

A NEW GENUS, *MARTINETTA*, AND TWO NEW SPECIES
OF XANTHOID CRABS FROM THE MIDDLE EOCENE
SANTEE LIMESTONE OF SOUTH CAROLINA

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I. ABSTRACT

Two new xanthoid crabs, *Martinetta palmeri*, new genus and new species, and *Eohalimede saundersi*, new species, are described from the middle Eocene Santee Limestone of South Carolina. *Martinetta palmeri* is thus far the largest middle Eocene crab known to occur in the Carolinas. *Eohalimede saundersi* is the second species of this genus described. *Saracarcinus campbellorum* is transferred from the family Cancridae to the family Portunidae.

II. INTRODUCTION

In the summer of 1995, Lauck W. Ward brought several pieces of a single large xanthoid crab to the attention of the first author. His specimen had been collected some years earlier from the Santee Limestone at the Martin Marietta Georgetown Quarry, Georgetown Co., South Carolina. It represented a crab considerably larger than any that we had yet seen from the Santee Limestone, but it was so fragmentary that it could not be identified to genus. We suspected it might belong to the Old World fossil genus *Harpactocarcinus* A. Milne-Edwards, 1862. In October 1996, Mr. Billy T. Palmer, Sr., of Goose Creek, South Carolina, brought a second large, very well-preserved specimen of this same taxon to our attention.

Mr. Palmer had collected this specimen from the Martin Marietta Berkeley Quarry, Berkeley Co., South Carolina. Though strikingly similar in outline and anterolateral dentition to *Harpactocarcinus*, this specimen obviously represented a new genus and species, *Martinetta palmeri*, which could be distinguished from the former on the basis of its much smaller front and V-shaped orbit alone. This new crab represents the largest crab species found in middle Eocene deposits of the Carolinas. In size it is challenged only by the much more common *Eocarpilius carolinensis* Blow and Manning, 1996, with which it co-occurs in the Santee Limestone, and *Menippe burnsi* Rathbun, 1935, from the Castle Hayne Limestone.

A second species of *Eohalimede* Blow and Manning, 1996, was also brought to our attention by Mr. Palmer in October. This new species, *E. saundersi*, is represented by two very well-preserved carapaces that are conspecific with our poorly preserved paratype of *E. walleri* Blow and Manning, 1996. The single paratype (USNM 484581) of *E. walleri* is therefore transferred to our new species, *E. saundersi*. The frontal and fronto-orbital proportions given for the type species of *Eohalimede*, *E. walleri*, are uncertain in that they were based solely on the paratype. The holotype, and now only known specimen of *E. walleri*, is truncated anteriorly just behind the front and orbits.

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The genus *Sarahcarcinus* Blow and Manning, 1996, is transferred from the family Cancridae to the family Portunidae. This reassignment is based on a single specimen also provided by Mr. Palmer, which exhibits a portunid-like front and orbits, characters unavailable for study in formulating our original description.

Repositories: Holotypes and some paratypes are deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., and The Charleston Museum, Charleston, South Carolina. Some paratypes, where indicated, are deposited in the Virginia Museum of Natural History, Martinsville, Virginia.

Abbreviations:

ChM No. PI, The Charleston Museum, Invertebrate Paleontology Catalogue Number.

M.M., quarries owned and operated by Martin Marietta Aggregates.

NMNH, National Museum of Natural History, Smithsonian Institution.

USGS, the U.S. Geological Survey (when used with a number indicates a locality).

USNM, abbreviation for catalogue numbers of the former U.S. National Museum, now the National Museum of Natural History.

VMNH, Virginia Museum of Natural History.

Measurements: Expressed in millimeters as follows: cl, carapace length, maximum longitudinal measurement; cw, carapace width, maximum transverse measurement; prl, propodus length, length of palm or combined length of palm and fixed finger; prh, propodus height; prt, propodus thickness; l, length, overall; w, width, overall.

III. ACKNOWLEDGMENTS

We especially thank Billy T. Palmer, Sr., of Goose Creek, South Carolina for sharing his knowledge and collection of Santee

Limestone crabs with us. We thank Albert E. Saunders of The Charleston Museum, Charleston, South Carolina, for bringing Mr. Palmer's collection to our attention and for making it available through The Charleston Museum for our study. We also particularly thank Lauck W. Ward of the Virginia Museum of Natural History, Martinsville, Virginia, for making his collection of Santee Limestone crabs available to us. Mrs. Jan Hester, registrar, The Charleston Museum, helped process the loan. Discussions between the first author, Gerald R. Baum of Texaco, Bellaire, Texas, and Francis M. Hueber of the National Museum of Natural History, Smithsonian Institution, Washington, D.C., added significantly to the content of this paper.

IV. SYSTEMATIC PALEONTOLOGY

Family MENIPPIDAE Ortmann, 1893
MARTINETTA, new genus

Diagnosis: Carapace large (cw exceeding 130 mm), transversely oval, strongly convex longitudinally, moderately convex transversely; length about 3/4 carapace width, broadest at anterolateral angle, regions weakly defined.

Fronto-orbital margin slightly less than 1/3 carapace width.

Front quadrilobate, width less than 1/4 carapace width, deflexed at about 45° along midline.

Orbit relatively small, marginal, V-shaped in dorsal view, composed of 4 lobes separated by three closed fissures; inner lobe eavelike, raised well above median and outer orbital lobes.

Basal antennal article relatively narrow, length slightly less than twice width, terminating well below inner angle of suborbital lobe.

Anterolateral margins without lobes or fissures, usually armed with 14 to 16 distinct denticles.

Protogastric and mesogastric regions distinctly elevated, forming broad platform.

Chelipeds unequal in males, right chela larger, massive, height of propodus about four-fifths length, distinctly highest distally.

Type Species: *Martinetta palmeri*, new species, by present designation and monotypy.

Etymology: This genus is named for Martin Marietta Aggregates in recognition of their considerable contribution to paleontology through their generosity in granting access to their commercial excavations which have provided so

many professional, student and amateur paleontologists with a much needed and enjoyed window to the past. Gender feminine.

Remarks: In dorsal outline and antero-lateral denticulation, *Martinetta* very closely resembles the genus *Harpactocarcinus* A. Milne-Edwards, 1862, type species by original designation (p. 46), *H. punctulatus* (Desmarest, 1822). It can, however, be separated immediately from *Harpactocarcinus* on the basis of its proportionally small, V-shaped (in dorsal outline) orbits alone. In contrast, the orbits of *Harpactocarcinus* are proportionally much larger and semi-circular in shape. *Martinetta* also has a narrower front, and broader, more elliptical carapace outline than *Harpactocarcinus*. *Martinetta* can further be distinguished from *Harpactocarcinus* by its: 1) more transversely flattened carapace; 2) relatively longer anterolateral margin; 3) low, thin orbital margins, unlike the raised, thickened orbital margins of *Harpactocarcinus*; 4) distinctly elevated protogastric and mesogastric regions; and 5) much shorter and much higher distally, more quadrate, massive right chela.

Martinetta also appears to be considerably larger than the average specimen of *Harpactocarcinus*. Both of our specimens are about 20% to 25% larger than the largest of more than 300 specimens of *H. punctulatus* (including the type of Desmarest) and *H. jacquoti* A. Milne-Edwards, 1865, measured by Via (1969, p. 241-256).

The small V-shaped orbits and lack of deep branchial grooves, characteristic of *Martinetta*, easily distinguish it from the genus *Harpactoxanthopsis* Via, 1959, which is represented in the South Carolina middle Eocene by *H. carolinensis* (Rathbun, 1935).

In outline and general form, the right or major chela of *Martinetta* is similar to that found in the genus *Eocarpilius* Blow and Manning, 1996. However, the right chela of *Martinetta* can be easily distinguished from *Eocarpilius* as follows: 1) *Martinetta* has a strong spine on the superior distal margin of the carpus, which is lacking on the carpus of *Eocarpilius*; 2) the superior margin of the propodus of *Martinetta* is much straighter than that of *Eocarpilius*;

and 3) the proximal tooth of the right propodus of *Martinetta* is much lower and shorter than the same tooth of *Eocarpilius*. In *Martinetta* the proximal tooth of the propodus is about one-third its length in contrast to one-half the length of the propodus in *Eocarpilius*.

To a lesser extent *Martinetta* is also somewhat similar to the extant genus *Menippe*, which is represented in the Middle Eocene Castle Hayne Limestone of North Carolina by *M. burnsi* Rathbun, 1935. This fossil species is based on an incomplete, large, left propodus (holotype USNM 371580) and a series of other partial chelae which do not appear to have been associated. In outline, the left propodus of the holotype of *M. palmeri* is very similar to that of the holotype or left propodus of *M. burnsi*, but unlike the latter where the left propodus is thickest proximally, in *M. palmeri* the propodus is thickest medially. In addition, the superior margin of the left propodus of *M. palmeri* is relatively smooth with a few very weak ridges along its inner surface. By contrast, the ridges found on both the inner and outer surfaces of the left propodus of *M. burnsi* are reticulated, more prominent, and much more extensive. No carapace or fragment thereof of the distinctive carapace of *Menippe* has thus far been reported from the carolinian Eocene. Members of both genera have proportionally small orbits and raised protogastric and mesogastric regions which form a platform. However, the continuous unbroken, denticulated margin of *Martinetta* easily distinguishes it from the deeply cut, lobate margin distinctive of *Menippe*.

MARTINETTA PALMERI, new species
(Plate 1, figure 1; text-figure 1)

Description: Carapace large (cw exceeding 130 mm), transversely oval, strongly convex longitudinally, moderately convex transversely; length about 3/4 carapace width, broadest just posterior to midline at anterolateral angle, regions very weakly defined.

Fronto-orbital margin slightly less than 1/3 carapace width.

Front quadrilobate, relatively narrow, width less than 1/4 carapace width, deflexed at about 45° along midline.

Frontal lobes subcarinate along lateral mar-

gins, submedian pair distinctly larger than lateral lobes; submedian lobes subparallel to midline, rounded in dorsal outline, close set, flattened, produced well beyond lateral lobes but not below dorsoventral plane; lateral lobes obliquely set to midline, laterally directed, subacute in dorsal outline, widely separated from submedian lobes, much thicker anteriorly than submedian lobes, each set clearly below inner orbital eave-like lobe and separated from the latter by a distinct lateral indentation.

Orbit relatively small, marginal, V-shaped in dorsal view, composed of 4 lobes separated by 3 closed fissures; inner lobe largest, eavelike, raised well above median and outer orbital lobes; outer orbital lobe about twice width of small median lobe and slightly greater than 1/2 width suborbital lobe; outer orbital angle defined by strong denticle, latter set just above anterolateral margin. Suborbital margin strongly concave, finely granulated below, inner angle subacute, strongly produced, visible in dorsal view.

Antennae incomplete; basal antennal article relatively narrow, lateral margins straight, subparallel, length slightly less than twice width, terminating well below inner angle of suborbital lobe. Basal article not reaching or in contact with lateral frontal lobe.

Antennule incomplete; basal article subtriangular in outline, outer lateral margin with weak carinae anteriorly, inner lateral margin with strong carinae. Article in contact with lateral margin of basal article of antenna along its entire length.

Anterolateral margins without lobes or fissures, strongly arched, converging anteriorly, slightly upturned at anterolateral angle; margins rounded, moderately thick, armed with 14 to 16 distinct, subconical, upturned denticles of subequal size; denticles usually equidistant, sometimes paired; posteriormost pair widely separated from denticle at anterolateral angle; latter strongest of all marginal denticles, distinctly upturned. Dorsal and ventral margins, where unweathered, smooth with scattered

punctae; denticles and surfaces near anterolateral angle finely granulate; ventral surfaces just below denticles finely granulate.

Posterolateral margins weakly sinuous in dorsal outline, strongly convergent posteriorly, length about 4/5 length of anterolateral margins. Margins slightly concave anteriorly where steep; slightly convex, inflated posteriorly.

Posterior margin very weakly convex in dorsal outline, width (estimated) less than 2/3 width of front; margin defined by very low, smooth, flattened, narrow, rim.

Dorsal surface without distinct grooves, regions ill defined, surfaces where unweathered, punctate; surfaces of front, orbits and anterolateral margin appear finely granulate.

Protogastric and mesogastric regions distinctly elevated forming broad platform, margins convergent posteriorly; platform weakly sulcate anteriorly along midline, bordered posterolaterally by shallow depressions.

Urogastric and cardiac regions weakly defined by shallow depression formed by epimeral muscle scars. Urogastric region weakly elevated, badly weathered; cardiac region with two widely spaced, laterally placed, small circular pits, surface otherwise smooth, flattened transversely, very weakly sulcate along midline.

Posterior gastric pits distinct, though small, circular, closely spaced, visible just anterior to epimeral muscle scars.

Intestinal region broader than long, moderately elevated, weakly separated from cardiac region, distinctly separated from branchial regions by broad, shallow grooves.

Pterygostomial region, where adjacent to buccal cavity, broader than subhepatic margin, surface smooth.

Buccal cavity subquadrate, width slightly less than 1/4 carapace width.

Third maxilliped broken, incomplete. Merus about 2/5 length of ischium, concave laterally, raised medially, with shallow, narrow depression along inner margin. Ischium ill-defined, fragmentary.

PLATE 1

1. *Martinetta palmeri* Blow and Manning, n. gen. and sp.

1a. Male holotype, articulated specimen in dorsal view, (USNM 496363), cl 91.9 mm, cw 126.7 mm; right propodus prl 106.4 mm, prh 56.1 mm, prt 31.5 mm; left propodus prl 78.1 mm, prh 30.7 mm, prt 19.9 mm. Scale = 20 mm.

1b. Male holotype above in ventral view. Scale = 20 mm.

Locality: M.M. Orangeburg Quarry, Orangeburg Co., South Carolina. Santee Limestone.

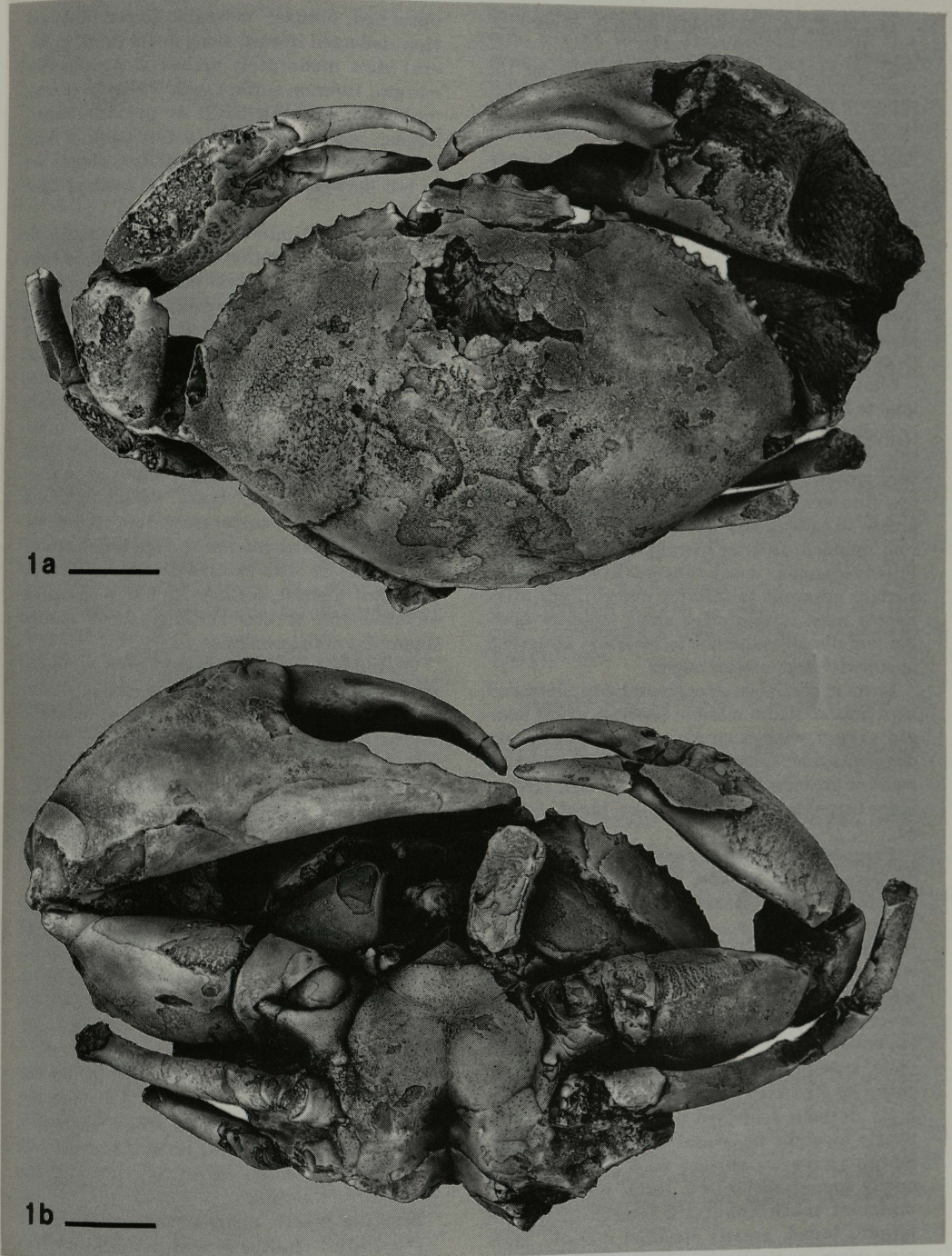


PLATE 1

Mandibles visible, broken distally, otherwise covered.

Sternum of male relatively narrow, about 1/3 carapace width, lateral margins convergent posteriorly, sternites 7, and particularly 8, very narrow.

Abdomen lacking, width (estimated) about 1/2 width of sternum, with somites broadening gradually posteriorly as inferred from outline of narrow, deep, abdominal depression.

Chelipeds unequal in males, right or major chela about twice the size of the left or minor chela. Surfaces of both right and left chelipeds punctate and very finely granulate. Most surfaces appear smooth to the unaided eye.

Meri of chelipeds short, length of each subequal to length of associated carpi, each distinctly highest distally; outer surface inflated, punctate with fine granules; inner surface concave, very smooth with few small punctae and very few fine granules. Superior margin strongly arched in lateral and dorsal views; margin narrow, rounded. Inferior margin broad, flattened. Punctae appear most concentrated on outer surface adjacent to inferior margin; granules appear most concentrated along superior margin and distally adjacent to insertion of carpus at superior and inferior angles.

Carpi of chelipeds strongly inflated, flattened near inferior distal margin; superior distal margin armed with a single, strong, obliquely directed spine; spine situated between superior point of articulation with propodus and strong, inner carpal angle; latter swollen, blunt, rounded.

Propodus of major or right cheliped of male massive, height of palm about 4/5 its length, highest distally, steeply sloping proximally; superior margin weakly arched; surface of entire palm densely granulate; outer surface with scattered punctae, most concentrated along or near superior and inferior surfaces; inner surface with weak reticulated ridges near superior margin. Fingers about 4/5 length of palm, subequal in length, widely gaping along entire length; fixed finger in dorsal view moderately deflected inward along entire length, nearly straight in lateral view along inferior margin; superior surface with 2 large, subequally spaced, molariform teeth; first or proximalmost tooth about 1/3 length of finger, largest, broad, greatly elevated distally, stepping down vertically to second, smaller tooth; second tooth about 3/4 width of first, blunt, very rounded marginally, steeply elevated above distal third of finger; tip of finger moderately

upturned, obtuse; moveable finger in dorsal view deflected inward along distal third, in lateral view moderately arched along superior margin; inferior surface with 2 closely spaced, molariform teeth; first or proximalmost, largest, set in opposition to first tooth of fixed finger; second about 1/2 size of first, obtuse, set to fall between first and second teeth of fixed finger.

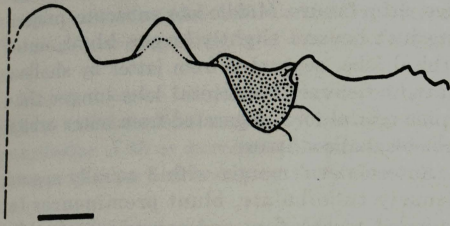
Propodus of minor or left cheliped of male much smaller than that of major, height of palm about 3/5 length, highest distally, superior surface gently sloping proximally; surfaces of palm badly eroded, fragment of original surface punctate and densely granulate. Fingers of subequal length, 3/5 length of palm; fixed finger deflected downward and inward; superior surface with at least three badly abraded teeth; first or proximalmost obtuse, second highest and like third, subcarinate; distal third of superior surface lacking; tip of finger, obtuse, weakly upturned; moveable finger moderately deflected downward and inward; inferior surface lacking proximally; surface with two subcarinate teeth, proximalmost highest; teeth set to fall in opposition on either side of second or largest tooth of fixed finger; tip of finger obtuse.

Ambulatory legs 1, 2 and 3? present, incomplete; length of 1st excluding dactylus slightly more than 2/3 width of carapace; length of merus of 1st leg about twice length of carpus and 1 1/2 times length of propodus; length of meri of each leg gradually decreasing posteriorly; meri compressed laterally, inner surfaces curved gently forward [anteriorly]; superior surface of legs finely granulate, other surfaces smooth with scattered punctae.

Description of the dorsal aspect of the carapace based principally on paratype ChM No. PI 15214. Description of the ventral aspect of the carapace and the chelipeds based principally on the male holotype. Both specimens are partially articulated with most of their respective cuticles intact.

Etymology: This species is named for the collector of the holotype Mr. Billy T. Palmer, Sr., United States Navy, Retired, who brought it to our attention and in recognition of his volunteer work and extensive collecting efforts for The Charleston Museum.

Holotype: Nearly complete male carapace with articulated chelipeds and ambulatory legs (USNM 496363) cl 91.9 mm, cw 126.7 mm (spines at anterolateral angle missing); estimate of cw complete, 131.0 mm; incomplete right propodus (superior margin missing along



Text-figure 1. *Martinetta palmeri* Blow and Manning n. gen. and sp. Paratype, right frontal lobes and orbit in dorsal view, (ChM No. PI 15355), estimated cw 140.0 mm. Scale = 4 mm.

Locality: M.M. quarry SE of Jamestown, Berkeley Co., South Carolina. Santee Limestone.

distal half) prl 106.4 mm, prh 56.1 mm, prt 31.5; incomplete left propodus (superior margin broken, nearly complete) prl 78.1 mm, prh 30.7 mm, prt 19.9 mm.

Type Locality: M.M. Orangeburg Quarry, Orangeburg County, South Carolina. Santee Limestone.

Paratypes: Incomplete carapace with fragments of sternum and articulated right merus and incomplete left cheliped (ChM No. PI 15214) cl 95.2 mm, cw 130.3 mm (left margin eroded, nearly complete) estimate of cw complete to tips of denticles 140.0 mm; right merus (nearly complete) l 45.6 mm; left propodus prl 34.3 mm, prh 14.5 mm, prt (covered). M.M. Berkeley Quarry, Berkeley County, South Carolina. Santee Limestone.

Associated weathered right and left halves of incomplete carapace (VMNH 904). Fragmentary right half of carapace including partial orbit, anterolateral margin with adjacent ventral surface and pterygostomial region intact, and articulated merus with fragments of carpus and propodus present, cw 86.7 mm, estimated cw of entire carapace, if complete, 165.0 mm; right merus l 38.8 mm; fragment of left half of carapace including partial anterolateral margin with adjacent ventral and pterygostomial region surfaces, overall length of fragment 48.2 mm; M.M. Georgetown Quarry, Georgetown Co., South Carolina. Santee Limestone.

Carpus and propodus of right or minor cheliped (ChM No. PI 15295) combined length of

both [carpus and propodus] 108.3 mm, prh 38.7 mm, prt 24.9 mm. Incomplete carpus and propodus of right cheliped, fingers lacking (ChM No. PI 15296) prl (to base of fixed finger) 61.0 mm, prh 53.2 mm, prt 29.9 mm. Incomplete right or major propodus with associated incomplete front, right orbit, and about half? of the right anterolateral margin of carapace (ChM No. PI 15355) prl (incomplete, proximal end missing) 105.3 mm, prh (incomplete, superior margin missing) 56.5 mm, prt (incomplete, cuticle of inner surface missing) 35.1 mm. (ChM Nos. PI 15295, PI 15296 and PI 15355) M.M. Quarry SE of Jamestown, Berkeley Co., South Carolina. Santee Limestone.

Occurrence: Santee Limestone, South Carolina.

Remarks: Of the two large crabs known to co-occur in the Santee Limestone, *Martinetta palmeri* and *Eocarpilius carolinensis*, carapaces of the latter are by far the more common. The three articulated specimens of *M. palmeri* on which our description is based and two or three others collected or seen by Mr. Palmer are the only specimens of this large crab known to the authors.

Family XANTHIDAE MacLeay, 1838

XANTHIDAE MacLeay, 1838, p. 59 [name on *Official List*].

EOHALIMEDE Blow and Manning, 1996

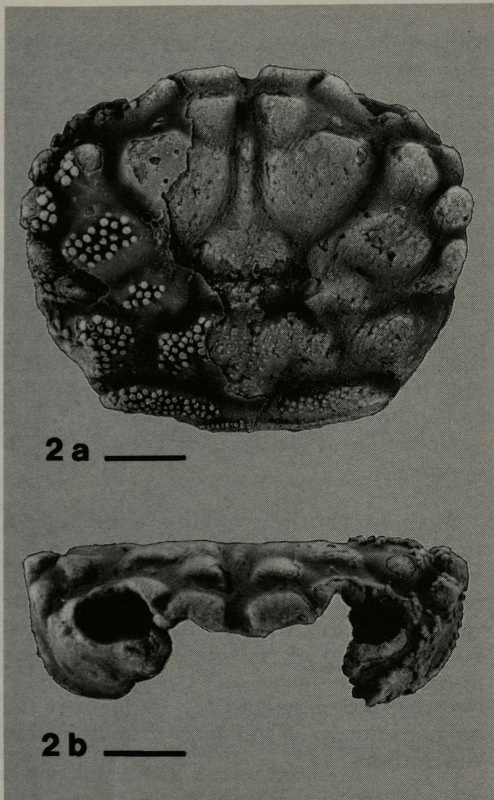
Type species: *Eohalimede walleri* Blow and Manning, 1996, p. 22, by original designation.

EOHALIMEDE SAUNDERSI, new species Text-figure 2

Eohalimede walleri Blow and Manning, 1996, p. 22, paratype only (USNM 484581).

Diagnosis: Very similar to *Eohalimede walleri* in carapace outline, placement of prominences, and general character, but without mushroom-shaped prominences. In contrast to the mushroom-shaped prominences of *E. walleri*, the elevated surfaces of this new species are covered with clusters of tubercles.

Description: Carapace suboctagonal, width greater than length, broadest at second lateral tooth; regions well defined, distinctly elevated, apex of most with distinctive clusters of small



Text-figure 2. *Eohalimede saundersi* Blow and Manning n. sp. (2a.) Holotype, carapace in dorsal view, (ChM No. PI 15210), cl 9.5 mm, cw 11.0 mm. Scale = 2 mm. (2b.) Holotype above, carapace in anterior view. Scale = 2 mm.

Locality: M.M. Orangeburg Quarry, Orangeburg Co., South Carolina. Santee Limestone.

tubercles, surfaces of carapace though very finely punctate, appearing smooth to unaided eye.

Fronto-orbital width about $3/4$ carapace width.

Front weakly projecting, bilobed, with deep, wide, median incision, width about $1/3$ carapace width; lobes weakly divergent, truncate, thickened anteriorly, lower margins beaded.

Orbit oval (length $1\ 1/3$ height), about half width of front, not produced beyond margin of carapace, composed of four unequal lobes, each decorated marginally with small, low, tubercles. Inner orbital lobe swollen, length slightly

longer than middle and outer orbital lobes combined, separated from middle lobe by distinctive, deep fissure. Middle lobe subacute, projecting just beyond slightly larger, blunt, outer orbital lobe, separated from latter by shallow, narrow fissure. Suborbital lobe longer than inner orbital lobe, separated from outer orbital lobe by shallow fissure.

Anterolateral margin with 3 equally spaced, densely tuberculate, blunt prominences (or rounded teeth); first and second round, third elongate; first distinctly smaller than second and slightly smaller than third, set well behind orbit, flanked mesially by broader, elongate, hepatic cluster of tubercles; second and particularly third flanked mesially by large subrectangular epibranchial cluster of tubercles.

Posterolateral margin with a large, broadly triangular, raised prominence of clustered tubercles boarded laterally by deep grooves; outer or lower flank of prominence broadest, flattened; inner or upper surface of prominence narrowing while extending onto mesobranchial region, where highest.

Posterior border slightly concave at midline, width about one-third carapace width, margin defined by finely beaded rim.

Dorsal surface, exclusive of postfrontal and epigastric regions, regularly ornamented with about 17 clusters of low, peg-like tubercles; superior surfaces of tubercles round, smooth; surfaces between tubercle clusters, broad, smooth.

Postfrontal region narrow, deep, outermost surface lacking, without tubercles, apparently smooth.

Epigastric region very inflated anteriorly where truncated and highest, surfaces without tubercles, smooth.

Protogastric region broadly subcircular, not subdivided into lobes, surface with about 15 scattered tubercles; tubercles appear largest and most concentrated along anterolateral margin.

Mesogastric region broad basally, low, covered with tubercles; anterior extension slender, low, with three tubercles, one posterior and two near anterior end where extension separates epigastric lobes basally.

Urogastric region low, very narrow, ridge-like; surface defined by transverse row of 7 to 8 small tubercles; row separated from base of mesogastric region by narrow shallow groove marked by distinct, close set, slit-like, posterior gastric pits.

Cardiac region T-shaped; cross of T with 2

relatively small, submedian, elongate, tubercle clusters, each paired with slightly smaller, subcircular, metabranchial tubercle cluster; base of T a single, much smaller, oval cluster of tubercles.

Intestinal region low, smooth, bordered laterally on metabranchial region by narrow, elongate cluster of 50 or more low tubercles; cluster rising, widening and becoming more dense laterally.

Branchial region uneven, subregions distinct, elevated and separated by shallow, smooth, grooves.

Epibranchial region with largest tubercle cluster, subrectangular in shape, obliquely directed inward, anteriorly converging; cluster set near outer angle of protogastric lobe and separated from same by cervical groove.

Mesobranchial region with two tubercle clusters, the first, a central, single small cluster set near the submesial angle with the urogastric lobe and the second, a much larger cluster extending from the posterolateral margin.

Metabranchial region defined by prominent, elongate, transversely placed tubercle cluster near the posterolateral angle and a single much smaller subcircular cluster adjacent to the cardiac lobe.

Description based on complete dorsal aspect of carapace with much of the cuticle intact.

Etymology: This species is named for Albert E. Saunders of The Charleston Museum, in recognition of his contribution to South Carolina paleontology and in grateful appreciation for his years of support for the first author's research.

Holotype: Carapace (ChM No. PI 15210) cl 9.5 mm, cw 11.0 mm.

Type Locality: M.M. Orangeburg Quarry, Orangeburg Co., South Carolina. Santee Limestone.

Paratypes: Incomplete internal mold, without surface detail, of carapace with remnant of base of front present and the left lateral margin lacking (USNM 484581) cl (incomplete) 12.1 mm, cw (incomplete) 11.9 mm; locality USGS 26882 M.M. Berkeley Quarry, Berkeley County, South Carolina. Santee Limestone.

Incomplete carapace, remnant of left orbit present, right orbit and right anterolateral margin lacking (ChM No. PI 15200) cl 12.3 mm, cw 13.7 mm (incomplete), estimated cw 14.4 mm; M.M. quarry SE of Jamestown, Berkeley Co., South Carolina. Santee Limestone.

Occurrence: Santee Limestone, South Carolina.

Remarks: Those regions with elevated tubercle clusters appear highest and more coarsely tuberculate anteriorly with each sloping posteriorly, suggesting that these short ridges, like the much longer ridges found in *Lophoranina* (see Savazzi, 1981), might have aided this species in back burrowing.

Only three specimens of this species are thus far known to us.

V. LOCALITY DATA

M.M. Georgetown (= Jamestown) quarry, approx. 2.8 miles (4.5 km) N 33°E of Jamestown, on W side U.S. 17A, Georgetown Co., South Carolina.

M.M. Berkeley (= Cross) quarry, approx. 5.3 miles (8.5 km) SE of Eutawville, and about 2.2 miles (3.5 km) S 20°E of South Carolina Rtes. 6 and 45 intersection with secondary hwy 59 (Berkeley-Orangeburg Co. line road) on E side of secondary hwy 59, Berkeley Co., South Carolina.

M.M. quarry, S side South Carolina Rte. 45, 4.2 miles SE of South Carolina Rtes. 45 and 41 intersection in Jamestown, Berkeley Co., South Carolina.

M.M. Orangeburg quarry, W side South Carolina Rte. 59, 5.7 miles N of South Carolina Rte. 311, Orangeburg Co., South Carolina.

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