

On: 12 March 2015, At: 07:49

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number:
1072954 Registered office: Mortimer House, 37-41 Mortimer Street,
London W1T 3JH, UK



Annals and Magazine of Natural History: Series 6

Publication details, including instructions
for authors and subscription information:
<http://www.tandfonline.com/loi/tnah12>

LVII.—New species of Cyclophorus and a Spiraculum from the Khasi and Naga Hills, Assam

Lieut.-Col H.H. Godwin-Austen F.R.S. &
Col. R. Beddome F.L.S.
Published online: 06 Oct 2009.

To cite this article: Lieut.-Col H.H. Godwin-Austen F.R.S. & Col. R. Beddome F.L.S. (1894) LVII.—New species of Cyclophorus and a Spiraculum from the Khasi and Naga Hills, Assam , Annals and Magazine of Natural History: Series 6, 13:78, 506-509, DOI: [10.1080/00222939408677742](https://doi.org/10.1080/00222939408677742)

To link to this article: <http://dx.doi.org/10.1080/00222939408677742>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views

of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

larval stage is lower and lower in embryonic level, suggests that the larval stage results from an attendant retrograde embryonic change to a line parallel with the Myriapod, and beyond to the memberless condition of a worm. The principle appears to be a general one among animals, and thence the higher the species the longer the stage of youth.

The relations in body-segments and limbs between the classes of Crustaceans, Limuloids, Arachnids, Myriapods, and Insects are shown in the table (p. 505). The segments of the body are numbered along the left margin; the zero opposite signifies that the segment, though present, has no appendage.

In this table the following abbreviations are used:—Ant., antenna; App., pairs of jointed appendages, either pediform or branchial; M., mandible; Mx., maxilla; P., feet; M-P., feet that serve also as jaws; Mx. & L. (under Insects), maxillæ and labium; Fol. P., foliaceous or lamellar feet or appendages.

Under the Limuloids the genus *Eurypterus* fails of antennæ, but they are present in *Pterygotus* and are chelate; and this chelate (or thumb-and-finger) form characterizes also the modern *Limulus*, the Scorpions, and the common Spiders. In the table the two pairs of maxillæ of Insects are assumed to belong to a single body-segment, as held by many zoologists, including (as he himself informs the writer) Prof. S. I. Smith; the table shows that, with this admission, the thorax and head of an Insect are essentially homologous with the head of a Tetrdecapod Crustacean.

LVII.—*New Species of Cyclophorus and a Spiraculum from the Khasi and Naga Hills, Assam.* By Lieut.-Col. H. H. GODWIN-AUSTEN, F.R.S. &c., and Col. R. BEDDOME, F.L.S. &c.

Cyclophorus Muspratti, sp. n.

Shell umbilicated, turbinate, slightly keeled; sculpture, apex smooth, the whorls thence are longitudinally ribbed and striated, increasing in strength near the suture from above downwards, and crossed by the lines of growth, producing a decussate surface; this is coarser and rougher on the last whorl and under surface. Colour madder-brown, crossed by mottled broken white lines on whorls 3 and 4. Spire conic,

moderately high, sides slightly convex, apex sharp; suture shallow; whorls 5, sides convex, the last somewhat keeled; aperture circular, oblique; peristome white, not thickened, slightly reflected.

Size, type: maj. diam. 48·75, min. 39·0; alt. axis 22·25 mm.

largest: " 50·0, " 42·0; " 23·0

Loc. Naga Hills (*Doherty*); Maokokchung, Naga Hills (*Muspratt*).

In the young shell the longitudinal striæ are very sharp and distinct, quite lirate in appearance; this character separates it from the other species of *Cyclophorus* from these hills.

Cyclophorus nagaensis, sp. n.

Shell umbilicated, turbinate, not keeled; sculpture, lines of growth only, without any spiral lines being visible. Colour grey-brown, more ochraceous below, when wetted of a madder-brown colour; a white line on the periphery, bounded by a broad very dark band, shaded off below; the third whorl is crossed by narrow wavy white lines; in the next growth these lines are wider apart and zigzag in outline; the next and final growth is plain. Spire depressedly conoid, apex subacute; suture shallow; whorls 5, rounded; aperture subvertical, large, circular, grey within; peristome not much thickened, scarcely reflected, bright orange-red.

Size: maj. diam. 45·0, min. 36·0; alt. axis 21·0 mm.

Loc. Naga Hills, near Khonoma and Kigwema, 5000–6000 feet (*Doherty*); Maokokchung (*Muspratt*).

The form of this species is very similar to *C. Pearsoni*, but the red of the lip is more intense than in shells from the typical locality; its very smooth surface also distinguishes it.

Cyclophorus pæciloneurus, sp. n.

Shell umbilicated, turbinate, keeled; sculpture, apex smooth and shining; five distinct lirate ribs run contiguous to the suture on the lower margin of the whorls, commencing with the third whorl; these have two finer thread-like ribs between them, and similar fine liration is continued above and on the lower surface of the shell, crossed by strong lines of growth on the epidermis. Colour umber-brown, marbled with madder-brown, given off from a few strong spots of this colour next the suture; the peripheral rib is dashed with white at intervals. Spire conoid, sides flat, apex sharp; suture shallow; whorls 5, subconvex, the last sharply keeled, forming a strong rib; aperture oblique-ovate, ample on the outer margin, grey

within; peristome white, well thickened in mature shells, sharply reflected.

	Maj. diam.	Min. diam.	Alt. axis.
	mm.	mm.	mm.
Type	31·0	25·75	15·0
Col. Beddome's largest sp.	33·0	26·0	16·0
Var. with red lip (<i>aureo-</i> <i>labris</i> , Nev.) . . . }	34·5	27·5	15·5

Loc. Type from the Lahúpa Naga Hills, Manipur (*coll. Lieut.-Col. Godwin-Austen*), and eastward to the Dihing.

Lieut.-Col. Godwin-Austen found two specimens of this species in the Lahúpa Naga Hills, in 1873; the late Mr. Ogle sent him three from the neighbourhood of the Dihing River, far to the eastward. Mr. Doherty obtained it in the Naga Hills, and Col. Beddome lately recorded it from Mr. Muspratt from Maokokchung, in the Naga Hills. In these eastern hills this form takes the place of *C. zebrinus* of the Khasi Hills &c., but it is much larger, the spiral ribbing is much stronger, the whorls are more convex, and it is more openly umbilicated.

All the specimens in Lieut.-Col. Godwin-Austen's collection, and also those collected by Mr. Doherty, are white-lipped shells; among the specimens received by Col. Beddome the red-lipped predominate*.

The coloration is very variable; in some, as in the type, the marbling occurs in fine zigzag lines far apart, in other examples these are so closely run together as to give the shell a beautiful ruddy colour.

Cyclophorus Fultoni, sp. n.

Shell somewhat depressedly turbinate, rather widely umbilicated, periphery rounded; sculpture nearly smooth, under a lens a fine, close, oblique, vertical striation is apparent, which is obsoletely decussated with delicate spiral lines. Colour a uniform dark ruddy brown or madder-brown above and on the sides, but several narrow and two or three broader dark longitudinal bands are distinguishable in a strong light, pearl-white beneath. Whorls 5, the last very large, rather suddenly increasing towards the aperture, the last three apical whorls

* Nevill, in his 'Hand-list,' 1878, p. 268, does not separate the Eastern forms, but names three specimens sent to the Indian Museum by Mr. S. E. Peal, from Sibsagar, as var. *aureolabris*. He says, "The largest variety I have yet seen and the only one with a coloured peristome, in this case a brilliant orange-colour." It may therefore stand under the above name.

rising suddenly; suture shallow; aperture wide, nearly circular, a little higher than broad, oblique; peristome continuous, rather thickened, slightly reflected, pale yellowish, columellar margin rounded; operculum of the same colour as the shell, having 5 or 6 acutely defined volutions, the interspaces with the usual oblique lines of growth.

Size: maj. diam. 49, min. diam. 43; alt. axis, max. 20, min. 19 mm.

Loc. Khasi Hills; three specimens obtained by Mr. Fulton.

The affinity of this beautiful species is with *C. siamensis*, from which it differs in its more depressed form and more oblique aperture, and especially in the coloration. The exact locality is not known; the Khasi Hills is a large tract, and many species found on the northern slopes draining to the Brahmaputra are not found on the south side, while intervening is a high grassy plateau with a very scanty number of land-shells.

Spiraculum nagaense, sp. n.

Shell discoidal, upper surface flat, widely umbilicated; sculpture, strong longitudinal striation, covered with a thick epidermis, with two parallel bands of close-set hairs on the periphery. Colour umber, with a series of darker bands crossing the whorls. Spire quite flat; suture deep, the sutural tube is 4.5 mm. behind the peristome, is well developed, arched and bending over, and lies directed backwards and parallel with the suture; whorls 5, rounded, the last descending very slightly; aperture circular; peristome thickened, white, continuous, with an angulate notch above and close to the body-whorl; operculum widely spiral, shelly, whitish grey.

Size: maj. diam. 17.5, min. 14.0; alt. axis 5.25 mm.

Loc. Maokokchung, Naga Hills (*Muspratt*). In coll. Col. Beddome.

This small form may be distinguished from *S. hispidum*, var. *minor*, of Teria Ghat in the Khasi Hills and base of the Daffa Hills, in the form and direction in which the sutural tube lies backward on the shell; in *hispidum* it lies across and nearly at right angles with the suture, in this new form it is on the line of the suture.