

Alabama drainage system, but Simpson states that Lea, himself, had identified certain shells from the Clinch River as that species. This may have been the source of the erroneous comparison. At any rate, in the collection of the late Mrs. George Andrews were shells from the Holston River, which had been identified by Marsh as *hartmanianum*, and it seems probable that it was with such shells that the comparison was made. These shells are identical with the form that he subsequently described as *Q. beauchampii*. Both this species and his *Q. andrewsii* are hardly distinguishable from *globata* Lea and *pilaris* Lea and, indeed, all of these forms, together with *lesueurianus* Lea, form a natural group of inosculating races, which may represent simply a phase of *subrotundum* Lea. In the French Broad, Tellico and Hiawassee rivers there is found a form that is more compressed than typical *pilaris* and which would seem to be nearer to *lesueurianus*. It is with this form that *missouriensis* is most closely allied and, until a final and authoritative disposition can be made of the entire group, it must be considered as the western representative of that very perplexing aggregation.

STUDIES IN NAJADES.

BY A. E. ORTMANN.

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CARUNCULINA TEXASENSIS (Lea) (See Ortmann, 1912, p. 339).

I have specimens from the Old River of the Ouachita River, Arkadelphia, Clark Co., Ark., among them gravid females, collected by H. E. Wheeler on July 17, 1911, which had in part eggs, in part young glochidia, and females with eggs collected August 20, 1912. L. S. Frierson sent gravid females with eggs and ripe glochidia, collected August 1, 1912, in Sabine River, Logansport, De Soto Par., La. Thus also here the breeding season remains obscure, but conditions might be the same as in *C. parva*. A specimen from Logansport, collected Aug. 1, was discharging.

Soft parts very much like those of *C. parva*, but the black spot behind the caruncle is not well marked, but represented by a black streak, extending along the branchial opening forward to the base of the caruncle, and beyond. Caruncle globular, subcylindrical, or pear-shaped, brownish or white, and quite conspicuous upon a black base. In the male, the black streak may be distinct or obscure, and the caruncle is entirely missing.

Rest of the anatomy as described previously; in one specimen, however, the inner lamina of the inner gills was free for only about one half of the length of the abdominal sac. In all specimens, the supraanal was open.

Glochidia identical with those of *C. parva*, Length: 0.18. Height: 0.20 mm.

Carunculina glans (Lea) (see: *Lampsilis* (*Carunculina*) *glans* Simpson, 1900, p. 565).

A sterile female from the Old River of Ouachita River, Arkadelphia, Clark Co., Ark., collected by H. E. Wheeler, July 17, 1911.

Inner edge of mantle, from branchial to caruncle, and a little in front of the latter, with a black streak, this streak, most intense just behind the caruncle, forming an ill-defined black blotch. Caruncle subcylindrical, brown.

Edge of sterile marsupium dark brown (no dark pigment seen here in *C. parva* and *texasensis*).

MEDIONIDUS CONRADICUS (Lea). (See Ortmann, 1912, p. 335.)

Only one male and a gravid female were at hand when I described the anatomy of this form. Recently I have collected a large number in North Fork, Holston River, Saltville, Smyth Co., Va. (September 17, 1912), and in Clinch River, Richland and Raven, Tazewell Co., Va. (September 20 and 21, 1912), and preserved the soft parts of six males, two sterile, and six gravid females. All of the latter have glochidia, but in some they are immature, thus indicating the beginning of the breeding season early in September.

Soft parts as described, and inner lamina of inner gills always free, except at anterior end. Marsupium as described, but

larger in larger specimens. Ovisacs as distinct as in other forms; their number may go up to 20 and even more. The marsupium assumes, when larger, the normal, kidney-like shape, but there is always a considerable part of the gill, at the posterior end, non-marsupial.

Inner edge of mantle, in front of the branchial, with very variable papillae. My former description apparently represents not the normal condition, for in the present material the papillae are posteriorly (near the branchial) generally very indistinct, often absent, and only anteriorly there are one, two or three rather long ones, of subcylindrical shape (but hardly "hair-like").

Glochidia as described before, almost subspatulate (with anterior and posterior margins nearly straight and forming an indistinct angle with the lower margin). They are much higher than long. Length 0.28, height 0.27 mm. (former measurements 0.22 x 0.28).

I have seen in none of the specimens from the Holston and Clinch Rivers a trace of the byssus of the adult shell.

Color of soft parts: whole mantle, and also the gills and posterior part of abdominal sac, suffused with black. Mantle margin intensely black posteriorly. The charged marsupium is white, without pigment on the edge, and contrasts strongly with blackish color of the rest of the gills.

I think *Medionidus* is a good genus, distinguished by character of shell and soft parts. The location of the marsupium, and of the marsupial swelling of the female shell is different from that of the allied genera (chiefly *Eurynia*), but also shell sculpture and papillae of mantle offer good characters.

(To be concluded.)

NOTES.

GONIDEA ANGULATA Lea. In a letter from Mr. John A. Allen who has been collecting shells in Oregon, especially about his home in Oswego, he states, that *Gonidea angulata* Lea was in great abundance in the canal which connects Tualatin River with Oswego Lake, Clackamas Co., Oregon. Only a few young ones were seen. The *Gonidea* were well sunk in the gravel,



Ortmann, Arnold E. 1915. "Studies in najades (continued)." *The Nautilus* 28, 141–143.

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