

SMITHSONIAN MISCELLANEOUS COLLECTIONS
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REPORTS ON THE COLLECTIONS OBTAINED BY THE FIRST
JOHNSON-SMITHSONIAN DEEP-SEA EXPEDITION
TO THE PUERTO RICAN DEEP

NEW MARINE MOLLUSKS

(WITH THREE PLATES)

BY

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(WITH THREE PLATES)

Among other Turritid mollusks obtained by the First Johnson-Smithsonian Deep-Sea Expedition to the Puerto Rican Deep is a small well-defined group consisting of six species, only one of which has been previously described, namely, *Drillia interpleura* Dall and Simpson.¹ This group appears to be unnamed and is here given the name *Buchema*, a new subgenus of *Carinodrillia* Dall. The five new species, the names of which have been derived from Puerto Rican mythology, are here described and figured.

I wish here to express my appreciation to the authorities of the United States National Museum for having extended to me the use of laboratory facilities and collections in making this study and the necessary comparative work. I am especially indebted to Dr. Paul Bartsch, Curator of the Division of Mollusks and Cenozoic Invertebrates, United States National Museum, for many helpful suggestions, and to Mrs. Aime Awl, United States National Museum, for retouching the photographs.

BUCHEMA, n. subgen.

The present paper deals with a group of moderate-sized, rather heavy shelled mollusks which resemble the members of the genus *Carinodrillia* Dall,² of which *Carinodrillia halis*, Dall, is the type. They differ from *Carinodrillia* in having the nuclear whorls without a median carina. Here they are rounded, the early whorls smooth, succeeded by a finely axially, closely lirate portion that passes into an axially slender ribbed part, which in turn passes into the postnuclear sculpture. The sculpture of the postnuclear whorls consists of strong

¹Dall, William Healey, and Simpson, Charles Torrey. The mollusca of Porto Rico. Bull. U.S. Fish Commission, vol. 20, for 1900, 1st pt., p. 386, pl. 57, fig. 21, 1902.

²Proc. U.S. Nat. Mus., vol. 56, p. 17, 1919.

axial ribs which weaken on the posterior sinus. The axial ribs and intercostal spaces are crossed by rather heavy spiral cords, finer spiral lirations between the heavier cords, and hairlike incremental lines. The combination of these last two elements produces a fine clothlike pattern, while their junction sometimes almost appears granulose. The columella is stout, and there is a weak umbilical chink at its anterior termination. The aperture is rather short, deeply channeled anteriorly and posteriorly, the posterior sinus falling a little anterior to the summit. The outer lip is protracted into a clawlike element between the anterior limit of the posterior sinus and the stromboid notch.

Type.—*Buchema tainoa*.

CARINODRILLIA (BUHEMA) TAINOA, n. sp.

Plate I, figs. 5, 6; plate 2, fig. 7; plate 3, fig. 1

Shell rather large, elongate-conic. Nucleus amber-colored, remainder of shell of various shades of brown, the intercostal spaces darker than the ribs. Summit of the whorls marked by brown spots separated by lighter-colored intervals. Nuclear whorls 2.2, the first 1.9 well rounded, smooth, the last .3 marked by fine axial lirations, slightly retractively curved at the summit, which become narrow axial riblets before passing into the postnuclear sculpture. Postnuclear whorls rounded, marked by very heavy humplike axial ribs which terminate at the anterior margin of the posterior sinus. Of these ribs, which are about as broad as the spaces that separate them, 9 occur upon the first and second, 10 upon the third and fourth, and 11 on the fifth and last whorls. In addition, the entire surface of the shell is marked by fine incremental lines. The spiral sculpture consists of strong cords, which are equal in strength and pass over the axial ribs. The spaces between them are almost as wide as the cords. Of the cords, three are present on the first to fourth whorls, and four on the fifth and sixth. There is a moderately strong cord at the appressed summit on all the whorls. In addition to the strong sculpture, there is a secondary and much weaker spiral sculpture consisting of fine lirations which are present on the posterior sinal region and between the strong cords over the axial ribs. Of these, three are present on the first whorl between the cord at the summit and the cords anterior to the sinus. On the second whorl four occur between the cord at the summit and the first strong cord. The third whorl is marked by seven lirations in the posterior sinal region, and two between the first and second, second and third, and third cord and the suture. On the fourth whorl there are 14 between the cord at the summit and the first strong

cord, 3 between the first and second cords, and 2 between the second and third and third cord and the suture. Two lirations are present on the fifth whorl between the cord anterior to the summit and the summit, 15 between the moderately strong cord and the first strong cord anterior to the sinus, 4 between the first and second and second and third, and 3 between the third and fourth and the fourth cord and the suture. The sixth whorl is marked by 3 lirations between the summit and the moderately strong cord anterior to it, 20 between the latter cord and the first strong cord, 4 between the first and second, and 5 between the second and third and third and fourth. Periphery of the last whorl well rounded. Base well rounded, marked by the continuation of the axial ribs which seem to bifurcate, and three spiral cords which are a little weaker than those on the spire. The junctions of these cords with the axial ribs form small tubercles which are most pronounced on the second cord. There are four lirations in the space between the first basal cord and the cord posterior to it, and three between the first and second and second and third cords. Columella stout, moderately short, with an umbilical chink at its tip. It is marked by eight spiral cords equal to those on the base and separated by spaces equal to the cords. There are three spiral lirations between the first and second and second and third cords. Aperture moderately large, deeply channeled anteriorly and posteriorly, the posterior sinus falling a little anterior to the summit. The outer lip is protracted into a clawlike element between the anterior limit of the posterior sinus and the stromboid notch. There is a heavy varix a sixth of a turn behind the outer lip. The inner lip is reflected over the columella as a heavy callus which extends over the parietal wall and forms a knob at its junction with the outer lip.

Type.—U.S.N.M. no. 429215, collected at station 104 in 80 to 120 fathoms between latitude $18^{\circ}30'40''$ N., longitude $66^{\circ}13'20''$ W. and latitude $18^{\circ}30'10''$ N., longitude $66^{\circ}13'50''$ W. It has 8.7 whorls and measures: Length, 14.2 mm; greater diameter, 5.9 mm.

U.S.N.M. no. 429217 contains nine specimens from the type locality.

CARINODRILLIA (BUCHEMA) SUIMACA, n. sp.

Plate 1, figs. 3, 4; plate 2, fig. 1; plate 3, fig. 3

Shell of medium size, elongate-conic, light brown. Nuclear whorls 2.1, the early portion well rounded, smooth, followed by a short portion marked by axial lirations which in turn passes into the last .5 marked by equally spaced, slender, almost vertical axial riblets which are slightly retractively curved at the summit. Postnuclear whorls

rounded, marked by heavy humplike axial ribs which attain their greatest development on the anterior two-thirds of the whorls. Of these ribs, which are about twice as wide as the spaces that separate them, 8 occur upon the first and second, 9 upon the third, 10 upon the fourth, 12 upon the fifth, and 9 upon the last whorl. In addition, the entire surface of the shell is marked by fine incremental lines. The spiral sculpture consists of heavy spiral cords, which cross the axial ribs. Of these cords, two occur upon the first three postnuclear whorls which are separated by spaces equal to them in width, while three are present on the fourth. Of these, the first is a little less strong than the other two. On the fifth whorl four of the strong cords are present, of which the third is a little less strong than the other three, which are about equal. The last whorl has five of these strong cords, of which the third and fifth are not quite as strong as the others. In addition to these, there are two moderately strong cords at the appressed summit of all the whorls but the first, which has one. In addition to the heavy spiral sculpture there is a secondary and much weaker sculpture which consists of fine spiral lirations. Of these there are three present on the first postnuclear whorl between the cord at the summit and the two strong cords anterior to the sinus. On the second whorl between the two moderate cords at the summit and the two strong cords anterior to the sinus, the sinial region is marked by six lirations, while three are present between the two strong cords. On the third whorl 11 lirations occur between the cords at the summit and the first strong cord anterior to the sinus, and 5 between the two strong cords. Between the two moderate cords at the summit of the fourth whorl one spiral liration is present, while nine occur between the moderate cords and the first strong cord, three between the first and second strong cords, and eight between the second and third. The fifth whorl is marked by 2 spiral lirations between the two cords at the summit, 14 lirations from the second cord at the summit and the first strong cord, 6 between the first and second strong cords, 2 between the second and third, and 5 between the third and fourth. There are nine lirations between the fourth cord and the suture. The last whorl, like the fifth, has two spiral lirations between the cords at the summit. The sinial region is marked by 16 spiral lirations while the spaces between the 5 strong cords anterior to the sinus are marked by 5 lirations between the first and second, 2 between the second and third, 5 between the third and fourth, and 2 between the fourth and fifth. The combination of the fine spiral lirations and the incremental lines produces a clothlike pattern, and the junction of these two fine elements gives to the shell a finely granulose aspect.

The periphery of the last whorl is marked by a spiral cord which is equal in strength to the five posterior to it. Base stout, moderately long, marked by the continuation of the axial ribs, and three spiral cords. There are eight spiral lirations between the periphery and the first basal cord, five between the first and second cords, and six between the second and third. Columella stout, moderately long, marked by seven spiral cords which are of the same strength as those on the base. Between the last basal and first columellar cord there are 10 spiral lirations. Nine spiral lirations are present between the first and second columellar cords, nine between the second and third, five between the third and fourth, four between the fourth and fifth, three between the fifth and sixth, and two between the sixth and seventh. Aperture moderately long, deeply channeled anteriorly and posteriorly, the posterior sinus falling a little anterior to the summit. The outer lip is protracted between the anterior channel and the posterior sinus into a clawlike element. There is a heavy varix a little beyond the edge of the outer lip. The inner lip is reflected over the columella as a heavy callus which extends over the parietal wall and forms a knob at its junction with the outer lip which projects into the posterior sinus.

Type.—U.S.N.M. no. 430160, collected at station 16 in 38 fathoms between latitude $18^{\circ}29'40''$ N., longitude $55^{\circ}08'30''$ W. and latitude $18^{\circ}31'00''$ N., longitude $66^{\circ}10'15''$ W. It has 6.5 whorls and measures: Length, 12.3 mm; greater diameter, 4.5 mm.

U.S.N.M. no. 430851 is a single specimen from the type locality.

CARINODRILLIA (BUCHEMA) MAMONA, n. sp.

Plate 2, figs. 2, 3, 5; plate 3, fig. 4

Shell of medium size, elongate-conic, yellowish horn-colored. Nuclear whorls 2.8, the first 2.6 well rounded, smooth, the last .2 marked by three slender equally spaced axial riblets which are slightly retractively curved at the summit. Postnuclear whorls rounded, marked by heavy, humplike axial ribs which evanesce in the posterior sinial region, attaining their greatest development on the anterior two-thirds of the whorls. Of these ribs, which are separated by spaces about equal to them, nine occur upon the first and second, and eight upon the remaining whorls. In addition, the shell is marked by fine incremental lines. The spiral sculpture consists of strong spiral cords which pass over the heavy axial ribs. Of these cords, two occur upon the first and second, two upon the third with the appearance of a third cord posterior to the others, and three upon the remaining whorls.

These cords are equal in strength and are separated by spaces almost twice as wide as the cords. There is a moderately strong cord a little anterior to the appressed summit on all the whorls. The finer spiral sculpture consists of lirations which occur in the spaces between the stronger cords. Three of these are present in the space between the cord anterior to the summit and the summit. The posterior sinial region is marked by 4 lirations upon the first whorl, 6 upon the second, 8 upon the third, 14 upon the fourth, 20 upon the fifth, and 22 upon the last. Between the cords which pass over the axial ribs, four lirations are present on the second whorl, while on the third whorl two are present between the first and second cords, and four between the second and third. On the fourth whorl four occur between the first and second cords, and nine between the second and third. The fifth whorl has four lirations between the first and second cords, nine between the second and third, and five between the third and the suture. The junction of the spiral lirations and the incremental lines gives to the shell a granulose aspect. Periphery of the last whorl rounded. Base rounded, moderately short, marked by the continuation of the axial ribs and three spiral cords which are not quite as strong as those on the spire. The space between the first cord posterior to the suture and the first basal cord is marked by 10 spiral lirations. The space between the first and second cords is marked by seven lirations and between the second and third by eight. Columella stout, moderately short, marked by eight spiral cords equal in strength to those on the base. Between the last basal and first columellar cord nine lirations are present. Seven occur between the first and second columellar cords, five between the second and third and third and fourth, and three between the fourth and fifth. Aperture moderately long, deeply channeled anteriorly and posteriorly, the posterior sinus being a little anterior to the summit. The outer lip is protracted into a clawlike element between the anterior limit of the posterior sinus and the stromboid notch. There is a heavy varix a quarter of a turn behind the outer lip. The inner lip is reflected over the columella as a heavy callus which extends over the parietal wall and forms a shelf over the posterior sinus at its junction with the outer lip.

Type.—U.S.N.M. no. 430993, collected at station 26 in 30 to 40 fathoms between latitude $18^{\circ}30'20''$ N., longitude $66^{\circ}22'05''$ W. and latitude $18^{\circ}30'30''$ N., longitude $66^{\circ}23'05''$ W. It has 8.3 whorls and measures: Length, 10.4 mm; greater diameter, 4.3 mm.

CARINODRILLIA (BUHEMA) APITOA, n. sp.

Plate 1, figs. 1, 2; plate 2, fig. 6; plate 3, fig. 2

Shell of medium size, elongate-conic, yellow. Nuclear whorls 2.3, the first 2 well rounded, smooth, the last .3 marked by fine axial lirations which pass into slender, evenly spaced axial riblets, slightly retractively curved at the summit, which in turn pass into the adult sculpture. Postnuclear whorls rounded, marked by heavy humplike axial ribs which evanesce in the posterior sinial region attaining their greatest development on the anterior two-thirds of the whorl. Of these ribs, which are about as wide as the spaces that separate them, eight occur upon the first and second, nine upon the third and fourth, and eight upon the last. In addition, the entire surface of the shell is marked by fine incremental lines. The spiral sculpture on the first postnuclear whorl may be worn, at least it is not apparent. Beginning with the second and continuing over all the whorls there is a moderately strong cord a little anterior to the summit. From the third whorl on, two spiral cords pass over the axial ribs between which two much slenderer cords are present on the fourth and last whorls. In addition, there are fine spiral lirations on the posterior sinial region and between the cords anterior to the sinus. About 15 may be counted on the last turn between the humps marking the posterior limit of the ribs and the moderately strong cord at the summit. Periphery of the last whorl well rounded. Base short, moderately round, marked by three spiral cords which are a little weaker than those on the spire, the space between the first of which and the cord posterior to it is marked by four spiral lirations. Between the first and second basal cords there are five lirations, and four between the second and third. Columella stout, marked by six strong spiral cords which are about a third as wide as the spaces that separate them. The spaces between these cords are also marked by feeble spiral lirations. Aperture pear-shaped, strongly channeled anteriorly and posteriorly, the outer lip protracted into a clawlike element between the anterior limit of the posterior sinus and the stromboid notch, and provided with a heavy varix a slight distance behind its edge. The inner lip is reflected over the columella as a heavy callus which extends over the parietal wall and forms a knob at its junction with the outer lip.

Type.—U.S.N.M. no. 430037, collected at station 104 in 80 to 120 fathoms between latitude $18^{\circ}30'40''$ N., longitude $66^{\circ}13'20''$ W. and latitude $18^{\circ}30'10''$ N., longitude $66^{\circ}13'50''$ W. It has 7.8 whorls and measures: Length, 9.9 mm; greater diameter, 4.8 mm.

U.S.N.M. no. 429625 is an additional specimen collected at station 55 in 17 fathoms.

CARINODRILLIA (BUHEMA) LIELLA, n. sp.

Plate 2, fig. 4, 8, 9; plate 3, fig. 5

Shell of moderate size, elongate-conic, yellowish white. Nuclear whorls 2.3, the first 2 well rounded, smooth, the last .3 marked by slender equally spaced axial riblets which are slightly retractively slanting at the summit. Postnuclear whorls rounded, marked by heavy, humplike axial ribs which evanesce in the posterior sinal region and attain their greatest development on the anterior two-thirds of the whorls. Of these ribs, which are as broad as the spaces that separate them, eight occur upon the first, nine upon the second to fourth, eight upon the fifth, and nine upon the remaining. In addition the shell is marked by fine incremental lines which are retractively slanting in the posterior sinal region. The spiral sculpture on the first postnuclear whorl is too worn to describe, but from the second to the last whorl the heavy axial ribs are crossed by three strong spiral cords. These are equal in strength and are separated by spaces almost twice as wide as the cords. There is a strong cord a little anterior to the appressed summit of the whorls which is equal in strength to those on the ribs. In addition to the strong spiral sculpture the posterior sinal region and the spaces between the cords anterior to the sinus are marked by fine spiral lirations. Of these, three are present on the sixth whorl between the first and second cords, and two between the second and third. On the seventh whorl there are four lirations between the three cords anterior to the sinus and between the third cord and the suture. Six are present on the eighth whorl between the three cords and between the third cord and the suture. The combination of the incremental lines and the spiral lirations produces a fine clothlike pattern. Periphery of the last whorl rounded. Base well rounded, short, marked by the continuation of the axial ribs, and three spiral cords which are equal in strength to those on the spire. The space between the first cord posterior to the suture and the first basal cord is marked by four spiral lirations. There are five lirations between the first and second cords, and four between the second and third. Columella stout, moderately short, with an umbilical chink at its tip. It is marked by the feeble continuation of the axial ribs, and seven spiral cords equal to those on the base. The spaces between these cords are likewise crossed by feeble spiral lirations. Aperture moderately short, deeply channeled anteriorly and posteriorly, the posterior sinus falling a little anterior to the summit. The outer lip is protracted into a clawlike element between the anterior limit of the posterior sinus and the stromboid

notch. The inner lip is reflected over the columella as a heavy callus which extends over the parietal wall and forms a small knob at its junction with the outer lip.

Type.—U.S.N.M. no. 429337, collected at station 56 in 17 fathoms in Samaná Bay, between latitude $19^{\circ}10'15''$ N., longitude $69^{\circ}27'20''$ W. and latitude $19^{\circ}10'15''$ N., longitude $69^{\circ}28'05''$ W. It has 10.8 whorls and measures: Length, 15 mm; greater diameter, 5.5 mm.

U.S.N.M. no. 430160a is a specimen from station 16 dredged in 38-95 fathoms.



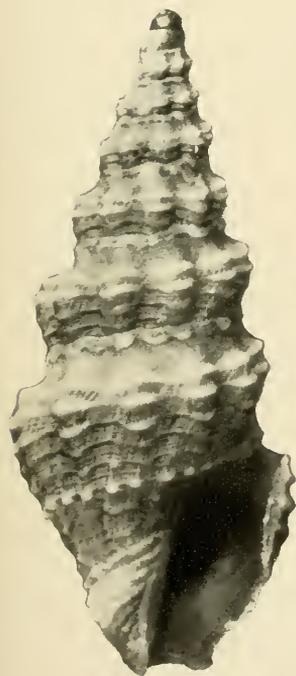
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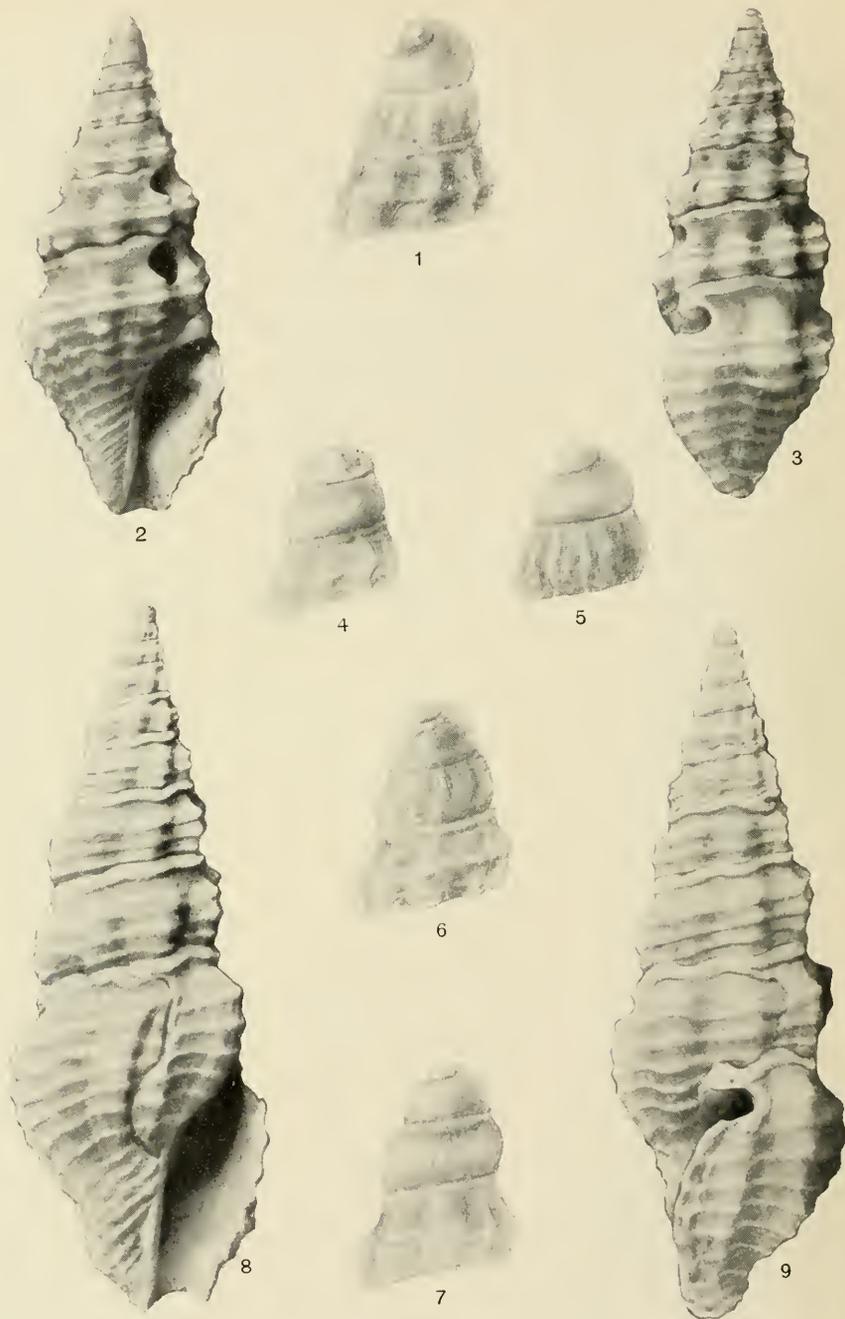
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6

NEW MARINE MOLLUSKS

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|--------------------------------------------|--------------------------------------------|
| 1. <i>Carinodrillia (Buchema) apitoo.</i> | 4. <i>Carinodrillia (Buchema) suimaca.</i> |
| 2. <i>Carinodrillia (Buchema) apitoo.</i> | 5. <i>Carinodrillia (Buchema) tainoo.</i> |
| 3. <i>Carinodrillia (Buchema) suimaca.</i> | 6. <i>Carinodrillia (Buchema) tainoo.</i> |



NEW MARINE MOLLUSKS

- | | |
|-------------------------------------------------------------|------------------------------------------------------------|
| 1. <i>Carinodrillia</i> (<i>Buchema</i>) <i>suimaca</i> . | 6. <i>Carinodrillia</i> (<i>Buchema</i>) <i>apitoa</i> . |
| 2. <i>Carinodrillia</i> (<i>Buchema</i>) <i>mamona</i> . | 7. <i>Carinodrillia</i> (<i>Buchema</i>) <i>tainoa</i> . |
| 3. <i>Carinodrillia</i> (<i>Buchema</i>) <i>mamona</i> . | 8. <i>Carinodrillia</i> (<i>Buchema</i>) <i>liclla</i> . |
| 4. <i>Carinodrillia</i> (<i>Buchema</i>) <i>liclla</i> . | 9. <i>Carinodrillia</i> (<i>Buchema</i>) <i>liclla</i> . |
| 5. <i>Carinodrillia</i> (<i>Buchema</i>) <i>mamona</i> . | |



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2



1

NEW MARINE MOLLUSKS

- 1. *Carinodrillia* (*Bucheima*) *tainoa*.
- 2. *Carinodrillia* (*Bucheima*) *apitou*.
- 3. *Carinodrillia* (*Bucheima*) *sinimaca*.
- 4. *Carinodrillia* (*Bucheima*) *mamoua*.
- 5. *Carinodrillia* (*Bucheima*) *sicla*.