

Studies on the Mud Crabs (Xanthidae)
of the Eastern Shore of Virginia

Small xanthid crabs are among the most abundant members of estuarine communities, and doubtless they have important influence in several communities. In Chesapeake Bay and environs mud crabs are one of the most conspicuous members of the oyster community, and they must comprise a large biomass, despite their small size.

Collections and observations were made at 11 localities visited at least once a month on the Eastern Shore of Virginia from August 1959 through November 1960, with some scattered study until August 1961. On the bayside, these localities were located in Messongo, Chesconnessex, Occohannock, Hungars and Cherrystone Creeks and the Gulf, all small tidal creeks draining into the eastern side of Chesapeake Bay. On the seaside crabs were observed in Hog Island Bay, Bradfords and Swash Bay which drain into the Atlantic Ocean. No major changes in distribution of species have been observed in these localities since 1959, so these distributions are probably real and fairly consistent.

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ABSTRACT

The distribution and habitat is given for four species of mud crabs in shallow waters of the Eastern Shore of Virginia. Rhithropanopeus harrisi was typically a low salinity crab, sometimes found in high salinities high in the intertidal zone. Eurypanopeus depressus dominated the intertidal zone in high and subtidal zone in moderate salinities. Neopanope texana was found only subtidally in high salinities. Panopeus herbsti was found mainly in the intertidal zone in high salinities. All four species were found living in sponges.

RHITHROPANOPEUS HARRISI (GOULD, 1841). This crab was previously found associated with the lowest salinities in an estuary (McDermott and Flower 1952¹⁴⁷, Ryan 1956). Hoese (1960³³¹) found that R. harrisi replaced Neopanope texana after salinities fell in a Texas Bay. Ryan (1956) reports this species in salinities of 2.8 to 18.6 ‰ and Fowler (1911) reported it in fresh water in Maryland.

On the Eastern Shore of Virginia R. harrisi was the only common mud crab associated with oysters in Messongo, Chesconessex, and Occohannock Creeks, which are the fresher creeks of the study area. No other species was found in Messongo Creek, which has experienced salinities as low as 2 ‰ after heavy rains. R. harrisi was rare in the higher salinity areas, but was recorded in salinities of 2.8 to 33.0 ‰. Although Ryan (1956) reported much overlap between R. harrisi and Eurypanopeus depressus, very little was found in this study. R. harrisi is evidently native to the Seaside, a few individuals being found very high in the intertidal zone on oysters in Spartina marshes at Wachapreague and in Finney Creek. It also survives for a time when brought with James River oysters imported to the Seaside.

Thirty-five ovigerous females were taken from Occohannock Creek on August 17-18, 1961.

EURYPANOPEUS DEPRESSUS (SMITH, 1869). This is the common intertidal mud crab in high salinity areas on the Eastern Shore. It was found in water 2 meters deep but reached its

greatest abundance in the intertidal zone where it is frequently found exposed to air with oysters (Table 1). Pearse (1929) found E. depressus living intertidally.

Only a few specimens were found in the low salinity creeks of Accomack County where R. harrisi is the predominant mud crab. Salinities where this crab was taken ranged from 16.9 to 35.6 ‰ which is much higher than Ryan's (1956) range of 4.5 to 20.4 ‰. Ryan found this to be a common subtidal crab with oysters in medium to low salinities, which is confirmed by data from the Rappahannock River taken during an oyster survey on December 8, 1960. E. depressus was the only mud crab observed from Urbanna to Waterview but about five miles upstream at Tarpley Point Rhithropanopeus was predominant. Eurypanopeus was common with the red sponge, Microciona, which was found at Waterview but not at Tarpley Point.

On the Eastern Shore Eurypanopeus does not extend far into low salinities and its range is similar to that of Neopanope. Eurypanopeus distribution in general is similar to that of oysters, C. virginica, in that they are subtidal in low salinities and intertidal in high salinities. However, Eurypanopeus is replaced by Rhithropanopeus in the lower salinities where oysters occur.

Twenty-six vigorous specimens were taken from several localities on the seaside and bayside from 28 June through 25 August. This was a common crab, sometimes with other species, in sponges (Table 2). Ryan (1956) reported E. depressus common in the red sponge, Microciona.

A large sponge, Lissodendoryx sp., from about a foot

below low water on a piling at Wachapreague, examined on August 9, 1961 contained 33 E. depressus and 2 Neopanope. Numerous crabs were also found in Halichondria which occurs barely subtidally on pilings at Wachapreague (Table 2). All were not counted but of 34 crabs, 2 were N. texana and 32 were E. depressus. All of these crabs were between 2 and 4 mm in carapace width. Similar size crabs, mostly E. depressus, were also abundant with oysters on these piling.

NEOPANOPE TEXANA (STIMPSON). This is a common high subtidal crab, but it is rare near the surface or in the intertidal zone (Table 1). None was ever found exposed at low tide. Usually this crab was not abundant when E. depressus was, but there was some overlap in shallow subtidal water. N. texana may not be native to oysters but occurs there since man started subtidal planting in high salinities. It was not reported from oysters by Pearse and Wharton (1938). McDermott and Flower (1952)⁴⁸ reported this to be the common xanthid on Delaware Bay oyster beds, which are largely man-made.

Cowles (1930) found N. texana to be the most abundant crab in the offshore waters of Chesapeake Bay, but Ryan (1956) found only a few specimens, probably because he did not sample where Neopanope is common. Ryan's data indicated that E. depressus and N. texana were isolated by salinity but depth seems to be the main factor in high salinities. N. texana was taken in salinities of 16.9 to 35.6 ‰.

N. texana was taken in sponges from Wachapreague and Cherrystone Creek (Table 2). McDermott and Flower (1952) found N. texana abundant in Microciona prolifera. This was the only mud crab occurring in the Zostera marina community at the Gulf.

Thirty ovigerous females were found in widespread localities from 12 May through 31 August.

PANOPEUS HERBSTI MILNE-EDWARDS, 1834. Although large Panopeus seemed relatively uncommon they were as widespread as was any other high salinity mud crab. Single individuals (rarely two or more on one date) are recorded at all high salinity locations. This species is adept at hiding for we found that killing one or two oysters on an intertidal reef at The Gulf brought out as many as three herbsti which were hiding deep within the reef. While picking through tide pools on oyster reefs in Hog Island Bay and the Machipongo River we took numerous specimens. Ovigerous specimens were taken from The Gulf and Hog Island Bay on 13 July through 22 August. Neither Schwartz and Cargo (1960) nor Ryan (1956) listed females with eggs, but one was mentioned by Rathbun (1930).
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Of 114 specimens examined from all localities 113 had the red spot basally on the inner surface of the third maxilliped. This spot was mentioned by Ryan (1956) and pointed out to me by W. A. Van Engel. All Panopeus examined were adult except for one immature male from Wachapreague.
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The spot in males was much larger and was reduced in females (including one ovigerous). A single ovigerous female from Hog Island Bay had no spot on either maxilliped.

Salinities where this mud crab was taken ranged from 16.9 to 33.2 ‰. It was another mud crab taken in the intertidal zone and found exposed at low tide (Table 1). The largest specimen measured was 47 mm in carapace width. Few measurements were made but all larger crabs (above about 31 mm) were males.

TABLE 1 -- Counts of xanthid crabs by depth in medium to high salinities.

SPECIES	INTERTIDAL ¹	SUBTIDAL ²
<u>Neopanope texana</u> ³	2	92
<u>Eurypanopeus depressus</u>	217	49
<u>Panopeus herbsti</u>	28	8
<u>Rhithropanopeus harrisi</u> ⁴	4	0

1. Localities included are Bradfords' Bay, Gulf, Drawing Channel, Wachapreague, Hog Island Bay.
2. Localities included are Swash Bay, Drawing Channel, Cherrystone Creek, Gulf, Occohannock Creek (depths 0 to 2 meters).
3. None taken exposed at low tide.
4. All counts from the Seaside. (see text).

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TABLE 2 -- Distribution of xanthid crabs in sponges on the Eastern Shore of Virginia, August, 1961.

SPONGE	LOCATION	DATE	CRAB SPECIES	NUMBER
<u>Lissodendoryx</u> sp.	Wachapreague	August 9, 1961	<u>Neopanope texana</u>	6
			<u>Eurypanopeus depressus</u>	33
<u>Halichondria</u> sp.	Wachapreague	August 9, 1961	<u>Neopanope texana</u>	2
			<u>Eurypanopeus depressus</u>	32
<u>Halichondria</u> sp.	Cherrystone Creek	August 15, 1961	<u>Neopanope texana</u>	9
<u>Haliclona</u> sp.	Occohannock Creek	August 17, 1961	<u>Rhithropanopeus harrisi</u>	1
<u>Hymeniacodon heliophila</u>	Hog Island Bay	August 22, 1961	<u>Neopanope texana</u>	1
<u>Microciona prolifera</u>	Gulf	August 24, 1961	<u>Eurypanopeus depressus</u>	11
<u>Hymeniacodon heliophila</u>	Wachapreague	August 25, 1961	<u>Eurypanopeus depressus</u>	7
<u>Microciona prolifera</u>	Wachapreague	August 25, 1961	<u>Neopanope texana</u>	18
			<u>Eurypanopeus depressus</u>	12

TABLE 2 --- Continued

<u>Lissodendoryx</u> sp.	Wachapreague	August 25, 1961	<u>Neopanope texana</u>	58
			<u>Eurypanopeus depressus</u>	40
			<u>Panopeus herbsti</u>	2
<u>Haliclona</u> sp.	Wachapreague	August 25, 1961	<u>Eurypanopeus depressus</u>	1
<u>Halichondria</u> sp.	Wachapreague	August 25, 1961	<u>Neopanope texana</u>	4
			<u>Eurypanopeus depressus</u>	15