

XXI THE GENUS *TEMNOTAIA* (VIVIPARIDAE).

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The genus *Temnotaia* was proposed by myself in 1919 as a subgenus of *Taia*, mihi; but in the following year I gave reasons for considering it distinct. A reference to the collection in the British Museum enables me to throw further light on the genus. I have to thank Mr. G. C. Robson for giving me full facilities for examining the specimens and Mr. J. R. le B. Tomlin for supplying me with the reference to Mabile's description of the allied Indo-Chinese genus *Chlorostracia* and lending me a copy of the scarce work in which it is contained. The Burmese genus may now be more fully described and its relations to *Chlorostracia* discussed.

Temnotaia, Annandale.

1919. *Temnotaia*, Annandale, *Rec. Geol. Sur. Ind.* L, p. 231.

1920. *Temnotaia*, *id.*; *Rec. Ind. Mus.* XIX, p. 115.

The shell is typically Vivipariform in outline, but thick and porcellaneous. It is ovoid, acuminate and imperforate, with $5\frac{1}{2}$ to $7\frac{1}{2}$ whorls, which increase in size gradually and never have the suture deeply impressed. In all the species yet known the umbilicus is imperforate. The body-whorl is never greatly swollen and the aperture is of moderate size, ovoid and slightly oblique. The external surface is smooth and highly polished in fresh shells, with a very thin, closely adherent periostracum. The sculpture consists of incised lines or very fine linear ridges or else is microscopic. Interrupted broad ridges, nodules, scales and spines are entirely absent. The columellar callus is short and broad, convex and highly polished. Dark spiral bands are present or absent.

The operculum resembles that of *Vivipara* and is moderately thick. Nothing is known of the radula or soft parts.

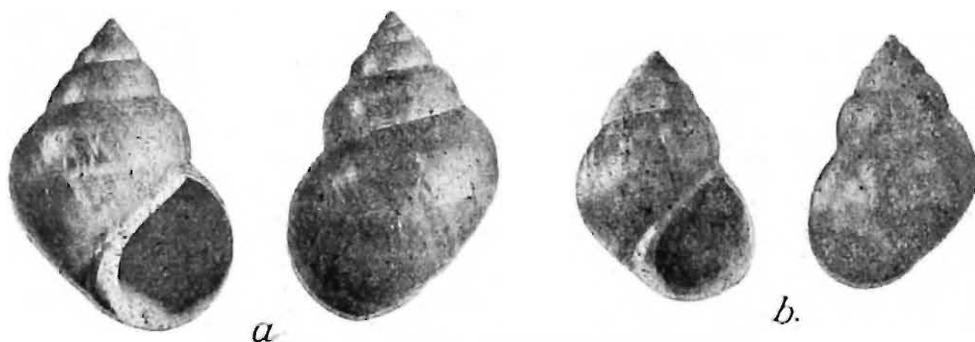
Temnotaia differs from *Chlorostracia*¹ mainly in its much more normal outline and in the structure of the operculum. The shell of the latter genus, of which a considerable number of species occur in Siam and French Indo-China, has a curiously *Natica*-like facies owing to its short spire, relatively large penultimate whorl, deep suture, perforate umbilicus, immense body-whorl and large aperture. Its operculum is characterized by the very large internal scar, which bears a curious crateriform process.

¹ Mabile, *Bull. Soc. Mal. France* VI, p. 309 (1889). The type-species is *C. bocourtei*, Mabile, the shell and operculum of which are figured in the same paper.

My own genus is only known from Upper Burma, Laos and Cambodia. I am now able to distinguish four species as follows:—

- I. Shell decorated with well-defined incised spiral lines :
 $5\frac{1}{2}$ whorls *T. incisa*.
- II. Shell without incised spiral lines, with more than 6 whorls.
 - A. Shell devoid of prominent linear ridges and not at all angulate *T. fulva*.
 - B. Body-whorl of shell bearing linear ridges or distinctly angulate.
 - i. Shell with more than one linear ridge : $7\frac{1}{2}$ whorls *T. concolor*.
 - ii. Shell with the body-whorl angulate : $6\frac{1}{2}$ whorls *T. bhamoensis*.

The first of these species is the type-species and is only known from the Chindwin watershed and in a subfossil condition. The second was described by Reeve¹ as *Paludina fulva* from Cambodia and also occurs in Laos. I have examined the type-series of three shells in the British Museum. *T. concolor* was originally described by Nevill² as *Paludina naticoides* var. *concolor*. The



TEXT-FIG. I.—Photographs (nat. size) of

(a) *Temnotaia concolor* (Nevill).

(b) *Temnotaia bhamoensis* (Nevill).

type-specimens have apparently been lost, but I was³ perhaps wrong in thinking that Nevill regarded them as identical with the *forma typica* of Theobald's *P. naticoides*. All he inferred was that the series in Calcutta was the type-series of his variety. In the small series in the British Museum there are two specimens from the Upper Salween, included under the name *Vivipara shanensis* (Theobald), which agree exactly with Nevill's brief description of the var. *concolor* except that the colour has faded to a greenish buff. The larger of them is here figured. There are $7\frac{1}{2}$ whorls. *T. bhamoensis* was also briefly described by Nevill,⁴ as a variety of *V. dissimilis* (Müller). I have not the type-specimen before me, but have asked Dr. Bani Prashad to add a note upon it.

¹ Reeve, *Conch. Icon.* XIV, pl. x, fig. 64 (1864).

² Nevill, *Hand List Moll. Ind. Mus.* II, p. 25 (1885). Since this was written Col. Godwin Austen has kindly shown me a series of specimens identified by Theobald as *Paludina naticoides*. Apparently he included *T. concolor* in that species as well as nearly smooth specimens of the true *Taia naticoides*.

³ Annandale, *Rec. Ind. Mus.* XIV, p. 163 (1918).

⁴ Nevill, *tom. cit.*, p. 29.

“Of *T. fulva* (Reeve) there is a single specimen in the Indian Museum received in exchange from the late Mr. Sowerby out of the type-series collected by Lombe Taylor in the Laos mountains. It is 23 mm. long and 17 mm. in maximum breadth. I give below a description of the only specimen of *T. bhamoensis* (Nevill); it is labelled as the type of the subvariety *bhamoensis* in Nevill's handwriting and was referred to by Dr. Annandale in his recent paper (*Rec. Ind. Mus.* XIX, p. 115).

The shell is thick, of moderate size and sharply conical; the spire of the unique specimen is greyish, but the body-whorl is of a uniform greyish-brown colour without spiral bands and with a highly polished periostracum. The suture is somewhat oblique and only moderately impressed, the whorls, which are swollen, are subangulate along their upper margin, and $6\frac{1}{2}$ in number. The spire is short and decreases rapidly but irregularly towards the apex; it is about $\frac{3}{4}$ the size of the body-whorl in dorsal view. The body-whorl is distinctly angulate and shows fine, but distinct, vertical and somewhat curved ridges corresponding to the regions of growth. The mouth of the shell is large, suboblique and prominent, somewhat ovoid in shape, with the outer lip sharp and not at all expanded outwards. The columellar callus is of the same type as in *T. incisa*, but is proportionately less broad; it is convex and highly polished.

The unique type measures 26 mm. in length and 17 mm. in breadth, the aperture measures 15 mm. \times 13 mm. [*B. Prashad.*]
