6-1979

Recycling Freshly Shucked Oyster Shells

John Ogle
Gulf Coast Research Laboratory

Al Chestnut
Gulf Coast Research Laboratory

DOI: 10.18785/negs.0301.05

Follow this and additional works at: <https://aquila.usm.edu/goms>

Recommended Citation

Ogle, J. and A. Chestnut. 1979. Recycling Freshly Shucked Oyster Shells. *Northeast Gulf Science* 3 (1).
Retrieved from <https://aquila.usm.edu/goms/vol3/iss1/5>

This Article is brought to you for free and open access by The Aquila Digital Community. It has been accepted for inclusion in Gulf of Mexico Science by an authorized editor of The Aquila Digital Community. For more information, please contact Joshua.Cromwell@usm.edu.

and Larry Johnson of Alabama Department of Conservation and Natural Resources. Appreciation is expressed to Dr. Eugene M. Bureson, Virginia Institute of Marine Sciences; and Lucy B. Williams, of the Department of Marine Sciences, University of Puerto Rico for reviewing the manuscript.

LITERATURE CITED

- Sawyer, R. T., A. R. Lawler, and R. M. Overstreet. 1975. Marine leeches of eastern United States and the Gulf of Mexico with a key to the species. *J. Nat. Hist.* 9: 633-677.
- Williams, E. H., Jr. and J. L. Gaines, Jr. 1974. Acanthocephala of fishes from marine and brackish waters of the Mobile Bay Region. *J. Mar. Sci., Alabama* 2 (3): 135-148.
- _____ and L. B. Williams. 1978. Cymothid isopods of some marine fishes from the northern Gulf of Mexico. *Northeast Gulf Sci.* 2 (2):122-124.
- Ernest H. Williams, Jr., *Department of Marine Sciences, University of Puerto Rico, Mayaguez, PR 00708.*

RECYCLING FRESHLY SHUCKED OYSTER SHELLS

Oyster shells are extensively used in culture operations to collect oyster spat. Those shells are either dredged (mud shells) or weathered shells from processing plants (St. Amant, 1958). The replanting of oyster shells immediately after shucking was reported by Moore (1897), but is not currently practiced along the Gulf Coast. The purpose of this study was to determine the growth and survival of attached spat on freshly shucked shells after replanting in Biloxi Bay, Mississippi.

MATERIALS AND METHODS

Freshly shucked, Louisiana oyster shells were obtained from two seafood processing plants on the Back Bay of Biloxi on two separate occasions. The shells were held in fiberglass troughs supplied with running bay water until planted five weeks later. The numbers of shells and the numbers of spat were determined for each of the four experimental groups of shells. The spat on each group of shells were measured (greatest umbo to bill dimension) and marked with an identifying number. The numbered, plastic tags were cemented to the spat with Marine Tex® epoxy resin (Travaco Laboratories, Inc., 345 Easter Ave., Chelsea, Mass. 02150). The four experimental groups were planted on the bottom of Biloxi Bay at Point Cadet just below mean low water in 1 m² staked plots during March, 1977. The four experimental plots contained 201, 525, 527, and 532 single valves with 37, 100, 100, and 41 marked spat, respectively. Two, 1m² control plots were also established and received no shells. All plots were cleared of existing shell material prior to treatment. In addition, two experimental plots were covered with four mil polyethylene sheeting prior to the planting of the shells.

RESULTS

Eighty-six of the 278 marked spat (31%; range 20 to 42%) were recovered at the end of ten months; of these 25 or 9% (range 5-24%) of the original marked spat were recovered alive (Table 1). The surviving spat had grown an average of 29.0 mm (2.9 mm/mo.),

Of the original 1,785 shells planted, 1,372 (77%; range 60 to 106%) were recovered from the experimental plots;

TABLE 1. Recovery, survival and growth of marked spat on shucked shells after replanting for ten months.

Plot number	1*	2*	3	4	All Plots	
					Total	Mean
Spat planted	37	100	100	41	278	
Spat recovered	13	20	42	11	86	
Recovery (%)	35	20	42	26		31
Living spat	9	6	8	2	25	
Survival (%)	24	6	8	5		9
Average length increase (mm)	31.8	25.7	28.4	28.5		29.0
Average growth (mm/mo)	3.18	2.57	2.84	2.85		2.90

*(Planted on polyethylene sheets)

1,076 of those shells (78%; range 73 to 94%) caught 2,420 live spat or an average of 2.25 spat per shell (Table 2). An additional 868 dead spat were found on the shells recovered from the experimental plots. Survival of newly attached spat averaged 74%.

Of the 59 shells recovered from the two control plots 53 shells contained a total of 102 recently attached spat; 64 (63%) of those were alive at the time of recovery. No marked spat were found on either control plot.

DISCUSSION

Based upon the present study, if freshly shucked oyster shell were replanted at least 9% of the attached spat could be recovered alive. A survival of only 4% should be profitable by virtue of yielding the same volume as planted (Hopkins, 1950). Commercially, one should expect a greater survival. The survival presented here

is somewhat low due to the loss of marked spat from the experimental plots (31% recovery). Since no attempt was made to prevent biological or physical activity in the plots, it must be assumed that predators, especially crabs, and wave turbulence caused by storms and passing boats moved shells onto and off the plots. The recovery of shells from the previously cleaned control plots supports this view. Loss of shells into the mud was not a problem as there was no observable effect due to the presence of polyethylene sheeting in two of the experimental plots (1 and 2). We believe that had the plots been in deeper water or had the shells been retained by fencing, more spat would have been recovered.

ACKNOWLEDGMENTS

We wish to express our appreciation to Paul Langefield and Kathy Flurry for technical assistance and to E. W. Cake, Jr. and Tom Deardorff for their review and comments of this manuscript.

LITERATURE CITED

Hopkins, S. H. 1950. The inter-relationship of weight, volume and linear

TABLE 2. Recovery, spat catch and spat survival on shucked shells after replacing for ten months.

Plots	Experimental						Control			
	1	2	3	4	All Plots		1	2	All Plots	
					Total	Mean			Total	Mean
Shells planted	525	201	532	527	1785		0	0	0	
Shells recovered	316	224	431	401	1372		25	34	59	
Recovery (%)	60	106	81	76	—	77	—	—	—	—
Shells with spat	231	210	323	312	1076		21	32	53	
Shells with spat (%)	73	94	75	78	—	78	84	94	—	89
Live spat	377	552	751	740	2420		27	37	64	
Dead spat	155	218	309	186	868		14	24	38	
Survival (%)	71	72	71	80	—	74	66	61	—	63

- measurements of oysters and the number of oysters per Louisiana sack measure. Texas A&M Research Foundation. Project 9. Unpublished report. 14 pp.
- Moore, H. F. 1897. Oysters and methods of oyster culture. U. S. Commission of Fish and Fisheries. Report of Commissioner for 1897: 163-340.
- St. Amant, L. S. 1958. Successful use of reef shells (mud shells) as oyster cultch in Louisiana. 1958 Proceedings National Shellfisheries Association 49: 71-76.
- John Ogle and Al Chestnut, *Oyster Biology Section, Gulf Coast Research Laboratory, Ocean Springs, MS 39564*.
- Callianassa (Callichirus) acanthochirus* (Stimpson, 1866) (Crustacea: Decapoda: Thalassinidea) FROM THE COASTAL WATERS OF ALABAMA
- One June 8, 1976, a single specimen of mud shrimp, *Callianassa acanthochirus* (Stimpson, 1866), was collected with a bucket dredge from the R/V Rounsefell approximately two miles south of Fort Morgan, Baldwin County, Alabama (30°10'N, 87°55'W). The specimen, a small, apparently mature male, had a carapace length of 13 mm. The body length, measured from the tip of the rostrum to the end of the telson, was 44 mm. It was taken at a depth of approximately 10 meters on a firm, fine sand bottom. Associated species occurring in the same same were a porcellanid crab, *Euceramus praelongus* (Stimpson, 1860), and a bivalve, *Pandora trilineata* Say, 1822.
- All previous reports of *C. acanthochirus* are from southern Florida (Miami, Florida Keys, Dry Tortugas), the Caribbean (Puerto Rico, Jamaica, Barbados, Antigua) and Venezuela (see Biffar, 1971). This Alabama record extends the range of *C. acanthochirus* approximately 700 km northwestward from south Florida into the northeastern Gulf of Mexico.
- Biffar (1971) gave an excellent supplemental description of *C. acanthochirus* based on material collected from south Florida and the Caribbean region. He also reviewed the literature, taxonomy, ecology, and previous records of this and other species of *Callianassa* Leach, 1814, from the south Florida area. Morphologically, our specimen agrees in all major respects with Biffar's account.
- Of the known northwestern Atlantic species, *C. acanthochirus*, along with four other species -- *C. guassutina* Rodrigues, 1966; *C. longiventris* A. Milne-Edwards, 1870; *C. rathbunae* Schmitt, 1935; and *C. hartmeyer* Schmitt, 1935 -- are characterized by having a pair of spinous lateral projections on the frontal margin of the carapace (Fig. 1, B). *Callianassa acanthochirus* is readily distinguished from these other species by the presence of 2 to 3 well-developed spines on the dorsal margin of the palm of the major chela (Fig. 1, A).
- Stimpson (1866) originally described *C. acanthochirus* as the type for the genus *Glypturus* with the type locality as the Florida Keys. Schmitt (1935) considered *Glypturus* a junior synonym of *Callianassa* and placed *C. acanthochirus* in the subgenus *Callichirus* Stimpson, 1866. In a brief systematic review of the family Callianassidae, de Saint Laurent (1973) described five new genera and reelevated *Callichirus* to full generic rank. Pending a more complete systematic revision of *Callianassa* we tentatively continue to recognize *Callichirus* as a subgenus.