ON A NEW FORM OF FRESHWATER SNAIL FROM BANGKOK, THAILAND (MOLLUSCA, GASTROPODA: FAMILY LYMNAEIDAE)

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(Plates V & VI.)

INTRODUCTION.

The present paper is based on the study of a collection of dry shells of molluscs received for determination in July, 1949, from Mr. Boon Indrambarya, Director-General of Fisheries, Department of Fisheries, Bangkok, Thailand. In forwarding the specimens, he noted that a kind of freshwater snail spawned in the aquarium at Bangkhen Fishpond Station and a study of its development from the egg stage was made, though the precise scientific name of the mollusc was not known. The specimens had, therefore, been sent to the Indian Museum for identification.

On a cursory view the collection was found to contain a fairly good series of specimens (numbering 51) of the well-known genus *Lymnaea* Lamarck. But a closer study revealed that they represent three different stages of development marked by certain very interesting features in their shell-characters which clearly indicate their close affinities with some forms of two very common Indian species *L. luteola* on the one hand and *L. acuminata* on the other. There was no difference regarding colouration and sculpture, save that a few shells were found covered with a black deposit more or less concealing the original pale yellow colour. One worn and decollate shell (see Pl. V, fig. 12) was also found partly orange-yellow in colour which may possibly be due to too much exposure. Of course, variation is not an unusual feature in the difficult genus *Lymnaea* where as Annandale and Rao (1925)[1] point out " Apart from differences due to age, we may, indeed, note three types :—(1) individual variability, (2) plasticity and (3) racial or local variation"

I am illustrating here with figures the remarkable variations as displayed by the shells in different stages of their growth (out of 51 shells, I have selected only 14 in order to show the nature and extent of variations in their shell-characters) and the close affinities shown by them with different forms of *Lymnaea luteola* and *L. acuminata*. That is, in the first stage (A) represented by the young shells (Pl. V, figs. 1—4) the spire appears distinctly narrow and elongate, sutures more impressed and bodywhorl (though oblong-ovate) more oblong than ovate—all these somewhat closely approaching the forms *patula* Troschel (Pl. VI, fig. 1—Rawalpindi, Punjab), *hians* Sowerby (fig. 2—Sangram Tank, Buldana, Berar) and *typica* Lamarck (fig. 3—South of Mandi, Punjab)

[1] Annandale, N. and Rao, H. S., *Rec. Ind. Mus.* XXVII, p. 137 (1925).

of the species *L. acuminata* available in our named collections. But there is one shell (Pl. I, fig. 5) in this lot which appears somewhat peculiar in being less thick in texture, more shining and provided with shorter spire and less oblong bodywhorl. In the second stage (B) represented by the intermediate shells (figs. 6—9) the spire gradually becomes short and less narrow, but slightly more broad and swollen, sutures less impressed and bodywhorl slightly more ventricose—all these approximating nearly to the forms *pinguis* Dohrn (Pl. VI, figs. 6, 7—Karachi; see also figs. 7, 10 in Pl. XX of *Conch. Ind.* (Hanley et Theobald), 1876—now considered as a synonym of the f. *australis* Annandale and Rao, pp. 159 (fig. 3), 184, 1925) and *succinea* Deshayes (fig. 8—Bollarum Tank, Secunderabad) of the species *L. luteola.* In this lot also there are two peculiar shells—one (Pl. V, fig. 10) having a more ovate bodywhorl and short but acuminate spire somewhat resembling the f. *chlamys* Benson (Pl. VI, fig. 4—4 miles from Gurdaspur, Punjab), while the other (Pl. V, fig. 11) in its narrow and elongate spire agreeing with those of the first stage, though the bodywhorl appears slightly more ventricose. In the third stage (C) represented by the large shells (figs. 12—14) the spire gradually becomes more short, broad and swollen (fig. 14) somewhat like *ovalis* Gray (Pl. VI, fig. 9—Assam), while the bodywhorl truly oblong-ovate like *acuminata.* This curious state of affairs really put me in great difficulty as to the exact identity of the specimens in question. In this connection I spared no pains to consult with care the admirable paper on Indian Lymnaeidae published by Annandale and Rao (1925) and also other relevant literature on the subject, but failed to come to any definite conclusion. So, the entire collection of Bangkok shells was sent to Dr. H. S. Rao, an authority on Indian Lymnaeidae and Chief Research Officer, Central Marine Fisheries Research Station, Mandapam, S. India, for opinion, and along with this some identified specimens representing different forms of the species *L. luteola* and *L. acuminata* were also sent from our named collections in order to help him in the way of comparison and study. The critical report he has so kindly given not only shows the depth of his knowledge and wide experience in the line extending over a quarter of a century, but also unravels many interesting points at issue as will be evident from the following :—

> " The Bangkok specimens certainly appear to represent the extreme variation of *L. luteola* towards *L. acuminata* and to provide a transition between the two species. I would therefore recommend the recognition of a new form designated as *L. luteola f. acuminata* [1] with close geographical affinities to the eastern type, f. *siamensis,* which will have the same status and significance as the other forms so far recognized. I appreciate the point you have raised about the likeness between these Bangkok shells and the Karachi ones. You will find the same tendency for variation even in the very small collection of 5 specimens from the Royal Lakes, Rangoon (Reg. No. 12042), in which two small shells are more near the Bangkok specimens in the shape and proportion of the spire in relation to the bodywhorl than the other three which have the typical outlines of an undoubted *L. luteola.* The best thing under the circumstances would be to publish good figures, as we did a quarter of a century ago, representing the whole gamut of variation with the species, *L. luteola,* and between it and *L. acuminata.* Of course, you will have to make a very careful selection of the more obviously ovate and long-spired forms to illustrate your point." *(15th April 1950.)*

[1] The name '*acuminata*' as suggested by Dr. H. S. Rao for this new form could not be used here, since it was found preoccupied among the Indian species of the genus *Lymnaea.*

As pointed out by Dr. Rao, the two small shells of the f. *siamensis* Sowerby (Pl. VI, figs. 10, 11) from the Royal Lakes, Rangoon, have been found after a careful examination to be more near the Bangkok shells than the other three (of which only one is shown here, see fig. 12) showing typical outline of an undoubted *L. luteola.* Now, I consider it a great pleasure to describe the shells in the series under investigation as a new form under the name of *L. luteola* f. *booni* in honour of Mr. Boon Indrambarya who sent the specimens. An attempt has also been made here to illustrate the extreme variation of this new form. In plate VI (figs. 1—12) I have tried to show as far as possible the affinity of this form with other existing forms of the species *L. acuminata* and *L. luteola* found in our named collections from various localities.

Lymnaea (Pseudosuccinea) luteola Lamarck, 1822 f. **booni**, nov.

(Plate. IV, figs. 1—14.)

Shell medium, solid, dextral, oblong-ovate, ventricose, pale yellow, polished and shining in most cases, surface covered with a black deposit only in a few cases (though not in all) which more or less conceals the original colour, ornamented with fine oblique longitudinal lines appearing more prominent but somewhat rough in the large shells ; spire much narrow and elongate in the young condition, but gradually becoming more short, broad and swollen in the adult, apex acuminate ; whorls $4\frac{1}{2}$ or 5, convex, regularly increasing in the upper part, but from the penultimate to bodywhorl appearing somewhat abrupt especially in the large shells, bodywhorl large, elongate (its length is about $2\frac{1}{2}$ times greater than that of the spire in the young shells, but $3\frac{1}{2}$ times or even more in the larger ones with rare exceptions), convex but not very broad, descends gradually downwards and becomes constricted at the base (excepting rarely) ; sutures more impressed and sinuous in the young than in the adult ; aperture large, somewhat oblong, less broad but more longer than in f. *australis* (=*pinguis*), white to pale yellow inside ; outer lip thin, long, curved at the upper part but compressed in the middle (Pl. V, figs. 7*a*, 9*a*, 14*a*) somewhat-like that of f. *australis* (see No. 3 in Text-fig. IV, p. 159, Annandale and Rao, 1925) and f. *chlamys* (Pl. VI, figs. 5, 5*a*) giving it a superficial angulated appearance at the upper part (Pl. V, figs. 6, 7, 9, 14 ; see also *ibid.* No. 6 in Text-fig. III. p.156) —this feature is not prominent in all cases, then descending downwards it makes a good curve before joining the inner lip or columella which is long, folded in the middle and slightly curved below.

Measurements.—The largest shell (fig. 14-*a*) in the series measures 21·5 mm. in length and 11 mm. in diameter with its aperture 16 mm. × 6 mm., while the smallest one (fig. I-*a*) measures 10·5 mm. in length and 5 mm. in diameter with its aperture 7 mm. × 3 mm.

Type-locality.—Aquarium at Bangkhen Fishpond Station, Bangkok, Thailand.

Type-series.—Reg. No. M $\frac{16087}{2}$ Zool. Surv. Ind.

Remarks.—Lymnaea (*P.*) *luteola* f. *booni* appears quite unique in its shell-characters which certainly show, as stated by Dr. Rao, the

extreme variation of *L. luteola* towards *L. acuminata* and provide a transition between the two species. The important points indicating true affinities of this interesting form with other forms of the species *L. luteola* and *L. acuminata* have been clearly discussed with the help of figures of specimens selected from our named collections. Such a remarkable variation in shell-characters as displayed by this new form has not been met with in any other forms so far described.

I express my great indebtedness to Dr. H. S. Rao for the care and interest with which he has examined the specimens and also for his expert opinion. My gratefulness is also due to Dr. S. L. Hora, Director, Zoological Survey of India, for his valuable suggestions. Sri S. C. Mondal, artist of our department, has taken great trouble in taking photographs of the shells used in Plates V and VI, for which I offer him my best thanks.