EXPERIMENTAL USE OF ANTIBIOTICS IN PREVENTING DELAYED MORTALITY IN A BASS TOURNAMENT ON LAKE SEMINOLE, GEORGIA[1]

by

J. A. Plumb and J. L. Gaines
Department of Fisheries and Allied Aquacultures
Alabama Agricultural Experiment Station
Auburn University, Auburn, Alabama

and

M. Gennings
Georgia Department of Natural Resources
Albany, Georgia 31705

ABSTRACT

Oxytetracycline, as a prophylaxis against secondary bacterial infections, was injected into 531 largemouth bass (*Micropterus salmoides*) which were caught during a fishing tournament on Lake Seminole, Georgia. The injected fish, along with 531 control bass, were held for observation in a 1-acre canal contiguous with the lake. After 19 days, 4.3% of the injected fish had died and 2.2% of the control fish had died. The oxytetracycline was not beneficial in reducing mortality in the released bass.

INTRODUCTION

When fish are handled or caught by hook and line, they frequently suffer from stresses that may result in death involving secondary bacterial infections of *Aeromonas liquefaciens*. If fish are injured, scales dislodged, mucous disrupted, or have severe hook lesions, they are more susceptible to a bacterial infection. Injecting antibiotics into broodstock when they are handled has been a chemotherapeutic tool for many years on warmwater hatcheries in Europe and the United States (Snieszko, 1965; Schaperclaus, 1967; Herman, 1970a, 1970b). The purpose of the antibiotic is to assist the fish in overcoming secondary bacterial infections which may result from injury or stress.

In recent largemouth bass (*Micropterus salmoides*) fishing tournaments sponsored by the Bass Anglers Sportsman Society (BASS), those fish surviving the tournament have been released back into the lake from which they were caught. In order to improve the fish's chances of survival after release the use of an injectible antibiotic has been explored; a technique initially used on tournament caught and released bass in Mississippi during April, 1973 (Wellborn and Barkley, 1973). The study reported here was carried out at a BASS sponsored tournament on Lake Seminole, Georgia on May 2-4, 1973, when one-half of the released bass were injected with an antibiotic and observed for 19 days in a blocked off canal.

METHODS AND MATERIALS

During fishing hours of the 3-day tournament, captured fish were held in boat live wells with recirculating water supplies. Upon docking for the weigh-in, fish were placed in perforated plastic bags (18″ x 36″) and held in 30 gallon cans containing a 10 ppm acriflavin solution until counted. After weighing, the fish were placed into a 500 gallon holding tank in which the temperature was adjusted to near that of the lake water and maintained by a cooling unit.

Dead and moribund fish were removed from the holding tank and 30 moribund bass (10 each day) were examined for external parasite infestations and bacterial infections. Parasite infestations were determined by microscopic examination of scrapings from gills, skin and fins. Bacterial infections were determined by streaking material from

[1]Research supported by Southeastern Cooperative Fish Disease Project, and Sport Fish Restoration Funds.

skin lesions and the kidney on brain-heart infusion agar (Difco Laboratories) plates. Isolated bacteria were presumptively identified as fish pathogens according to the method of Bullock, Snieszko, and Dunbar (1965).

Living fish were individually netted from the holding tank and their weight estimated to the nearest one-half pound. Alternate fish were injected intraperitoneally with liquid oxytetracycline (Terramycine: Pfizer Co., Terre Haute, Indiana) at a rate of 25 mg per pound of body weight.

Injected fish were given different finclips for each of the 3 days. Injected and control fish were transferred to a fish truck and hauled 5 miles to a 1-acre canal (average depth 3 ft.) which was contiguous to Lake Seminole, but separated from the lake by a block net. Daily checks were made in the canal for dead fish which were removed and examined for fin clip. The block net was removed from the canal 19 days after the first fish were released. Six bass were captured by hook and line prior to net removal and examined for bacterial infections, parasitic infestations, and general condition.

RESULTS AND DISCUSSION

A total of 1,413 largemouth bass, which weighed 2,753 pounds, were caught during the 3-day tournament at Lake Seminole, Georgia; 347 (24.6%) of these fish died before they could be included in the antibiotic experiment (Table 1). The highest percentage of weigh-in mortality occurred on the first and second day of the tournament.

Table 1. Number and weight of largemouth bass captured in the Lake Seminole, Georgia, Bass Tournament, May 2, 3, and 4, 1973.

Day	Total Catch		Deaths (at weigh-in)		Percentage mortality (at weigh-in)
	Number	Weight (lb)	Number	Weight (lb)	
1	535	1,031	163	324	30.5
2	496	945	130	202	28.5
3	382	777	54	138	14.4
Total	1,413	2,753	347	664	24.6

The bacterium *Aeromonas liquefaciens* was isolated from skin lesions on five of the 30 moribund bass, but not from the kidneys of any fish. External parasites included: *Scyphidia* and *Trichodina* on the gills of one fish each, *Epistylis* on the skin of five fish and *Lernaea* on the skin of six fish. Monogenetic trematodes (*Urocleidus*) were on the gills of 18 fish. Internally, larval *Posthodiplostomum minimum* were found in three fish and *Contracaecum* in six fish. Many fish had small to massive hemorrhaged lesions on the skin which were associated with *A. liquefaciens* infections and *Epistylis* or *Lernaea* infestations. On the third day of the tournament, 15% of the fish had such lesions. The etiology of these lesions was probably detrimental to the fish and contributed to the mortality on the day fish were caught. The lake water temperature was a moderate 21 C which is not excessively high for handling fish.

Twenty-four (4.3%) of the 531 injected fish were found dead while only 12 (2.2%) dead non-injected fish were found during the observation period (Table 2). In the injected group, 96% of the mortality occurred during the first 6 days after release; 83% of the control mortality occurred during the same period. Similar to the pattern on the days of the tournament, the highest mortality occurred in those fish released on the first and second day of the tournament. In contrast to data presented by Wellborn and

Barkley (1973) the injection of antibiotics into the captured and released bass in this study did not result in a lower mortality than in the control group. The additional handling, and possibly the fin clipping, may have been more detrimental to the fish than any benefit from the antibiotic. It is plausible that some dead fish were not recovered from the canal, but there were few areas in the canal that the bottom was not visible.

Table 2. Summary of results of antibiotic injection into largemouth bass caught and released during a fishing tournament on Lake Seminole, Georgia, May 2, 3, and 4, 1973.

Tournament day	Injected			Control		
	Number	Deaths	Percent dead	Number	Deaths	Percent dead
1	186	12	6.4	186	--	--
2	183	9	4.9	183	--	--
3	162	3	1.8	162	--	--
Total	531	24	4.5	531	12	2.2

When the block net was removed 19 days after the first fish were released into the cove, six fish (3 marked and 3 unmarked) were easily captured on artificial bait. These fish were in excellent condition, harbored no bacterial infections, or external parasitic infestations, and there were no skin lesions. Also, there were signs of spawning activity in the canal, but there was no assurance that fish trapped in the canal prior to block-off were not responsible for the nests.

CONCLUSIONS

Injection of oxytetracycline into largemouth bass captured and released during the Lake Seminole bass tournament was of no prophylactic value. The delayed mortality of the test fish was higher than the control fish and overall mortality was considered to be very low. The adoption of routine antibiotic injection into released bass for future tournaments does not appear feasible either in efficacy or from a practical standpoint. Fish that survived the tournament were readily recaptured on artificial baits 19 days after release at which time they were in good condition.

ACKNOWLEDGMENTS

Appreciation is expressed to Mr. Ray Scott, President, Bass Anglers Sportsman Society, for his cooperation in the study, and to Mr. W. D. Green and Mr. John Purinton for checking the retention area each day and collecting the dead fish.

LITERATURE CITED

Bullock, G., S. F. Snieszko, and C. Dunbar. 1965. Characteristics and identification of oxidative pseudomonads isolated from diseased fish. J. Gen. Microb., 38:1-7.

Herman, R. L. 1970a. Prevention and control of fish diseases in hatcheries. In: *Symposium on Diseases of Fishes and Shell Fishes.* Ed. by S. F. Snieszko. Amer. Fish. Soc. Spec. Pub. No. 5:3-15.

Herman, R. L. 1970b. Chemotherapy of fish diseases: A review. J. Wildl. Dis. 6:31-34.

Schaperclaus, W. 1967. Erfolgreiche bekampfung der Infektiosen Bauchwas Sersucht des Karpfens mit Antibiotisches mitteln in 11 Jahren. Deut. Fish. 14:64-66.

Snieszko, S. F. 1965. The control of bacterial and virus diseases of fishes. In: Control of Fish Diseases and Parasites (S. F. Snieszko, Chairman) Biol. Prob. in Water Pollution. 3rd Seminar, 1962:281-282.

Wellborn, T. L., Jr. and J. H. Barkley. 1973. Study on the survival of tournament released bass on Ross R. Barnett Reservoir, April, 1973. Proc. 27th Ann. Conf. Southeast. Assoc. of Game and Fish Comm. 27:512-519.

INITIAL AND DELAYED MORTALITIES OF LARGEMOUTH BASS CAPTURED IN THE 1973 NATIONAL KEOWEE B.A.S.S. TOURNAMENT[1]

by

Donald L. Archer[2]
South Carolina Wildlife and Marine Resources Department
Columbia, South Carolina 29202

Harold A. Loyacano, Jr.
Department of Entomology and Economic Zoology
Clemson University
Clemson, South Carolina 29631

ABSTRACT

Tournament-caught largemouth bass were compared with hatchery bass to determine survival rates of bass injected or uninjected with oxytetracycline. Significant mortality rates occurred only in injected tournament-caught bass held in plastic pools. Hatchery controls, uninjected tournament bass and injected tournament bass held in hatchery ponds exhibited mortality rates similar to each other. Survival was best in hatchery ponds, but not significantly better than in pools except for injected tournament-caught bass.

INTRODUCTION

Angling tournaments are not new on the sport fishing scene but they have increased recently in magnitude and number with several contests now organized on a professional level by a national organization. This trend may continue until a significant number of these tournaments will occur on every major lake and reservoir in the country.

These contests are usually directed at a particular species, the largemouth bass, *Micropterus salmoides* (Lacepede), which is a terminal predator and an important constituent of a well-balanced fish population. These tournaments tend to intensify angling pressures on this highly-preferred species by a group of fishermen who may be more proficient anglers than the general fishing public. For this reason the continued proliferation of these contests could have adverse effects on fish populations in our public waters.

In an attempt to reduce the impact of tournaments on bass populations and to allay public concern, a recent innovation by many tournament sponsors has been a "return-your-catch" policy, whereby qualifying fish are retained in live wells and returned to the lake of origin at the end of the contest day. Success of the release approach depends upon a relatively high survival rate for captured fish, which is directly related to the care taken by the individual angler and the refinement of holding and handling procedures.

Probably the most extensive and best planned handling procedures have been developed by the Bass Anglers Sportsman's Society (B.A.S.S.) in its national

[1]Technical Contribution no. 1199. South Carolina Experiment Station. Published by permission of the Director.
[2]Present address: Utah Division of Wildlife Resources, Cedar City, Utah 84720.