshwater turtles from Jammu, India. *Hamadryad*, 18: 10-12.

continued on page xx (morphometry of squirrel)...

P.G. Department of Bioscience University of Jammu,
Jammu & Kashmir - 180 004