

ZOOLOGY.—*Sarsiella*, *tricostata* a new ostracod from San Francisco Bay (*Myodocopa*: *Cypridinidae*). MEREDITH L. JONES, University of California, Berkeley.<sup>1</sup> (Communicated by Fenner A. Chace, Jr.)

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In the course of sampling the benthic fauna off Point Richmond, San Francisco Bay, Calif. (Jones, 1954), a series of three types of ostracods were encountered. These animals, which provide the basis for the following description, were collected at depths of 2 to 30 feet below mean lower low water and were most common at depths of less than 12 feet. At first, because of the press of the program at hand, and owing to the scanty knowledge of Pacific coast members of this group, they were referred to as Ostracods "A," "B," and "C." Subsequent investigation indicated that all three were of the genus *Sarsiella* Norman, 1869.

At the time of Müller's work (1912) some 19 species of *Sarsiella* were recognized, and since then only one additional species has been described (*S. misakiensis* Kajayama 1912). Of the known species, only two (*S. americana* Cushman, 1906, and *S. zostericola* Cushman, 1906) possess shells bearing three ridges that converge near the shell center, a characteristic that is constant in the specimens from Point Richmond. However, although the gross outline of Ostracod "A" was almost identical to that of *S. americana*, the shell ribs of Ostracod "A" were oriented differently, and the dorsal margin of the shell (irregularly notched in *S. americana*) was smooth. On the other hand, Ostracods "B" and "C" bore a superficial resemblance to the female and male of *S. zostericola*, respectively.

As will be seen later, there are other differences that help differentiate between Cushman's two species of *Sarsiella* and the present form and that justify the erection of a new species, *Sarsiella tricostata*; to include Ostracod "A," the mature female, Ostracod "C," the mature male, and Ostracod "B," juvenile forms of undeterminable sex. The specific name is based on the obvious ribbing of the shell surface.

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Suborder MYODOCOPA

Family CYPRIDINIDAE

Genus *Sarsiella* Norman, 1869

*Sarsiella tricostata*, n. sp.

Figs. 1, A-P; 2

Ostracod "A" (female) Jones, 1954.

Ostracod "C" (male) Jones, 1954.

Ostracod "B" (juvenile) Jones, 1954.

Since three morphologically distinct forms were encountered, they will be described separately.

MATURE FEMALE (Fig. 1, A-E)

The shell of the mature female (Fig. 1 A) is subovate, with the posteroventral margin drawn into a broad, bluntly pointed process. The ventral margin is entire, and fine setae are inserted along the margin from the anterodorsal area continuously to and around the posterior process. The main surface of the shell is slightly raised from the marginal area, except near the posteroventral process. A secondary margin is thus formed from which some setae originate in the ventral region. Fine hairs are scattered over the main surface of the shell, which is divided into three fields by three ridges extending from or near the secondary margin to a point of junction, slightly anterior and ventral to the midpoint of the shell. The areas delimited by the ridges vary in size, the largest being dorsal, the smallest anteroventral, and the medium posteroventral. A fourth field in the posterior area lies in the transverse plane and extends from the margin to an indentation of the raised surface of the shell. There is a light calcification rendering the shell translucent, although occasionally it may be quite transparent. The length of the shell is 1.2 mm, its height 1.0 mm.

The last (fifth) joint of the antennules (Fig. 1 B) bears five to seven heavy, annulated setae, and the fourth joint bears one or two annulated setae. The third joint bears three setae, two of which are annulated, at the posterior distal angle, and two more nonannulated setae on the anterior margin, one proximal, and one distal. In addition,

a fine seta may be present on the posterior margin of the third joint.

The natatory (primary) branch of the antenna is composed of 10 joints, the base of which is shown in Fig. 1 C (cf. Fig. 1 N). The first may bear a single fine seta on the anterior margin, the next eight joints bear a single heavy, annulated seta on each, and the terminal joint bears a pair of heavy annulated setae. The secondary branch of the antenna is a rudimentary protuberance which bears a single distal spine and a pair of heavier proximal spines.

The mandible (Fig. 1 D) usually bears short spines at the anterior distal angle of the second, third, and fourth joints, and four or five spines on the posterior margin of the second joint. In addition, the last three joints bear the large spines characteristic of the genus.

The caudal lamina (Fig. 1 E) has five heavy spines in each plate, decreasing in size dorsally. The shortest spine bears only fine hairs, but the other four all bear short spines proximally, which grade into fine hairs, distally. In addition, there are fringes of fine hairs on the posterior margins of the laminae.

#### MALE (Fig. 1, F-K)

The shell of the male of *Sarsiella tricostata* (Fig. 1 F) is strikingly similar to that of the male of *S. zostericola*. The dorsal margin is broadly rounded. The ventral margin is nearly straight and gives way to the antennal sinus anteriorly, while the posterior margin is truncated, rounds gently into the dorsal margin, and, ventrally, forms nearly a right angle. As in the case of the female, the main surface of the shell is raised from the level of the margin and is divided into three fields by ridges. The fourth field is essentially lacking. The surface of the shell is strewn with fine hairs, and fine marginal setae extend from the anterior area, along the ventral margin, to the posterior area. The length of the shell is 1.0 mm, its height 0.7 mm.

The third joint of the antennules (Fig. 1 G) possesses a cluster of long filamentous setae with an accompanying heavy annulated seta. On the anterior margin there are two setae, as in the female. The fourth joint bears two setae, and the fifth bears six heavily annulated setae.

The primary branch of the antenna (Fig. 1 H) is similar to that of the female, but the secondary branch is quite different. It is composed of three joints; the first bears two spines, the second, three

heavy spines, and the third is recurved onto the three spines of the second. In addition, the tip of the terminal joint appears to be equipped with a ridged area which may function, along with the spines of the second joint, as a part of a clasping apparatus.

The second joint of the mandible (Fig. 1 I) bears three main annulated spines. In addition there may be two to four smaller annulated spines at the base of the most proximal of the main spines. On the lateral distal margin there are three fine annulated setae, one short and two long. The third, fourth, and fifth joints bear large clawlike setae and may also have a small spine at the distal lateral angle. At the base of the large claw of the fifth joint there may be a second small spine.

The caudal lamina (Fig. 1 J) is similar to that of the female except that the fringe of setae on the posterior margin is replaced by a few short bristles.

The copulatory organ (Fig. 1 K) is similar to that of the male of *S. zostericola* in that each half is composed of a large blunt hook and a smaller one with a pair of spines distal and another pair proximal to the smaller hook. In *S. tricostata*, however, there are no spines near the base of the organ.

#### JUVENILES (Fig. 1, L-P)

As stated above, the shell of juvenile *S. tricostata* (Fig. 1 L) is quite similar to the outline of the female of *S. zostericola*. It is similar to the shells of adult *S. tricostata*; the fourth area of the shell surface is obvious, as in the adult female, and the centrally oriented ribs delimit the other three fields. Marginal hairs extend from the anterodorsal margin, ventrally, to the posterior dorsal area. A posteroventral process similar to that of the adult female is also present.

The antennules (Fig. 1 M) are also similar to those of the adult female, and differ only in having five to seven terminal annulated setae and one large annulated seta and several small ones on the posterior margin.

The structure of the secondary antennal branch (Fig. 1 N) is quite variable in the juvenile forms of *S. tricostata*. Indeed it is possible to trace a line of development of this appendage (Fig. 2). The series illustrated was arranged according to two criteria. First, it was felt that the length of the first joint of the primary antennal branch was indicative of relative age. Second,

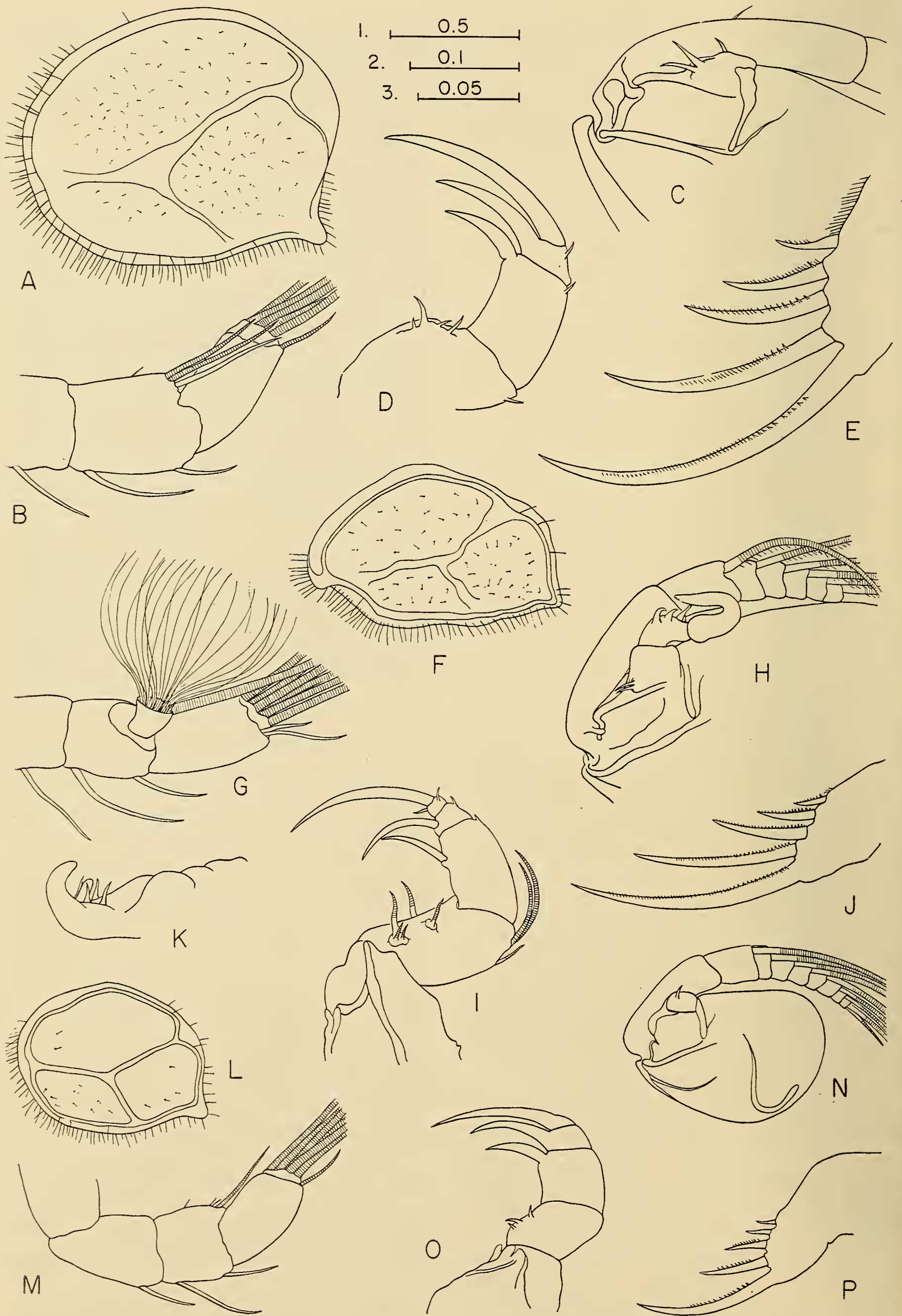


FIG. 1.—(For explanation, see opposite page).

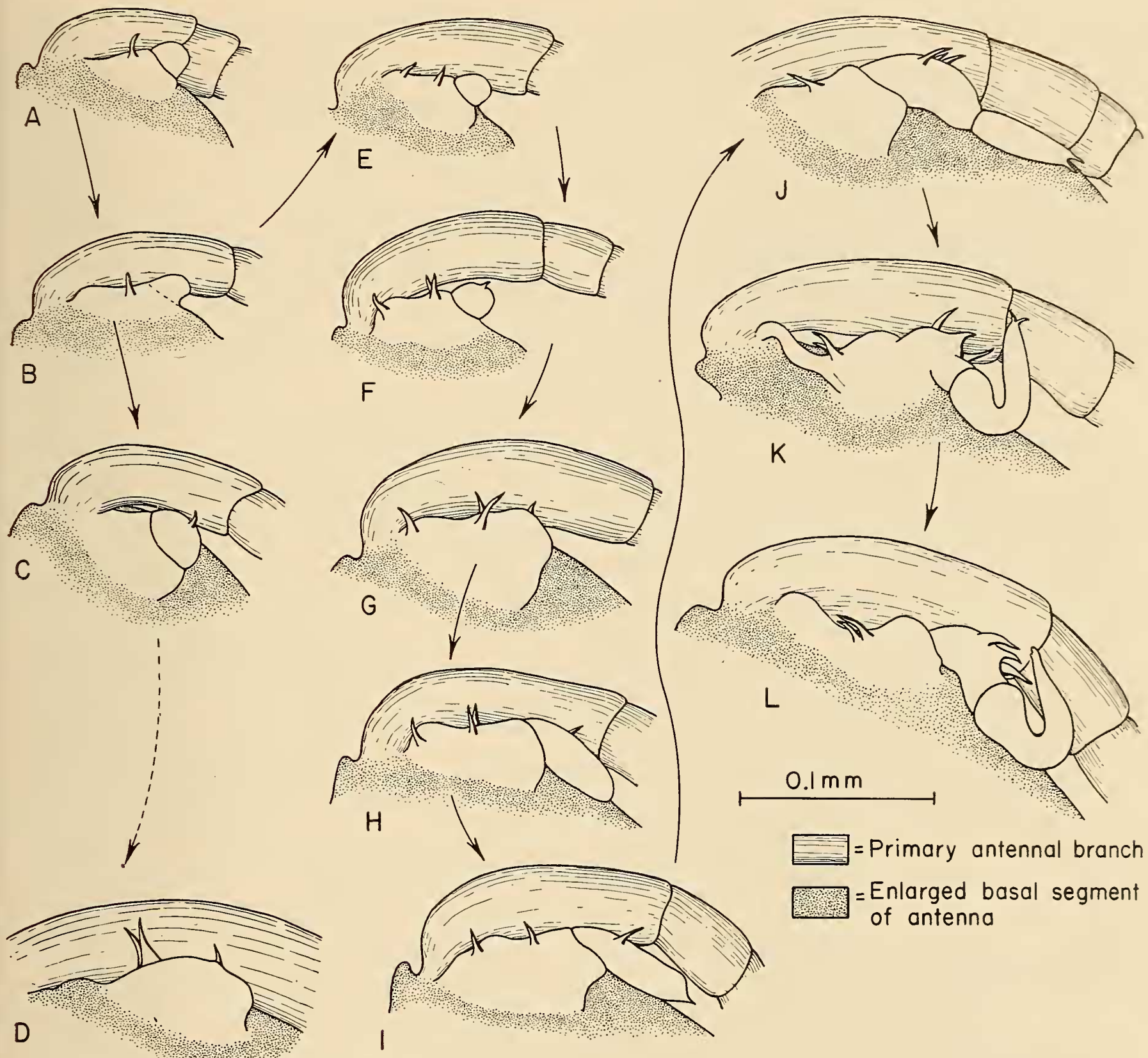


FIG. 2.—*Sarsiella tricostata* n. sp.: A schematic representation of the possible development of the second antennal branch, prepared from *camera lucida* drawings. 2 D shows the condition in the adult female, and 2 K and 2 L that in adult males. The remaining figures are those of juveniles.

it was assumed that once a spine pattern had been established, it would probably not be disrupted. The only nonjuvenile forms shown in Fig. 2 are "D" (adult female) and "K" and "L" (adult males). It would seem that, during the development of the secondary antennal branch in female *S. tricostata*, there is an early fusion of

two joints to form the rudimentary branch with a single distal spine and two proximal spines. In the male there is an early fusion and, in later molts, the redevelopment of the second and the appearance of a third joint. No claim is made that this series is complete, and it is admitted that the appearance and disappearance of certain

FIG. 1.—*Sarsiella tricostata*, n. sp.: A-E, adult female; F-K, adult male; L-P, juvenile. A, lateral view of left shell of female; B, medial view of right antennule; C, medial view of left antenna; D, medial view of right mandible; E, lateral view of right caudal lamina; F, lateral view of left shell of male; G, medial view of right antennule; H, medial view of left antenna; I, medial view of right mandible; J, lateral view of right caudal lamina; K, lateral view of left half of copulatory organ; L, lateral view of left shell of juvenile; M, medial view of right antennule; N, medial view of left antenna; O, medial view of right mandible; P, lateral view of right caudal lamina. (Scale 1 at the top of the plate applies to figures of the shells, 1 A, 1 F, and 1 L; scale 3 applies to the figure of the male copulatory organ, 1 K; and scale 2 applies to all of the remaining figures.)

spines may be due to difficulties in observation. However, it is felt that the general trend of development can be made out in this figure.

The mandibles of the juvenile form (Fig. 1 O) are similar to those of the adult female, but with fewer spines on the posterior margin (3-5) and no small spines at the distal anterior angles.

The spines of the caudal lamina (Fig. 1 P) are also similar to those of the female adult, but the two smallest spines are devoid of either short spines or fine hairs.

Since *S. tricostata* most closely resembles *S. zostericola* a table comparing the two species is presented opposite.

*Distribution of type material.*—The adult female of *Sarsiella tricostata* is designated as the holotype, and the male adult is designated as an allotype. The holotype (U.S.N.M. no. 100903) the allotype (U.S.N.M. no. 100904), and paratypes (15 females, 4 males, and 15 juveniles, U.S.N.M. no. 100905) have been deposited with the U. S. National Museum. In addition, paratypes have also been deposited with the Museum of Paleontology, University of California, Berkeley, and the British Museum, London.

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	<i>S. zostericola</i>	<i>S. tricostata</i>
Antennules:		
Number of setae on fifth joint	5*	6(5-7)**
Number of setae on fourth joint	3*	1-2
Number of setae on posterior distal angle of third joint	2*	3
Antennae:		
Setae on rudimentary secondary branch	1 distal 1 proximal	1 distal 2 proximal
Mandible:		
Number of spines on posterior margin, second joint	7*	4-5

\* Number is based on text figure, not on the text itself.

\*\* Figures within parentheses represent ranges, figures outside represent mean or the most common number.

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	<i>S. zostericola</i>	<i>S. tricostata</i>
Antennules:		
Number of setae on fourth joint	3	2(1-2)
Antennae:		
Number of joints in secondary branch	4	3
Mandibles:		
Number of spines on posterior margin, second joint	3	5(5-7)
Number of setae on anterior margin, second joint	2 long 2 short	2 long 1 short
Copulatory organs:		
Number of setae on upper end	2	0

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*Nature never says one thing and science another.*—JUVENAL.