

**HEMIGRAPSUS ESTELLINENSIS: A NEW  
GRAPSOID CRAB FROM NORTH TEXAS**

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## HEMIGRAPsus ESTELLINENSIS: A NEW GRAPSOID CRAB FROM NORTH TEXAS<sup>1</sup>

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ABSTRACT. This species is described from Estelline Salt Spring, Estelline, Hall County, in the Panhandle. It is very much like *H. oregonensis* of the Pacific coast but differs in a number of morphic characteristics. The remarkable nature of the occurrence of crabs of this marine genus 500 miles inland in an arid area is pointed out, as is the probability that the new species is probably already extinct.

During the author's biotic survey of the Texas Panhandle and South Plains of the last four years the following remarkable crab was discovered.

**Hemigrapsus estellinensis** sp. nov. Holotype: a sexually mature male (USNM 107855) taken from Estelline Salt Spring, ½ mi. N Estelline, Hall County, Texas, collected by Gordon C. Creel, February 18, 1962. Paratypes: 15, 5 males and 10 females (USNM 107856) collected by Gordon C. Creel, *et al.*, same locality and date.

DIAGNOSIS. Carapace rectangular in shape, wider than long; mean carapace length 13.9 mm.; mean carapace width 16.4 mm. Carapace length (measured at midline) about 84 per cent of the greatest width of the carapace; lateral margins of carapace about parallel. Three well-developed teeth (counting orbital angle) on anterior half of each lateral margin; posterior tooth smallest (Fig. 1 and 2). Antennae with 8-10 segments. Eyestalks stout, about twice as long as wide. Carapace drab green in color with ferruginous spots; spots on the legs larger than those on the carapace; ventral surface of the cephalothorax and entire abdomen emaculate. Well developed chemoreceptor or hairy patch on ventral surface of cheliped manus in males only (Fig. 3), absent in females. The dactyli of second and third walking legs longer than those of the first, and those of the first longer than those of the fourth. Outer maxillipeds moderately gapping. Ends of copulatory organs very hairy and triangular. Dactyli of the last pair of walking legs short, stout, with up-turned tips. All dactyli of walking legs with 6 well defined longitudinal rows of bristles; tips horny. Tips of chelipeds horny; teeth irregular, moderately gapping.

COMPARISONS. This species differs from others in the genus, and specifically from its closest relative, *H. oregonensis*, in that it is densely

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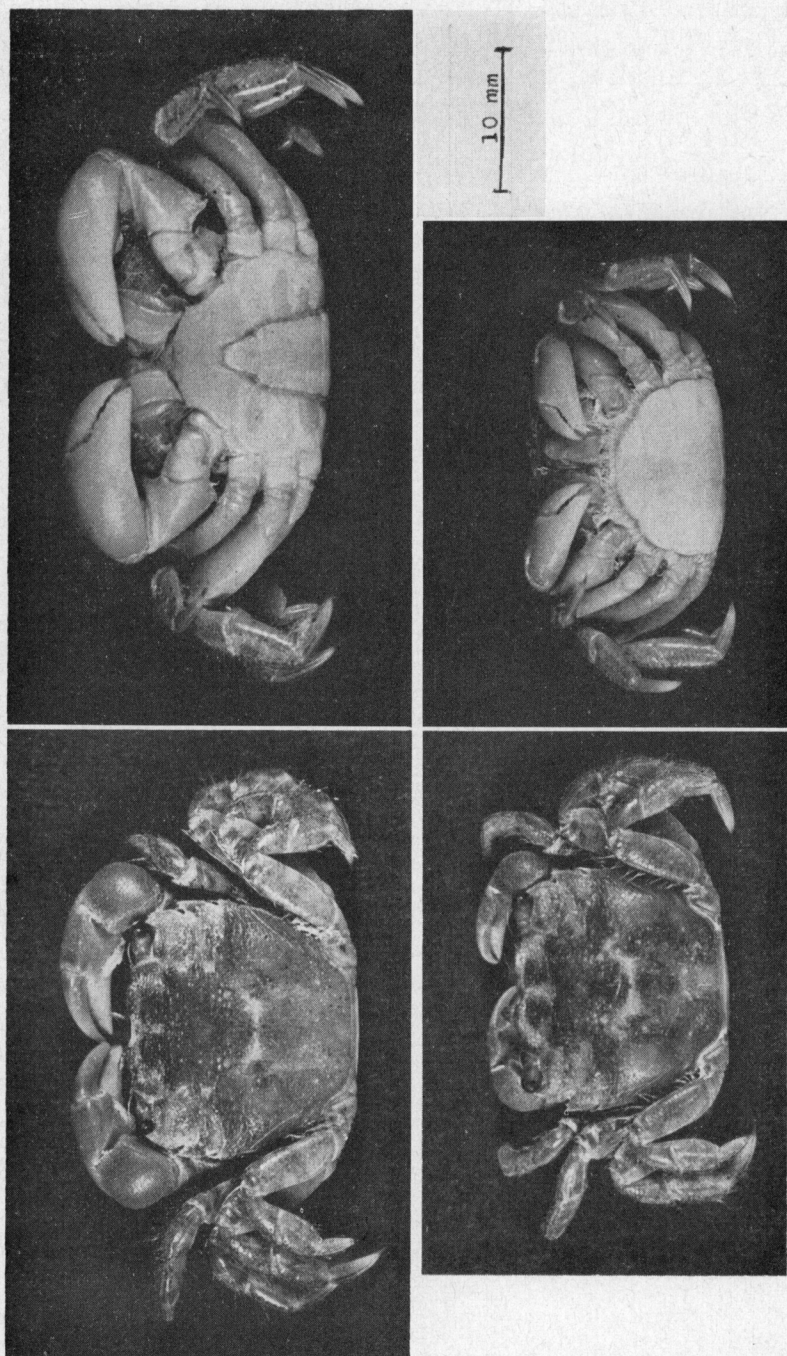


Fig. 1. Dorsal and ventral view of male (left) and female (right) paratypes of *Hemigrapsus estellinensis*.

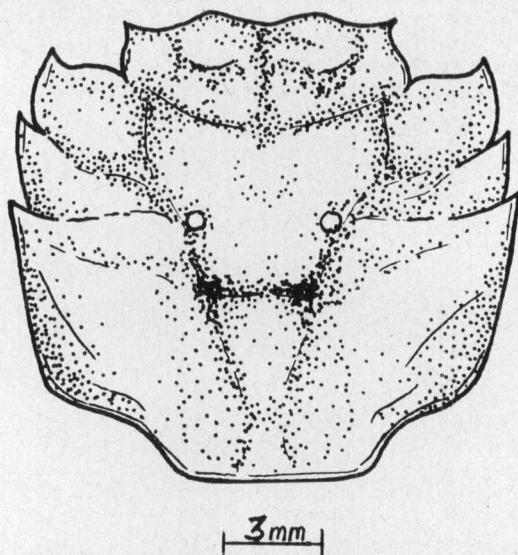


Fig. 2. Drawing of the carapace of *H. estellinensis* showing outline in detail.

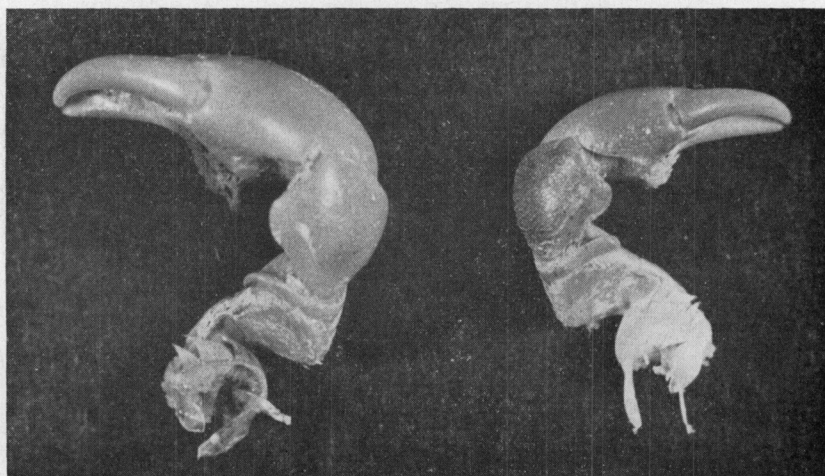


Fig. 3. Relative size comparison of the chelipeds of *H. oregonensis* (largest) and *H. estellinensis* (smallest). Both are from males of same carapace size.

spotted anteriorly, and has a white spot at the upper end of H-impression with 2 additional ones on each side between those at the end of the H-impression and lateral margin. The chelipeds of the males are proportionally smaller than those of male *H. oregonensis* (Table I, Fig. 3). Outer maxillipeds are farther apart than in *H. oregonensis*, about

TABLE 1

Comparison of some important measurements of *H. estellinensis* to its closest relative *H. oregonensis*. Numbers in parenthesis are means. Measurements are in millimeters. Proportions are expressed as per cent.

Species	Number	Carapace length	Carapace width	Length width	Front width	Greatest cheliped width over carapace width (males only)
<i>oregonensis</i>	77	6.5-23.5 (16.2)	7.5-29.0 (19.3)	77.4-92.6 (83.8)	3.7-13.4 (8.9)	35.7-48.8 (42)
<i>estellinensis</i>	16	11-18.5 (13.9)	13-22 (16.4)	80-88.2 (84.6)	6-10 (7.9)	33.5-39.4 (36)

the same as in *H. nudus*. The dactyli of the last pair of walking legs are about 20 per cent shorter than in *H. oregonensis*. They also differ in other measurements and proportions (Table I). Females of *H. estellinensis* have carapaces up to 18.5 mm. long and up to 22 mm. wide, thus larger than those of the *H. oregonensis* examined, which have carapaces up to 17 mm. long and 20 mm. wide. The largest known male of *H. estellinensis*, with a length of 16.4 mm. and a width of 19.1 mm. is much smaller than the largest male (length, 23.5 mm., width, 29 mm.) in the examined sample of 39 males of *H. oregonensis*.

VARIATIONS. The ranges of variation (with means shown in parenthesis) for certain measurements and proportions for the holotype and 15 paratypes are shown in Table I. The stridulating ridge of the males comprises 5 or 6 elongate smooth tubercles, the most anterior one being largest. The stridulating ridge of the females comprises 20 to 27 (mean of 23.9) smaller tubercles, all about equal in size.

HABITAT. The flow of the spring is about 3,000 gallons per minute. The pool is about 65 feet wide at the surface at an elevation of 1742 5 feet above sea level; it narrows downward and is only 20 feet wide at a depth of 25 feet, but farther down widens slightly to the 120-foot depth. At the bottom of the main pool is an opening about 3 feet wide leading into a large cavity completely filled by water. The pool empties into the Prairie Dog Town Fork of the Red River. The salinity of the water is nearly constant at 43 0/00, and has a temperature that varies from about 64 to 72° F. The 24-hour oxygen cycle ranges from a low of 2.9 PPM at 6 am. to a high of 4.3 PPM. The pH ranges from a low of 5 to a high of 6. The main spring pool has an algal flora, including *Oscillatoria formosa*, *Lyngbya Bergei*, *Enteromorpha clathrata*, *E. intestinalis* and about 20 species of diatoms. The algal growth is dense from the surface to about 30 feet deep and becomes less dense farther down. Many invertebrate species occur here, but the most striking was a

barnacle. The only fish observed and captured in the pool was a *Cyprinodon rubrofluviatilis*. The crabs were found only in the main spring pool; the outflowing stream was searched for several hundred yards but no other crabs were found.

DISCUSSION. The crabs were taken alive to the Wayland College laboratory in shallow enamel pans. They were not crowded and could get in and out of the spring water at will. All of them died within 17 hours of collection. During transport the temperature of the water dropped from 64° to 62° F. The campus is about 1500 feet higher than the spring. I doubt that the change in temperature or elevation or oxygen level of the water can account for the death of the crabs.

The account of Texas crabs by Pound (1961) was consulted, but she does not mention or describe any crabs in Texas like the ones described here, nor does she mention the occurrence of any so far inland. The accounts of grapsoid crabs by Rathbun (1918, 1924), which also do not mention any populations in this region, were used to establish the generic identity of the Estelline crabs. According to Rathbun (1924) the range of *H. oregonensis* is from Prince Williams Sound, Alaska, to Todos Santos Bay, Baja California, just south of the United States border. The present geographies would indicate a long isolation of that species from *H. estellinensis*.

The foreman of the ranch in which the spring is located reported seeing several crabs in September, 1960; he did not think it unusual. On the date of my collections a number of SCUBA divers were collecting and charting the spring, disturbing the sediments of the sides of the pool. Perhaps this disturbance caused a change in oxygen level, forcing the crabs to the surface. Not all the crabs seen were collected. During December 1962 the author and Don Beer explored as much of the spring pool as was safe using SCUBA gear; in 8 days of searching, during which nearly every inch was searched, no further crabs were found. The U.S. Corps of Engineers has been trying for several months to stop the flow of this spring. It appears that much of the native life of the spring is now extinct, including probably *H. estellinensis*. The only specimens remaining are in the U.S. National Museum.

It may be of some interest that two of the females collected laid eggs before they died. The number of eggs was estimated by count-volume to be 8,000 and 3,000 respectively.

To Mr. N. T. James of the Mill Iron Ranch I wish to express my appreciation for permission to enter the ranch and study the spring. I wish to thank and acknowledge the help of Don Beer, Bob Hollingsworth and their students in SCUBA diving, for assistance in charting the spring and help in collecting specimens. The doctors Paul Prior and Lyle Kuhnley helped with the collection and identification

of the flora. I appreciate the help of several other colleagues and students from Wayland College. Photographs and drawings are the work of Don Fritz of Montana State College.

#### LITERATURE CITED

POUNDS, SANDRA G. 1961. The crabs of Texas. Bull. Tex. Game & Fish Commission 43. Austin, Texas.

RATHBUN, MARY J. 1918. The grapsoid crabs of America. Bull. U.S. Nat. Mus. 98. Washington, D.C.

———. 1924. The brachyuran crabs collected by the U.S. Fisheries Steamer "Albatross" in 1911, chiefly on the west coast of Mexico. Bull. Amer. Mus. Nat. Hist. 48: 619-637, plates 26-36.

