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Cymothoid Isopods of Some Marine Fishes from the Northern Gulf of Mexico

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LITERATURE CITED

Bowman, T. E., S. A. Grabe, and J. H. Hecht. 1977. Range extension and new hosts for the cymothoid isopod *Anilocra acuta*. Chesapeake Sci. 18(4): 390-393.

Comeaux, G. T. 1941. Parasitic isopods of fishes from the Grand Isle, Louisiana Region. Proc. Louisiana Acad. Sci. 5(1): 86.

Dahlberg, M. D. 1969. Incidence of the isopod, *Olencira praegustator* and copepod *Lernaeenicus radiatus*, in three species and hybrid menhaden (*Brevoortia*) from the Florida coasts, with five new host records. Trans. Amer. Fish. Soc. 98: 111-115.

Guthrie, J. F. and R. L. Kroger. 1974. Schooling habits of injured and parasitized menhaden. Ecology 55:208-210.

Hastings, R. W. 1972. The barnacle, *Conchoderma virgatum* (Spengler), in association with the isopod, *Nerocila acuminata* Schioedte and Meinert, and the orange filefish, *Alutera schoepfi* (Walbaum). Crustaceana 22(3):273-278.

Hutton, R. F. 1964. A second list of parasites from marine and coastal animals of Florida. Trans. Amer. Micros. Soc. 83(4):439-447.

Pearse, A. S. 1952. Parasitic crustacea from the Texas coast. Inst. Mar. Sci. Bull. 2:5-42.

Richardson, H. 1905. Monograph on the isopods of North America. Bull. U. S. Nat. Mus. 54, 727 p.

Turner, W. R. and R. B. Roe. 1967. Occurrence of the parasitic isopod *Olencira praegustator* in the yellowfin menhaden, *Brevoortia smithi*. Trans. Amer. Fish. Soc. 96(3):357-359.

Williams, E. H., Jr. 1972. Parasitic infestation of some marine fishes before and after confinement in feeding cages. Ala. Mar. Res. Bull. 8:25-31.

———— 1974. Treatments employed for control of parasites of selected fishes stocked in mariculture experiments (1969-1972). Proc. World Maricult. Soc. 5:291-295.

———— and J. L. Gaines, Jr. 1974. Acanthocephala of fishes from marine and brackish waters of the Mobile Bay Region. J. Mar. Sci. Ala. 2:135-148.

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A METHOD FOR TAGGING IMMATURE BLUE CRABS (*Callinectes sapidus* Rathbun)

The economically important blue crab (*Callinectes sapidus* Rathbun) has proven to be a difficult subject for life history and population studies. Crabs periodically molt their exoskeleton along with any attached tags or markings. The most commonly used method of tagging blue crabs has been that developed by Fiedler (1930) in which a tag placed across the dorsal surface of the carapace is secured to the lateral spines. Because the tags are shed with molting their use has been largely limited to adult crabs (Cronin, 1949; Cargo, 1958; Tagatz, 1968). Studies on growth have been conducted with caged animals or by analysis of length-frequency data.

The present method was developed during the planning stage of a project on the population biology of the blue crab in Louisiana waters. Floy Tag and Manufacturing, Inc. of Seattle, Washington, furnished samples of tags that could be used in the project. In order to tag a large number of crabs quickly and easily spaghetti-type tags compatible with the standard Floy Mark II® fish tagging gun were used. This type of tag is constructed of a thin monofilament leader and anchor to which a length of plastic tubing bearing the desired information is secured. The tag is inserted through the thick membrane at the dorso-posterior articulation of the coxa of the fifth leg (paddle) with the body. The tagging gun greatly facilitates this operation as the membrane is quite tough and resists penetration. After the needle of the gun has been inserted, the operator pulls the trigger and forces the anchor end of the tag into the muscle cavity where it is retained by the membrane. The gun produces a small hole only slightly larger than the diameter of the leader. The whole procedure takes less than ten seconds.

It should be noted that the length of the monofilament leader is critical to the success of the molt; length of the spaghetti tag is not. In use, the thin leader slides through a groove in the needle during insertion. The construction of the tag causes the crab to molt in two steps. In the first step the crab molts normally except that it remains attached to the old shell by the tag, which catches on the hole in the membrane at the junction of the leader with the tag. The crab is apparently unable to pull the tag through while the new shell is completely soft. After the shell hardens slightly the crab is able to pull the end of the tag through the old shell and complete the molt. Too short a leader prevents the crab from extricating itself from the old shell.

In the experiment thirty crabs were tagged in two lots using leaders of various lengths. Sixteen crabs kept as controls were not tagged. The tagged crabs varied from 80 to 150 mm in carapace width. Only two of the eighteen crabs tagged with leaders shorter than 12 mm were able to molt successfully, while none of the animals tagged with longer leaders died during the molting process. Best results were obtained with a No. FD67B tag with a 30 mm leader. Four of the ten crabs tagged with this model tag shed successfully within ten days after tagging. The remaining six did not attempt to molt before the conclusion of the experiment.

The experiment was conducted with animals confined in aquaria using artificial sea water at a salinity of 5°/∞. Observations on tagged crabs in the aquaria revealed no behavioral changes after tagging. The tags did not impede swimming ability and the crabs appeared oblivious to both their own tags and those of other crabs in the same tank. The tags offer little water resistance and stream behind the crabs as they swim. During the experiment two tagged female crabs were observed mating with tagged males shortly after molting. Statistical comparisons between control crabs and tagged crabs were impossible because of several failures in the water filtration system that caused heavy mortalities among both groups. However, two tagged crabs that molted successfully were kep in captivity for more than three weeks before they were sacrificed for dissection. No ill effects from the tagging were noticeable either before or after molting. None of the tagged crabs attempted to molt more than once, but it is my

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opinion that the tag would be retained in successive molts.

In summary, the method described above of tagging crabs by internally anchoring an external spaghetti tag seems promising based on laboratory trials. The only drawback observed in the laboratory is that the tag somewhat hinders molting and may therefore increase the susceptibility to predation of the crab during this vulnerable time. It is possible that this drawback could be avoided by hand insertion of a conventional dart tag which has no leader and would offer less resistance to molting. However, this type of tag would also be more difficult to insert and require punching a larger hole in the membrane. The gun produces a small hole only about one mm in diameter and minimizes trauma to the crab.

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LITERATURE CITED

Cargo, D. G. 1958. The migration of adult female blue crabs, *Callinectes sapidus* Rathbun, in Chincoteague Bay and adjacent waters. J. Mar. Res. 16(3):180-191.

Cronin, L. E. 1949. Comparison of methods of tagging the blue crab. Ecology 30(3):390-394.

Fiedler, R. H. 1930. Solving the question of crab migrations. Fishing Gazette 47:18-21.

Tagatz, M. E. 1968. Biology of the Blue crab, *Callinectes sapidus* Rathbun, in the St. Johns River, Florida, U. S. Fish and Wildl. Serv. Fish. Bull. 67(1):17-33.

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FOOD HABITS OF THE BAY ANCHOVY, *Anchoa mitchilli*, IN APALACHICOLA BAY, FLORIDA

Ontogenetic, spatial and temporal aspects of the food habits of the bay anchovy, *Anchoa mitchilli*, were examined in fish collected from Apalachicola Bay, Florida. Calanoid copepods were the major constituent of the anchovy diet, but their importance declined with fish growth as larger zooplankters such as mysids were consumed. Specialization upon copepods led to moderate diet similarity among sites in the estuary, except in areas near the mouth of the Apalachicola River where mysids, insect larvae, and cladocerans were major food items. Copepods were the dominant prey in all months but were markedly less abundant prey in October, December, and February when other crustaceans and insect larvae became relatively more abundant.

INTRODUCTION

The bay anchovy, *Anchoa mitchilli*, is one of the most abundant fishes in South Atlantic and Gulf coast estuaries, ranking first in numerical abundance in many areas (Gunter, 1945; Perret, 1971; Swingle, 1971; Gallaway and Strawn, 1974; Subrahmanyam and Drake, 1975; Cain and Dean, 1976). An extended spawning season has been indicated (Gunter, 1938; Springer and Woodburn, 1960; Hoese, 1973), and one study (Dunham, 1972) found planktonic eggs and larvae throughout most of the year. This accounts for the collection of juveniles less than 30 mm in length