FHS NEWSLETTER

FISH HEALTH SECTION - AMERICAN FISHERIES SOCIETY

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Increasing Occurrence of *Flexibacter maritimus* in the Marine Aquaculture of Spain

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Flexibacter maritimus was first described as the causative agent of "marine flexibacteriosis" in several cultured fish in Japan and became a common problem in that country (Wakabayashi et al, 1986). This microorganism has also been isolated in association with fish disease in the UK (Campbell and Buswell, 1982) and France (Bernardet, 1992).

In Spain, sporadic cases of flexibacteriosis have previously been observed in turbot, and halophilic filamentous bacteria have been detected by microscopic examination of wet mount preparations from skin lesions of diseased turbot (Devesa et al., 1989; Toranzo et al., 1990). Nevertheless, attempts to recover the microorganism using the specific culture media Marine Agar (Z2216l,l Difco) and Anacker and Ordal's Agar (Anacker and Ordal, 1955) had been unsuccessful until present. Interestingly, since July 1992 the incidence of infections by *F. maritimus* in different cultured fish in Galicia (Northwestern Spain) has become an increasing problem for marine aquaculture. Fortunately, using a modified Anacker and Ordal's Agar that we named *Flexibacter maritimus* medium (FMM - peptone 0.5%, sodium acetate 0.001%, yeast extract 0.05% and agar 1.5%, prepared in seawater), the successful isolation of this microorganism from salmon and turbot lesions was achieved. Recently we have also isolated this organism from internal organs of disease turbot.

Affected fish (juveniles and adults) show ulcerative skin lesions as well as fin and tail necrosis. In addition, hemorrhagic jaws ("red mouth") are a typical clinical sign, but have only observed in turbot. Smears from the different ulcerative zones revealed the presence of numerous, slender, non-motile filamentous shaped bacteria measuring 0.5 x 15 - 40 m, which allowed us to assign them as belonging to *Flexibacter* species.

The ten Spanish isolates were Gram-negative, oxidative, oxidase and catalase positive. Colonies were flat, pale yellow, with uneven edges and adherent to the agar. The morphological, physiological and biochemical characteristics of the isolates were determined as previously described (Bernardet et al., 1990) All the isolates were phenotypically similar to the *F. maritimus* reference strains (NCIMB2153, 2154 and 2158) using both standard biochemical tests and the API® system. Table 1 shows the typical API-ZYM profile of reference *Flexibacter* strains and the ten isolates. Although all the strains were totally resistant to quinolones, they were highly sensitive to tetracyclines, chloramphenicol, nitrofurans and potentiated sulfonamides. Agglutinating assays using "O" antigens revealed that only strains isolated from salmon reacted strongly with serum against the type strains NCIMB 2153 isolated from black sea bream (*Acanthopagrus schlegeli),* which suggested the possible existence of different serological groups within *F. maritimus* isolates. However, SDS-PAGE and immunoblot (Western blot) analysis of lipopolysaccharides (LPS) did not support the existence of antigenic diversity. Presently a more extensive characterization of the isolates at phenotypic and molecular level is being performed, and the results will be reported elsewhere.

(Continued on page 2)

In This Issue:

(Continued from page 1)

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Table 1. API-ZYM Profile of *Flexibacter maritimus* strains.

Enzymes	*Flexibacter maritimus*	
	Reference strains (n = 3)	Spanish isolates (n = 10)
Alkaline phosphatase (2)*	+	+
Esterase (3)	+	+
Esterase lipase (4)	+	+
Lipase (5)	+	+
Leucine acrylamidase (6)	+	+
Valine acrylamidase (7)	+	+
Cystine acrylamidase (8)	+	+
Trypsin (9)	+	+
Chymotrypsin (10)	+	+
Acid phosphatase (11)	+	+
Naphtol-AS-BI-phosphohydrolase (12)	+	+
a -galactosidase (13)	-	-
b-galactosidase (14)	-	-
b-glucuronidase (15)	-	-
a-glucosidase (16)	-	-
b-glucosidase (17)	-	-
N-acetyl-b-glucosaminidase (18)	-	-
a-mannosidase (19)	-	-
a -fucosidase (20)	-	-

* Number in parenthesis indicate API codes.

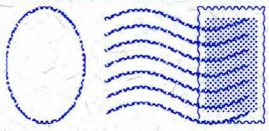
Diseases Reported in Pen-Reared Salmonids from Chile

Sandra Bravo, SALMOLAB, Puerto Montt, Chile

Yersinia ruckeri, the causative agent of enteric redmouth disease (ERM) has been detected among Atlantic salmon (*Salmo salar*) juveniles reared in net pens located in three lakes of southern Chile. The first and only isolation of *Y. ruckeri* in Chile was reported from the gut of common carp (*Cyprinus carpio*) in 1987. In this case, *Y. ruckeri* was isolated during September and October, 1992 from Atlantic salmon (4.5 - 6.0 cm in length). The temperature of the water was 11° C. Clinical signs exhibited by infected fish included bilateral exopthalmia and lethargy. The most characteristic internal signs were the digestive tract devoid of food and an enlarged spleen. The fish were initially stressed by handling and then subsequently by storm conditions in the area of the lakes. This bacterium was not transmitted to other stocks of fish reared in the same area, nor to other species of salmonids reared in cages next to the infected fish. The level of mortality was not significantly high in the affected stock, and in the most severe case it was only 7% (accumulated). Within a week after the infected lots were transferred to seawater, the fish again showed clinical signs of ERM. The bacterium was isolated from kidney, eye and gut of the infected fish and identified at the Laboratory for Fish Disease Research, Department of Microbiology, Oregon State University. All isolates agglutinated with antisera to *Y. ruckeri* Type I and II. Antibiotic sensitivity testing indicated that these isolates were sensitive to oxolinic acid, oxytetracycline and flumequine.

In May 1992, *Argulus* spp. was detected on the body surface of a 2.0 kg rainbow trout (*Oncorhynchus mykiss*). The fish had been swimming erratically and exhibited loss of equilibrium. In 1979, *Argulus* was detected among wild fishes form the river of central Chile, however, this report documents the first observation of *Argulus* sp. parasitizing salmonids in southern Chile. The trout was collected at Huillinco Lake, Chiloe Island (lat. 42°, 41'S; long. 73°, 57' W). This lake has a salinity gradient and is connected to the Pacific Ocean through an intermediate lake. This organism could be an important parasite of small fishes because it causes mechanical damage to external surfaces of fish, thus providing a route of infection for other pathogens.

LETTER TO THE EDITOR:



ARE WE COMPETING WITH OURSELVES?

The Fish Health Section Newsletter has attracted an amazing series of well written and informative scientific articles. This played an important role in the evolution of the Fish Health Section. The Section now has a Journal. One cannot help but wonder if some of this effort to create journal-quality unpublished articles (journal-like, gray literature) in the FHS Newsletter might not be better directed by producing peer-reviewed, published communications and scientific articles in the FHS *Journal of Aquatic Animal Health*?

Bert Williams
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Editor's reply: It has been my observation in my first year as co-editor that the overall tone of many articles has changed e.g., becoming more technical with more and detailed references. This is in contrast to the more informal articles dealing with preliminary research results and case studies seen in previous years. Perhaps the newsletter is only a microcosm of the changes taking place in the arena of fish health in general. It should be noted that many of the articles found in the newsletter are turning up again as more detailed journal articles. Newsletter editors are notorious for being grateful for any submissions (try it, you'll see why). However, maybe we should consider being more selective. Readers, this is your newsletter, let me know what you think.

Chris Wilson

Effects of PEG Pretreatment, Inoculum Volume, Adsorption and Time on IHNV Titers Determined by EPC Plaque Assay

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Optimization factors for epithelioma papulosum cyprini (EPC) plaque assay conditions to determine the presence and titer of IHNV include the effect of polyethylene glycol (PEG), viral inoculum size, and time and method of adsorption (Batts et al. 1991). For clinical IHNV examination or routine inspections of rainbow trout, *Oncorhynchus mykiss*, we use a 24-well plate tissue culture system. Each well has 1.88 cm^2 of cell monolayer growth area. Using this system, previous studies have shown that an inoculum volume of 50 µL results in detection of the highest number of IHNV plaques using drained monolayers that are rocked during a 1 h adsorption period (Warren J. Groberg, Oregon Department of Fish and Wildlife, personal communication). For any assay system used, consideration must be given to enhancement obtained by cell treatments, inoculum volume and effect on sensitivity, and labor and equipment constraints. In this report we describe our optimization for the 24-well plate tissue culture system.

The EPC cell line used in this study was maintained in minimum essential medium with 10% fetal bovine serum buffered to pH 7.5 with 7.5% sodium bicarbonate and 1M Hepes (MEM-10). For plaque assays, stock cells were suspended in MEM-10 and seeded into 24-well plates and incubated at 25°C overnight. Two stock viruses, 220-90 and 184-90, were used in this study. These viruses exhibit serological differences with monoclonal antibodies. Additionally, tissues kidney, spleen, and liver from three rainbow trout fry (previously waterborne exposed to IHNV 220-90 using standard procedures), were pooled, homogenized (1:10) in Hanks Balanced Salts Solution (HBSS), centrifuged, and the supernatant tested. Serial 10-fold dilutions (10^{-5} and 10^{-6}) of virus isolates or homogenate supernatant were prepared in HBSS. To treat cells with PEG, growth media was removed, and 20 µL of decontamination diluent (Dulbecco's phosphate buffered saline, gentamicin sulfate, and amphotericin B) containing 7% (w/v) PEG-20,000 was added to cell monolayers prior to 50 or 100 µL virus dilutions. Each dilution was inoculated in triplicate, with and without PEG, using an inoculum volume of 50 or 100 µL for each treatment. Additionally, replicate plates were inoculated to test the effect of duration of continuous rocking during adsorption on virus titers. Immediately after inoculation (time 0) and after 15, 30, 45, 60, 75, and 90 min, inoculum was removed and 0.5 mL of an overlay consisting of MEM containing 5% fetal bovine serum and 0.75% methyl cellulose buffered to pH 7.5 with 7.5% sodium bicarbonate and 1M Hepes was added to each well. Type of adsorption, continuous or interval rocking, was also tested with IHNV-isolate 220-90. Using an identical 24-well plate set-up (in triplicate, with and without PEG, with an inoculum volume of 50 or 100 µL) plates were continuously rocked on a rocker platform or rocked manually for 10 sec beginning immediately post-inoculation and at 15 min intervals. After 30, 45, 60, 75, and 90 min, inoculum was removed and overlay added to each well. Plates were incubated for 6 d at 18°C then fixed and stained with a solution of formalin and crystal violet. Enumerated plaques were reported as plaque forming units (PFU)/mL or g.

Results for all treatments after continuous rocking at each adsorption interval indicated that there was 1) up to a 2.1-fold increase in virus titer with PEG compared to no PEG with a 50 µL inoculum, 2) generally no difference in titer with 100 µL inoculum with or without PEG, 3) up to a 2.3-fold increase in virus titer with or without PEG for 50 µL compared to 100 µL inoculum, 4) generally an increase in titer with increased adsorption time up to 75 min with a slight decrease after 90 min, and 5) a 4.4 to 9.6-fold increase in maximum titers after 75-90 min of adsorption compared to titers determined immediately post-inoculation (time 0). An exception was IHNV 220-90 using 100 µL, with or without PEG in which titers increased 15- and 13-fold (Tables 1 and 2). The same trends for PEG enhancement and effect of inoculum volume at different time points post-adsorption were also observed for plates either continually rocked or manually rocked at 15 min intervals. Additionally, the highest virus concentrations were generally observed with continual rocking regardless of PEG treatment, inoculum volume, or duration of adsorption. However, the highest titer was only 1.3-fold greater than those obtained with manual rocking (Table 3).

In the study reported herein, both cell culture supernatant and clarified fish tissue homogenate containing IHNV adsorbed efficiently to PEG treated and untreated EPC monolayers immediately following inoculation, in agreement

with earlier reports (Batts and Winton 1989). In a similar study, Batts et al. (1991) reported that a 30 min pretreatment of EPC cells with PEG enhanced efficiency of plating for selected fish rhabdoviruses by 3 to 6-fold when using 100 µL of PEG and 100 µL inoculum in wells with 8.6 cm^2 of surface area (8-well plates). They also reported that when using PEG treated monolayers the number of plaques detected increased directly with the volume of inoculum.

In our study using wells with 1.88 cm^2, a 20 µL PEG treatment and a 50 µL inoculum adsorbed with continual rocking for 75 min appeared to optimize the virus titers. However, continuous rocking and longer adsorption times did not appear to be necessary for effective virus detection. Laboratories without rocker platforms or with limited time and manpower to perform viral diagnostic tests could still detect IHNV in clinical specimens using a simple cell culture based assay.

We did not observe an increase in plaques detected with increased inoculum volume. As others have noted (Batts et al. 1991), the current Blue Book states a 2 cm^2 well be inoculated with a minimum of 250 µL (Amos 1985). Results from this study suggest that large inoculum volumes in wells with small growth areas could decrease sensitivity of virus detection. Groberg (personal communication) actually observed this in studies conducted with IHNV in 12-well plates that have 3.83 cm^2 of growth area. The new Blue Book (Thoesen, in preparation) suggests that a minimum of 50 µL be inoculated for each cm^2 of growth area per well.

For cell culture systems used for viral inspections consideration must be given for enhancement obtained by cell treatments, inoculum volume, and sensitivity of detection.

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Table 1. Effect of polyethylene glycol (PEG) treatment, inoculum volume (µL), and time of adsorption (min) with continuous rocking during adsorption on virus titer (PFU/mL) determination of cell culture produced IHNV

INHV:	220-90				184-90			
PEG:	Yes		No		Yes		No	
Inoculum volume:	50	100	50	100	50	100	50	100
Time								
0	$9.1x10^7$	$3.2x10^7$	$4.7x10^7$	$3.6x10^7$	$1.2x10^7$	$7.0x10^6$	$6.7x10^6$	$6.0x10^6$
15	$1.4x10^8$	$1.1x10^8$	$1.4x10^8$	$9.2x10^7$	$4.1x10^7$	$2.4x10^7$	$2.5x10^7$	$1.5x10^7$
30	$2.0x10^8$	$1.5x10^8$	$1.8x10^8$	$1.3x10^8$	$3.6x10^7$	$3.0x10^7$	$2.7x10^7$	$1.8x10^7$
45	$3.0x10^8$	$2.1x10^8$	$2.3x10^8$	$1.6x10^8$	$4.4x10^7$	$4.2x10^7$	$3.7x10^7$	$2.7x10^7$
60	$4.2x10^8$	$4.2x10^8$	$2.7x10^8$	$2.5x10^8$	$7.1x10^7$	$5.1x10^7$	$3.8x10^7$	$4.1x10^7$
75	$7.5x10^8$	$1.7x10^8$	$4.5x10^8$	$2.7x10^8$	$8.1x10^7$	$5.3x10^7$	$4.5x10^7$	$4.8x10^7$
90	$5.5x10^8$	$4.9x10^8$	$4.5x10^8$	$4.7x10^8$	$7.4x10^7$	$5.2x10^7$	$4.8x10^7$	$4.6x10^7$

Table 2. Effect of polyethylene glycol (PEG) pretreatment, inoculum volume (µL), and time of adsorption (min) with continuous rocking on titer (PFU/g) determination on IHNV infected fish tissue homogenate.

	PEG Treated		No PEG	
Inoculum volume:	50	100	50	100
Time				
0	$1.5x10^6$	$8.0x10^5$	$1.4x10^6$	$8.0x10^5$
15	$2.9x10^6$	$1.7x10^6$	$2.0x10^6$	$1.8x10^6$
30	$4.4x10^6$	$1.9x10^6$	$2.1x10^6$	$2.3x10^6$
45	$4.1x10^6$	$3.1x10^6$	$3.9x10^6$	$3.4x10^6$
60	$6.2x10^6$	$3.4x10^6$	$4.8x10^6$	$3.3x10^6$
75	$8.3x10^6$	$4.0x10^6$	$6.1x10^6$	$3.6x10^6$
90	$7.7x10^6$	$4.5x10^6$	$5.1x10^6$	$3.7x10^6$

Table 3. Effect of continuous rocking versus manual rocking at 15 min intervals during virus adsorption on virus titer (PFU/mL) determination of cell culture produced IHNV isolate 220-90.

Rocking:	Continuous				Interval			
PEG:	Yes		No		Yes		No	
Inoculum volume:	50	100	50	100	50	100	50	100
Time								
30	$1.3x10^8$	$7.8x10^7$	$1.0x10^8$	$7.1x10^7$	$1.3x10^8$	$7.7x10^7$	$8.5x10^7$	$5.9x10^7$
45	$1.6x10^8$	$8.8x10^7$	$1.2x10^8$	$7.8x10^7$	$1.6x10^8$	$9.1x10^7$	$1.2x10^8$	$7.8x10^7$
60	$1.7x10^8$	$1.1x10^8$	$1.5x10^8$	$1.1x10^8$	$1.4x10^8$	$1.0x10^8$	$1.3x10^8$	$1.0x10^8$
75	$2.3x10^8$	$1.4x10^8$	$1.8x10^8$	$1.3x10^8$	$2.0x10^8$	$1.2x10^8$	$1.7x10^8$	$9.8x10^7$
90	$2.2x10^8$	$1.5x10^8$	$1.7x10^8$	$1.3x10^8$	$2.0x10^8$	$1.3x10^8$	$1.8x10^8$	$1.3x10^8$

ANNOUNCEMENTS

1993 FHS Meeting Abstracts Booklet Available

Forty copies of the program and abstracts booklet for the FHS Annual Meeting held in Denver Colorado on July 20-22, 1993 are still available. Copies can be purchased for $7.50 (within U.S.) or $10.00 (outside U.S.) by sending a U.S. currency check or money order made out to "Fish Health Section/AFS" to Dennis E. Anderson, P.O. Box 737, Ft. Morgan, CO 80701-0737.

MEETINGS

- *International Symposium on Fish Nutrition and Feeding.* **October 4 - 7, 1993.** Hobart, Tasmania. Contact: Victoria Dock, Hobart, Tasmania 7000 Australia.
- *Joint Meeting of the American Society of Tropical Medicine and Hygiene and the American Society of Parasitology.* **October 31 - November 4, 1993.** Atlanta, GA. Contact: Secretariat, ASTMH, 8000 Westpark Dr. Suite 130, McLean, VA 22102; (703) 790-1745.
- *World Aquaculture '94.* **January 12 - 18, 1994.** New Orleans, LA. Contact: Leroy Greswell, Harbor Branch Oceanographic Institute, 5600 Old Dixie Highway, Ft. Pierce, FL 34946; (407) 466-1506.
- *Uses and Effects of Cultured Fishes in Aquatic Ecosystems.* **March 12 - 17, 1994.** Albuquerque, NM. Abstract Deadline: December 14, 1993. Contact: Gary Carmichael, 213 Bryn Mawr Drive SE, Albuquerque, NM 87106.
- *International Association for Aquatic Animal Medicine.* **May 11 - 14, 1994.** Napa, CA. Contact: Brad Fenwick, Department of Veterinary Pathology, College of Veterinary Medicine, Kansas State University, Manhattan, KS 66506; (913) 532-4412.
- *Eastern Fish Health Workshop.* **May 25 - 28, 1994.** Blacksburg, VA. Contact: Steve Smith, Department of Pathobiology, VA/MD Regional College of Veterinary Medicine, VPI, Blacksburg, VA 24601; (703) 231-5131.
- *Virulence Mechanisms of Bacterial Pathogens.* **June 6 - 8, 1994.** Ames, IA. Contact: Dr. James A. Roth, Professor, Department of Microbiology, Immunology and Preventative Medicine, College of Veterinary Medicine, Iowa State University, Ames, IA 50011; (515) 294-8459.
- *Genetics in Aquaculture.* **June 19 - 25, 1994.** Dalhousie University, Halifax, Nova Scotia. Contact: Pamela Gaines, Marine Gene Probe Laboratory, Life Sciences Center, Dalhousie University, Halifax, NS, Canada B3H 4J1; (902) 494-3736 Fax.
- *Congress of Veterinary Virology of the European Society for Veterinary Virology.* **September 4 - 7, 1994.** Interlaken, Switzerland. Contact: Administrative Secretariat, S. Kihm/ I. Muler, Wydenweg 11, CH-4112 Fluh, Switzerland; (41) 61-731-13-13.

CHANGE OF ADDRESS

Charlie Smith retired from the U.S. Fish & Wildlife Service on July 2, 1993 and currently works part time from his home for Rangen Inc., Buhl, Idaho. His address, phone number and FAX number are as follows: **Charlie E. Smith, 212 Story Hill Rd., Bozeman, MT 59715 Phone (406) 586-2856 FAX (406) 587-5289**

FHS President's Annual Report - 1993
John R. MacMillan, President

The AFS Fish Health Section continues to be a strong advocate for fish health management based on credible science. The protection of our natural fisheries resources and the success of commercial aquaculture in the U.S. in part, attest to the success of this advocacy. Our professional certification programs continue to denote competence by inspectors and pathologists. The certification program is a model other AFS sections look to for their guidance as they also develop professional certification programs. We continue to strive to address the needs of a diverse membership which includes non-DVM and DVM fish health specialists.

Ongoing programs of the section continue to provide a means of communication and promote the science of fish health management. The chairpersons and other committee member volunteers are to be especially commended for their efforts. The FHS Newsletter and the Journal of Aquatic Animal Health function to inform and to help improve fish health management. The Technical Procedures and Blue Book Committees have made considerable effort rewriting and reviewing the Blue Book. The Professional Standards Committee and the Board of Certification continue to make considerable efforts on our behalf. The Membership committee continues to recruit new members to our section. The Archives Committee serves an important role in our section keeping track of our important documents. The Awards Committee continues to provide the special recognition some FHS members deserve. We need to continually strengthen all of these activities .

The very success of our programs has created some challenges which during the past year the FHS has started to address. The most emotional challenge is one from the American Veterinary Medical Association (AVMA) in which serious question has been raised about the adequacy of our professional certification program and the role of the non-DVM in fish health management. The AVMA and other veterinary groups or individuals have recognized the opportunities fish health management offers their members. They have legitimately questioned how fish health policies are determined and they have questioned the wisdom of regulating pathogens rather than diseases. Their challenge has prompted us to become introspective and examine ourselves as an AFS-section. The Long Range Planning committee has started the arduous task of developing our plan for the future. We must all work to shape this plan for final adoption within the coming year. Our professional standards committee has proposed to strengthen our certification program and, with the assistance of an ad-hoc continuing education committee, are proposing to require continuing education requirements to maintain professional certification and ensure we stay current in our fish health knowledge.

The Blue Book is in its final draft. The Executive Committee must decide whether to publish the document or to delay pending development of certified pathogen detection procedures. The debate over the Blue Book substance highlights the importance of certified diagnostic tests. The question remains, who would provide the certification? The federal government's USDA and Animal and Plant Health Inspection Service (APHIS) are the most logical and provide a legally enforceable means of certification. Yet they must ultimately be dependent on the FHS and our membership for the expertise. We have an opportunity to continue to provide leadership in this arena.

Animal welfare issues are also challenging us as scientists and fish health managers. An ad-hoc committee was established to address these concerns and consider developing some guidance

(Continued on page 9)

in the conduct of fish health research. Their efforts need to continue.

The JSA National Aquatic Animal Health Strategy Committee is developing short and long range plans to move fish health management into the 21st Century. While many of our members are key players in this effort, we have an opportunity as a section to provide insight into this effort. The Fish Health Section has been requested by this strategy committee to provide comment on appropriate structures and requirements for professional accreditation and recognition. There are other areas we may want to provide insight. Since much of the deliberations of the strategy committee are dependent on the impact of fish pathogens on natural fisheries resources, I initiated an international survey to discover the experience of others on host-pathogen-environment interactions. Unfortunately, there is not unanimity regarding the significance of fish movements, pathogen movement or indemnification programs. Nevertheless, important insight have been provided and these will be made available to the strategy committee. An upcoming US Trout Farmer Association symposium on the interaction of cultured fish and wild fish regarding disease should be helpful. The FHS needs to help sponsor this symposium.

There were two additional items of merit occurring during the year. As President of the FHS, I participated in an AFS sponsored meeting to assist CNN and the AFS-Fisheries Action Network (FAN) develop a documentary on U.S. fisheries. Finally, the FHS has been active in the JSA Working Group on Quality Assurance. We petitioned the FDA to classify various aquaculture chemicals as "Low regulatory priority." They have responded to our petition and have classified several different compounds as LRP or have elected not to regulate them as drugs. These are important steps as we and the aquaculture community strive to improve the U.S. fish drug availability situation.

There remain several areas we as fish heath scientists, managers and as the FHS could address. One of the more important issues pertains to how we might assist the aquaculture community in developing quality assurance programs that ensure drug and chemical residue avoidance. We could help shape producer fish health management programs and ensure proper use of the drugs that are available. We might consider serving as QAP verifiers. One of our primary functions as a section has been and should continue to be the promotion of fish health management on the basis of credible science and the effective communication of that science.

Fish Disease

With few exceptions, most economically serious fish diseases remain unchanged in status from previous years. The commercial catfish industry reports enteric septicemia of catfish (ESC), caused by *Edwardsiella ictaluri*, continues to be their most significant fish health problem. This is closely followed by winter kill which appears related to cold temperature immunosuppression confounded by other stressors. Proliferative gill disease caused by an actinosporean parasite and an anemia of unknown etiology are also significant. As in all fish species, *Flexibacter columnaris, Aeromonas spp.* and *Pseudomonas spp.* can be primary or ancillary pathogens. Problems have been identified with *Mycobacterium fortuitum* and *M. marinum* in the hybrid striped bass industry. These bacteria are of human health concern and indeed forced the closure of two commercial facilities. *Mycobacterium* have also been detected in some tilapia. *Pasteurella piscidia* has been identified as a problem in hybrid striped bass and red drum production even causing the closure of one hybrid striped bass production facility. Salmonid fisheries, both commercial and public, continue to report problems with IHNV, IPNV, BKD, EIBS, furunculosis, and cold water disease. Hitra disease (due to *Vibrio salmonicida*) has caused significant mortality in the net pen Atlantic salmon industry. Infestations of *Ceratomyxa shasta* are a problem in some water sheds of the Pacific Northwest

as are infestations with *Nanophyetus salmincola*. The *N. salmincola* infestations may be complicated by BKD or vibriosis.

New disease occurrences have also been reported. IHNV has been isolated from Atlantic salmon held in marine net pens from British Columbia. This isolate was from harvestable sized fish and was responsible for mortality. White sturgeon iridovirus (WSIV) was associated with mortality of Kootnai sturgeon, a species proposed for listing as endangered under the ESA. The North American strain of VHSV was isolated from Pacific Coast herring. Herring populations have been declining and while the VHSV was isolated from moribund fish, it is unclear as to its significance in herring abundance. *Myxobolus cerebralis* was detected in salmonids from Utah for the first time. Various control measures (depopulation) were instituted.

The significance of ELISA based positive BKD determinations is of concern. Several pathologists report ELISA positive but FAT negative diagnoses. There is concern for possible false positives or false negatives depending on testing method. There are management implications to either scenario.

Drugs and water treatments are of considerable and universal concern. There is a significant lack of FDA labeled compounds. In addition, there is increasing scrutiny by regulatory agencies (FDA and EPA) regarding the use of various drugs or water treatments long used in aquaculture. Significant effort both financial and scientific, will be needed to address this issue.

An alternative or ancillary to drug use is the use of vaccines. Two commercial companies have introduced vaccines for the prevention of ESC. Their efficacy under field conditions remains to be demonstrated.

1993 FISH HEALTH SECTION MEETING HIGHLIGHTS

- **Membership Dues Raised:** Section dues were raised to $15, international dues to $20, and $7 for student membership. This is warranted because of escalating costs associated with publishing the newsletter and a desire of the membership to have funds available for travel by FHS officers, development of continuing education program, and as a long term goal, perhaps the hiring an executive director. Additionally, the Membership and Balloting Committee was instructed to develop a tier dues system that denotes amounts for corporate sponsors (e.g. sustaining membership).

- **Award Committees To Be Combined:** The Snieszko Student Award Committee was abolished and the Awards Committee is planning to expand by two members and to take over Snieszko Student Travel Awards. This will require a change in the bylaws. Ballots will be mailed soon.

- **NAAHM:** The president of FHS will be contacting the co-chairs of National Aquatic Animal Health Management Strategy (NAAHMS) and request listing the Fish Health Section (FHS) as observers. Additionally, the president will appoint six adhoc committees to work in conjunction with NAAHMS committees.

- **Sponsorship of Symposium**: The FHS agreed to non-financially cosponsor a US Trout Farmer Association symposium on interactions and impacts between wild and hatchery fish (Duluth, Minnesota).

- **Blue Book To Be Published:** The Blue Book shall be released for publication on February 1, 1994. Any additions or changes submitted by the special committee on pathogen inspection procedures shall be submitted to the Technical Procedures Committee for review on or before December 1, 1993. Any portions not approved on or before February 1, 1994 can be added as updates. In addition headers will be added to each page to indicate a version number and date.

(Continued from page 10)

ARCHIVES COMMITTEE

The FHS archives are currently located at the USFWS, Leetown (WV) Library. Plans for the coming year are to catalogue the Archives by computer. **The membership is encouraged to send materials (photographs, etc...) that can be added to the Archives to the chairperson,** Yolanda Brady, Department of Fisheries and Allied Aquacultures, Auburn University, AL 36849; (205) 844-9208.

Yolanda Brady, Chairperson

AWARDS COMMITTEE

1993 S.F. Snieszko Award Winners: Charlie E. Smith, recently retired as the Center Director of the United States Fish and Wildlife Service's, Fish Technology Center in Bozeman, Montana, and Dr. W. A. (Bill) Rogers, Professor in the Department of Fisheries and Allied Aquacultures, Auburn University, Alabama were joint recipients of the 1993 S.F. Snieszko Award. **Congratulations !!**

Nominations for the Distinguished Service Award were not submitted. Doug Anderson suggested that past Editors of the FHS Newsletter should be honored and they were recognized for their contributions to the Section at the annual meeting. In addition, the Snieszko Student Award Committee was abolished and the Awards Committee plans to expand by two members and will take over Snieszko Student Travel Awards. This require a change in the bylaws. Ballots will be mailed soon. The membership needs to submit nominations for both the Snieszko Award and Service Award. It is a time consuming process but it is absolutely necessary for appropriate recognition within the profession.

Pete Taylor, Chairperson

MEMBERSHIP COMMITTEE

The membership directory was printed and distributed to all FHS members in June, 1992. Included in the directory was a listing of all FHS members as of December, 1991, bylaws of the section, certification procedures for Fish Pathologists and Fish health Inspectors and lists of those currently certified, and lists of past section officers and committee members.

Election of officers for 1992-1993 was completed in September, 1992. Twenty eight percent of the membership returned ballots.

A membership drive was initiated. EXCOM members were asked to comment on proposals to offer rebates to members who recruit new members of the FHS and to produce a current flier explaining the benefits of membership in the FHS. The Bethesda office is in the process of printing new fliers for the FHS to be included in mailings from their office.

Pat Chapman, Chairperson

NEWSLETTER COMMITTEE

The newsletter committee has published 3 issues since transfer of editors last fall. Chris Wilson and Leni Oman jointly took on the job from Randy MacMillian. Leni acted as first editor, Chris acted as second editor and publisher. Due to the lack of material and unavoidable delays in transfer of bulk mailing permits, editions 3 & 4 for volume 20 in 1992 were combined. Although this was noted in the newsletter, a few recipients were confused by the change. Other changes included the use of recycled paper and soy ink in printing.

(Continued on page 12)

(Continued from page 11)

The high cost of international mailings for packaging and surface air postage has raised some concerns for the section. The possibility of increasing the cost of international membership to cover costs has been discussed and implemented by EXCOM. Submissions have generally been good. As much as possible, we are encouraging submissions to be made via diskette in WordPerfect 5.1 or ASCII format.

Leni Oman has informed me that she will step down as co-editor effective immediately. Her efforts in the past have been greatly appreciated. Larisa Ford has agreed to occupy her role as co-editor. Finally, two of our sponsors, Moore-Clark and Bioproducts have not renewed their support. We are in the process of contacting other sponsors for possible financial support.

Chris Wilson, Chairperson

NOMINATING COMMITTEE

Lists of nominees were forwarded to Pat Chapman for inclusion on the ballot for 1993-1994 elections. A file of the names of people who were nominated previously and who were contacted for this year's round of nominations as well as those who accepted will be provided to the chairperson for 1994. Perhaps this file can be sent to each new chairperson to give some continuity and guidance to the Committee.

Paul Reno, Chairperson

BOARD OF CERTIFICATION

Since the previous report of May 1, 1992, there have been 10 applications for Fish Health Inspector. Six of these applicants have been certified, one denied and the remaining three are in the process of either completing their application materials or being voted upon by the Board of Certification. Two additional applications remain incomplete from the last reporting period. Four Fish Health Inspectors have and no others have allowed their certifications to lapse during this reporting period. Presently there are 49 active Fish Health Inspectors and 12 inactive (certifications expired or FHI retired).

No new Fish Pathologists have been certified. Two applications were received, one is pending successful completion of the written certification examination and the other is still incomplete. Ten Fish Pathologists recertification applications were received this past year of which 9 were approved and one is pending. All were 10 year certifications. One certification was allowed to lapse due to retirement. Currently there are 54 active Fish Pathologists and 8 inactive (certifications expired or FP retired).

BOARD OF CERTIFICATION SUMMARY TO DATE:

Fish Health Inspectors

Total number applicants	95
Number applicants certified	61
5 year recertification	16
10 year recertification	12
Number inactive	12

Fish Pathologists

Total number applicants	93
Number applicants certified	62

5 year recertification	44
10 year recertification	9
Number inactive	8

Ted Meyers, Chairperson

PROFESSIONAL STANDARDS COMMITTEE

During the past year, a long-in-coming draft of the new requirements for certification as a Fish Pathologist has been finally completed and is out for preliminary review. The draft was discussed at the EXCOM meeting in Denver. The document "*Procedures for Revocation and Censure of Fish Health Inspector - Fish Pathologist Certification*" has also been revised. Revisions to the requirements for certification as a Fish Health Inspector are also forthcoming. Once finalized, the revised documents will be made available in a future newsletter edition. I am optimistic that the revised documents will be finished and approved within the next 3 to 4 months.

The Continuing Education Program, although still in its infancy, has taken a big step this year. Craig Olson, chairman of the committee, has put together a proposal which is under review. The proposed program is intended to provide and encourage ongoing educational opportunities for anyone and to provide a basis for recertification of Fish Health Inspectors and Pathologists. When the program is approved and formalized, Craig will be announcing the details in the newsletter. Many thanks to all those who have contributed in some way, and also to those who laid the groundwork with the original program.

John Cvitanich, Chairperson

TIME AND PLACE COMMITTEE

In 1994, the Section will host an International Symposium on Aquatic Animal Health which will be held in Seattle, WA at the Sheraton Hotel on September 4-8. The organizing committee for this meeting is comprised of Ron Hedrick, John Rohovec and Jim Winton.

John Rohovec, Chairperson

BLUE BOOK FIELD ADVISORY COMMITTEE

In 1988, the committee developed a questionnaire that was sent to the membership so that a revised document would reflect the concerns of the section. Only 64 out of 600 questionnaires were returned. The committee proceeded making revisions and working out the problem areas. The question of how detailed the procedures need to be remains. The concern ranges from those who want 100% step-by-step methods to others that want a general guide with latitude to use individual discretion. The document has been reviewed by 20 fish health experts around the country, the Technical Procedures Committee and the EXCOM.

Concerns I have are:

-It has been 5 years-we need to get the document published.

-We are out of money

I think that if strict procedures are going to be written, the Technical Procedures Committee should begin this process as high priority. We may want to go ahead and get this part of the Blue Book out and send procedures out as an appendix at a later date.

John Thoesen, Chairperson

(Continued on page 14)

(Continued from page 13)

TECHNICAL PROCEDURES COMMITTEE

This year the committee received the draft of the Blue Book from the Blue Book Field Advisory Committee for review, prior to publication. After reviewing the document, four of the five members wanted to modify the document in some major way before publication. Faced with this dilemma, we referred the matter to the EXCOM for resolution.

Rod Horner, Chairperson

SCIENTIFIC JOURNAL REPORT

The Editorial Board for the Journal of Aquatic Animal Health was assigned during the year. The Editorial Board has eight members and they will serve staggered terms of two years each after the first year. Approximately 60 manuscripts have been submitted to the Journal in each of the last two years. Manuscripts are being submitted at about the same rate this year as they have been for the last two years. The papers have been generally good quality although some required extensive revision. Approximately 15 percent of submissions were rejected. During the past year, average time from receiving a manuscript to acceptance/rejection was slightly more than 5 months. Manuscripts averaged being published within 12 months from time of submission. Editors at AFS have been a lot of help to us and have gotten the Journal out on time during the last year. They also have developed and distributed a brochure promoting the Journal.

W. A. Rogers, Chairperson

LONG RANGE PLANNING COMMITTEE

The purpose of the committee is to evaluate what the goals and objectives should be for the next 10-25 years, and how mechanisms to obtain these goals can be facilitated. This initial report summarizes comments obtained from current and past section officers and committee chairs derived from a questionnaire. This report is an initial step in a much longer process of gathering the greatest sum possible of perspectives of our section's membership. This draft and the next several drafts will become parts of a larger document. As chairperson, I propose the following approach in proceeding with our long range planning activities:

-A preliminary report was distributed to members at the annual meeting in Denver prior to the business meeting.

-The report was presented at the meeting and discussion was open for input from the membership.

-Incorporate these comments into the next draft of the report.

-Develop a list of steps to reach each objective and goal.

-Provide a time table for achieving each objective and goal.

-Send a draft plan to the membership for review.

-Seek EXCOM and membership approval for the final revised plan.

Ronald P. Hedrick, Chairperson

FINANCE COMMITTEE REPORT

As of July 12, 1993 we have a total of $3,121.21 in the General Account (West One Bank, Bull, Idaho) and owe $543.13 to the Blue Book Account (AFS Office, Bethesda, Maryland). A detailed accounting of this year's income and expenses are listed below.

	Transactions	Subtotal	Total
FHS General Account			
Beginning Balance			6653.52
Credits			
Section dues		2827.00	
Certificates	610.00		
Feed Co.	500.00		
Interest	56.14	3993.14	10646.66
Debits			
Newsletter	3157.69		
AFS Plaque/Cert Seal	271.54		
'94 International Meet	2000.00		
FHS Directory	337.01		
Misc Postage	39.11		
'92 Meet	200.00		
93 Ballot & Mailing	420.10		
Blue Book	1100.00		
Ending Balance of General Account			**3121.21**
Blue Book Account			
Beginning Balance			9386.40
Debits			
1-7-91 SOS Invoice	1396.00		
6-20-91 SOS Invoice	2378.50		
12-4-91 SOS Invoice	5268.50		
Mailing	428.00		
Packaging	459.03		
Ending Balance of Blue Book Account			-543.13
Due to SOS Publications			
3-3-92 SOS Invoice			3123.00
Pd from General Account	1100.00		
Ending Balance Due			2023.00
Total Due on Blue Book			2566.13

Membership should be encouraged to solicit financial donations from private or corporate sponsors. Additionally, the sections should consider raising annual dues to cover operating costs and using meetings and publications togenerate additional capital Long term goals maky include providing travel expenses for sectional officers and perhaps the hiring an executive director.

Scott E. LaPatra, Chairperson

Fish Health Section Newsletter

The Fish Health Section Newsletter is a quarterly publication of the Fish Health Section of the American Fisheries Society. Submissions of any length on a topic of interest to fish health specialists are encouraged with the understanding that material is not peer reviewed. Submissions (files on diskette in WordPerfect 5.1 preferred) should be addressed to the co-editors listed

Dr. Larisa Ford National Fish Health Research Laboratory Box 700 Kearneysville, WV 25430 304-725-8461 ext 225 Phone 304-725-8461 ext 237 FAX	Dr. Chris Wilson Fisheries Experiment Station 1465 West 200 North Logan, UT 84321-6262 801-752-1066 Phone 801-752-6977 FAX

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