

XXV. THE AQUATIC CHELONIA OF THE
MAHANADDI AND ITS TRIBUTARIES.

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The smaller streams that join to form the Mahanaddi (literally the "Great River") rise in various mountain-ranges in the Central Provinces of India and their united waters flow eastwards through Orissa to the Bay of Bengal, which they reach by several mouths. The Mahanaddi river-system is thus, on the eastern side, the most northerly system of any importance in Peninsular India properly so called, that is to say India south of the Ganges and the Indus. From the Gangetic system it is not separated either by any great distance or by any very important natural barrier; the most northerly mouth of the Mahanaddi is hardly more than 100 miles south of that of the R. Hughli, and there are neither mountain-ranges nor deserts between them.

Almost all that is known of the aquatic chelonia of the Mahanaddi river-system is contained in a paper by the late Dr. W. T. Blanford published in the *Journal of the Asiatic Society of Bengal* in 1870 and entitled "Notes on some Reptilia and Amphibia from Central India." In preparing my recent account of the Indian Trionychidae (*Rec. Ind. Mus.*, VII, pp. 151-180) I had before me most of the specimens of that family collected by Dr. Blanford but was unable, for lack of further material, to add much to what he had written. Now, however, thanks to the assistance given me by Mrs. F. deMonte of Cuttack in Orissa, Mr. T. Southwell, Deputy Director of Fisheries, Bengal, and Mr. B. L. Chaudhuri of the Indian Museum, it has become possible to deal in a more satisfactory manner both with Dr. Blanford's specimens and with those that have recently been acquired. Even so, I have only been able to prove the existence in the Mahanaddi and its tributaries of four aquatic tortoises, although at least eleven species that may be called strictly aquatic haunt the waters of the Ganges. These eleven species are the following:—

<i>Trionyx gangeticus</i>	} Trionychi- dae.	<i>Hardella thurgi</i>	} Testudini- dae.
<i>Trionyx hurum</i>		<i>Batagur baska</i>	
<i>Emyda granosa</i>		<i>Kachuga lineata</i>	
<i>Pelochelys cantoris</i>		<i>Kachuga dhongoka</i>	
<i>Chitra indica</i>		<i>Kachuga smithii</i>	
	<i>Kachuga tectum</i>		

It is probable that at least three of the Gangetic Testudinidae also occur in the Mahanaddi system, viz., *Kachuga lineata*, *K. dhongoka* and *Batagur baska*. Of the first I have examined a young specimen taken by the late Dr. W. T. Blanford¹ in the lower reaches of the Godaveri, while the second is represented in the Indian Museum by quite typical examples from the Nerbadda and from Hyderabad, and the third by a skull from the Godaveri. Of the four forms, moreover, of which specimens have actually been obtained from the Mahanaddi, three are so closely related to Gangetic forms that they may be regarded merely as subspecies or local races thereof. The distribution of the fourth is still very imperfectly known; it may occur in the upper reaches of the Ganges.

The following are the four tortoises actually known to live in the Mahanaddi :—

TRIONYCHIDAE.

Trionyx gangeticus mahanaddicus,
subsp. nov.
Trionyx leithii.
Emyda granosa intermedia.

TESTUDINIDAE.

Kachuga tectum intermedia.

The type specimens of all except *Trionyx leithii* are in the collection of the Indian Museum.

Fam. TRIONYCHIDAE.

TRIONYX GANGETICUS MAHANADDICUS, subsp. nov.

Trionyx gangeticus, Cuv. var. (*partim*), Blanford, *J.A.S.B.* (2) XXXIX, p. 344 (1870).

Trionyx gangeticus, Annandale, *Rec. Ind. Mus.* VII, Addenda Nos. 1678I, 1679I, 16792, 1087-8, p. 180, pl. v, fig. 2 (1912).

Closely allied as the Mahanaddi *Trionyx* is to the typical *T. gangeticus* I now think, after examining a fully adult specimen, that it must be recognized as a distinct race. It may be defined as follows :—

Costal plates eight pairs, the last well developed and in contact in the middle line; two neurals between the first pair of costals; plates coarsely pitted and vermiculate. Epiplastra narrowly separated in front of the entoplastron, which forms an obtuse angle; existing plastral callosities very large, but no entoplastral callosity. Plastron as in *T. gangeticus*.

Head moderate; snout (on skull) considerably longer than orbit; interorbital region, in the adult, a little narrower than the nasal fossa; postorbital arch about half as wide as greatest diameter of orbit; mandible with inner edge strongly raised,

¹ Identified by Dr. Blanford as "*Batagur ellioti*?", *J.A.S.B.* (2) 1879, p. 110.

forming a sharp ridge, which sends off a short triangular tubercle at the symphysis; *immediately in front of this tubercle a deep transverse semi-circular depression; diameter of mandible at symphysis equal to or a little less than greatest diameter of orbit; a faint longitudinal ridge in this region; alveolar part of the lower jaw relatively shorter than in T. gangeticus; coronal bone more nearly vertical; both jaws, in adult, less blunt at the tip.* Branchial skeleton as in *T. gangeticus*.

Dorsal surface of carapace pale olive without radiating lines in the young; in the adult, dark olive with pale yellowish vermiculate veinings over the bony carapace and a more or less distinct marbling on the margin; dorsal surface of limbs and neck dark olive, the anterior part of the latter marbled with dull yellow; head yellowish olive in old individuals, green in young ones; on the vertex behind the eyes two broad, dark olive ^-shaped bars of irregular outline and often more or less interrupted; a straight but otherwise similar bar running obliquely on each side from behind the eye to near the gape; numerous dark-olive spots of different sizes between and behind the bars, between the eyes, on the snout and the sides of the head; these spots growing relatively larger with age; the whole ventral surface greyish white.

Distribution.—Hasdo river (tributary of the upper Mahanaddi), Bilaspur district, Central Provinces; Sambalpur and Cuttack, Orissa.

Type.—Skeleton (skin of head in spirit): No. 17014 in the Indian Museum Register of Reptiles, etc.

I have examined four individuals in the flesh and after preservation, as well as the two young skulls obtained by Dr. Blanford in the Hasdo river; three of my specimens were obtained by Mrs. F. deMonte from fishermen at Cuttack, which is situated at the upper end of the Mahanaddi delta, while the fourth was taken at Sambalpur, some distance higher up the river, by Mr. B. L. Chaudhuri. In skull-characters the six individuals agree closely, allowance being made for differences in age. It is evident that in this race pigmentation increases with age, the opposite being the case in that of the Ganges; for the young specimens are stated by Dr. Blanford to have had no dark markings on the carapace and apparently only a dark veining on the head, while the largest individual examined (the type) was much darker than others of smaller size. The entire disk of this individual (a male) was 70 cm. long by 55 cm. broad, while the bony carapace was 38 cm. by 46 cm.

It is evident that Dr. Blanford was dealing with two distinct species in writing the description cited above, for the very young individuals to which he referred as being ocellate on the back actually represent not the new subspecies but *T. leithii*, Gray. The skull of that species is narrower than that of either form of *T. gangeticus*, the symphysis of the lower jaw longer and the inner edge of the mandible without any trace of a ridge.

The following are the measurements of four skulls of *T. gangeticus mahanaddicus*:—

	No. 17014.	No. 16790.	No. 15912	No. 1088.
Length	100 mm.	102 mm.	87 mm.	65 mm.
Greatest breadth ..	97 ,,	73 ,,	65 ,,	44 ,,
Length of snout ..	29 ,,	27 ,,	24 ,,	17 ,,
Length of orbit ..	18 ,,	15 ,,	15 ,,	13 ,,
Width of postorbital arch	8 ,,	7 ,,	8 ,,	4 ,,
Interorbital width ..	13 ,,	13 ,,	15 ,,	..
Width of nasal aperture	17 ,,	16 ,,	15 ,,	..
Length of mandibular symphysis ..	18 ,,	16 ,,	14 ,,	..

No. 1088 is one of Dr. Blanford's specimens from the Hasdo river in the Central Provinces; the other skulls are from Orissa. The length of the skull is measured in each case from the tip of the snout to that of the articular condyle.

TRIONYX LEITHII (GRAY) (1870).

Aspilus cariniferus (*partim*), Gray, *Suppl. Cat. Sch. Rept.* I, p. 101 (1870).

Trionyx gangeticus, Cuv. var. (*partim*), Blanford, *J. A. S. B.* (2) XXXIX, p. 344 (1870)

Trionyx leithii and *gangeticus* (*partim*), Gray, *P. Z. S.* 1873, pp. 49 and 27, fig. 3 (p. 48), pl. viii.

Trionyx sp. ?, Blanford, *J. A. S. B.* (2) XLVIII, p. 110 (1879).

Trionyx leithii, Boulenger, *Cat. Chel. Brit. Mus.*, p. 249 (1889) and *Faun. Brit. Ind. Rept.*, p. 12; Annandale, *Rec. Ind. Mus.* VII, pp. 159, 160, fig. 2 (1912).

Young specimens of this species were obtained by the late Dr. W. T. Blanford in the Hasdo river. The species is also known from the Western Ghats and the Godaveri, Kistna and Nelambar rivers and is said to occur in the Indus or the Upper Ganges.

EMYDA GRANOSA INTERMEDIA, Annandale.

Emyda vittata? Peters, Blanford, *J. A. S. B.* (2) XXXIX, p. 343 (1870).

Emyda vittata, *id.*, *ibid.* XLVIII, p. 111 (1879); Annandale, *Rec. Ind. Mus.* I, p. 397 (1907).

Emyda granosa intermedia, *id. ibid.* VII, pp. 171, 172, pl. VI, fig. 3 (1912).

I have recently examined several additional specimens from Cuttack and Sambalpur. They agree well with the type, except that one old male has the shell olive-brown instead of olive-green.

The dark reticulation is, however, well marked on its disk. The disk of my largest specimen (a female) measures 306 × 270 mm. The race is apparently found all over central and eastern India from the headwaters of the Mahanaddi to the mouth of the Godaveri.

Fam. TESTUDINIDAE.

KACHUGA TECTUM INTERMEDIA (Blanford).

Emys (*Pangshura*) *tectum*, Bell var. *intermedia*, Blanford, *J.A.S.B.* (2) XXXIX, p. 339, pl. xiv.

Pangshura tecta var. *intermedia*, *id.*, *ibid.* XLVIII, p. 110.

Kachuga intermedia, Boulenger, *Faun. Brit. Ind. Rept.*, p. 43.

This form is very common both at Cuttack and at Sambalpur; I have examined a large series of living examples as well as many skeletons and skulls. So far as I can discover, there is no constant structural difference between it and the *K. tectum* of the Ganges, although in the great majority of individuals the second neural plate is much shorter. I have, however, seen individuals of *intermedia* in which it was no longer than is usual in *tectum*, and of the true *tectum* in which it was just as short as it is in *intermedia*; nor is the outline of its posterior margin by any means constant in either race. The coloration of the two races is, however, always different, at any rate in fresh or well preserved specimens, and in young individuals of *intermedia* the carapace is never so deep in the middle as it is in the Gangetic race. The carapace of *intermedia* is always much paler than it is in the true *tectum* and instead of the posterior part of the head being occupied by a broad V-shaped red or orange mark, it is for the most part of the same dull olive as the snout. There is always a conspicuous red spot behind each tympanum and sometimes less distinct and paler red marks can be detected on the top of the head behind the eyes. There are no spots on the dorsal surface of the limbs, but the thighs and often the upper arms are striped with pale olive. In the true *tectum* it is noteworthy that the V-shaped red or orange mark on the head is occasionally broken up into a coronal of spots.

The shell of the largest specimen of the race *intermedia* that I have measured is 260 mm. long by 245 mm. wide, the measurements being taken along the curves. I cannot distinguish the skulls of the two races.

It is probable that the race *intermedia* occurs all over the river-systems of the Mahanaddi and the Godaveri and that the typical *tectum*¹ is confined to those of the Indus, the Ganges and the Brahmaputra. Several specimens from the Godaveri in the collection of the Indian Museum were labelled "*tectum*" by the late Dr. J. Anderson, but a close comparison has assured me that

¹ Siebenrock regards *Pangshura cochinchinensis*, Tirant, as a synonym of *K. tectum*: see Tirant, *Etudes Div. Miss. Pavie* III, p. 494, and Siebenrock, *Zool. Jahrb. Suppl.* X, 1909, p. 454.

they actually represent the southern race, the colour of the carapace being quite distinct. It is probable moreover, that other herpetologists, misled by the belief that in *intermedia* the second neural plate is always transverse, may have identified specimens incorrectly. Mr. Boulenger records specimens of *K. tectum* from the Cuttack river and the Deccan (*Cat. Chel. Brit. Mus.*, p. 59), but both in his "Catalogue" and in the "Fauna" he states that the recent distribution of *K. tectum* is the "Ganges and Indus systems." In this I think he is right, for *K. cochinchinensis* (Tirant) probably represents a distinct race, as that of the Upper Brahmaputra may also do.