

2001 Annual Report

Mississippi State University

College of Veterinary Medicine

Fish Diagnostic Laboratory

**THAD COCHRAN NATIONAL WARMWATER
AQUACULTURE CENTER**

www.msstate.edu/dept/tcnwac

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SUMMARY

We had a total of 2001 case submissions to the Fish Diagnostic Laboratory at Stoneville for 2001. This was a decrease from our previous year's total of 2594. This decrease was from producer submissions (1602 compared to 2189) with research submissions remaining relatively stable (399 versus 405). This drop may reflect a combination of climatic conditions that did not allow for severe epizootics for some diseases and perhaps better control and management strategies as well.

As with the previous years, each case represents fish from one pond. Routine diagnostics include evaluation of gill clips, fin and skin scrapes, gross external and internal lesions, touch impressions of tissues (particularly the liver and posterior kidney), bacterial cultures of the brain and posterior kidney, viral cultures of the spleen, posterior and anterior kidney, as well as histopathology.

The diagnosis of the major diseases/conditions were based on the following criteria:

Enteric septicemia of catfish (ESC) - isolation of *Edwardsiella ictaluri* on blood agar from cultures of the brain and posterior kidney.

Columnaris - isolation of *Flavobacterium columnare* on dilute Mueller Hinton agar on microscopic identification of the typical slender filamentous bacteria on fin/skin scrapes, or gill clips of fish with the characteristic necrotic lesions. Our client reports differentiate between the two methods with the latter used for the designation of external Columnaris when the bacteria cannot be isolated on agar. For the purposes of this report, all cases of Columnaris (external or internal) have been grouped together.

Proliferative Gill Disease (PGD - Hamburger gill) - diagnosis is based on microscopic detection of cartilage defects on gill wet mounts or in histopathology sections.

Channel catfish virus (CCV) disease - this is based on observance of cytopathic effects in channel catfish ovary cell cultures that have been inoculated with suspensions from the spleen, posterior and anterior kidney.

Saprolegnia (winter fungus) - this is based on microscopic identification of typical fungal hyphae on skin/fin scrapes or gill wet mounts.

Channel catfish anemia - this is diagnosed when the pack cell volume (PCV) in stocker or food fish is less than 10%

Branchiomyces- this is based on microscopic identification of the characteristic fungal hyphae on gill wet mounts.

Visceral toxicosis of catfish (VTC) - this is based on biological testing i.e. injecting test fish with serum from affected fish (those with typical lesions, chylous effusions, intussusceptions, congested spleens, intestines with pale serosal surfaces and prominent blood vessels and a reticular pattern to the liver) and having the test fish succumb to this disease with similar gross lesions.

Trematodes - this is the diagnosis of the digenetic trematode that has been tentatively identified as *Bulbophorus confusus*. This is based on the morphological characteristics of the metacercariae that are obtained from the affected fish. This does not include yellow grub (*Clinostomum*).

The major diseases followed a trend similar to the previous year. Bacterial diseases were still the major problem with Columnaris representing 37.2 % (596 out of 1602) of the producer submitted cases. This is a drop from 2000 where it was 42.6% (933 out of 2189 cases). ESC was a close second with 36.4% (583 cases) which represents a rise in the percentage of cases (33.5% in 2000), but a decrease in actual cases (734 in 2000). PGD was again the third most common disease (20.1% or 322 cases in 2001 and 29.8% or 653 cases in 2000). There were 167 cases of Saprolegnia in 2001 and 230 in 2000. However, the percentage of cases these represent are very similar, 10.4% of cases in 2001 and 10.5% in 2000. There was, however, a dramatic increase in CCV cases (117 or 5.8% versus 51 or 2.3% in 2000). There was relatively no increase in percentages of channel catfish anemia cases; approximately 5% in both years (80 versus 108 in 2000). There was an increase in methemoglobinemia cases from 3 cases in 2000 to 10 cases in 2001 (0.14% and 0.62% respectively). The number of cases of *Ichthyophthirius multifiliis* decreased in numbers: 29 cases versus 59 in 2000 (1.8% and 2.7% respectively). For the trematodes, there was a decrease from 123 cases (5.6%) to 70 cases (4.4%) in 2001. We were also able to document the confirmed VTC cases to be 41 or 2.6% of producer submitted cases. There were approximately 19% of cases (304) that

we were unable to ascertain an etiology (disease check). This was an increase from 15% (328 cases) in 2000.

As a whole, the water temperatures (based on mid-morning temperatures on 35 ponds from 4 different locations in Sunflower, Humpherys and Washington counties) was higher than in 2000, except for the first three months of the year. The differences were most pronounced for the fall and winter months. This may have played an integral role in the incidence of several of the diseases.

Water quality submissions were increased from last year; 1037 compared to 888 submissions in 2000. However, there were less individual farms involved in these submissions (more samples from individual farms).

- There was also a slight increase in the numbers of antibiotic resistant cases in the known pathogens for channel catfish. There were 4 cases of *Edwardsiella ictaluri* that were sensitive to both Romet and Terramycin, as opposed to 2 cases in 2000.

We hope that we have provided you with some useful information. Please do not hesitate to contact the laboratory if there is some other information that you would like to see in the future included in this report.

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Fish Diagnostic Laboratory - Stoneville, MS - 2001

Disease	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Columnaris (Col)	3	0	2	8	9	12	20	29	26	16	6	0	131	6.55%
Columnaris, Enteric Septicaemia (ESC)	0	0	0	2	42	8	15	75	56	16	8	0	222	11.09%
Columnaris, Channel Catfish Anemia (CCA)	1	0	0	1	0	0	0	1	1	6	1	0	11	0.55%
Columnaris, Ich	1	0	0	1	0	0	0	0	0	0	0	0	2	0.10%
Columnaris and Trematode	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Columnaris, Channel Catfish Virus (CCV)	0	0	0	0	0	0	26	21	0	0	0	0	47	2.35%
ESC	0	0	0	0	30	9	18	51	42	24	15	0	189	9.45%
ESC, CCA	0	0	0	2	3	0	0	0	0	5	0	0	10	0.50%
ESC and Trematode	0	0	0	0	0	2	0	1	0	0	0	0	3	0.15%
ESC, CCV	0	0	0	0	0	0	2	2	0	0	0	0	4	0.20%
ESC, Col, CCV	0	0	0	0	0	0	1	3	0	0	0	0	4	0.20%
ESC, Col, CCA	0	0	0	0	1	0	0	2	2	3	1	0	9	0.45%
CCA	0	0	0	3	2	0	1	3	4	3	4	2	22	1.10%
CCV	0	0	0	0	0	17	40	4	0	0	0	0	61	3.05%
CCV, Trematode, Columnaris	0	0	0	0	0	0	0	1	0	0	0	0	1	0.05%
Ich	2	7	7	2	1	0	0	0	0	0	0	0	19	0.95%
Toxic Bloom	0	0	0	0	0	0	1	0	0	0	0	0	1	0.05%
Brown Blood, Col, PGD	0	0	0	0	0	0	0	0	0	1	0	0	1	0.05%
Brown Blood	0	0	0	0	0	0	0	0	2	0	1	3	6	0.30%
Brown Blood, CCA	0	0	0	0	0	0	0	0	1	0	0	0	1	0.05%
Brown Blood, CCA, PGD	0	0	0	0	0	0	0	0	0	1	0	0	1	0.93%
VTC	0	0	8	17	0	0	0	0	0	0	1	1	27	25.23%
VTC, SAP, COL	0	0	1	0	0	0	0	0	0	0	0	0	1	0.93%
VTC, PGD, SAP, COL	0	0	1	0	0	0	0	0	0	0	0	0	1	0.93%
VTC, SAP	0	0	2	1	0	0	0	0	0	0	0	0	3	2.80%
VTC, Col	0	0	0	2	0	0	0	0	0	0	0	0	2	1.87%
VTC, PGD	0	0	0	4	0	0	0	0	0	0	0	0	4	3.74%
VTC, ESC	0	0	0	1	0	0	0	0	0	0	1	0	2	1.87%
VTC, COL, PGD	0	0	0	1	0	0	0	0	0	0	0	0	1	0.93%

Fish Diagnostic Laboratory - Stoneville, MS- 2001

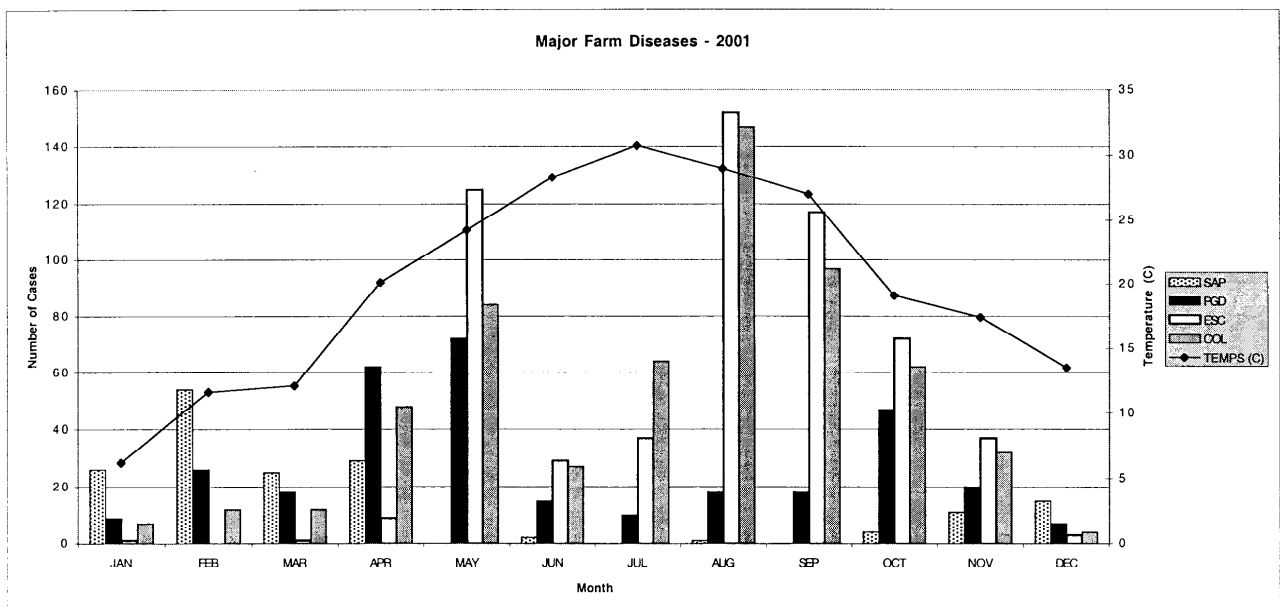
Disease	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Saprolegnia	19	33	10	3	0	0	0	0	0	0	0	5	70	3.50%
Saprolegnia, Proliferative Gill Disease (PGD)	2	12	1	2	0	0	0	0	0	0	0	2	19	0.95%
Saprolegnia, CCA	0	0	0	1	0	0	0	0	0	0	1	1	3	0.15%
Saprolegnia, CCA, PGD, Columnaris	0	0	1	0	0	0	0	0	0	0	1	0	2	0.10%
Saprolegnia, ESC	0	0	0	0	0	0	0	0	0	0	1	1	2	0.10%
Saprolegnia, Columnaris, PGD	0	2	1	4	0	0	0	0	0	2	0	0	9	0.45%
Saprolegnia, ESC, PGD	0	0	0	0	0	0	0	0	0	0	0	1	1	0.05%
Saprolegnia, Columnaris	2	7	2	17	0	0	0	1	0	2	1	2	34	1.70%
Saprolegnia, Columnaris, Ich	0	0	1	0	0	0	0	0	0	0	0	0	1	0.05%
Saprolegnia, ESC, Columnaris	0	0	0	0	0	0	0	0	0	0	4	1	5	0.25%
Saprolegnia, CCA, Brown Blood	0	0	0	0	0	0	0	0	0	0	0	1	1	0.05%
Saprolegnia, Columnaris, CCA	0	0	1	0	0	0	0	0	0	0	3	1	5	0.25%
Saprolegnia, Columnaris, PGD, ESC	0	0	0	1	0	0	0	0	0	0	0	0	1	0.05%
Saprolegnia, Aeromonas	0	0	0	0	0	2	0	0	0	0	0	0	2	0.10%
Saprolegnia, Ich	2	0	4	0	0	0	0	0	0	0	0	0	6	0.30%
PGD, Ich	0	0	0	1	0	0	0	0	0	0	0	0	1	0.05%
PGD	6	8	9	34	17	5	8	3	1	10	7	4	112	5.60%
PGD, Columnaris	0	3	1	10	7	0	1	4	3	8	4	0	41	2.05%
PGD, ESC	0	0	1	2	23	2	0	8	8	11	2	0	57	2.85%
PGD, ESC, Columnaris	0	0	0	1	24	3	0	1	6	7	2	0	44	2.20%
PGD, CCA	0	1	0	1	0	0	0	1	0	1	1	0	5	0.25%
PGD, CCA, ESC	0	0	0	0	1	1	0	0	0	5	2	0	9	0.45%
PGD, CCA, Col, ESC	0	0	0	0	0	0	0	0	0	0	1	0	1	0.05%
Parasitism	0	0	0	0	0	1	0	0	0	1	0	0	2	0.10%
Aeromonas hydrophila	0	0	0	0	0	1	0	0	0	0	0	0	1	0.05%

Fish Diagnostic Laboratory - Stoneville, MS-2001

Disease	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%
Branchiomyces	0	0	1	0	0	2	3	0	0	0	0	0	6	0.30%
Branchiomyces, Columnaris	0	0	0	0	0	0	0	1	0	0	0	0	1	0.05%
Trematode, ESC, PGD	1	0	0	0	0	0	0	1	0	1	0	0	3	0.15%
Trematode, PGD	0	0	1	0	0	3	1	0	0	0	0	0	5	0.25%
Trematode, ESC	0	0	0	0	0	0	1	2	0	0	0	0	3	0.15%
Trematode, ESC, Columnaris, PGD	0	0	0	0	0	1	0	0	0	0	0	0	1	0.05%
Trematode, ESC, Columnaris	0	0	0	0	1	3	0	6	3	0	0	0	13	0.65%
Trematode	0	0	1	0	0	10	21	1	2	0	0	0	35	1.75%
Trematode, Col	0	0	1	0	0	0	1	2	0	1	0	0	5	0.25%
Trematode & Saprolegnia	1	0	0	0	0	0	0	0	0	0	0	0	1	0.05%
Research	31	15	55	72	69	28	9	36	43	9	18	14	399	19.94%
Histology Only	1	0	1	0	1	1	0	0	0	0	0	0	4	0.20%
Health Check	0	1	0	0	0	0	0	0	0	0	0	0	1	0.05%
Disease Check	26	2	0	36	32	27	93	30	22	17	14	5	304	15.19%
CASES SUBMITTED BY FARMERS	67	76	58	158	194	110	253	254	179	141	82	30	1602	80.06%
CASES SUBMITTED FOR RESEARCH	31	15	55	72	69	28	9	36	43	9	18	14	399	19.94%
CATFISH CASES	97	90	113	218	258	136	262	278	220	149	100	43	1964	98.2%
OTHER SPECIES	1	1	0	12	5	2	0	12	2	1	0	1	37	1.8%
TOTALS	98	91	113	230	263	138	262	290	222	150	100	44	2001	
Water														
Farms	10	16	17	36	48	29	24	37	36	32	25	10	320	
Quality														
Ponds	28	36	60	254	133	46	63	101	144	81	69	22	1037	

Major Farm Diseases 2001

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
SAP	26	54	25	29	0	2	0	1	0	4	11	15	167
PGD	9	26	18	62	72	15	10	18	18	47	20	7	322
ESC	1	0	1	9	125	29	37	152	117	72	37	3	583
COL	7	12	12	48	84	27	64	147	97	62	32	4	596
TEMPS (C)	6.2	11.6	12.1	20.1	24.2	28.3	30.7	29.0	27.0	19.1	17.4	13.5	



MSU-CVM-Fish Diagnostic Laboratory - Stoneville

TOTAL CASES OF EACH MAJOR DISEASE ^(*1)

2001 Case Summary

Disease	#
Columnaris	596
ESC	583
PGD	322
Saprolegnia	167
CCV	117
Anemia	80
Brown Blood	10
Ich	29
Disease Check ^(*2)	304
Health Check ^(*3)	1

^(*1) A case may be represented by more than one disease.

^(*2) Cases from ponds with mortality and no pathogens identified.

^(*3) Cases from healthy ponds for monitoring/pre-purchase exams.

Antibiotic Resistance - 2001

Organism	# Tested	Romet Only	Percent	Terramycin Only	Percent	Both	Percent
<i>Flexibacter columnare</i>	596	0	0.0%	0	0.0%	0	0.0%
<i>Edwardsiella ictaluri</i>	583	0	0.0%	0	0.0%	4	0.07%
<i>Edwardsiella tarda</i>	1	0	0.0%	0	0.0%	0	0.0%
<i>Aeromonas hydrophilia</i>	3	0	0.0%	0	0.0%	0	0.0%
<i>Plisiomonis shigeloides</i>	1	0	0.0%	0	0.0%	1	0.02 %

Virology Cases in 2001

549 Tested for Channel Catfish Virus of which 117 were positive (5.8% of all cases 2001)

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