



# Fish Health Section Newsletter

# AFS

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Number 4

## FISHERIES CHEMICALS

QUARTERLY HIGHLIGHTS OF FWS REGISTRATION ACTIVITIES INVOLVING  
FISHERY-USE CHEMICALS AND DRUGS (JULY-SEPTEMBER, 1978)

- Application forms #1800 and #2656 were submitted to FDA for 98 National Fish Hatchery installations and 12 Fishery Research Laboratories that will permit the purchase/use and milling of medicated premixes containing oxytetracycline or sulfamerazine. The Hatchery Biologists-Area were a big help in providing the technical data needed for labeling.
- Because of the many comments and issues raised, FDA has postponed final action on proposed regulations that would require a prescription from licensed veterinarians for the purchase of oxytetracycline. The FWS position is that fish culture should be exempt. If not exempted, we then believe that if fish health specialists were certified by the AFS Fish Health Section they would be the better qualified to diagnose and prescribe treatments for fish.
- We were informed by EPA that registration is not required of 3 chemicals for these intended fishery uses: rhodamine B and fluorescein sodium dyes to determine waterflows, water distribution patterns, and dilution rates needed to apply registered fish toxicants accurately; potassium permanganate to oxidize organic materials in waters in order to alleviate oxygen depletion in fish ponds or to terminate the piscicidal activity of rotenone or antimycin.
- FDA, in response to a FWS inquiry, stated that sodium bicarbonate, carbon dioxide, and acetic acid are classified as GRAS items (Generally Regarded As Safe) when properly used as feed additives and are readily available for widespread use. However, if we were to seek labeling and sale specifically for fishery use, their clearances would require a NADA (New Animal Drug Application).
- Additional data on quinaldine sulfate was submitted to FDA as another step toward its registration. Yet needed is the 90-day subacute oral test on rats. This study is contemplated in FY1979, to be funded by reverted Federal Aid monies when available.

1978  
8281  
AFS/AFS 6(4)  
Branchiomyces p10  
Lernaea (DDVP?) 8/16/78

- We were notified by EPA that an Experimental Use Permit (EUP) will not be required to carry on an experimental study on the efficacy of the candidate piscicide GD-174 in a few selected small streams.
  - Arrangements were initiated with FDA for the release of FWS labeling data on the use of formaldehyde in fish culture to interested drug manufacturers for marketing purposes. Registration for its use as a fungicide and parasiticide is contingent on completing this action.
  - Approval was granted by EPA for the disposal of metal TFM lampricide containers through recycling as an option to burial in landfills. Disposal of containers has become an increasing problem.
  - FWS has applied to FDA for an Investigational New Animal Drug Application (INAD) to water harden trout eggs in erythromycin phosphate at the Fish Genetics Laboratory, Beulah, Wyoming. The purpose is to stop vertical transmission of the bacterial kidney disease organism.
  - Federal Aid administrative funds, totaling \$220,000 will support 2 mammalian safety studies on rotenone in FY1979. Additional reverted funds will become available during the year for other registration-oriented studies. Under consideration are the quinaldine study (mentioned earlier), contract services for Ames mutagenicity tests on a number of new candidate compounds, teratology and metabolism tests with Hyamine, and oncogenicity tests with Hyamine and Furanace.
  - The NFRL, La Crosse recently submitted the following list of priority chemicals based on current needs of our National Fish Hatcheries and Fisheries Assistance. The funding estimate to complete registration-oriented research on these 11 chemicals alone totals more than \$6.5 million.
    1. A fungicide to replace malachite green
    2. Registration of a quaternary ammonium compound
    3. A broad spectrum antibiotic
    4. A bacterial gill disease control agent
    5. Rotenone (reregistration)
    6. Furanace (extension of label to allow use on food fish)
    7. GD-174) a candidate piscicide)
    8. Masoten (extension of label to allow use on food fish)
    9. Antimycin (reregistration)
    10. Quinaldine sulfate (completion of registration)
    11. Erythromycin (registration)
- (Harry Van Meter, Registration Liaison  
Officer, Division of Fishery Research)

## SPECIAL REPORT

## Compounds Registered for Fishery Uses

by  
 Rosalie A. Schnick<sup>1</sup>, Fred P. Meyer<sup>1</sup>,  
 and Harry D. Van Meter<sup>2</sup>

The following summary provides a list of chemicals for which fishery uses have been registered. Readers are advised to consult labels on formulations for specific details concerning their use.

<u>Chemical</u>	<u>Fishery Use</u>	<u>Comments</u>
Antimycin	Fish toxicant-- 5-10 ppb	Nonfood fish use only
Bayer 73	Lampricide-- Rate not to exceed 2% of TFM applied; as a sampling tool, 100- 200 lb/A	Nonfood fish use only; restricted to use by Great Lakes Fishery Commission (GLFC) Federal or State personnel
Calcium hypo- chlorite (HTH)	Disinfectant-- 5-10 ppm for 12-24 h for control of algae and bacteria; 200 ppm for 1 h to sanitize	Food fish use
Casoron (Dichlobenil)	Herbicide-- 7-15 lb/A	Nonfood fish use only
Copper (from basic copper carbonate)	Herbicide-- 14 lb/150-250 gal water/A	Food fish use
Copper sulfate	Algicide-- Rate dependent on water chemistry; 2.3-4 ppm	Food fish use
2,4-D	Herbicide-- 6-40 lb/A	Food fish use; restrict- ed to use by Federal, State, or local public agencies
Dichlone	Algicide-- 0.055 ppm	Nonfood fish use only

<sup>1</sup>National Fishery Research Laboratory, La Crosse, WI 54601

<sup>2</sup>U.S. Fish and Wildlife Service, Division of Fishery Research,  
Washington, DC 20240

Chemical	Fishery Use	Comments
Diquat	Herbicide and algicide --5.4 ppm in water for submerged weeds; 3 lb/ A for floating weeds	Food fish use
Endothall	Herbicide-- 6.8-9.5 lb/A ft	Food fish use
Fenac	Herbicide-- 15-19.5 lb/A	Nonfood fish use only
Fluorescein sodium	Dye to check water flows and/or dilution 0.1 ppm	Food fish use; exemp- ted from registration
Furanace	Antibacterial drug for myxobacteria-- 0.05-0.1 ppm for an indefinite period; 1.0 ppm for 5-10 min	Nonfood fish use only
Lime	Pond sterilant-- 1,338 lb/A of quick lime; 1,784 lb/A of slaked lime	Food fish use; Generally Regarded as Safe (GRAS)
Masoten	Parasiticide for copepods--0.25 ppm active ingredient	Nonfood fish use only
MS-222	Anesthetic-- 15-66 ppm for 6-48 h for sedation; 50-330 ppm for 1-40 min for anesthesia	Food fish use; 21-day withdrawal
Potassium permanganate	Oxidizer and detoxi- fier--2 ppm	Food fish use; exemp- ted from registration
Rhodamine B	Dye to check water flows and/or dilu- tion rates--20 ppb	Food fish use; exemp- ted from registration
Rotenone	Fish toxicant-- 1-5 ppm	Nonfood fish use only
Salt	Osmoregulatory enhanc- er--0.5-1% for indefi- nite period; 3% for 10-30 min	Food fish use, GRAS
Silvex	Herbicide-- Granular--40 lb/A; liquid--6 lb/A ft for submerged weeds; 8 lb/A for emerged weeds	Nonfood fish use only
Simazine	Herbicide and algicide--1.4-6.8 lb/A ft	Food fish use

Chemical	Fishery Use	Comments
Sulfamerazine	Antibacterial against furunculosis; 10 g/100 lb fish/day/14 days in feed	Food fish use in salmonids
Terramycin (oxytetracycline)	Antibacterial against <u>Aeromonas</u> and <u>Pseudomonas</u> ; 2.5-3.75 g/100 lb fish/day for 10 days in feed	Food fish use
TFM	Lampricide-- 1-10 ppm depending on water quality	Nonfood fish use only; restricted to GLFC, Federal, or State personnel
TFM:Bayer 73	Lampricide-- 98:2 (TFM:Bayer 73), TFM at 1-10 ppm	Nonfood fish use only; restricted to GLFC, Federal, or State personnel
Xylene	Herbicide-- 100 gal/A	Nonfood fish use only
The following compounds are of indefinite status at this time.		
Acetic acid	Parasiticide	Declared as GRAS by FDA as feed additive; not labeled for fishery use
Carbon dioxide	Anesthetic	Declared as GRAS by FDA as feed additive; not labeled for fishery use
Formalin	Parasiticide-- 25 ppm in ponds; up to 250 ppm for 1 h in tanks and raceways	All requirements completed; awaiting final action by FDA
Sodium bicarbonate	Anesthetic	Declared as GRAS by FDA as feed additive; not labeled for fishery use

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Subject matter was extracted and updated from Meyer, F.P., and R.A. Schnick. 1978. The approaching crisis in the registration of fishery chemicals. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 30(1976): 5-14.

REQUIREMENTS FOR THE  
REGISTRATION OF FISHERY USES OF CHEMICALS

The following listing represents the safety protocols which EPA may require for the registration of fishery compounds. Part One relates to tests which must be performed to satisfy concerns for human and animal health. Part Two relates to studies required to answer questions pertaining to hazards to fish and wildlife. Part Three concerns additional studies which are required to support applications for re-registration.

In July and August, 1978 EPA amended the above guidelines and added a significant number of new requirements. Several former requirements were dropped or incorporated into other studies. Part Four describes the latest changes in requirements for registration.

The significance of the 1978 changes is uncertain at this time. The research protocols on TFM and Bayer 73 were developed to fulfill earlier requirements agreed upon by EPA and the 1975 guidelines.

Hopefully the application for the registration of TFM will not be affected. There is a remote chance that they may request some of the new studies listed in Part Four. When we apply for re-registration of TFM, there is a 50:50 chance that many of the new studies will be required.

The 1975 requirements will be fulfilled when we submit the Bayer 73 application for registration in early 1979. There is a high probability that some of the studies in Part Four will be required but our strategy will be to wait for the EPA to specify which ones they feel are necessary. When re-registration is necessary, the studies in Part Four are likely to be required.

Required Studies to Support Submissions for the  
Registration or Re-registration of Chemical Uses

Part 1. Hazards to humans and domestic animals (1975 EPA Guidelines)

A. Acute

1. Acute oral LD50 - rat
2. Acute dermal LD50 - rabbit
3. Acute primary dermal irritation - rabbit
4. Acute primary eye irritation - rabbit
- \*5. Inhalation LD50 - rat
- \*6. IV or IP injections

B. Subacute

- \*1. 21-day subacute dermal - rabbit
- \*2. 14-day subacute inhalation - rat
- \*3. 90-day subacute oral - rat and hamster
- \*4. Teratology - rabbit
- \*5. Neurotoxicity - adult hen and rat or dog
- \*6. Metabolism - cow or chicken and rat or dog

## C. Chronic

- \*1. 2-year oncogenicity - rat and mouse or hamster
- \*2. 6-month feeding - dog
- \*3. Three-generation reproduction - rat
- \*4. Other chronic tests - hematopoiesis, endocrine, or histopathology

## D. Special Studies

- \*1. Mutagenicity - in vivo cytogenetics, heritable translocation test, and specific locus test
- \*2. Potentiation - if there is a possibility that the toxic effects of the chemical could be potentiated, studies are required
- \*3. Foliar residue - studies for persons re-entering treated area
- \*4. Other studies - when appropriate, additional studies based on similarity of the chemical structure between the test compound and those known to produce specific toxic effects may be required; studies may also be required to determine reversibility of effects found after subacute feeding

## Part 2. Hazards to fish and wildlife (1975 EPA Guidelines)

## A. Acute

- 1. Avian acute oral LD50 - mallard
- 2. Fish acute toxicity 96-h LC50 - rainbow trout and bluegill
- 3. Invertebrate acute toxicity 96-h LC50 - Daphnia
- \*4. Mammalian toxicity data - as required for evaluation hazard to humans and domestic animals -- will normally be adequate to indicate hazard to wild animals
- \*5. Acute toxicity data 96-h LC50 - shrimp and crabs
- \*6. Acute toxicity data 96-h LC50 - oyster larvae
- \*7. Toxicity and residue - bottom-feeding fish, cold-water and warmwater fish predators, mollusks, crustaceans, insect larvae or nymphs

## B. Subacute

- 1. 8-day avian subacute dietary LD50 - mallard
- \*2. Mammalian toxicity data - as required for evaluating hazard to human and domestic animals will normally be adequate to indicate hazard to wild mammals
- \*3. Toxicity and residue - bottom-feeding fish, cold-water and warmwater fish predators, mollusks, crustaceans, insect larvae or nymphs

- C. Chronic
  - \*1. One-generation reproduction - bobwhite or mallard
  - \*2. Subacute or chronic fish and/or invertebrate reproduction - fish, 1 year; invertebrate, 3 months
- D. Special studies
  - \*1. Field tests - as needed
  - \*2. Toxicity data - as needed
  - \*3. Tolerance establishment - if chemical will be used on food fish

Part 3. Studies required to support applications for the re-registration of chemical uses (1975 EPA Guidelines)

If the toxicity testing data previously submitted to EPA conforms to the requirements of the Guidelines, no acute toxicity testing for evaluation of hazards to man are required for re-registering pesticides that are currently registered with EPA.

- I. Hazards to humans and domestic animals
  - \*A. Teratogenicity - rabbit
  - \*B. 2-year oncogenicity - rat, mouse and/or hamster
  - \*C. Mutagenicity - in vivo cytogenetics, heritable translocation test, and specific locus test
  - \*D. Chronic feeding tests - central nervous system, hematopoietic system, histological changes in the liver, kidney, and reproductive systems
  - \*E. Three-generation reproductive studies - rat
  - \*F. Foliar residue - studies for persons re-entering treated area
- II. Hazards to fish and wildlife
  - A. Avian subacute dietary LC50 - 8-day protocol
  - B. Acute toxicity 96-h LC50 - fish
  - C. Acute toxicity 96-h LC50 - invertebrate

Part 4. Amendments to the 1975 EPA Guidelines based on the July and August, 1978 EPA Announcements

- I. Hazards to humans and domestic animals
  - A. Acute
    - 1. Studies added
      - a. Dermal sensitization study (guinea pig)
      - b. Acute delayed neurotoxicity study (chicken)
    - 2. Studies deleted
      - IV or IP injections
  - B. Subacute
    - 1. Studies added
      - 90-day dermal toxicity study - rabbit
    - 2. Studies deleted
      - 90-day subacute oral - hamster

- C. Chronic
    - 1. Studies added
      - a. Teratology - rat (second species required)
      - b. Chronic feeding study - rat (can be combined with oncogenity)
    - 2. Changes in studies
      - a. Reproduction study - rat or rabbit (previously had been combined with oncogenicity studies, now requires a separate test)
      - b. Oncogenicity studies - now require rat and mouse (previously was rat and mouse or hamster)
    - 3. Studies deleted
      - Other chronic tests
  - D. Special Studies
    - 1. Studies added
      - Mutagenicity - eight tests are now required
        - 3 to detect gene mutation
        - 3 to detect chromosomal aberrations
        - 2 to detect primary DNA damage
  - E. New Section - General metabolism studies
    - 1. Studies added
      - Additional metabolism studies (to clarify important points)
- II. Hazards to fish and wildlife
- A. Acute
    - 1. Studies deleted
      - Acute toxicity data - oyster larvae
  - B. Subacute
    - 1. Studies deleted
      - a. Mammalian toxicity data
      - b. Toxicity and residue
- III. Additional Section: Environmental chemistry
- A. Physical - chemical degradation
    - 1. Hydrolysis
    - 2. Photodegradation
  - B. Metabolism
    - 1. Anaerobic aquatic metabolism
    - 2. Aerobic aquatic metabolism
    - 3. Effects of microbes on pesticides
    - 4. Effects of pesticides on microbes
  - C. Mobility
    - 1. Adsorption
    - 2. Water dispersal
  - D. Field dissipation
    - 1. Soil (food use)
    - 2. Water

## E. Accumulation

1. Rotational crop (food use)
2. Irrigated crop
3. Fish accumulation - lab
4. Fish accumulation - field (aquatic non-food use)

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\*Optional tests which may be required by the regulatory agencies if the use pattern is likely to create an unusual or unique potential hazard to applicators or nontarget organisms, if the nature of the chemical suggests potential hazards, or if required tests indicate unusual side effects.

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## U.S. Environmental Protection Agency

- 1975 Pesticide program: Guidelines for registering pesticides in United States. Fed. Regist. 40 (123): 26801-26938.
- 1978a Registration of pesticides in the United States: Proposed guidelines. Fed. Regist. 43(132): 29695-29741.
- 1978b Pesticide programs: Proposed guidelines for registering pesticides in the U.S.; hazard evaluation: human and domestic animals. Fed. Regist. 43(163): 37335-37403.

## BRANCHIOMYCES RIDES AGAIN

Eagle eyes Drew Mitchell has found Branchiomyces in golden shiners in two different locations. Other interesting finds of it include: Barthelmes et al (1968)-rainbow trout, Germany; Lucky (1970)-European catfish, Czechoslovakia; Grimaldi (1971)-Alburnus alborella, Italy; Hoffman (1972)-guppies, USA; Egusa and Ohiwa (1972)-Japanese eels; Rehulka and Tesarick (1972)-tench, Czechoslovakia; W. Rogers (1972)-largemouth bass, USA; Wolke (1972)-pumpkinseed sunfish, USA; Meyer and Robinson (1973)-striped bass, largemouth bass; Warren et al (1973)-northern pike, USA; Srivastava and Srivastava (1976)-Channa marulius, India. A quick review of the international state of the art indicates that this prolific organism exists widely in subtropic to warmish temperate waters, has little host specificity (except perhaps for B. demigrans in northern pike), relishes warm water (20°C or higher) and organically polluted water, is not highly contagious to fish in other ponds, usually kills about 30% of the fish with the remaining making complete recovery, is not usually recurrent in the same pond because it requires a "RARE COMBINATION OF NUMEROUS FACTORS" (Most of the latter details from Bauer, Musselius and Strelkov, 1969). For further information contact G.L. Hoffman, or A.J. Mitchell, U.S. Fish and Wildlife Service, Fish Farming Experimental Station, P. O. Box 860, Stuttgart, AR 72160.

## CERTIFICATION

The following are the rationale and procedures for certification of Fish Health Specialists. This represents years of argument, deliberation and revision by the Professional Standards Committee currently under the chairmanship of Dr. Richard Heckman. It was presented in essence at Kansas City last August and revised as per the discussions there.

It is submitted for the review of the membership in hopes that comments pro and con will be submitted to the Committee.

Please send comments to:

Dr. Richard Heckman  
Department of Zoology  
Brigham Young University  
Provo, Utah 84601

The Professional Standards Committee and the Executive Committee will then consider and act on the proposal.

### PROCEDURES FOR THE CERTIFICATION OF FISH HEALTH SPECIALISTS

Rationale: Need for a "registry," certification procedure whereby ranks can be policed and upgraded by peer review. Attain a marked degree of professionalism among section members. Need to recognize those who can competently diagnose health problems and administer proper corrective measures.

1. Introduction - The professional certification of fish health specialists has three basic objectives:
  - a. To identify general professional and ethical competence of individuals qualified to diagnose and prescribe treatment in the fish health field.
  - b. To provide Universities, public agencies, private industry, courts, and the general public with definitive minimum standards required for professional competence of individuals in the fish health field.
  - c. To guide educators in the development of qualifying curricula for fish health professionals.
2. Basic Qualifications - Individuals may apply for certification as a Fish Health Specialist immediately after obtaining three years of work experience performed in fish health work and completing the requirements specified in "3" and "4."

3. Specialized Training Required - The Board of Certification will review all applications to identify evidence of training specifically applicable to the fish health field. A minimum of 16 quarter hours or 12 semester hours of specialized training is required.<sup>1</sup> Examples are as follows:
  - a. Credits earned in fish health or directly related topics at an accredited university.
  - b. Formal lecture/laboratory courses in fish health.<sup>2</sup>
  - c. Specialized on-the-job training in fish health.
  
4. Written Examination - There will be a 3 year grace period for applicants relative to this requirement. In 1982 a written examination will be required. Applicants meeting the requirements set forth in items 2 and 3 above will be admitted to take a written examination. The examination will consist of multiple choice, matching, true/false and fill-in-the-blank questions. Topics covered include general fisheries, fish culture, fish anatomy and physiology, fish disease etiology, diagnostic procedures, pathology of fish diseases, therapy, fish disease control, and other items essential to basic knowledge of the care and health of fish. The examination will be administered to qualified applicants by a member of the Board of Certification at least annually at one or more regional or national fisheries meetings. Details on examination sites and dates will be coordinated to accommodate applicants. Consideration on the examination will be given to those applying with highly specialized training, e.g., virology, bacteriology, and histopathology.
  
5. Application Procedures -
  - a. Application forms may be obtained from the Chairman of the Professional Standards Committee.
  - b. Individuals seeking certification as Fish Health Specialists shall file completed application forms with the Chairman of the Board of Certification. Applicants should arrange for the forwarding of the required three letters of recommendation to the Board Chairman at the time of the preparation of their application. Supporting documents (AFS Certification as a fishery scientist) should also be submitted.

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<sup>1</sup>In unusual cases, the Board may waive this requirement if valid evidence of equivalent qualifications can be demonstrated. Requirements of "2" and "4" cannot be waived.

<sup>2</sup>Credits for courses and OJT not offered for college credit are to be calculated on the basis of 2 semester credits per 40 hours of formal classroom/laboratory work as determined by the Board of Certification or guidelines established by the Professional Standards Committee.

- c. The Board shall review all applications. Upon satisfactory completion of all application requirements, the Board shall so notify the applicants in writing. The Chairman of the Board of Certification shall then notify the President and Secretary-Treasurer of the Fish Health Section of successful applicants. After the three year grace period successful completion of the written examination will also be required.
- d. Upon receipt of notice, new applicants shall remit a certification fee of \$25.00 to the Secretary-Treasurer of the Section. Following payment of the fee the Secretary-Treasurer shall so notify the President of the Fish Health Section and Chairman of the Professional Standards Committee. The Fish Health President, when assured of the completion of all required certification procedures, shall then officially notify the applicant of his certification as a Fish Health Specialist. Notification shall be in the form of a congratulatory letter and a certificate indicating period of certification. Applications not approved by the Board shall be returned to the applicant.
- e. The Boards shall, at least semi-annually, conduct official business including the review and processing of all new and renewal applications received by the Chairman since the previous business session. Board members shall be excused from sessions at which their own certification applications are considered. All forms and supporting information used in the rating of applicants shall be those prepared and provided by the Professional Standards Committee and shall remain in the confidential files of the Board of Certification.
- f. An annual report of all actions, both affirmative and negative, shall be prepared by the Board Chairman and submitted to the Chairman of the Professional Standards Committee at a time designated by the Committee Chairman. Permanent file copies of all Board actions must be maintained in confidential files and made available to the Professional Standards Committee upon the request of the Chairman of the Committee.
- g. Certifications awarded by the President of the Section shall be valid for five (5) years from the date of issuance unless revoked for just cause. Renewal applications shall be obtained from the Professional Standards Committee and submitted to the Board for their review as designated above. The fee for renewal of certification shall be \$10.00.
- h. Any applicant desiring a review of a negative decision by the Board may file a request with the Chairman of the Professional Standards Committee for a formal review of his application by the Committee. The review panel convened for such considerations shall consist of all Committee members and the Chairman of the Board of Certification. The decision of the review panel shall be final.

- i. Fish Health Specialist certification may be revoked by the Board of Certification, with notification of such action sent via registered mail, for the following causes: gross negligence, incompetence, falsification of data or reports, misrepresentation, or acceptance of a bribe. Such adverse actions by the Board may be appealed through the process indicated in "g" above.
  - j. Information concerning unethical action as indicated in "h" should be filed with the Chairman of the Professional Standards Committee.
6. Guidelines for Completing Application -
- a. Fill out each section of the application by typing the required information.
  - b. Where supportive documents (AFS certification, description of other training, how work experience obtained, course outlines, etc.) will help in the evaluation of the application, please attach.
  - c. Application forms will be weighed approximately 50% academic training, 50% actual work experience in fish health, for the first three years. After the grace period rating will be as follows: 35% academic training, 35% actual work experience in fish health, and 30% on the written examination.

Chairman, Professional Standards Committee  
Dr. Richard A. Heckmann  
153 WIDB, Zoology Department, Brigham Young Univ.  
Provo, Utah 84602

Chairman, Board of Certification  
James Warren, Fish & Wildlife Service  
Dept. of Interior, Box 252  
Genoa, Wisconsin 54632

## NEW PUBLICATION

AQUATIC MERMITHIDAE OF THE FAUNA OF THE USSR, VOL I by I.A. Rubzov, 1972. Akad. Nauk, Zool. Inst., Leningrad (Translation TT74-52046, U.S. Dept. Commerce, NTIS, Springfield, Va. 22161). Mermithids are nematodes which parasitize insects. I have six free copies available on a first come, first served basis. For further information contact Dr. G.L. Hoffman, U.S. Fish and Wildlife Service, Fish Farming Experimental Station, P.O. Box 860, Stuttgart, AR 72160.

## GOEDE ON NONINFECTIOUS DISEASES

I have run into some interesting attitudes in some of our members with respect to the concerted effort to include and/or expand the efforts relative to noninfectious diseases. It appears that some of our members are reluctant to see this move. I have difficulty understanding this territorial imperative and refuse to consider it as valid.

The fact that this area of concern is not presently incorporated is more a matter of circumstance than intent. I shall attempt to explain our predilection for infectious diseases.

The people concerned primarily with infectious diseases were organized in a loose fashion prior to formation of the Fish Health Section because of a need to prevent the spread of infectious diseases.

Agency personnel maintained close and constant liaison with their peers. This loose organization permitted an inventory of problems and consultation relative to prevention and treatment. It also served as a vanguard in our battle to control dissemination.

Some quasi-organized efforts aided in these areas. These were meetings such as the Western Fish Disease Conference, Midwest Fish Disease Workshop, and a number of fish disease oriented workshops sponsored by the U.S. Fish and Wildlife Service. The graduates of the formal training at the old Eastern Fish Disease Laboratory at Leetown, West Virginia provided a framework which served to collate the efforts of field trouble shooters such as the hatchery biologists.

The increasing interest and demand for comprehensive legislation for control of the spread of infectious diseases introduced the need for certification of inspectors and technical approval of acceptable methods of detection.

It was around this "nucleus" that the Fish Health Section of the A.F.S. was organized and chartered. Standard methods and certification of inspectors are a reality now and certification of general fish health practitioners is at the "threshold" of realization.

The Colorado River Wildlife Council adopted a fish disease policy thus ushering in the drainage concept of disease regulations and the Great Lakes Commission followed shortly thereafter.

There is now some concerted effort to establish something similar in the northwest. All of these regulating entities require a set of methods which have been subjected to peer review and approval.

The need for an organization of peers was a vital factor in the ultimate formal organization and charter of the Fish Health Section. It was centered around infectious disease at that time because the early quasi-organization provided a framework for formal organization. The initial "thrust" then involved those items which provided the impetus for organization. We have these problems facing those people working with noninfectious diseases or disorders. We are only now beginning to appreciate the magnitude of these problems and their impact upon the total health picture for fishes.

Those people attending the meeting in Kansas City last August heard Bob Putz emphasize the need to look at "total fish health." We will need help if we are to accept this challenge.

We have a vast resource in the array of fish health specialists which are not presently represented in our section.

The toxicologists, nutritionists, environmental physiologists, histopathologists, clinical chemists and geneticists are a few of the specialists not properly represented in our ranks.

We need to know who these people are and make a serious effort to enlist their participation. They are needed to develop standard methods, routine investigational procedures, forensic protocols and a framework for future meetings and projects.

We need to know which of our current members have interest and expertise in these areas, but perhaps more importantly, we need to know of the many nonmembers involved in these areas.

Dr. Marsha Landolt has agreed to chair the committee which will develop this area of interest. She is a Marine Toxicologist on the staff at the University of Washington. If you have an interest in noninfectious diseases or know people who are but are not members, please contact Dr. Landolt at the following address:

Dr. Marsha Landolt  
College of Fisheries - WH-10  
University of Washington  
Seattle, Washington 98195  
Phone: (206) 543-4290

#### POTENTIAL CANDIDATE FOR RESEARCH ON LERNAEA CONTROL

According to one of our European colleagues 2,2-dichlorovinyl dimethyl phosphate (DDVP, dichlorvos, Nerkol, Vapona) at 1 ppm for 1 hr is effective in controlling the salmon "sea louse" Lepeophtheirus. With more reports of apparent resistance of Lernaea to Masoten this item becomes important.

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The NEWSLETTER of the Fish Health Section of the American Fisheries Society is published four times annually in accordance with Section objectives and mailed to the Section membership in good standing at the time of publication. The use of company or registered trade names does not constitute an endorsement but serves only to keep members informed. Contributions to the NEWSLETTER are encouraged and should be sent to one of the following Committee members no later than the 15th of March to be included in the next quarterly issue. The NEWSLETTER Committee members include:

- Dr. Joseph R. Sullivan (editor), 1106 East Third, #201,  
Moscow, Idaho 83843
- Dr. Mark Dulin, 1403 Clark Street, Ames, Iowa 50010
- Dr. Joe Geraci, Pathology Dept., University of Guelph,  
OVC, Guelph, Ontario, Canada N1G 2W1
- Dr. Glenn Hoffman, Parasitologist, U.S. Fish and Wildlife  
Service, Fish Farming Experimental Station, P. O. Box  
860, Stuttgart, AR 72160
- Mr. Paul Janeke, U.S. Fish and Wildlife Service, Fish Disease  
Control Center, 1100 E. Burlington Ave., P. O. Box 917,  
Fort Morgan, CO 80701

# Y'ALL COME

The 1979 Midwest Fish Disease Workshop will be held July 11 and 12, 1979 in Madison, Wisconsin at the Holiday Inn #2, 6301 East Broadway. All persons interested in fish disease are welcome to attend. Contact Mr. Paul E. Degurse, Wisconsin Department of Natural Resources, 3911 Fish Hatchery Road, Madison, Wisconsin 53711, or telephone 608-266-0816 for further details.

## FISH HEALTH COURSE

The U.S. Fish and Wildlife Service Fisheries Academy and Haywood Technical Institute will sponsor a course on Fish Health Management, February 5-9, 1979. Classes will be held at Haywood Tech in Clyde, N.C. (about 25 miles west of Asheville on I-40).

This course will present through lab and lecture the general principles of prevention, clinical signs, control procedures, and treatments of major coldwater bacterial, parasitic, and viral diseases. Material presented will be of interest to trout growers, biologists, and hatchery workers. Those who will be unable to attend for a whole week may register to attend February 5 and 6 which will be a general overall presentation of fish diseases. The balance of the week will be more detailed lecture and lab.

Instructors will be Dr. Pete Bullock, Dr. Glenn Hoffman, a representative from Tavolek (Redmond, Washington), and several trout growers whose fish have experienced serious disease problems.

A \$5.00 registration fee will be charged, payable 10:00 am on February 5. For more information or to register, contact Charles W. Johnson, Area Coordinator, Fisheries Occupational Training, Haywood Technical Institute, P.O. Box 457, Clyde, N.C. 28721. Phone: 704-627-2821.

Catfish

Bert



## FISH DISEASE DIAGNOSTIC SERVICE

The National Veterinary Services Laboratories (formerly known as the National Animal Disease Laboratory), Ames, Iowa, is now accepting preserved fish tissues for histopathological examination. To ensure that the specimen is of diagnostic quality, the following recommendations are made:

1. To avoid excessive postmortem autolysis the tissues should be placed in fixative immediately after death. Tissues that have been frozen are not acceptable.

2. To ensure good fixation there should be 1 part tissue to 9 parts preservative. For large fish it may be necessary to remove the organs you want sectioned. For smaller fish, a mid-line incision should be made and the gas bladder punctured. Use either 10% buffered neutral formalin or Bouin's fixative.

3. If more than one fish is submitted they should be numbered. A thorough case history and differential diagnosis are desirable.

4. Package specimens so the container is not likely to break or freeze in transit. Mail tissues to: Dr. Mark P. Dulin, Pathology Laboratory, USDA, APHIS, NVSL, P.O. Box 844, Ames, IA 50010.

MEA CULPA, MEA CULPA, MEA MAXIMA CULPA!  
MORBUM RENUM FALSO PROTULI

I incorrectly cited the proposed name for the kidney disease organism in the last NEWSLETTER. The correct spelling is Corynebacterium salmoninus sp. nov. According to Bennett's New Latin Grammar (1895) rule 151,2 concerning adjectives derived from nouns, the suffix "-inus" signifies "belonging to, connected with" in case you did not know that. --Editor

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