

formation of North Carolina⁸ and from the Pamlico formation of the District of Columbia.⁹

MOLLUSCA

Rangia cuneata (Gray) Dall

This well known species, which is said to range from the Pliocene to the Recent, is found at the present time in shallow water along the coast of the Gulf of Mexico from Alabama westward and southward to Mexico. Although occurring in both normal sea water and brackish water, it is said to find its optimum conditions in the latter. Its range reaches northward as far as Maryland in the late Pleistocene where it has been recorded not only from the lower beds on both sides of Point Lookout, but from Sparrows Point and Middle River in Baltimore County, as well as Nanjemoy Creek in Charles County.

Some of the foregoing occurrences, as well as additional localities in North Carolina are discussed by Mansfield.¹⁰

This species appears to be common in the silty clay below Popes Creek in Westmoreland County, Virginia, but is in a very bad state of preservation.

? *Macoma balthica* Linnaeus

This is essentially a northern form although it is said to range southward to the Mediterranean in Europe and to Georgia along our Atlantic coast. It was recorded from the Talbot formation of Wailes Bluff in Maryland, and more recently from Yonges Island, S. C., by Mansfield. The present record is based upon poorly preserved material and is therefore tentative. It is somewhat smaller than the figured specimen from Wailes Bluff. Linnaeus' type was the thin shell of the brackish waters of the Baltic.

Galls

Gall scales similar to those figured from the Pamlico formation of the District of Columbia¹¹ are not uncommon at the present locality.

ZOOLOGY.—*A new crawfish from Florida.*¹ HORTON H. HOBBS, JR.,
University of Florida. (Communicated by MARY J. RATHBUN.)

The first specimens of this crawfish, a male (Form I) and three females, were collected by Professor J. S. Rogers and myself in April, 1935, from a pine flatwoods four miles northwest of Blountstown, Calhoun Co., Florida. Dr. Waldo L. Schmitt, of the U. S. National

⁸ BERRY, E. W. U. S. Geol. Survey Prof. Paper 140: 115, pl. 57, fig. 6, 1926.

⁹ BERRY, E. W. This JOURNAL 23: 20, figs. 53, 54, 1933.

¹⁰ MANSFIELD, W. C. U. S. Geol. Survey Prof. Paper 150-F, 1928.

¹¹ BERRY, E. W. This JOURNAL 23: 24, figs. 72-77, 1933.

¹ Received November 16, 1937.

Museum, examined these specimens for me and stated that they are closely related to the members of the first section of Ortmann's first group,² Faxon's Group II,³ although differing in one or another point from all known species.

In April, 1937, I collected two males (Form I), two males (Form II) and one female from the same locality. One of the Form I males is the holotype (U.S.N.M. cat. no. 75120) and the female the allotype (U.S.N.M. cat. no. 75121). From two miles further north I succeeded in taking five males (Form I), one male (Form II), and three females from the same habitat.

Because of Professor Rogers' interest in crawfishes and the aid and encouragement he has given my work on these animals, I take pleasure in naming this species for him.

Cambarus rogersi, n. sp.

Holotypic male (Form I).—Body stocky, thickened dorso-ventrally, compressed laterally. Abdomen much narrower than cephalothorax.

Carapace subovate. Width of carapace slightly greater than depth in region of caudo-dorsal margin of cervical groove. Greatest width of carapace about midway between cervical groove and caudal margin of cephalothorax. (Fig. 4)

Areola linear, almost obliterated, depressed, more than half as long as cephalic section of carapace; a single row of punctations present along fusion line of branchiostegites; sides parallel for a short distance in middle.

Rostrum somewhat broad-lanceolate; apex not reaching distal end of second joint of antennule peduncle; upper surface punctate, excavate, with margins elevated, gradually tapering off towards the apex; no lateral spines present. Apex of rostrum directed ventrad, the extreme apex abruptly bent upward. Cephalic region, in lateral aspect, evenly rounded. Postorbital ridges extending caudad more than half the distance between apex and cervical groove.

Surface of carapace punctate; granulate laterally anterior to cervical groove. No lateral spines present. Cephalo-lateral margins each with one spine near anterior extremity of cervical groove.

Abdomen shorter and narrower than carapace. Anterior section of telson with one spine in each of the postero-lateral angles.

Anterior margin of epistoma irregularly semi-circular; without median anterior projecting spine or point; almost as long as wide.

Antennules of the usual form—a spine present on ventral side of basal segment of the right.

Antennae extending slightly beyond caudal margin of carapace when bent backward.

Antennal scale small; extending almost to tip of second joint of peduncle of antennule. Spine on outer margin strong.

First pereopod very broad and thin, triangulate, with sharp apex. Inner margin of palm with eight regular tubercles in a single row. Both surfaces

² Proc. Amer. Philos. Soc. 44: 98-101. 1905.

³ Mem. Mus. Comp. Zool. 40 (8): 411. 1914.

of hand partially punctate; both fingers setose. Both fingers with two distinct ridges. Palm with a prominent ridge along articulation with moveable finger. (Fig. 2)

Moveable finger: inner margin excavated near base; dorsal surface with a prominent sub-median ridge extending from base almost to apex. Outer edge studded with four tubercles along proximal third; remaining distal two-thirds with about eight setiferous punctations. Inner margin broken by two major tubercles; one about midway of the proximal third; the other just distad to middle. The excavated region between the major tubercles with one or two smaller tubercles; distad of the distal major tubercle, the margins with minute denticles. Apex sharply pointed and curved laterad toward the tip of immoveable finger; when the fingers are brought together the moveable finger passing beneath the immoveable finger extends slightly laterad of its lateral margin.

Immoveable finger: outer edge trough-like or punctate, studded with hairs; a few tubercles present along outer margin of base. Inner margin broken by one major tubercle which, when the fingers are closed, is about half-way between the major tubercles of moveable finger. Three or four smaller tubercles present along proximal half; distal half, as in other finger.

Carpus longer than wide; longer than inner margin of palm of chelae, with a deep longitudinal groove above; punctate, three tubercles on distad border of inner surface directed forward terminating in sharp spines. Also smaller proximal spines on inner margin.

Merus smooth except on lower side which has a row of very small tubercles (about eleven) on outer margin; a row of larger ones on inner margin (nine on left, ten on right).

Ischiopodite of third pereopods hooked; hooks strong, long; caudo-ventral surface rounded; cephalo-dorsal surface excavate. (Fig. 6)

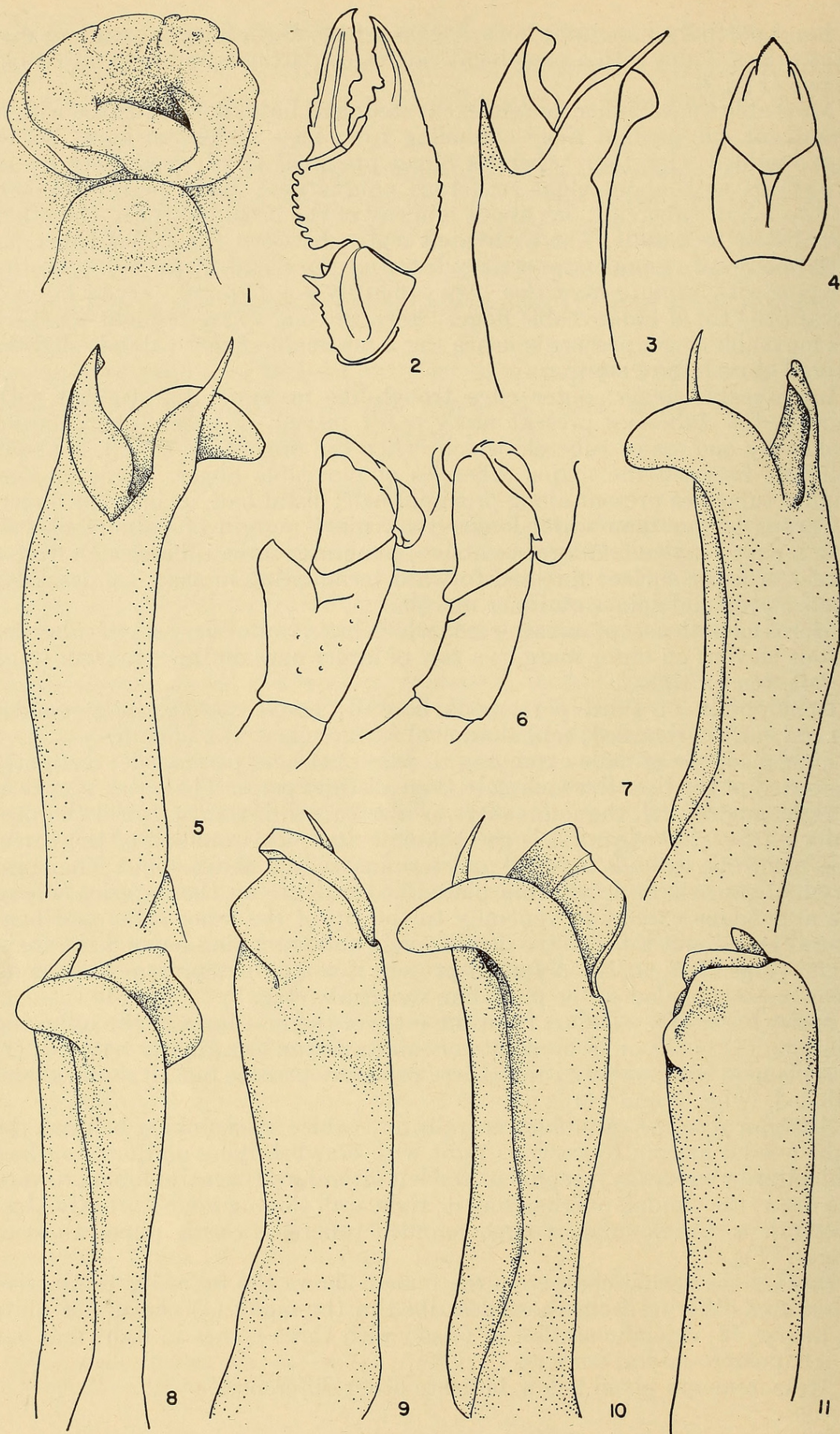
First pleopods of male extending to base of second pereopods; distinctly separated at the tips; tips ending in three distinct parts. The outer, recurved at right angles with the main shaft, is also turned inward to form the posterior part of the organ. It is the heaviest and most rounded of the three. The inner one extends forward and terminates in a sharp spine. The third terminal consists of a flat, thin plate-like structure on the anterior side of the appendage extending ventrally to the tip of the inner spine and bent laterally at about a forty-five degree angle and extending beyond the main shaft. (Figs. 5, 7, 9, 10) A fourth process is sometimes present as a small spine meso-cephalad of the plate-like structure. (Fig. 3)

Male (Form II).—Differs from the male of the first form in the following respects: (1) hooks on ischiopodite of third walking legs greatly reduced, (2) first pleopod with no horny tips, three processes present but all rounded and reduced. (Figs. 8 and 11)

Allotypic female.—Annulus ventralis moveable; fossa sinking beneath the right caudal margin (observer's right with crawfish lying on dorsal surface and anterior end away); cephalad and left lateral walls gently sloping toward the fossa; the caudal, overhanging it; right wall sloping more abruptly. Just posterior to the annulus, a large rounded tubercle bearing punctations or ridges. (Fig. 1)

Besides the sexual characters the female shows the following distinctive structures differing from those described in the male: (1) chelae not quite as heavy, (2) cephalic section of telson with three spines in right and one in left postero-lateral corners.

Measurements given below indicate other differences.



(Legend on bottom of page 65)

Measurements.—The holotype: carapace, height 1.3, width 1.4, length 2.79; areola, linear, length 1.11; rostrum, length 0.44, width 0.41; abdomen, length 2.69; left chela, inner margin of palm 0.6, width of palm 1.06 length of outer margin of hand 1.93, moveable finger 1.14; carpopodite of 1st pereiopod, length 0.75, width 0.63 mm. The allotype: carapace, height 1.24, width 1.32, length 2.58; areola, linear, length 1.02; rostrum, length 0.4, width 0.4; abdomen, length 2.31; left chela, inner margin of palm 0.52, width of palm 0.94, length of outer margin of hand 1.62, moveable finger 0.99; carpopodite of 1st pereiopod, length 0.78, width 0.57 mm.

Type Locality.—Low pine flat-woods four miles north of Blountstown on State Highway no. 6. Pitcher plants (*Sarracenia psittacina* Michx. and *Sarracenia drummondi* Croom) and grasses made up the dominant flora. The soil was a sandy clay mixture. All the crawfish were taken from complex burrows ranging from one to three feet deep and with several passages. The water table was about one foot below the surface and the crawfish were always below it—usually at the end of one of the several tunnels. The burrows were numerous and easily located as each was marked by a neat mound of carefully piled pellets. These so-called chimneys were usually four to six inches high. Living in the burrows with the crawfish were other crustaceans: a few white isopods, *Asellus* species; several amphipods, *Eucrangonyx gracilis* (Smith), determined by Mr. Joel Martin; and quite a number of copepods.

The male holotype (Form I), the female allotype and a male paratype (Form II) are deposited in the collections of the United States National Museum. The paratypes: A male (Form I) and a female have been deposited in the Michigan Museum of Zoology; a male (Form I) and a female in the Museum of Comparative Zoology; a male (Form I) and a female in the Carnegie Museum; four males (Form I), two males (Form II) and three females I have retained in my personal collection.

Relationships.—*Cambarus rogersi* probably is more closely allied to the species of Faxon's Group III, namely: *Cambarus bouvieri*, *simulans*, *gracilis*, *hagenianus*, and *advena*. Structurally, *C. rogersi* has its closest affinities with *C. advena*; the chelae of the two forms are strikingly similar. On the other hand, *C. hagenianus* is the only species of this group in which the areola is obliterated. The first pleopods of *Cambarus rogersi* are distinct from all known species and suggest no very close affinities to any of the species mentioned.

FIG. 1.—Annulus ventralis of female (Allotype). FIG. 2.—Dorsal view of right chela (Holotype). FIG. 3.—Diagram of tip of 1st pleopod (male) showing the fourth process which is sometimes present (Fourth process stippled). FIG. 4.—Dorsal view of carapace. FIG. 5.—Mesal view of the 1st pleopod (Holotype). FIG. 6.—Ischiopodites of the 3rd and 4th pereiopods showing heavy hook on the 3rd (Holotype). FIG. 7.—Lateral view of the 1st pleopod (Holotype). FIG. 8.—Caudal view of the 1st pleopod of male (Form II). FIG. 9.—Cephalic view of the 1st pleopod (Holotype). FIG. 10.—Caudal view of the 1st pleopod (Holotype). FIG. 11.—Cephalic view of the 1st pleopod of male (Form II). The pubescence has been removed from all 1st pleopods.



1938. "A new Crawfish from Florida." *Journal of the Washington Academy of Sciences* 28, 61–65.

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