TREATMENTS EMPLOYED FOR CONTROL OF PARASITES OF SELECTED FISHES STOCKED IN MARICULTURE EXPERIMENTS (1969-1972)

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ABSTRACT

Effective indefinite prolonged treatments with 20 ppm formalin for the external protozoa, Scyphidia sp. and Trichodina spp. (Ciliata) of eight species of fishes, and 0.25 ppm Dylox for 24 hours for the polyopisthocotylean monogenetic trematode, Bicotyphthora trachinotis, from the gill filaments of pompano (Trachinotus carolinus) are discussed. These treatments were successfully employed during 4 years of mariculture experiments at Dauphin Island, Alabama. A prolonged treatment for cymothoid isopods of pompano is discussed. Subsequent testing of the treatment was not possible. Toxicity of Dylox to pompano in saltwater is presented.

INTRODUCTION

During the summers of 1969 through 1972 and the winter of 1971-1972, mariculture experiments were conducted by the Marine Resources Division of the Alabama Department of Conservation and Natural Resources at the Alabama Marine Resources Laboratory on Dauphin Island, Alabama. The purpose of these experiments was to develop techniques of culturing marine fishes in floating cages (Swingle, 1970, 1971a, 1971b, 1972; Swingle and Tatum, 1971; Powell, 1972; Tatum, 1972). Fish used in these experiments were examined to determine the abundance of parasites before and at the conclusion of

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these experiments (Williams, 1972; Williams, et al., unpubl. data). The experiments were concluded in 1972 and the present report is based on treatments for parasites employed during this period.

**PROTOZOA TREATMENT**

External protozoan parasites of the genera Scyphidia spp. and Trichodina spp. (Ciliata) were the most serious disease problem of the mariculture experiment conducted in 1969 (Williams, 1972). These parasites caused hyperplasia of the epithelial cells of the gill filaments in five species of fishes as evidenced by histological studies. Massive mortalities of pompano (Trachinotus carolinus) held in aerated seawater in concrete tanks and circular raceways, occurred after the mariculture experiment because of heavy infestations of these parasites.

During initial collecting of pompano and striped mullet (Mugil cephalus) for the mariculture experiment in 1970, formalin was employed as a prolonged treatment to eliminate external protozoan parasites. Approximately 200-300 pompano averaging 8.4 cm in total length were placed in 400 liters of aerated saltwater at 30 ppt salinity. Replicates were treated with 15 and 20 ppm formalin for 24 hours. Samples of approximately 100 to 200 striped mullet averaging 3.6 cm in total length were treated similarly. Twenty untreated specimens of each species were examined for protozoan parasites, and five specimens were examined from each replicate after treatment.

Birdsong and Avault (1971) achieved complete control of Oodinium sp., Scyphidia sp., and Trichodina spp. on juvenile pompano with 15 ppm formalin in saltwater at 20 ppt salinity. In the present experiment, 15 ppm formalin was not effective in eliminating external protozoans of pompano and striped mullet, but 20 ppm completely eliminated external protozoans. In subsequent mariculture experiments 20 ppm formalin was completely effective in eliminating external protozoans in pompano; striped mullet; striped bass (Morone saxatilis); Atlantic croaker (Micropogon undulatus); spot (Leiostomus xanthurus); Southern kingfish (Menticirrhus americanus); tilapia (Tilapia aurea); and rainbow trout (Salmo gairdneri).

**POLYOPISTHOCOTYLEAN MONOGENETIC TREPAMODE TREATMENT**

During the mariculture experiment in 1970, mortalities occurred with caged pompano due to infestation of the gill filaments with Bicotylophora trachinoti, a polyopisthocotyloid monogenetic trematode. The mortalities occurred in the majority of the cages with one or two individuals dying each day or every few days. In some individuals the trematode infestation was considered heavy enough to cause injury to the host while others had very few worms. Formalin treatment at 100 ppm for 3 hours prior to stocking of fishes did not eliminate the trematodes. Dylox was employed as a prolonged treatment in an attempt to eliminate the trematodes.
Five pompano averaging 9.6 cm in total length were placed in 40 liters of saltwater at 30 ppt salinity, with aeration. Replicates were treated with 0.10, 0.25, 0.50, 0.75, 1.00, 3.00, 5.00, 7.00 and 10.00 ppm Dylox (active ingredient). Each sample was examined for mortalities at 3, 6, 12, 24, 48, 72, and 96 hours duration. A concentration of 0.25 ppm was chosen from the results (see table) and cages of pompano were given a 24 hour treatment. Five pompano were examined from each cage after treatment and no monogenetic trematodes were observed.

ISOPOD TREATMENT

During initial collecting of pompano for the mariculture experiment in June of 1969, 4 to 5% of the fishes were infested with isopods (Crustacea: Cymnothoidae) in the branchial cavity. Formalin was employed as a dip and as a prolonged treatment to eliminate the isopods.

Four pompano averaging 7.2 cm in total length were placed in 12 liters of saltwater at 30 ppt salinity with aeration. Replicates were treated with 100, 200, 500, and 1,000 ppm formalin.

Two hundred ppm formalin for 40 minutes was found to kill the isopods without producing stress on the fish. During all treatments isopods would occasionally move about on the fish and cause erratic swimming and rapid opercular flap movements in the host. At the higher treatment rates (500 and 1,000 ppm) the isopods often left the host and did not reattach to any of the fish.

In subsequent collections in 1969 through 1972, isopods were rarely encountered. Further testing of the treatment was not possible and its application became unnecessary.

ACKNOWLEDGEMENTS

Thanks are extended to Ronald P. Phelps, Dr. John L. Gaines, Jr., and Wilmer A. Rogers of the Southeastern Cooperative Fish Disease Project; M. R. Powell, W. M. Tatum, H. A. Swingle, and W. E. Swingle and other personnel of the Alabama Marine Resources Laboratory for assistance and loan of facilities.

LITERATURE CITED


Powell, M. R. 1972. Striped bass, Morone saxatilis production to establish commercial stocks in Alabama estuaries. Alabama Department of Conservation and Natural Resources, Marine Resources Division, Federal Aid Annual Progress Report AFC-3-


Table 1 - Toxicity of Dylox to Pompano in Percentage Mortality (At 30 ppt Salinity)

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