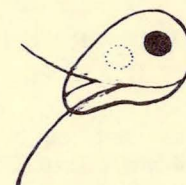


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# FISH HEALTH SECTION



# NEWS LETTER



Volume 10, Number 2

Peter G. Walker, Editor

APRIL - JUNE 1982

## KLONTZ ENDS TERM EARLY

TO: The Executive Committee, FHS/AFS

FROM: Bill Klontz

DATE: 23 July 1982

SUBJECT: Transfer of duties

With your permission, I would like to transfer the Presidentship of FHS/AFS to Emmett Shotts at this time rather than in September. I have given the matter considerable thought, and I think it would be best for the Section.

First, I will be unable to attend the AFS meeting in September because of having no travel funds. The State of Idaho Board of Regents has declared a state of financial emergency within the university system. That means that lay-offs can occur - and have. We lost 85 positions here at the University of Idaho. The Departments of Fishery Resources and Wildlife Resources have been combined into the Department of Fish and Wildlife Resources. The Associate Dean for Academics stepped down and is now the Department Head. It is a real mess - for the third straight year, and "they" say that we have another year coming up which will be even worse.

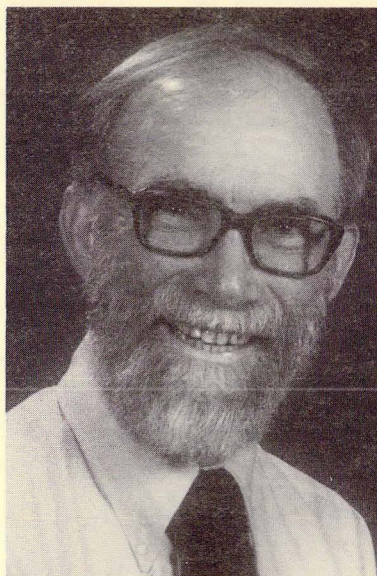
The second major factor which influenced my decision is my involvement in the second finding of the organism causing PKD at our Hagerman IDFG hatchery. As you know, it appeared last summer, which ended in over 800,000 catchable trout being buried and the facility sanitized. Well, the organism appeared again three weeks ago, and we have been working like something else to survey all watersheds where fish have been planted.

While on the PKD matter, in May and June I spent a day at Bern University, two days at Stirling University, and two days at the Department of Agriculture and Fisheries for Scotland Laboratory in Aberdeen. I met with all the workers in Europe who have had first-hand experience with this critter. From all that I can gather, this thing is nothing to leave be. So, the FWS, IDFG, and us are working together to get a handle on what the problem is and how far it extends.

Back to the subject at hand, I talked with Emmett this past week, and he agreed with my suggestion. He plans to attend the AFS meeting. I rather imagine he will call an EXCOM meeting before he meets with the AFS EXCOM - so you might be prepared to respond either in person or writing.

Winding down, I must say that I am not very pleased at the accomplishments I have not during the past year. The lack of them has not been entirely my fault, but I should have been more forceful in getting things done which I delegated to others.

So, unless I hear something fairly soon from you individually or collectively, please expect the transfer to take place before the end of next week.



FHS President  
Emmett B. Shotts, Jr.

## — NONINFECTIOUS FISH DISEASES — FHS ANNUAL MEETING '83 AND 14TH ANNUAL MIDWEST FISH DISEASE WORKSHOP: CALL FOR PAPERS

The 1983 meeting of the Fish Health Section of the American Fisheries Society will be held in Ames, Iowa on April 26 and 27, 1983 concurrently with the 14th Annual Midwest Fish Disease Workshop. The FHS program will be comprised of a special topic section, *The Role of Noninfectious Diseases in Fish Health Management*. Additional papers from all facets of the fish health field are solicited as well.

Student papers are encouraged. A cash prize will be awarded to the presenter of the best student paper.

Submit titles and brief abstracts (less than 150 words) along with the author(s) name, address, and phone number to:

Dr. John Nickum, Leader  
Iowa Cooperative Fishery Research Unit  
Iowa State University  
Science II  
Ames, IA 50011

Deadline: February 15, 1983

Information concerning accommodations and travel will be included in the next newsletter.

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FHS Cryptosporidium parvum p. 4-5 1982

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## USFWS FISHERY USE CHEMICAL AND DRUG REGISTRATION ACTIVITIES

Compiled by Harry Van Meter, Registration Liaison Officer and submitted by Robert E. Stevens, Chief, Division of Fishery Ecology Research, USFWS, Washington, DC 20240.

In the recent biennial survey on fishery use drugs conducted by the Fish and Wildlife Service's Technical Advisory Group (TAG), 105 responses were received from the National Fish Hatcheries, Fish Cultural Development Centers, Fishery Assistance Stations and Hatchery Biologists. The primary objective of this survey was to obtain input on each facility's priority fish health needs in the registration of fishery use compounds. From these data, the National Fishery Research Laboratory (NFRL), La Crosse, WI, has developed priority rankings for the Service's drug and chemical clearance research.

The questionnaire listed more than 48 registered and unregistered compounds, with additional space provided for comments and *write in* candidates. The compounds were listed under five principal categories: piscicides, lampricides and collecting aids; therapeutants, disinfectants, and oxidizing agents; herbicides and algicides; fungicides; and anesthetics. The respondents were asked to evaluate each compound on the basis of (1) being essential to fish health, (2) good to have around, (3) having an occasional need of and (4) never used.

An analysis of the survey tally revealed the following information. Major emphasis indicated a pressing need for chemotherapeutants (antibiotics, antibacterial compounds, and sanitizing agents) and parasiticides. Formalin ranked as the Number 1 priority among all compounds for its use as a parasiticide and fungicide. Other drugs high on the list and in priority order by category were as follows: HTH, Wescodyne and Betadine (disinfectants); Terramycin, Roccal and the two Hyamines (antibacterials); copper sulfate (herbicide/algicide); malachite green (fungicide/parasiticide); potassium permanganate (oxidizing agent); MS-222 and quinaldine sulfate (anesthetics); and rotenone and antimycin (fish toxicants). Twelve of the top 20 compounds which were checked as *most needed* by the respondents already have registrations or are nearing registration for the intended uses.

Tentative plans call for publication and distribution of the 1982 TAG report to interested parties. Readers are advised, however, that the report relates directly to the Service's priority needs and does not necessarily reflect those of states and the burgeoning commercial aquaculture industries.

The Food and Drug Administration (FDA) has published a document in the April 9, 1982, issue of the *Federal Register* (Vol. 47, No. 69) that announces the availability of Service date to qualified sponsors wishing to apply for a New Animal Drug Application (NADA) to market formalin for fishery use. Publication of this announcement culminates 9 years of Service effort to clear formalin as a fish parasiticide and fungicide. Unfortunately, drug manufacturers were reluctant to share the cost of studies required for its clearance because no one had proprietary rights to the compound. However, several companies recently have indicated an interest in applying for an NADA to produce and market formalin for the intended fishery uses.

FDA is withholding clearance of Ro5-0037 for fishery use pending the submission of additional information by Hoffman-La Roche in its NADA application. The intended use of this potentiated sulfonamide is designed to control furunculosis and enteric redmouth disease in juvenile trout and salmon through their diets. Most of the data required for registration of the compound have been generated by the National Fish Health Research Laboratory, Kearneysville, West Virginia. In closely associated studies, our scientists have determined that Ro5-0037 injected into prespawning Atlantic salmon returnees being held as brood stock greatly curtails the incidence of furunculosis outbreaks. Efforts are now underway to develop adequate tissue residue and efficacy data to support FDA clearance of the injection procedure.

FDA has renewed the Service's Investigational New Animal Drug Application (INAD) for the 1982 calendar year covering the restricted use of malachite green at 11 Pacific and 4 Atlantic National Fish Hatcheries. The drug is needed to control fungal infections on prespawning salmon adults that are captured and held for egg taking purposes. The INAD for malachite green, which is issued annually, authorizes the Service to continue generating data on the drug's residue in fish tissue and eggs.

It also provides the Service additional time to screen for and to develop a replacement compound for malachite green.

The Environmental Protection Agency (EPA) recently approved an updated version of the existing TFM label to permit shipment and use of the lampricide by sea lamprey control teams in 1982. One of the labeling changes requires that municipalities using these streams as potable water sources be notified of an impending TFM treatment at least 24 hours prior to application. A second change in labeling requires that farmers using the streams as a source of irrigation also be notified 24 hours prior to application. This labeling approval is contingent on assurances by the Service that a completely revised label will be submitted within another year to meet all current EPA registration requirements. The format is being prepared by NFRL-La Crosse and will incorporate the supplemental label which governs the combined use of TFM and Bayluscide.

## FISH HATCHERY MANAGER WANTED

The Fisheries Department of Humboldt State University in Arcata, California announces an opening for a Fish Hatchery Manager to operate and maintain a recirculating instructional-research salmonid hatchery. Minimum qualifications include a Bachelor's Degree in aquaculture, fisheries or a closely related field and three years of experience in hatchery management or in fisheries management emphasizing culture techniques or research. The salary range for this permanent, full-time position is \$1708-1789-1873-1962-2055/mo. Resumes including the names and addresses of three references should be sent to: Personnel Office, Humboldt State University, Arcata, CA 95521. Additional information can be obtained from George H. Allen, Chairman, Fisheries Department. The application deadline is February 17, 1983.

## ELISA PRODUCT AVAILABLE FOR RESEARCH

Practical application of Enzyme Linked Immunosorbent Assay (ELISA) technique in fish disease diagnostics may be close at hand. Immuno-systems, Incorporated of Kennebunk, Maine is now offering rabbit anti immunoglobulin IgM labeled with horse radish peroxidase for limited research or diagnostic use. The product can be used in ELISA to detect the presence of trout antibody.

For further information, contact: Bruce Ferguson, President, Immuno-systems, Incorporated, P.O. Box 1027, Kennebunk, Maine 04043.

## EFFECTS OF STOCKING DISEASED TROUT ON WILD POPULATIONS

Submitted by Ivan B. McElwain, Director, Lamar National Fish Hatchery and Fish Cultural Development Center, Lamar, Pennsylvania 16848.

In 1979 and 1980, the Lamar Fish Cultural Development Center cooperated with the Leetown National Fish Health Laboratory on a study of trout populations in four streams located in the watershed of the Tylersville unit of the Lamar National Fish Hatchery in Pennsylvania. The study was designed to determine the effects of planting diseased fish into natural watersheds. Field samples were collected in 1979 and 1980 and the laboratory analyses completed in 1981. Examined were trout from two streams stocked for many years with carriers of whirling disease (*Myxosoma cerebralis*), furunculosis (*Aeromonas salmonicida*), and infectious pancreatic necrosis virus (IPNV) and two nearby streams (one with a brown trout population and one with a brook trout population) that, insofar as is known, have never been stocked. The results indicated that bacterial diseases are maintained in native populations by continued stocking, but that the disease carrier incidence is low (less than 5%). The only evidence for the maintenance of the IPN virus in stocked populations was the occurrence of one infected fish in the 311 examined (about 0.3%). Whirling disease was present in a high proportion of the fish (20-25%). In the two streams that had never been stocked, whirling disease and IPNV were not present but furunculosis was found in two of 80 fish examined from the native brown trout population. The stocking of fish with furunculosis or IPN apparently has little adverse effect on native fish.



## ABSTRACTS: ROCKY MOUNTAIN CONFERENCE OF PARASITOLOGISTS

The following abstracts of interest to fish health workers were excerpted from the program of the Rocky Mountain Conference of Parasitologists, held at Idaho State University on May 7-8, 1982.

*The Role of a Helminthic Parasite in the Reduction of the Pupfish Population in Ash Meadows, Nevada.* Bert B. Babero. Department of Biological Sciences, University of Nevada, Las Vegas, Nevada 89154.

In the Spring of 1981 an investigation was conducted relative to the roundworm infections by *Eustrongylides* Jagerskiöld, 1909 in aquatic and avian hosts of the Ash Meadows (southern Nye County) area. Five natural occurring thermal springs were investigated, each of which is known to harbor two or three species of fish, including the desert pupfish, an endangered species. In the past, considerable controversy existed between conservationists and land developers whose persistent disruption of the ecosystem of the pupfish threatened their survival and the eventual extinction of the species. The role that parasitism may play in decimating the population has not been thoroughly investigated. Preliminary studies by this investigator have revealed the presence of a dioctophymid parasite in fishes of each of the Springs comprising this study. One spring, Longsteet, revealed an infection rate in fish of nearly twenty percent. This roundworm, *Eustrongylides*, is highly pathogenic to its fish host and numerous dead fish both in nature and in the laboratory have been observed due to infection by this parasite.

*A Parasite Survey of Northern Squawfish (Ptychocheilus oregonensis Richardson) from Priest Lake, Idaho.* Consetta M. Helmick and John W. Crane. Department of Biology, Washington State University, Pullman, Washington 99164.

A parasite survey of Northern Squawfish (*Ptychocheilus oregonensis* Richardson) from Priest Lake, Idaho was conducted during the summer of 1980 and 1981. Nine genera of helminths, one unidentified nematode, and one leech were recovered. These included one trematode species, *Plagiocirrus primus*; one metacercarial trematode species, Neascus-type metacercaria; two cestode species, *Bothriocephalus cuspidatus* and *Proteocephalus* spp.; four nematode species, *Cystidicola stigmatura*, *Rhabdochona pellucida*, *Rhabdochona cascadiella*, and *Hepaticola bakeri*; one unidentified nematode species; one Acanthocephala species, *Neoechinorhynchus rutili*; and one leech species, *Placobdella* spp.

*Problems associated with the taxonomy of the ancyrocephaline Monogenea of North American freshwater fishes.* M. Beverly-Burton, Department of Zoology, College of Biological Science, University of Guelph, Guelph, Ontario, Canada N1G 2W1.

Recent studies on the anatomy of some ancyrocephalines parasitizing freshwater fishes in Ontario have resulted in the recognition of several "penis types", each of which appears to be characteristic of parasites infecting fish which are phylogenetically (or ecologically) related. Taxonomic affinities using penis type, host relationships and haptor characteristics have been used in re-evaluating some of the North American ancyrocephaline genera (e.g. *Actinocleidus*, *Cleidodiscus*, *Onchocleidus* and *Urocleidus*).

It is hypothesized that recognition of the phylogenetic relationships of some host taxa may be facilitated by an awareness of the relationships of their ancyrocephaline parasites.

*Xenomas of Wild Fish from Idaho.* A. Jim Chacko. Department of Fishery Resources, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, Idaho 83843.

Xenoma tumors caused by microsporidian (*Microspora* ph.n.) *Glugea* spp. in two species of wildfish from Idaho are discussed. Northern squawfish (*Ptychocheilus oregonensis*) from St. Joe

River and Sunapee trout (*Salvelinus alpinus* L.) from Sawtooth Lake showed parasitic xenomas as described by Weissenberg. Histopathologically, the xenomas showed the multiplying intracellular parasite in the host cell. This is the first report of such tumors in fish from Idaho.

*Histochemical and X-Ray Microelemental Analysis of the Haptorial Armament of Gyrodactylus spp. (Platyhelminthes: Monogenea).* R. J. Kayton, Dept. of Biology, Idaho State University, Pocatello, ID. 83209.

Histochemical techniques were used to investigate the composition of the anchors, hooks, bars, and shield of *Gyrodactylus* spp. found on the Utah Chub, *Gila atraria*. X-ray microelemental analysis was used to confirm the histochemical data. The five histochemical tests were (1) performic acid alcian blue (PFAAB), (2) Dimethyl-dihydroxy-dinaphthyl-disulphide (DDDa), (3) Dimethyl-dihydroxy-dinaphthyl-disulphide (DDDb), (4) Red sulphhydryl reagent (RSR) and (5) p-dimethylaminobenzaldehyde (DMBA). PFAAB, DDDa, DDDb, RSR specifically identify sulphur bearing proteins and DMBA is specific for the amino acid tryptophane. Parasites used for energy dispersive spectroscopy (EDS) were placed in a drop of distilled water on a carbon stub and air dried. The anchors and hooks stained dark blue with PFAAB; none of the sclerites stained with DDDa; DDDb stained the anchors reddish purple and stained the hooks light pink; RSR stained the shield and bars light orange; DMBA did not stain the adult sclerites. The EDS spectrum produced by the anchor showed large amounts of sulphur as well as significant amounts of potassium and calcium. It is concluded that the anchors and hooks are composed of a scleroprotein with a substantial amount of sulphur bearing amino acids, and that the anchor protein is different than that of the hook. The ventral bar, dorsal bar and shield are apparently composed of yet another protein with few if any sulphur bearing amino acids.

Contributed by: Dr. Richard Heckman, Department of Zoology, Brigham Young University, Provo, Utah 84602.

## ALASKAN IHN VIRUS FINDINGS

Submitted by Jill Follett, Lab Manager, Fisheries Rehabilitation, Enhancement and Development Division, Fish Pathology Section, Alaska Dept. of Fish and Game, 333 Raspberry Road, Anchorage, Alaska 99502.

In 1980, IHN virus was found in a sample of ovarian fluids taken from pink salmon spawning in Tamgas Creek, Alaska. Only one of the 60 samples was positive for the virus. We tested the progeny from this brood as well as 150 1981 spawning adults and found no virus. The '82 adult pinks will also be checked since they are the same population. At the time of the virus positive sampling, sockeye salmon were also in the creek. It is possible that the original isolate actually may have been a contaminant from the sockeye. Virus isolates from the Tamgas Creek sockeye salmon are being sent to Oregon State University to have a protein profile done and compared to that of the pink salmon isolate.

## BROWN BLOOD PROBLEMS IN COMMERCIAL CHANNEL CATFISH PRODUCTION

by T. E. Schwedler\*

Nitrite-induced methemoglobinemia (brown blood) has become a major problem in commercial channel catfish in the Mississippi Delta. The disease was first diagnosed in 1978 as brown blood and attempts to effectively treat this disease have been in progress since. Early attempts used both chloride salts and methelene blue as pond treatments, however methelene blue was soon determined to be non-feasible as a pond treatment.



Successful treatment of brown blood disease was eventually derived from the existing literature to be 25 ppm NaCl for each 1 ppm of nitrite in the pond. This treatment was very effective but costly and logistically cumbersome.

Idiosyncrasies were discovered when commercial producers started monitoring nitrite levels in their ponds. Individual producers might have 8 ppm nitrite but have no overt clinical signs of brown blood disease while other producers would have acute brown blood disease when only 1 - 2 ppm of nitrite existed in the ponds.

In reviewing the literature, several authors suggested that chloride (Cl<sup>-</sup>) ions protected fish from nitrite-induced methemoglobinemia. Implementation of a policy of checking Cl<sup>-</sup> concentrations in ponds when appreciable nitrites were observed was initiated. The outcome of these investigations indicated that water with high ambient Cl<sup>-</sup> concentrations could in fact protect fish from nitrite-induced methemoglobinemia. Bioassay research done at Mississippi State Veterinary College established that nitrite to chloride ratios were important in predicting the percent of methemoglobin induced in channel catfish. Therefore the treatment approach changed, taking into account ambient chloride ion concentrations when determining if a chloride treatment was necessary.

Producers in Mississippi have been instructed to keep a 3 chloride ions to 1 nitrite ion ratio in their pond water. This 3:1 ratio in practice keeps fish from demonstrating clinical signs of brown blood disease, (i.e., below 30% methemoglobin). If the chloride to nitrite ratio drops below 3:1, a recommendation of increasing the ratio to above 3:1 using a chloride salt (NaCl or CaCl<sub>2</sub>) is made.

Through effective monitoring of nitrite and treatments based on maintaining a 3:1 chloride to nitrite ratio, we can successfully and economically control our brown blood problems in commercial channel catfish ponds.

\* Department of Wildlife and Fisheries, Mississippi Cooperative Extension Service, Stoneville, Mississippi 38776.

## BOOKS AND PUBLICATIONS

*Chemoreception in Fishes*. Edited by Toshiaki J. Hara. 1982. Published by Elsevier Scientific Publishing Company, P.O. Box 211, 1000 AE Amsterdam, The Netherlands. Canadian and U.S. customers should order from: Elsevier Science Publishing Co., Inc., 52 Vanderbilt Avenue, New York, NY 10017. 434 pp. US \$100.00 / Dfl. 215.00.

*Unipub Catalog - 1982*. Includes the publications of Allanheld, Osmun, Canadian Government Publishing Centre, Fishing News Books, Ltd., Food and Agriculture Organization, International Atomic Energy Agency, National Fisherman, New England Fisheries Development Foundation, United Nations Educational, Scientific and Cultural Organization and the White Fish Authority. Unipub, 345 Park Avenue South, New York, NY 10010.

*Water Quality Management for Pond Fish Culture*. By Claude E. Boyd. 1982. Published by Elsevier Scientific Publishing Company, P.O. Box 211, 1000 AE Amsterdam, The Netherlands. Canadian and U.S. customers should order from: Elsevier Science Publishing Co., Inc., 52 Vanderbilt Avenue, New York, NY 10017. 318 pp. US \$69.75 / Dfl. 150.00.

## MORE PUBLICATIONS OF INTEREST

In addition to our regular New Publications feature, we have the following compilation submitted by A.J. Udchitz, 2301 Parliament Avenue, Regina, Saskatchewan S4S 4G5, Canada.

Desert Research Institute  
Bioresources Center  
P.O. Box 60220  
Reno, Nevada 89506

DRI No. 50006. Koch, D.L., E.L. Lider and J. J. Cooper. The effect of ammonia, nitrite, and nitrate on egg incubation, hatching success, and fry and fingerling survival of Lahontan cutthroat trout (*Salmo clarki henshawi*). 41 pp. \$3.50.

DRI No. 50009. Knoll, J., D.L. Koch, J. Sommer, L. Hoffman and S. Lintz. Physiological adaptations of salmonid fishes (*Salmo clarki henshawi*, *Salmo gairdneri*, and *Onchorhynchus kisutch*) to alkaline saline water and its toxic effects. 82 pp. \$6.00.

DRI No. 50011. Kõch, D.L., E.L. Lider and Stephen Robertson. Toxic effect evaluation of ammonia, nitrite and nitrate on cui-ui (*Chasmistes cujus*). \$3.00.

DRI No. 50016. Evaluation of the combined effects of ammonia, nitrite and nitrate on the egg incubation, hatching and fry development of Lahontan cutthroat trout (*Salmo clarki henshawi*). \$3.00.

Elsevier Science Publishing Co., Inc.  
52 Vanderbilt Avenue  
New York, NY 10017

Developments in Aquaculture and Fisheries Science Series, Volume 8: Chemoreception in Fishes, edited by Toshiaki J. Hara. 1980. 350 pp. (ISBN 0-444-41866-0).

Developments in Aquaculture and Fisheries Science Series, Volume 9: Water Quality Management for Pond Fish Culture, by Claude E. Boyd. 1982. 318 pp. (ISBN 0-444-42054-1).

Academic Press, Inc.  
111 Fifth Avenue  
New York, NY 10003

Aquarium Systems, edited by A.D. Hawkins. 1981. 452 pp. (ISBN 0-12-333380-6).

Stress and Fish, edited by A.D. Pickering. 1981. 367 pp. (ISBN 0-12-554550-9).

Noyes Publications  
Mill Road at Grand Avenue  
Park Ridge, NJ 07656

Food Technology Review No. 53. Aquaculture and Algae Culture: Processes and Products, by A. Shaw Watson. 1979. 310 pp. (ISBN 0-8155-0779-8).

State Mutual Book & Periodical Service Ltd.  
521 Fifth Avenue  
New York, NY 10017

Coldwater Fish Cyclopaedia, by F.W. Orme. 1981. (ISBN 0-904558-84-3).

Texas University Press  
Lubbock, TX 79409

Evolution of Vertebrate Endocrine Systems, edited by P.K.T. Tang and A. Eppe. 1980. 404 pp. (ISBN 0-89672-077-2).

Canada Institute for Scientific and Technical Information  
National Research Council Canada  
Ottawa, Ontario K1A 0S2  
Canada

(This agency offers the following on a demand basis.)

Translation Series No. 3054. Laboratory Diagnosis of Fish Diseases, by G.D. Goncharov. 1974. 179 pp.

Translation Series No. 3548. Population Genetics of Fishes, by Yu P. Altukhov. 1975. 248 pp.

Translation Series No. 3558. The Maturation and Spawning of Fish: Fundamentals and Applications, edited by T. Hibiya et al. 1975. 260 pp.

Translation Series No. 3861. The Biology, Reproduction and Development of the Pacific Salmon, by A.I. Smirnov. 1976. 335 pp.

Translation Series No. 4069. Sex Differentiation in Fishes, by G.M. Persov. 1977. 116 pp.

Translation Series No. 4660. Elements of the Physiology and Biochemistry of Total and Active Metabolism in Fish, edited by G.E. Shul'man. 1978. 291 pp.

Miscellaneous titles:

Living Without Oxygen: Closed and Open Systems in Hypoxia Tolerance, by Peter W. Hochachka. 1980. Harvard University Press. 181 pp. (ISBN 0-674-53670-3).

Parasites, Infections and Diseases of Fish in Africa. CIFA Technical Papers: No. 7. 1980. (ISBN 92-5-100982-1, F2032, FAO). Unipub, New York.

Fishes: An Introduction to Ichthyology, by P.B. Moyle and J.J. Cech. 1982. (ISBN 0-13-319723-9). Prentiss-Hall, New Jersey.

## CRYPTOBIA CARASSII (SWEZY, 1919) AN ECTOPARASITE FROM FRESHWATER FISHES

This small (5-7 mm), triangular biflagellate with *agitated* movement was first described as *Trypanoplasma carassii* by Swezy (1919) from *Carassius auratus* in California. In 1947, H.S. Davis described it as *Bodomonas*



*agitans* from *Pomoxis* spp. in West Virginia. In 1956, Chen described it as *Cryptobia agitata* from *Aristichthys nobilllis* and *Hypophthalmichthys molitrix* in China. Because of the laws of binomial nomenclature, the name of the genus of ectoparasitic biflagellates is *Cryptobia* and that of the blood forms is *Trypanoplasma* (Lom, 1979).

Until proven otherwise, *C. carassii* is not considered a serious pathogen. References cited:

Chen, C.-L. 1952. The protozoan parasites from four species of Chinese pond fishes: *Ctenopharyngodon idella*, *Mylopharyngodon piceus*, *Aristichthys nobilllis* and *Hypophthalmichthys molitrix*. Acta Hydrobiologia Sinica 1956 (2): 279-299.

Davis, H. S. 1947. Studies on the protozoan parasites of freshwater fishes. Fishery Bul. 41: 1-29 & 224 illus.

Lom, J. 1979. Biology of the trypanosomes and trypanoplasms of fish. Chapter 6 in: Lumsden, W.H.R. and Evans, D.A. (eds.) Biology of the Kinetoplastida. Vol. 2, Acad. Press, New York, London.

Swezy, Olive 1919. The occurrence of *Trypanoplasma* as an ectoparasite. Trans. Amer. Microscop. Soc. 38(1): 20-25 & 5 illus.

Submitted by: Glenn L. Hoffman, Fish Farming Experimental Station, USFWS, P.O. Box 860, Stuttgart, Arkansas 72160.

### SHORT COURSES WW FISH DISEASE COURSE SET FOR M.S.U.

The short course *Diagnosis and Treatment of Diseases of Warmwater Fish* (WL 4124/6124) will be taught at Mississippi State University on May 16-27, 1982. This course will provide instruction in the methodology of diagnosis and treatment of parasitic, bacterial, viral, nutritional and environmental diseases of warmwater fish. Undergraduate or graduate credit of four semester hours will be given for the successful completion of the course.

Tuition for the course has been set at \$176.00. This, however, is subject to change. The course is limited to 24 persons and applications must be received on or before March 1, 1983. Applicants will be notified of acceptance before April 1, 1983. Students will be expected to provide their own compound microscopes. A limited number, however, will be available for those who do not have access to one.

Instructors for the warmwater short course at M.S.U. will be Dr. Thomas L. Wellborn, Jr., Leader, Wildlife and Fisheries Department, Mississippi Cooperative Extension Service, Mississippi State, Mississippi and Dr. Thomas E. Schwedler, Area Fisheries Specialist, Stoneville, Mississippi. For applications and further information, contact Dr. Wellborn at the Mississippi Cooperative Extension Service, P.O. Box 5405, Mississippi State, Mississippi 39762.

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The Fisheries Academy of the National Fisheries Center in Leetown, West Virginia is scheduling a variety of aquaculture-related short courses around the country during 1983. Included are the following:

March 21-25, 1983. *Pacific Salmon Culture*. Location: Corvallis, Oregon. Closing date for application: 2/4/83. Tuition fee: \$100.00.

March 21 - April 1, 1983. *Coldwater Fish Culture*. Location: Leetown, West Virginia. Closing date for application: 2/4/83. Tuition fee: \$180.00.

April 11-15, 1983. *Introduction to Fish Health*. Location: Twin Falls, Idaho. Closing date for application: 2/25/83. Tuition fee: \$100.00.

May 9-13, 1983. *Introduction to Fish Health*. Location: Leetown, West Virginia. Closing date for application: 3/25/83. Tuition fee: \$100.00.

June 6-10, 1983. *Fish Genetics and Brood Stock Selection*. Location: Twin Falls, Idaho. Closing date for application: 4/22/83. Tuition fee: \$100.00.

July 18-22, 1983. *Warmwater Fish Culture*. Location: San Marcos, Texas. Closing date for application: 6/3/83. Tuition fee: \$100.00.

August 8-19, 1983. *Pacific Salmon Culture*. Location: Bellingham, Washington. Closing date for application: 6/24/83. Tuition fee: \$180.00.

September 12-16, 1983. *Warmwater Fish Culture*. Location: Orangeburg, South Carolina. Closing date for application: 7/9/83. Tuition fee: \$100.00.

September 12-23, 1983. *Coldwater Fish Culture*. Location: Twin Falls, Idaho. Closing date for application: 7/29/83. Tuition fee: \$180.00.

Two audio-visual training courses are now available in ¾-inch video tapes from the Fisheries Academy: *Fish Marking: Principles and Techniques* (43½ min.) and *Preparing Fish for Shipment to Diagnostic Stations* (16½ min.). The price for these tapes is \$30.00 each.

Application and order forms, a complete course catalog and further information can be obtained from: Fisheries Academy, National Fisheries Center-Leetown, P.O. Box 700, Kearneysville, West Virginia 25430.

### BOOK REVIEW

Submitted by Dr. Joe Hunn, Leader - Fish Toxicity Section, Columbia National Fisheries Research Laboratory, USFWS, Route 1, Columbia, Missouri 65201.

Smith, L.S. 1982. *Introduction to Fish Physiology*. T.F.H. Publications Inc., Neptune, N.J. 352pp.

Lynwood Smith has produced an excellent one volume fish physiology text. The title is a bit misleading as this text requires a good background in basic physiology or comparative physiology to tackle some of the concepts presented such as the differences in proposed gill ion pumping models. Having said this however, this is the best available single volume text on fish physiology. The book contains twelve chapters: I. Introduction, II. Osmoregulation, III. Circulatory System, IV. Respiratory System, V. Bioenergetics and Metabolism, VI. Digestion, VII. Muscle Metabolism and Function, VIII. Sensory Organs, IX. Central Nervous Systems, X. Endocrine System, XI. Reproduction and XII. Applied Physiology. Most of the references in the bibliography are pre-1979 indicating that the manuscript was in process for a period of time.

A few minor problems were encountered in regard to the printing of the figures - too light or dark or overly cramped for space. One figure is slightly misleading (111-1) in that there is a hepatic artery supplying the liver with arterial blood.

If this text is updated, this reviewer would like to see Chapter XII expanded and some information present on the impact of contaminants (organic and inorganic) on the physiology and biochemistry of fishes.

Lynwood Smith and T.F.H. Publications have done a real service for those of us who teach fish physiology courses in providing a very readable and affordable text.





**UPCOMING EVENTS**

February 9-11, 1983. *First International Biennial Conference on Warm-water Aquaculture - Crustacea*. Location: George Q. Cannon Activities Center, Brigham Young University, Hawaii Campus, Laie, Hawaii. Contact: Richard A. Heckmen, Dept. of Zoology, Brigham Young University, Provo, Utah 84602.

April 26-27, 1983. *The Annual Meeting of the Fish Health Section/AFS: The Role of Noninfectious Diseases in Fish Health Management*. Location: Iowa State University, Ames, Iowa. Contact: Dr. John Nickum, Iowa Cooperative Fishery Research Unit, Iowa State University, Science II, Ames, Iowa 50011.

May 1-4, 1983. *International Association for Aquatic Animal Medicine*. Location: Queensway Bay Hilton, Long Beach, California. Hosted by: Marineland, Rancho Palos Verdes, California. Contact: Don Dumwalt, P.O. Box 937, Rancho Palos Verdes, California 90270.

May 15-18, 1983. *39th Northeast Fish and Wildlife Conference*. Location: Mount Snow Resort, Dover, Vermont. Contact: Angelo Incerpi, Agency of Environmental Conservation, Fish and Game Department, State Office Building, Montpelier, Vermont 05602.

July 10-14, 1983. *Annual Meeting of the Western Division of AFS*. Location: Jackson Hole, Wyoming. Contact: Earl M. Thomas, Game and Fish Department, Cheyenne, Wyoming 82002.

August 14-20, 1982. *The 113th Annual Meeting of the American Fisheries Society*. Location: the University of Wisconsin at Milwaukee, WI. Contacts: (questions regarding the program) Charles C. Coutant, Environmental

Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37830; (questions regarding facilities and meeting arrangements) Fred P. Binkowski, Center for Great Lakes Studies, University of Wisconsin-Milwaukee, P.O. Box 413, Milwaukee, Wisconsin 53201.

December 4-7, 1983. *45th Midwest Fish and Wildlife Conference*. Location: the Sheraton-St. Louis Hotel, St. Louis, Missouri. Contact: Ollie Torgerson, Missouri Department of Conservation, P.O. Box 180, Jefferson City, Missouri 65102.

**KEEP THE NEWSLETTER IN MIND**

The FHS Newsletter is one of the most important functions of our organization. Yet it is only as good as we, the members, make it. Nearly all of us have something of interest to report at one time or another. Please take the time to send it in. Items of potential interest include, but are not limited to new discoveries, interesting observations, research updates, career milestones, announcements, book reviews and editorials. Black and white photographs and artwork are welcome.

Keep the Section in mind. Send your Newsletter contributions to:

Peter G. Walker, Newsletter Editor  
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