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Description of the female of *Chordodes albi- barbatus* Montg.

By

Thos. H. Montgomery jr., Ph. D.,
Lecturer in Zoology, University of Pennsylvania.

With Plate 29.

The male and type of this species was described by me in a paper published in 1898 in this Journal ("Descriptions of two new exotic species of *Chordodes*"). Since then I have received, through the kindness of Dr. PHILIP P. CALVERT of the University of Pennsylvania, a female specimen, which differs from the male in certain points and hence warrants a separate description. This specimen was collected by the Rev. Mr. NASSAU at the Gaboon River, W. Africa; it was found in a jar containing various Orthoptera, from one of which it had probably escaped. This female appeared to be mature, with the ovaries filled with ova.

Cuticle (surface view in Canada balsam). Scattered on the surface of the cuticle are seen groups of high papillae, which appear darker than the intermediate, lower ones. In the centre of each of these groups lie 2 papillae, of much greater diameter than the others (*a* Fig. 2); each one of this central pair bears on its summit a thick cluster of long, hyaline hairs, each such cluster appearing like a white spot to the naked eye; the two papillae of each pair are situated close together near the centre of the group. The high papillae surrounding this central pair appear the darkest of all on surface view (*b* Fig. 2). Between these groups of high papillae are situated, close together, much more flattened papillae, usually of an oval form with their long axes placed perpendicular to the longitudinal axis of the body (*c* Fig. 2); many of these appear ring-shaped, or double ring-

shaped, owing to the central portion in such cases being lighter than the peripheral. The high papillae of the groups mentioned above also show a clear, central core.

Cuticle (transverse section). Five different kinds of prominences may be noted: 1) a pair of papillae occurring at the centre of each group of high papillae (*a* Figs. 2, 3, *a* Figs. 1, 3). These are the most elevated and broadest of all; they are rounded at the summit (which is of a lighter color than the basal portion), and appear more or less barrel-shaped in outline. The peripheral portion is darker and denser than the axial. Attached close together in a ring around the basis of the summit are found numerous, white, thick hairs, of greater diameter than the papilla itself. They are not stiff but very pliable, as is shown by the fact that they are generally irregularly bent and interlaced together (these hairs are shown in Fig. 4, but in Fig. 3 are purposely not reproduced in order to show more clearly the form of the central papillae). 2) High papillae situated around the pair just described, about 12–20 in number in each group, the number being variable (*b* Figs. 1, 3). The highest of these (those situated nearest the large central pair) have about the height of the central pair, while those towards the periphery of the group are only one-half or one-third so high. All of these are much narrower than those of the large central pair, the more central ones being finger-shaped, the more peripheral ones more conical. Their summits are either rounded or somewhat pointed, and each bears on its summit a few short, delicate hairs; their bases are the broadest portions. Like the preceding kind, these papillae have a darker periphery and a lighter core, but they are not so dark in color as the preceding. Both these kinds are translucent. 3) The lowest and most numerous papillae, which occupy all the space between the groups of the high papillae, are placed close together (*c* Figs. 1, 3, 4). Their substance is denser and darker than that of any other cuticular prominence: they appear lighter on surface view owing to their smaller degree of elevation. They are usually longer than high, lowest at the margins; but they vary somewhat in form, and a few are higher than broad. Their summits have a dentated appearance, i. e. each summit is multi-tubercular; these apical tubercles vary in size and have a more or less rounded-conical shape. Each papilla is transversed by a varying number of narrow canals, which are directed perpendicularly; the external opening of each of these lies between two of the tubercular prominences. These canals do not extend into the underlying fibrous

cuticula. Beneath many of these papillae are found one (sometimes two or three) clear, oval or rounded spaces, which are sunk into the surface of the fibrous cuticle; it is such papillae, which on surface view show a central clear space. 4) Slender, hyaline processes, club-shaped or finger-shaped, of greater height than the 3rd kind of papillae; these occur singly and sparingly, and are similar to those found in most other species of *Chordodes* (*d* Fig. 1). 5) Hyaline, translucent, yellowish spines, which are even less numerous than the 4th kind of prominences (*e* Fig. 4). These are placed usually at an angle to the surface of the body, are largest at the base, which is enlarged and rounded except for a terminal concavity. They are more or less hook-shaped in outline, and are most slender at the distal end, this portion making an angle with the proximal part. The basis does not lie within the fibrous cuticula, but is situated in a rounded depression in the surface of the latter; that is to say, the layers of the fibrous cuticle are bent inward at this point.

The groups of high papillae are not found on the head, nor on the terminal portion of the posterior end.

Form. Body stout, nearly cylindrical with median grooves; anterior third the narrowest, becoming more slender towards the head end (Fig. 5), which is pointed, with a truncated tip. Posterior end (Fig. 6) of less diameter than the middle of the body, separated off by a constriction, spherically rounded and of greater diameter than the immediately preceding portion; this form is that generally characteristic for females of this genus. Cloacal aperture nearer the ventral than the dorsal margin, placed in the centre of a circular depression. Seen from the side the posterior end appears truncated.

Color. A deep chocolate-red, not mottled or spotted, lighter anteriorly. Tip of the head and the knob-shaped posterior end, light yellow. The cuticular hairs are white.

Dimensions. Length 215 mm; greatest diameter 2 mm.

Comparisons. This specimen is undoubtedly the female of *Chordodes albibarbatus* MONTG., though it differs from the latter (besides differences in form) in color, and in that the summits of the lowest papillae are much more dentate in appearance. In my description of the male, I had overlooked the cuticular spines, but on now studying again the sections of that specimen I find them to be present, but less numerous than in the female.

This species differs from the most closely allied ones as follow:

1) *C. balzani* CAMERANO (from Bolivia) approaches nearest to

C. albibarbatus, but differs from it in that the largest papillae occur in fours ("due a due"), in that the high papillae which surround the preceding do not bear hairs, and in the different form of the cuticular spines.

2) *C. moutoni* CAM. (from China) differs from it in the arrangement of the papillae, in the summits of the lower papillae not being dentated, and in the cuticular spines being placed on the summits of papillae.

3) *C. timorensis* CAM. (Timor Island, Malaysia) differs from it in lacking the curved spines, in the shortness of the hairs on the central papillae, and in the grouping of the latter into threes.

4) *C. ferox* CAM. (Congo, Africa) differs from it in that the smallest papillae have not dentated summits, and in that each group of larger papillae is not composed of more than 9—13 papillae.

The following paper, describing a new *Chordodes*, has been inaccessible to me: JÄGERSKIÖLD, "Chordodes Kallstenii, eine neue Gordiide aus Kamerun", in: Bih. Svenska Vet.-Akad. Hdlgr., V. 23.

Wistar Institute of Anatomy and Biology,
University of Pennsylvania, Philadelphia, U.S.A.

20. April, 1898.

Explanation of the Figures.

Plate 29.

All figures are drawn with the camera lucida, Figs. 5 and 6 from the alcoholic specimen, the other figures from Canada balsam preparations. A microscope and lenses of ZEISS were employed.

Fig. 1. Transverse section of the cuticle (homog. immers. $\frac{1}{12}$, oc. 2).

Fig. 2. Surface view of the cuticle (obj. C, oc. 4).

Figs. 3, 4. Transverse sections of the cuticle; in Fig. 4 the layers of the fibrous cuticle are somewhat diagrammatically represented; in Fig. 3 the hairs of the large central papillae are not drawn (homog. immers. $\frac{1}{12}$, oc. 2).

Fig. 5. Outline of the head end (obj. A, oc. 2).

Fig. 6. Outline of the posterior end, lateral view (idem).

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Autor(en)/Author(s): Montgomery jr. Thos. H.

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