AMERICAN FISHERIES SOCIETY

PROCEEDINGS

ANNUAL MEETING
MISSISSIPPI CHAPTER

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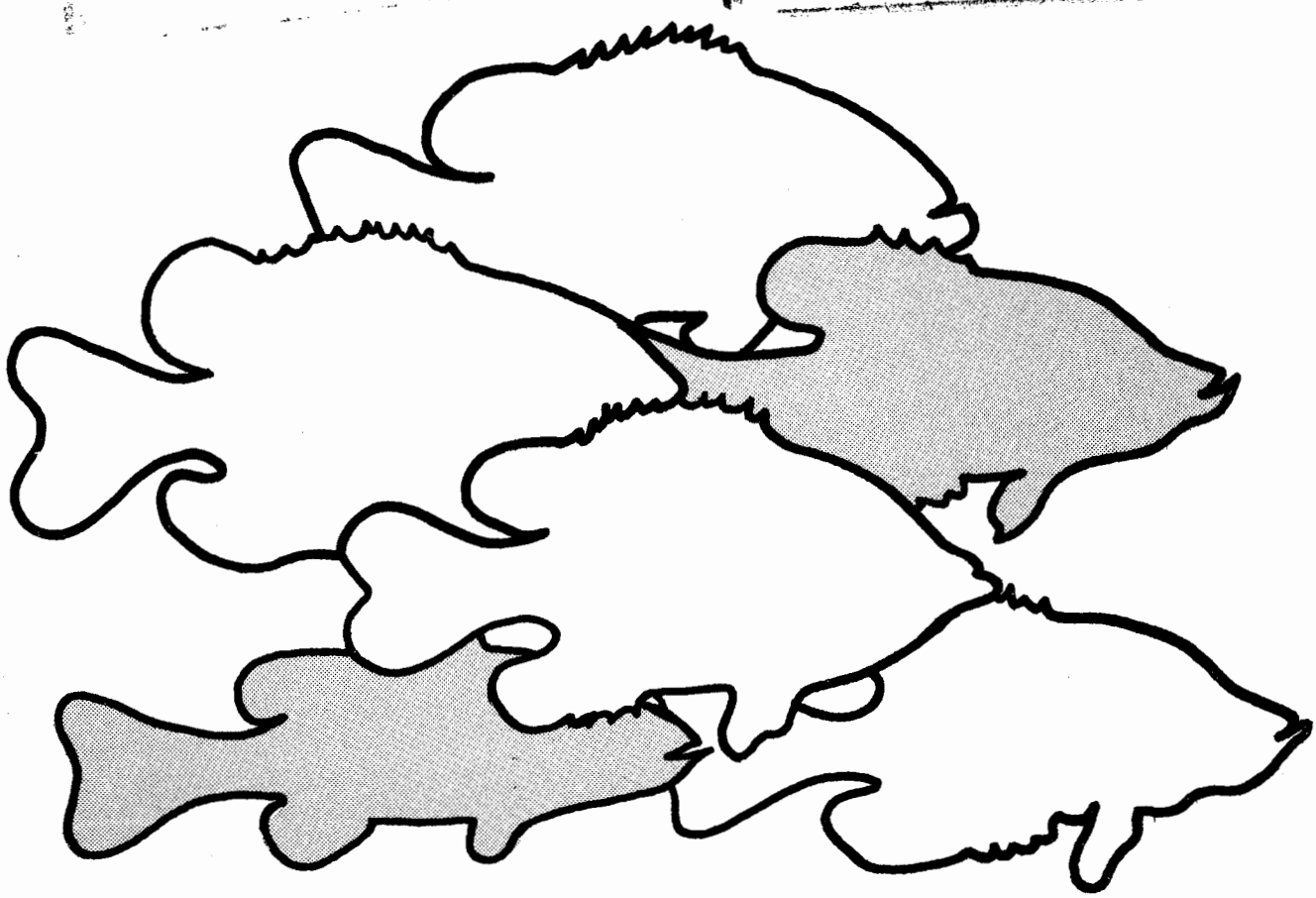

VOL. VIII
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National Marine Fisheries
Service Laboratory
Pascagoula, MS

PROCEEDINGS

ANNUAL MEETING OF THE MISSISSIPPI CHAPTER AMERICAN FISHERIES SOCIETY

16-17 February 1984

National Marine Fisheries Service Laboratory
Pascagoula, Mississippi

OFFICERS

H. Randall Robinette, President
Mississippi State University

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Mississippi Department of Wildlife Conservation

John A. Baker, Secretary-Treasurer
USAE Waterways Experiment Station

ANNUAL MEETING OF THE MISSISSIPPI CHAPTER

OF THE

AMERICAN FISHERIES SOCIETY

16 & 17 February 1984

at the

National Marine Fisheries Service Laboratory

Pascagoula, Mississippi

AGENDA

Thursday

0745-0830 Registration.

0830-0850 Call to order and welcome.

0850-0950 Keynote Speaker - Dr. Rudolph Rosen, Fisheries Specialist with the National Wildlife Federation.

0950-1010 Break.

1010-1215 Business Meeting.

1400-1520 Technical Session I:

"The Effects of Acute Stress on Channel Catfish."
Catherine F. Ellsaesser, Craig J. Lobb, and L. W. Clem.

"The Use of Monoclonal Antibodies to Separate Subpopulations of Lymphocytes from the Channel Catfish."
Norman W. Miller, Catherine F. Ellsaesser, Craig J. Lobb, and L. William Clem.

"Potentiated Sulfonamide Therapy of Bacterial Infections in Channel Catfish."
Paul R. Bowser, William W. Falls, Doug Munson, and Ruth Floyd.

"Cortisol Levels in Commercially Raised Channel Catfish."
Gerald Ainsworth and Paul Bowser.

1520-1540 Break.

1540-1700 Technical Session II:

"Pathology Associated with a Natural Edwardsiella ictaluri. Infection in Channel Catfish (Ictalurus punctatus Rafinesque)."
Herman H. Jarboe, Paul R. Bowser, and H. R. Robinette.

"Update on 'While Lip Disease'."
Susan Simmons, Ruth Francis-Floyd, and J. R. MacMillan.

"Mineral Supplementation of Practical Catfish Diets."
Delbert M. Gatlin, III, and Robert P. Wilson.

"Comparison of 35% and 32% Crude Protein Levels in Practical Catfish Feeds."
H. R. Robinette and Rob Busch.

Friday

0830-0930 "Environmental Systems and Refinery at the Pascagoula Chevron Refinery."
Bob Wallace.

0930-0950 Break.

0950-1110 Technical Session III:

"Vertical Distribution of Larval Fish in the Lower Mississippi River."
C. H. Pennington, Timothy R. Bosley, and Michael E. Potter.

"Macroinvertebrate Colonization of Concrete Revetment in the Lower Mississippi River."
C. Rex Bingham, David C. Beckett, and Linda E. Winfield.

"Winter Growth of Bluegills and Bluegill X Green Sunfish Hybrids in Mississippi."
Martin W. Brunson and H. Randall Robinette.

"Catchability of Male Bluegill X Female Green Sunfish Hybrids in Mississippi Ponds."
Martin W. Brunson and H. Randall Robinette.

1110-1130 Adjourn.

ABSTRACTS

Title: The Effects of Acute Stress on Channel Catfish.

Authors: Catherine F. Ellsaesser, Craig J. Lobb, and L. William Clem. University of Mississippi Medical Center, 2500 North State Street, Jackson, MS 39216-4505.

Baseline hematologic and immunologic parameters have been established for the peripheral blood leucocytes of both laboratory-acclimated and commercial pond-reared channel catfish. The techniques employed included the use of specialized cytochemical and immunochemical stains, cytofluorography and automated blood chemistry analysis. In addition a variety of in vitro tests for immune cell identification and function were developed. During the course of establishing these parameters it was observed that recently transported channel catfish were abnormal by multiple criteria and consequently experiments on the effects of acute "transport stress" on catfish were undertaken. The results of these studies show rather profound multiple effects demonstrable as early as 3 hours and persisting up to a week after stress. The diagnostic potential of this approach is suggested by the finding of such abnormalities in both diseased fish and in apparently normal fish from a production pond which subsequently underwent extensive mortalities of unknown origin.

Title: The Use of Monoclonal Antibodies to Separate Subpopulations of Lymphocytes from the Channel Catfish.

Authors: Norman W. Miller, Catherine F. Ellsaesser, Craig J. Lobb, and L. William Clem. University of Mississippi Medical Center, 2500 North State Street, Jackson, MS 39216-4505.

By employing monoclonal antibodies to catfish immunoglobulin in an indirect panning procedure, catfish PBL were separable into adherent (AD, > 90% sIg+) and nonadherent (NAD, < 10% sIg+) subpopulations. The functional features of the AD and NAD subpopulations from hapten-carrier primed fish were assessed by in vitro studies wherein anti-hapten antibody secreting cells (PFC) were generated by thymus independent (TI) and thymus dependent (TD) antigens. The results indicated that only the AD subpopulation is required for a primary PFC response to the TI antigen. In contrast, both the AD and NAD populations are required for a secondary PFC response to TD antigens. This study provides formal proof that the hapten-carrier response in fish requires the participation of at least two cell types, presumably T and B cells.

Title: Potential Sulfonamide Therapy of Bacterial Infections in Channel Catfish.

Authors: Paul R. Bowser, William W. Falls, Doug Munson, and Ruth F. Floyd. College of Veterinary Medicine, Drawer V, Mississippi State, MS 39762.

The purpose of this research was to evaluate the efficacy of a potentiated sulfonamide for therapy of Aeromonas hydrophila and Edwardsiella ictaluri infection in channel catfish. Fingerling channel catfish were challenged with a intraperitoneal injection of a standard dose of virulent bacteria. The fish were fed one of a series of drug doses (0, 25, 50, 75, 100 mg/kg) for 5 days, then fed a control ration for an additional 16 days. Daily mortalities were monitored throughout the trial. Our results to date suggest that a dose of 50 mg/kg for 5 days would be an appropriate dose for field evaluation.

Title: Cortisol Levels in Commercially Raised Channel Catfish.

Authors: Jerald Ainsworth, and Paul R. Bowser. College of Veterinary Medicine, Drawer V, Mississippi State, MS 39762.

Reference values for cortisol in commercially raised channel catfish have never been established relative to stocking density. Levels of cortisol were measured with a commercially available radioimmunoassay. Samples were obtained from an ongoing study concerned with three stocking densities, that is, 4000, 6000 and 8000 fish/acre. Results of this study will be presented.

Title: Pathology Associated with a Natural Edwardsiella ictaluri Infection in Channel Catfish (Ictalurus punctatus Rafinesque).

Authors: Herman H. Jarboe, Paul R. Bowser, and H. R. Robinette. Mississippi State University, Mississippi State, MS 39762.

Four ponds of a nine pond nutrition study on the South Farm Research Unit, Mississippi Agricultural and Forestry Experiment Station, Mississippi State, MS experienced an epizootic of bacterial origin. Estimated cumulative mortalities for affected ponds were 14.0, 12.4, 12.4, and 6%. After an evaluation of clinical findings it was concluded that the most probable cause of mortalities was Edwardsiella ictaluri. Therapy involved the administration of oxytetracycline to treatment feeds. Three ponds received a $CuSo_4$ treatment to reduce protozoan parasite infestations.

Title: Update on "White Lip Disease."

Authors: Susan Simmons, Ruth Francis-Floyd, and J. R. MacMillan. College of Veterinary Medicine, Drawer V, Mississippi State, MS 39762.

"White Lip Disease" was first diagnosed on commercial catfish farms in the Mississippi Delta in 1980. The disease is seasonal, occurring in the spring and fall, and is characterized by severe anemia and high mortalities. Hematocrits of less than 1% are not uncommon in affected fish. Clinical findings to date, including hematology, serum chemistries, histology, cytology and microbiology, will be discussed. The etiology of this syndrome has not yet been discovered. Several possibilities which will be discussed, include 1) a viral agent (electron micrographs of red blood cells have not revealed any viral particles); 2) erythrocytic toxins and 3) immune-mediated disorders.

Title: Mineral Supplementation of Practical Catfish Diets.

Authors: Delbert M. Gatlin III, and Robert P. Wilson. Mississippi State University, P.O. Drawer BB, Mississippi State, MS 39762.

Our laboratory has continued to investigate various mineral requirements of channel catfish. Their minimum dietary zinc requirement was determined with purified egg white diets to be 20 mg Zn/kg diet based on serum alkaline phosphatase, serum zinc, bone zinc and bone calcium data. Ingredients such as soybean meal and rice bran may reduce zinc bioavailability; therefore, we conducted an experiment with practical diets and determined that 150 mg/kg supplemental zinc was optimum for these diets. In two other experiments the selenium requirements of channel catfish fed adequate vitamin E was determined to be 0.25 mg Se/kg diet based on growth data and liver and plasma glutathione peroxidase activities. Typical catfish production diets may not contain adequate selenium; therefore, we recommend that the allowable level of 0.1 mg/kg supplemental selenium be added to commercial catfish feeds. Selenium supplementation will be even more critical if fish meal is reduced in practical diets since it is the primary source of selenium.

Title: Comparison of 35% and 32% Crude Protein Levels in Practical Catfish Feeds.

Authors: H. Randall Robinette, and Robert Busch. Mississippi State University. P.O. Drawer LW, Mississippi State, MS 39762.

During the 1981 and 1982 growing season, 3 computer derived least-cost feeds were compared to a commercial 35% crude protein feed containing 12% fish meal. Nutritional restrictions for least-cost feeds were: (1) no minimum crude protein or fish meal restriction, but same essential amino acid to energy ratios as control feed; (2) minimum 32% crude protein and 8% fish meal and equivalent essential amino acid to energy ratios as control; (3) no minimum crude protein or fish meal restriction, but some essential amino acid to energy ratios as in #2. There were no significant differences ($P \geq 0.05$) among the treatment for average weight gain, feed conversion or survival.

Title: Vertical Distribution of Larval Fish in the Lower Mississippi River.

Authors: C. H. Pennington, Timothy R. Bosley, and Michael E. Potter. USAE Waterways Experiment Station, P.O. Box 631, Vicksburg, MS 39180.

Larval fish were collected from main channel and dike pool habitats on the lower Mississippi River in mid-May and early-June 1982 to investigate diel fluctuations in diversity and abundance at discrete depths. Density estimates differed significantly ($P < 0.05$) among depths during June in the main channel and density was greater at the surface than at other depths and higher during daylight hours than at night in May and June. The same trend was observed in the dike pool only in June. There was no difference in number of taxa among time intervals during May or June nor among depths in May in the main channel and dike pool. However, number of taxa differed significantly among depths at both habitats in June. In May, Alosa spp. and Dorosoma spp. dominated the catch in the main channel and Alosa spp., Dorosoma spp., Aplodinotus grunniens, Carpiodes spp., and Ctenopharyngodon idella were the common taxa in the dike pool. During June, Aplodinotus grunniens was the most abundant species in both habitats.

Title: Macroinvertebrate Colonization of Concrete Revetment in the Lower Mississippi River.

Authors: C. Rex Bingham, David C. Beckett, and Linda E. Winfield. USAE Waterways Experiment Station, P.O. Box 631, Vicksburg, MS 39180.

Macroinvertebrates colonizing Articulated Concrete Mattress (ACM) Revetment of the Lower Mississippi River (LMR) were successfully sampled in two ways: (1) Blocks of concrete revetment measuring 35.6 cm x 38.1 cm x 7.6 cm (1/3 of full slabs) were placed on existing underwater ACM and recovered approximately one month later (2) Existing ACM slabs were removed from 20 cm deep water. Invertebrates were immediately brushed and picked from the retrieved ACM and preserved in the field. Two sets of samples using ACM blocks were taken. The first set was retrieved on 5 and 8 November 1982 and the second was retrieved on 4, 5 and 12 October 1983. Existing ACM slab samples were taken on 25 August 1983. Insect larvae were numerically dominant in all samples. Crustaceans and gastropods were present in all sampling efforts. Hydrozoans were abundant in the November 1982 samples but sparse in others. Mayfly larvae (Stenonema and Stenacron) numerically dominated the November 1982 samples. All samples during 1983 (block and existing slabs) were numerically dominated by the tube building, filter feeding midge larvae Rheotanytarsus. Caddisfly larvae were taxonomically rich and numerically abundant with Hydropsyche orris and Neureclipsis crepuscularis about equally represented on the ACM slabs. Local interactions of the ACM with river dynamics produce markedly heterogeneous conditions upon the seemingly uniform ACM revetted river banks. Consequently both total numbers and taxonomic richness of samples from the ACM may vary considerably from location to location as well as seasonally.

Title: Winter Growth of Bluegills and Bluegill X Green Sunfish Hybrids in MS.

Authors: Martin W. Brunson[1], and H. Randall Robinette. Mississippi State University, P.O. Drawer LW, Mississippi State, MS 39762.

Winter growth of young of the year bluegills (Lepomis macrochirus) and male bluegill X female green sunfish (L. cyanellus) hybrids was compared. After 112 days in ponds with a mean afternoon surface water temperature of 10.4 C, when stocked separately or in combination, the hybrids were significantly ($P < 0.01$) longer and heavier than the bluegills, outgrowing the bluegills by a ratio of approximately 2 to 1.

[1]LSU Rice Research Station, P.O. Box 1429, Crowley, LA 70527-1429.

Title: Catchability of Male Bluegill X Female Green Sunfish Hybrids in Mississippi ponds.

Authors: Martin W. Brunson[1], and H. Randall Robinette. Mississippi State University P.O. Drawer LW, Mississippi State, MS 39762.

The vulnerability of male bluegill (Lepomis macrochirus) X female green sunfish (L. cyanellus) to capture by hook-and-line was investigated in two experiments. In the first, during 10 angler hours each with three bait types, hybrids were caught most frequently with live worms (16.5 fish/hr) followed by artificial spinner bait (9.5 fish/hr), and dry flies (3.6 fish/hr). During the five day angling period, 18% of the captured hybrids were caught a second time, and 39% of those captured twice were caught a third time.

The second experiment was conducted to determine the effect of intensive angling on hybrid sunfish populations. Two ponds were subjected to intensive angling for two hours each, with no restrictions as to angler proficiency or bait type. On these ponds, during 12 and 18 angler hours, 21% and 66%, respectively, of the hybrids present were removed by hook-and-line.

[1]LSU Rice Research Station, P.O. Box 1429, Crowley, LA 70527-1429.