

The



quatic

terinarian



Food Fish or Ornamental Fish?
Oscars and other cichlids netted for food
in the Rio Negro, Amazonas, Brazil.
(See related articles on pages 16-20)

Volume 8, Number 1
First Quarter, 2014



THE AQUATIC VETERINARIAN

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Formerly *Aquatic Vet News*

First Quarter 2014

WORLD AQUATIC VETERINARY MEDICAL ASSOCIATION

WHO ARE WE

The mission of the World Aquatic Veterinary Medical Association is to serve the discipline of aquatic veterinary medicine in enhancing aquatic animal health and welfare, public health, and seafood safety, in support of the veterinary profession, aquatic animal owners and industries, and other stakeholders.

The purpose of the World Aquatic Veterinary Medical Association is:

- To serve aquatic veterinary medicine practitioners of many disciplines and backgrounds by developing programs to support and promote our members, and the aquatic species and industries that they serve.
- To identify, foster and strengthen professional interactions among aquatic medical practitioners and other organizations around the world.
- To be an advocate for, develop guidance on, and promote the advancement of the science, ethics and professional aspects of aquatic animal medicine within the veterinary profession and a wider audience.
- To optimally position and advance the discipline of aquatic veterinary medicine, and support the practice of aquatic veterinary medicine in all countries.

The ideas presented in this publication express the views and opinions of the authors, may not reflect the view of WAVMA, and should not be implied as WAVMA recommendations or endorsements unless explicitly stated. Information related to the practice of veterinary medicine should only be used within an established valid Veterinarian-Patient-Client Relationship.



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Please send articles, clinical reports, or news items to the editor by the following submission dates:

Issue 1 – February 15 (published in March)
Issue 2 – May 15 (published in June)
Issue 3 – August 15 (published in September)
Issue 4 – November 15 (published in December)
All submissions should be in 10-point Arial font, single spaced.
Submissions may be edited to fit the space available.

[See page 13 for further instructions to authors.](#)

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EDITORIALS

First Quarter 2014

Editor's Note

This issue was a bit delayed due in a large part to my two week long trip to the Rio Negro in Brazil with **Project Piaba**. This organization is nearing 25 years of progress in promoting the sustainable ornamental fisheries in the Rio Negro region of Brazil. Their motto is "Buy a Fish, Save a Tree!"

This refers to the fact that the Piabeiros (ornamental fishermen) make their living by collecting cichlids, tetras, plecostomus, corydoras, and other tropical fish in an environmentally sound manner, to be shipped around the world for the ornamental fish trade. The alternative methods of sustenance there are farming and cattle ranching, both of which are destructive to the forest and also to the waterways and wildlife dependent on the forest for survival.

Project Piaba is supervised by Scott Dowd of the New England Aquarium. I would highly recommend all aquatic veterinarians visit this area of the world to see first hand the amazing scenery and beautiful fish this area produces.

For more information, see:

<http://opefe.com/piaba.html> and
http://www.neaq.org/conservation_and_research/projects/endangered_species_habitats/project_piaba.php

Nick Saint-Erne

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Executive Editor



Download a QR reader onto your Smart Phone and scan the Quick Response Code to the right. It will take you to the WAVMA.org website page for accessing all of the past WAVMA Newsletters.



You will need your WAVMA User ID and Password to access the most recent back-issues of *The Aquatic Veterinarian*.

Cover Photo: by Nick Saint-Erne



A basket of 12" Oscars (*Astronotus ocellatus*) along with other cichlid species that were captured with gill nets in a lake off the Rio Negro, Amazonas, Brazil. These were being transported to market as food fish. We purchased several of these fish to eat during our boat trip up the Rio Negro with Project Piaba in January 2014.

It was disconcerting at first to eat so many fish species found there that are commonly kept as aquarium pets, but in Brazil are considered food fishes. The Plecostomus was especially tasty, once you got through that tough outer plating! See the articles starting on page 16 for more information about Project Piaba.

Photo (right):

Nick Saint-Erne catches a piranha with a string and meat-baited hook off the side of the canoe. There was a whole school of piranhas in the stream—no swimming recommended here!

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EXECUTIVE REPORTS

First Quarter 2014

President's Report

What is the WAVMA about? The WAVMA gives aquatic veterinarians identity, and opportunities to learn and to contribute; connecting veterinarians through space and time, to continuously acquire new and better forms of knowledge to apply to our work and lives. It is global, multidisciplinary and inter-generational.

The discipline of aquatic veterinary medicine can be described as both a niche, and the fastest growth area in veterinary science. The WAVMA is dedicated to reinvent veterinary science by bringing aquatic veterinary medicine to the forefront, creating new opportunities, positioning ourselves for the future, by building a competitive advantage and harnessing the skills of our members.

The vision for this year is to promote and fine tune our existing programs, and to create more opportunities for aquatic veterinarians. We need to enhance market access of aquatic veterinarians and improve not only the awareness of aquatic veterinarians, but also client perception of our area of expertise. By doing these things, we can really grow the World Aquatic Veterinary Medical Association.

Three areas we will concentrate on in the year ahead are:

1. Relevance: to satisfy the needs and wants of our members, through support, CEPD, recognition of prior experience and defending the aquatic area for the veterinary profession.
2. Pre-eminence: about growing the WAVMA brand within our profession (to our colleagues) and outside our profession (to our clients) by promoting the value and utilisation of suitably qualified aquatic veterinarians to our clients.
3. Reach: through the internet (social media) and engaging in open dialogue with other organisations.

We look forward to your input as a member of the WAVMA. We will be having WAVMA events at various Veterinary Conventions around the world this year. Please try to attend and visit us at the WAVMA exhibit booth.

If travel is not your thing then get your CEPD through WAVMA's [Clinical Corner](#). Keep an eye on Members-L, [eNews](#) or [WebCEPD](#) pages for further information.

WAVMA's quarterly publication [The Aquatic Veterinarian](#) is now indexed (ISSN 2329-5562) and



includes peer reviewed papers. Our thriving listserv provides contact with professional colleagues, meetings and job vacancies globally. Membership brings many other benefits including discounts on text books and webinars, access to scholarships and unlimited cloud back-up of computers allowing you to access and/or share your documents on any computer, tablet or smartphone.

WAVMA membership means being part of the largest aquatic veterinary association which actively strives to achieve its Mission Statement. Additionally, with the new programs introduced for 2014, your membership dues could save you well over \$600 annually in member discounts and services.

WAVMA is an Affiliate member of the World Small Animal Veterinary Association ([WSAVA](#)) and an Associate member of the World Veterinary Association ([WVA](#)).

Dr Richmond Loh

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Secretary's Report

The WAVMA was founded in 2006, which corresponds to the Chinese year of the Dog, and has come a long way indeed. Currently we are in the Chinese year of the Horse and, according to the predictions, the fortune of the "dog people" will improve in 2014. While I love this prediction and have no reason to doubt its credibility, it can only materialize for us if we work assiduously together to achieve the noble objectives of which we uphold in the WAVMA. The first thing we all need to do as members is to renew our membership.

We are trying to enhance the benefits that we can offer as an association and we welcome your suggestions on how we can be of better service to you. We continue to be fortunate in having an executive committee that is committed and under the stewardship of Dr. Richmond Loh, it is expected that we will make new inroads internationally. He certainly brings a new air to the WAVMA board with a vision of making WAVMA more visible, particularly in Asia, which is important in the fisheries and aquaculture sector.

The year 2013 under the guidance of Dr. Mohamed Faisal was certainly historic with the WAVMA Fellows completing a year of existence, and the finalization of the CertAqV program resulting in the first certifications being awarded. This may very well be our most important member benefit to date and, with a willing and able pool of mentors available, members will find it relatively easy to navigate through the process in this current dispensation.

Last year was indeed an exciting one for the student members, and several student chapters were formed. Although it is quite early in the year, two new such chapters have been formed in 2014, namely at the Western University of Health Sciences, College of Veterinary Medicine and the Murdoch University, Western Australia. Veterinary students form a very large component of our members on Facebook and keep up most of the activity there. In this breath, it is necessary to reiterate our conviction and support for the integration and enhancement of aquatic veterinary medicine in veterinary schools globally. This is engaging the attention of the Executive Board very early in the year and we anticipate making a pitch in this regard at the WVA conference on veterinary education in Singapore in November.



On this note, it must be emphasized that being members of organizations such as the World Veterinary Association and the World Small Animal Veterinary Association can only be for the best of all of us. I encourage members to take advantage of the benefits derived from such partnerships. I wish to end my first report as secretary by congratulating Dr. Chris Walster who previously served in this capacity on being elected to serve as President in the following year. May we all work together to make the predicted good fortunes come through in this year of the horse.

Devon Dublin, DMVZ, MSc. CertAqV
WAVMA Secretary

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EXECUTIVE REPORTS

First Quarter 2014

Treasurer's Report

Below is the budget for 2014, including income and expenses for the first quarter of 2014.

Nick Saint-Erne, DVM, CertAqV
WAVMA Treasurer

2014 Budget World Aquatic Veterinary Medical Association

as of 3/31/2014

					Beginning Bank Balance: \$10,534.39
SUMMARY	ACTUAL	BUDGETED	OVER BUDGET	UNDER BUDGET	Current Bank Balance: \$10,811.33
Total income	7,300.00	17,050.00		-9,750.00	Balance in England: \$ 3161.59
Total expenses	7,123.06	17,020.00		-9,896.94	Total Cash Assets: \$13,972.92
Income less expenses:	176.94	30.00	146.94		Net change from 2013 = \$3438.53
INCOME DETAILS	ACTUAL	BUDGETED	OVER BUDGET	UNDER BUDGET	NOTES
Veterinarian Memberships	3,700.00	9,500.00		-5,800.00	Full Members (\$100) paid dues in 2014
Student Memberships	1,200.00	1,500.00		-300.00	Students (\$25) paid dues in 2014
New Graduate Memberships	50.00	200.00		-150.00	New Graduates (\$50) paid dues in 2014
Other Memberships- AVO	850.00	850.00			ANZCVS Membership dues
Webinar/Meeting Income		1,000.00		-1,000.00	
CertAqVet application fees	1,500.00	2,500.00		-1,000.00	\$250 per veterinarian
Income - WAVMA merch		500.00		-500.00	
Donations / Sponsorship		1,000.00		-1,000.00	
Total income:	7,300.00	17,050.00		-9,750.00	
EXPENSE DETAILS	ACTUAL	BUDGETED	OVER BUDGET	UNDER BUDGET	NOTES
MEETINGS					
Annual General Meeting		3,000.00		-3,000.00	ISAAH - Portland, OR
AVMA Meeting		500.00		-500.00	Denver
AFS-DAA9/ FAVA / WVA		3,000.00		-3,000.00	Vietnam / Singapore
WSAVA		500.00		-500.00	Travel expenses
AVMA/AqVMC	491.49	1,000.00		-508.51	2 meetings @ \$500 each
SAVMA		100.00		-100.00	Booth Fee
Total Meetings expenses:	491.49	8,100.00		-7,608.51	
Percent of total expense:	6.90%				% of Total Expenses
ADMINISTRATIVE					
Illinois Secretary of State	10.00	36.00		-26.00	Corporation Annual Report Fee
Credit Card TXN Fee	271.52	720.00		-448.48	Average of \$60/month
Bank Fees		180.00		-180.00	
Fellowship Plaques		200.00		-200.00	Fellow s
Illinois NFP Corp Status		100.00		-100.00	Non-Profit filing fee
Office supplies		100.00		-100.00	
WAVMA Store Merch		50.00		-50.00	
Postage/Shipping		50.00		-50.00	
Promotions for Booths		100.00		-100.00	Brochures/Banners/Give-aways
Contributions		500.00		-500.00	Refund to Student Chapters
Organization Dues	999.46	934.00	65.46		WSAVA \$169 / WVA \$765 2014 Dues
AVMF Scholarship		1,000.00		-1,000.00	Donation to AVMA/AVMF
Total admin. expenses:	1,280.98	3,970.00		-2,689.02	
Percent of total expense:	17.98%				% of Total Expenses
SERVICE & EQUIPMENT					
Accounting - DD Pyle		100.00		-100.00	
Legal - DKM&O	125.00	200.00		-75.00	Preparing Corp Annual Report
Professional Management		100.00		-100.00	Soliciting membership and funding
Skype/Telephone		100.00		-100.00	
Survey Monkey		200.00		-200.00	
Vimeo/ ProProfs/ WordPress	59.95	700.00		-640.05	Vimeo
LiveDrive		650.00		-650.00	
2014 Website Hosting Account		1,000.00		-1,000.00	£36.00 (~\$60) per month + \$193.17 email fee
Website Development	5,165.64	2,000.00	3,165.64		
Total S&E expenses:	5,350.59	4,950.00	400.59		
Percent of total expense:	75.1%				% of Total Expenses

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COMMITTEE REPORTS

First Quarter 2014

Meetings Committee Report

The Meetings Committee is continuing to plan and update our schedule for this year. We all thank Myron Kebus, Dave Scarfe and all the other members and participants who spoke and helped out at the booth at Aquaculture America 2014 in Seattle, Washington on February 9-12, 2014.

The 41st SAVMA Symposium will be held from March 20-22, 2014 at Colorado State University, Loveland, Colorado. This is the best opportunity for WAVMA to promote aquatic veterinary medicine to US vet students.

The AVMA Annual Convention will take place in Denver, CO from July 26-29, 2014. In addition to our information booth, in conjunction with the AVMA Aquatic Veterinary Committee, we will have several WAVMA members, including President Richmond Loh and Treasurer Nick Saint-Erne lecturing during the aquatic sessions. If you plan to attend, join them for the talks as well as informal discussions during the conference.

The International Symposium on Aquatic Animal Health (<http://isaah-7.science.oregonstate.edu/>) will be held in Portland, Oregon, Aug 31–Sept 4, 2014. With the large number of WAVMA members planning to attend, as well as the potential for attracting new members, we have decided to hold our Annual General Meeting here during the conference on the evening of Tues. Sept. 2. The meet and greet get-together, which will include dinner and a short business meeting, will be at a venue in downtown Portland. If you will be there, plan to attend and enjoy a hearty meal and lively discussion. The exact time and location will be announced soon. As space is limited, please contact me to reserve a seat.

The World Small Animal Veterinary Association, of which WAVMA is a member organization, will take place in Cape Town, S. Africa from Sept.16-19, 2014. Our representative, Devon Dublin, will be in attendance.

The Asian Fisheries Society will host the Diseases of Aquatic Animals 9, aimed at improving aquaculture in the region, in Ho Chi Minh City, Vietnam from Nov. 24-28, 2014. Immediately after, the Singapore Veterinary Association will host the Federation of Asian Veterinary Associations (FAVA) conference, to take place in Singapore from Nov. 28- 30, 2014. President Richmond Loh will be attending and speaking at this conference

and has expressed his interest in having WAVMA present an organized program here. Though still in the early stages of development, we are working on realizing this event. More info to come

Julius Tepper, DVM, CertAqV

Meetings Committee Chair

cypcarpio@aol.com



Dr. Julius Tepper corrals some koi.

2014 WAVMA Programs

WAVMA has once again organised educational programs or will be present at several meetings around the world:

Aquaculture America 2014,
Seattle, Washington. February 9 - 12.

AVMA Convention.
Denver, Colorado. 25 - 29 July

ISAHH.
Portland, Oregon. August 31 – September 4, where we will also hold our AGM.

FAVA.
Singapore. 28 – 30 November

Additionally WAVMA Board members will attend the **WSAVA Congress**, **FVS Scientific Meeting**, Edinburgh, UK. 25 – 26 March. **SAVMA Symposium** and possibly **AFS–DAA9** Ho Chi Minh City, Vietnam 24-28 November.

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Credentialing Committee Report

The WAVMA CertAqV Program is administered by the WAVMA Credentialing Committee, along with the assistance of other Certified WAVMA members who serve as mentors and adjudicators.

To be credentialed by WAVMA as a Certified Aquatic Veterinarian and utilize the CertAqV honorific, individuals must be a WAVMA member, have a veterinary degree from a nationally recognized veterinary school, college or university and have demonstrated general knowledge and competency in core subject areas that are currently considered necessary to practice aquatic veterinary medicine. Students of a nationally recognized veterinary institution of higher education can register for the program, but will not be certified or entitled to utilize the CertAqV honorific until they graduate.

Individuals that desire to participate in the WAVMA CertAqV Credentialing Program are required to:

Be a current member of the World Aquatic Veterinary Medical Association,

Register for the Program (application at www.wavma.org or contact the [WAVMA Administrators](#)).

Identify a mentor to assist the registrant through the Program. The potential mentors would be any available WAVMA Certified Aquatic Veterinarians.

Provide the mentor with written evidence of satisfactory completion of each of the core Knowledge, Skills and Experience (KSE) subject areas.

Petition the Credentialing Committee for recognition of completion of all KSE requirements after the mentor has approved the documentation.

The initial WAVMA Certified Aquatic Veterinarian (CertAqV) program certified 11 veterinarians in 2013, after two years of working on the program development and procedures.

In 2014 three more veterinarians have already been certified:

David Pasnik, DVM, CertAqV

Jessica Sanders, DVM, CertAqV

Daniel Michael Corcoran, DVM, CertAqV

Congratulations to these newly certified aquatic veterinarians. There are an additional six members currently in the process of being certified.

Student Committee Report

Current WAVMA Student Chapters:

Murdoch University, School of Veterinary & Life Sciences (established 2014)

Faculty Advisors - Drs. Lian Yeap & Richmond Loh. **Chapter contact** – [click here](#)

Auburn University, College of Veterinary Medicine (established 2013)

Faculty Advisor - Dr. Ray Wilhite

Chapter Contact - [click here](#)

St. George's University, School of Veterinary Medicine (in development)

Tuskegee University, School of Veterinary Medicine (established 2012)

Faculty Advisor - Dr. Kenneth Newkirk

Chapter Contact - TBA

University of Florida, College of Veterinary Medicine (established 2013)

Faculty Advisor - Dr. Tom Waltzek

Chapter Contact - TBA

University of Illinois, College of Veterinary Medicine (in development)

University of Prince Edward Island, Atlantic Veterinary College (in development)

University of Tennessee, College of Veterinary Medicine (established 2012)

Faculty Advisors - Dr. Michael Jones & Dr. Debra Miller **Chapter Contact** - [click here](#)

View the Chapter's [Facebook](#) page

University of Wisconsin, College of Veterinary Medicine (in development)

Western University of Health Sciences, College of Veterinary Medicine (established 2014)

Faculty Advisor - Dr. Suzana Tkalcic

Chapter Contact - [click here](#)

University of Nottingham, School of Veterinary Medicine & Science (in development)

For information or assistance, please contact the [WAVMA Chapter Coordinator](#)

To initiate a new Student Chapter see the "Guidance for Forming a New Student Chapter" ([click here](#) to download PDF).

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COMMITTEE REPORTS

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STUDENT COMMITTEE: A Summer of Firsts By Austin Leedy

I am currently a second year student at Auburn University College of Veterinary Medicine and a Second Lieutenant through the Army Health Professions Scholarship Program. This summer was full of excitement as I was a veterinary intern at Gulf World Marine Park in Panama City Beach, FL.

My internship started off with the birth of a female bottlenose dolphin on my first day! Sandy went into labor that morning around 10am and did not have Capri until 3:33am the next morning. This was my first live birth to witness, and it was quite the experience. After the birth, we began 24/7 calf watch. We recorded everything, how long the calf nursed and on what side, any behaviors seen with the mother and the calf, and we also took respirations every hour. All the information was documented to make sure that mother and calf are doing well and there is no need for human intervention. Total this summer we had three calves born.



Mother Brinnon and Calf Mako Born
at 5:21 pm on June 3, 2013

Gulf World has created The Gulf World Marine Institute and is involved with Southeast Marine Mammal Stranding Network and the Sea Turtle Stranding and Salvage Network. That being said, they are responsible for any stranded animals within about a two hour radius from the park. When I arrived, they had a Green Sea Turtle, May Day, who had stranded a week prior with abscesses on his carapace. We also got in a Kemps Ridley Sea Turtle, Miles, who stranded entangled in monofila-

Veterinary Intern
Austin Leedy
caring for
May Day – a
green sea turtle
that stranded

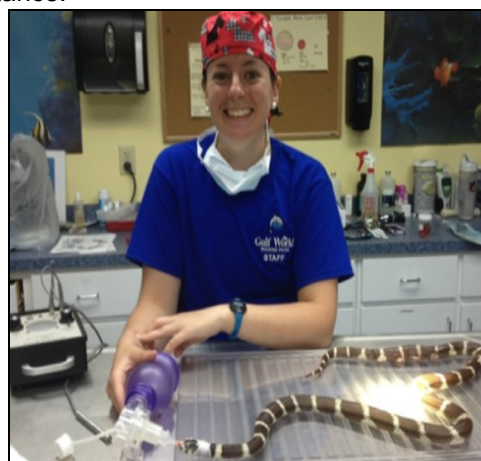


ment fishing line. The monofilament on Miles was deeply embedded and we were afraid he may lose his flipper. Both Miles

and May Day successfully recovered and were released in July. Through this process, I learned how to perform exams on the sea turtles when they come in and how to rehabilitate them.

We got a call one day on a Pygmy Sperm Whale that had stranded nearby. We arrived on site and took the animal back to the park. Unfortunately, research has shown that Pygmy Sperm Whales do not rehabilitate well and most likely strand due to cardiomyopathy, other heart related illness, or colonic impactions. Due to this information, the decision was made to humanely euthanize the whale. After euthanasia a necropsy was performed. I learned how to do a necropsy according to NOAA and UME standards. Necropsy revealed that the colon was severely impacted and his small intestine looked distended and inflamed. Several of his lymph nodes looked inflamed as well. I also performed a Necropsy on a Logger Head Sea Turtle this summer. We felt he had pneumonia and upon necropsy we found his lungs filled with a caseous substance.

Austin
Leedy
assisting
with post
surgical
recovery
on King
Snake,
Smiley



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I also assisted with a surgery on a Kingsnake named Smiley. Smiley had an internal mass removed about five years ago that histopathology reported back as renal adenocarcinoma. A similar mass appeared that we removed and sent off for histopathology to again find more evidence of renal adenocarcinoma. This was my first surgery to observe performed on a snake! I got to breathe for him throughout the surgery and recovery. I also got to use the Doppler for the first time! It was such a neat machine and the heartbeat was really cool to hear. The Doppler quickly became my favorite thing to share with the kids at vet camp!

Unfortunately one of the Red Tailed Boas, Bubba, fell ill this summer. He presented with a history of lethargy and inappetence for about a month's duration. His caudal 1/2-1/3 was hanging limp and he was severely dehydrated (when touched, the finger imprints stayed visible). Bubba's lower jaw looked extremely swollen, possibly due to edema. Upon palpation we could feel a mass about 2/3 of the way down his length. We took radiographs of bubba and saw three white circular masses right at his caudal end and then a large 2-3 inch radio-opaque structure surrounded by air where we were palpating the mass. We were suspicious of fecaliths and constipation.

Bubba was placed on a strict treatment plan of fluids, enemas, an injectable antibiotic (Fortaz) and a diet of blended rabbit with mineral oil. Over time, many bone-filled fecaliths combined with urates were passed while performing an enema. About 5-6 weeks after initial presentation, surgery was performed on Bubba to remove the bulk of the fecaliths that remained. After surgery, Bubba pooped by himself in his habitat for the first time in about two months!



Dr. Lydia Staggs and veterinary intern Austin Leedy giving Red Tail Boa, Bubba, laser therapy



Dr. Lydia Staggs giving Rough Toothed dolphin, Astro, laser therapy

Gulf World is also home to the only collection of Rough Toothed Dolphins in long term human care! Among them is Astro, who stranded off the coast of Texas in 2005. Astro was deemed non releasable due to a hearing disability and he developed a curvature in his spine shortly after he stranded that developed into scoliosis. Part of his treatment plan for the scoliosis includes laser therapy using a Class 4 laser. The laser will increase blood flow to the tissue and promote the formation of more ATP or energy within the cells. An increase in energy promotes growth and healing while decreasing pain and inflammation. The laser can be used for almost anything from arthritis, scoliosis, and hip dysplasia to pneumonia, scratches, and open wounds. The laser helps to speed up the recovery process. The only things a laser cannot be used on are pregnant animals, fungal infections, over the thyroid gland, and on cancer. We used the laser on almost all species in the park and for any possible ailment or injury; the possibilities for healing and a faster recovery were endless!

Part of the internship involved running the kids' vet camp that Gulf World hosted. Every Monday and Friday groups of four to twelve children ranging from eight to fourteen years old were at the park for the day. During their time we taught them a little about veterinary medicine, including jobs you can do with a veterinary degree, marine mammal anatomy, sample collection and analysis, and diagnostic techniques. We held a mock stranding event where we taught them how we assess and treat stranded turtles. We also held a mock surgery

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where we had Al the alligator who “seemed a little off” and we “took radiographs” to assess what he had eaten and then took him to surgery to remove their foreign objects. The kids loved their time at the camp and I enjoyed sharing more about our wonderful profession with them and getting them excited about science and medicine.

This summer was truly a summer of firsts! The summer after my first year of vet school! The first time I have collected blood from dolphins, penguins, and reptiles! Reading my first cytology slides on dolphin gastric and blow hole samples, participating in my first necropsies, and being so up close and hands on with marine mammals in a veterinary setting! I could not have dreamed a better summer experience if I tried nor a summer packed with more learning opportunities. This truly has been my best summer ever!

There were not much “after hours time” considering it was tourist season and we had three babies with calf watch. They tried to give me two days off per week, but sometimes I had to come in for treatments. The beach is right across the street from the park and Pier Park is right next door. Pier Park has tons of restaurants and shops. Of course there are always the beach tourist attractions to partake in as well!

Housing and transportation are not provided and the internship is voluntary (unpaid) – but the experience is totally worth it! Fortunately I was able to pay expenses through my recent acceptance into the Army's HPSP program and a scholarship from the University of Florida. There is a scholarship offered by WAVMA through AVMF that you can apply for as well.

Senior students are selected each year to participate in the 4-6 week internship; only one student is on-site at a time. Internship times are available during January-April and August-November. A maximum of 4 students will be selected each year for the clinical internship. During this time, students are given the opportunity to observe and participate in various clinical activities under the direction of the veterinary staff. Responsibilities are assigned based on each student's level of interest and aptitude. Students must complete a project, which will be determined in the first week.

Two first or second year veterinary students may be selected for a summer internship. This internship is an 8-10 week program, which will teach the student basic medical training with marine mammals. No senior student will be allowed an in-

Veterinary
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Leedy and
Sea Lion
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ternship during the time of the summer internship time slots.

Third and fourth year students must submit applications for 2015 internship year beginning October 15, 2014 and ending November 15, 2014. Unfortunately positions for first and second year students have already been filled for the upcoming summer 2014.

All internships are voluntary, and students are responsible for their own transportation and housing arrangements. Students may apply for a grant to help with cost of living through the University of Florida. Students must be U.S. citizens in AVMA-accredited veterinary schools.

All students interested in the Veterinary Medical Externship should send a letter to the address below. This letter should include reasons for wanting to participate in the program and dates of availability. It is recommended that applicants list at least three prioritized availability dates. In addition, students must submit a curriculum vitae, two letters of reference, and proof of U.S. citizenship – INCOMPLETE APPLICATIONS WILL NOT BE REVIEWED.

All application materials should be forwarded to:

Gulf World Marine Park
Attn: Veterinary Internship
15412 Front Beach Road
Panama City Beach, FL 32413

For more information please visit:

<http://www.gulfworldmarinepark.com/marine-mammal-internships>

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Instructions for Authors and Contributors

While any information relevant to aquatic veterinary medicine might be published, we particularly invite contributions for the following regular columns in *THE AQUATIC VETERINARIAN*:

Colleague's Connection

An article explaining why and how a veterinarian became interested in aquatic veterinary medicine and what that veterinarian has done in their aquatic veterinary career.

Peer-Reviewed Articles

Original research or review of any aquatic veterinary topic. Articles will be reviewed by 3 veterinarians and comments and changes referred back to the author prior to publication. The text for an article begins with an introductory section and then is organized under the following headings:

- Materials and Methods
- Results
- Discussion (conclusions and clinical relevance)
- References (cited in the text by superscript numbers in order of citation).

Clinical Cases

Clear description of a distinct clinical case or situation and how it was resolved. These may be submitted for peer-review. Begin with the signalment (species, age, sex, body weight or length) of the animal or animals, followed by a chronologic description of pertinent aspects of the diagnostic examination, treatment, and outcome, and end with a brief discussion.

Book Reviews

Brief review of a published book, including an overview and critique of the contents and where to obtain the book.

Publication Abstracts

Abstracts of published veterinary and scientific journals with full citation/reference (authors, date, title, and journal volume and page numbers – ½-1 page).

News

Brief synopsis or information about aquatic veterinary news published elsewhere. List original source of information.

Legislative & Regulatory Issues

Synopsis or description of emerging legislation or regulations with information on how to access further detailed information or a link to website.

Meetings and Continuing Education and Professional Development (CE&PD) Opportunities

Description or synopsis of upcoming aquatic veterinary or (veterinarian-relevant) non-veterinary in-person or on-line educational meetings noting the meeting title, dates, location, and contact person or website.

Jobs, Internships, Externships or Residencies

Description with specific contact information for veterinary student externships and post-graduate internships or residencies at private practices, institutions, universities or organizations. Description of available full or part-time employment for aquatic veterinarians, with contact information.

Please send articles, clinical reports, or news items to the editor by the following submission dates:

- Issue 1 – February 15 (published in March)
- Issue 2 – May 15 (published in June)
- Issue 3 – August 15 (published in September)
- Issue 4 – November 15 (published in December)

All submissions should be in 10-point Arial font, single spaced. Submissions may be edited to fit the space available.

We can also use editors to proof-read submissions or review articles. Please contact the Editor if you are interested in assisting.

The World Aquatic Veterinary Medical Association also has opportunities for members to assist with committees. Contact any member of the Executive Board to volunteer to help.



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Denver fish vet known as "Dr. Koi" keeps patients feeling fin

By John Davidson

twojd@aol.com

Special to The Denver Post

POSTED: 02/28/2014



Excerpted from online article – for complete text, go to: http://www.denverpost.com/homegarden/ci_25247904/denver-fish-vet-known-dr-koi-keeps-patients#

The doctor reached down to lift her patient, a 2-year-old koi, a fish species bred in Japan hundreds of years ago to add flashes of brilliant color and life to ponds and water gardens. The doctor is Jena Questen — more popularly known by the nickname Dr. Koi. She is a veterinarian (Colorado State University, 2001) who later trained herself to treat ornamental fish because she saw so many of them dying needlessly.

On this day, Dr. Questen was demonstrating fish care to visitors at the Denver Holistic Center, a mélange of mainstream and alternative animal care practices in north Denver. She maintains Colorado's first fish hospital there. And her treatments run the same gamut as those for other species: exams, vaccinations, x-rays, ultrasound and surgery. Like others who've encountered her work, this crowd was curious about the details. For example: How do you know if a fish is sick?

"No. 1, if it's not swimming naturally," Questen said. "Or if it swims apart from other fish. If it's

not eating. If there is obvious swelling. If it has growths or injuries."

She plucked a wriggling, silver-white koi, 8 inches long, from a large fish tank to demonstrate. She placed it in a plastic bucket filled with water and picked it up, turning it over to inspect it.



(Photos: Kathryn Scott Osler, The Denver Post)

"He has reddened fins," Questen said. "That indicates an injury or bacteria." Questen points out an area on the fin that has turned bright red, which is similar to a human's bruise-type injury.

She routinely scrapes mucous covering the scales from each fish she examines to check for bacteria and parasites. The cure for either malady will be antibiotic injections or medicated baths. Another common question: How the heck do you operate on a fish?

"Many people are bewildered by the notion," she said. "They ask if I have to go underwater to do it." The answer is no.

To show how, Questen set up two plastic containers, each about a foot tall and 14 by 18 inches wide and long. One sits on the exam table, the other on the floor, with both connected by a hose.



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To perform fish surgery, Questen adds an anesthetic in the top container's water. Then the lower container gets a lid with a sponge cover, into which a "V" shape is cut. During the procedure, the fish is placed in the "V." Water from the upper container is continually pumped over it to keep the fish oxygenated and medicated.

Questen started treating koi in 2005 when she began working with the Rocky Mountain Koi Club. Her patients include other fish species as well — goldfish, bettas (also known as Siamese fighting fish) and cichlids (the fish family that includes angelfish). She also sees mammals, including dogs, cats and horses, at the clinic and through her mobile practice, East West Vet Service. And she consults, teaches, makes educational videos and does public appearances.



Owner dedication to this ornamental fish can run to extremes. Koi typically live about 50 years, much longer than a dog or cat. Koi can be an expensive investment, with fanciers booking international plane trips to view and buy them.

"The priciest one I've worked on was worth \$26,000," Questen said. Her typical fee to treat a koi runs about \$175 to \$250. But a fish's price or rarity is no indicator of its owner's devotion, or willingness to consult a vet.

Know more about koi

Rocky Mountain Koi Club, rmkc.net

Dr. Jena Questen

Koivet.com

Denver Holistic Center: 4640 Pecos St.;

Denver, Colorado

877-585-5444;

denverholisticcenter.com

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AVNeditor@wavma.org.

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Meet the Student: Nora Hickey

acipenseriformes@gmail.com

I first heard about Project Piaba five years ago while being interviewed by a guy with his arm elbow-deep in an electric eel tank. "Are captive bred aquarium fish always better than wild caught fish?" he asked me as I watched the eel eyeing his hand hungrily. The correct answer to this question is no, as I would later learn. Unfortunately I said yes, but I was somehow still accepted for the internship in the New England Aquarium's Freshwater Gallery with Scott Dowd—Electric Eel Wrangler and head of Project Piaba. I would learn a lot about Project Piaba during the three years that I volunteered for Scott.

The project is centered on the idea of "Buy a Fish, Save a Tree." The Rio Negro ornamental fishery in Brazil is a very sustainable fishery with a plethora of desirable species for the aquarium trade. What really sets this fishery apart is the environmental stewardship that it promotes. Because the Rio Negro fishermen and fisherwomen rely upon the river for their livelihood, they are invested in preserving its health. This environmental stewardship ultimately extends beyond the river to protecting the rainforest, as well, because erosion could hurt the fishery. As a result, the people of the Rio Negro preserve their way of life by preserving the rainforest. Project Piaba illustrates that captive bred fish are not always better than wild caught fish for your home aquarium.

I went into my internship at the New England Aquarium having absolutely no idea what I was going to do with my life. It was through my experiences in the freshwater gallery and aquarium medical center that I thought about applying for vet school. I continued volunteering at the New England Aquarium throughout college until I went back to my home state of Wisconsin and started vet school at University of Wisconsin-Madison.

Perhaps even worse than the incessant polar vortices currently plaguing Wisconsin has been the lack of a public aquarium to volunteer at. There's something therapeutic about spending your Saturday morning scrubbing algae off tank backgrounds inside of a 2000 gallon, 90 degree Amazon flooded-forest exhibit—and feeding the anacondas is always a nice perk. So when I saw an e-mail from Dr. Saint-Erne inviting WAVMA members on a trip to Brazil with Project Piaba to examine the ornamental fishing industry there, I



Jim Watson (Shedd Aquarium) holding a 3-toed sloth for a photo opportunity for Nora. Dr. Tim Miller-Morgan is sitting in the center of the canoe.

knew that this was a huge professional development and networking opportunity. And I would also be able to get a wicked tan I could show off to my snowbound classmates.

The expedition, led by my old aquarium supervisor Scott Dowd, was two weeks of warm weather, snorkeling with all of my favorite fish species (piranhas and stingrays and candiru, oh my!), and of course working with and learning from two awesome fish veterinarians. Drs. Miller-Morgan and Saint-Erne were great about letting me participate and get my hands fishy. One thing that I enjoy about being a vet student who is interested in aquatic animal medicine is the approachability and helpfulness of the veterinarians in this field. This is really neat, and from my experience not always the case for students in other fields of veterinary medicine. I would encourage students who are interested in aquatics to get to know the aquatic vets at their school and in their area. These are people who are excited to meet and mentor students; getting to know aquatic vets is probably the best way to learn about opportunities such as educational programs, internships, and ultimately job openings.

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For this particular fish experience, I had the opportunity to improve my fish necropsy skills on a wide range of species. We dissected everything from knifefish to stingrays. The goal of our work was to identify points in the supply chain where major insults to fish quality were happening. The journey between the fishermen catching the fish and a customer buying the fish at a pet store is long and composed of many steps. We took samples of the fish and water from the major points in the supply chain and then performed fish health assessments and water quality testing. I spent some quality time with Dr. Miller-Morgan's nifty water quality test kit as well as gained some serious small-fish dissection skills. Cardinal tetras are one of the Rio Negro's major exported species, and they max out at about two centimeters. I took a picture of the smallest fish I necropsied for bragging rights (I imagine for fish veterinarians this is similar to people who keep a picture of their child in their wallet) and have been showing it to fishy types back at school.

Photo above:

Dr. Tim Miller-Morgan and Nora Hickey examine necropsy specimens aboard the ship *Dorinha* on the Rio Negro River.

Photo right:

Nora observes Captain Mo feeding squirrel monkeys that jumped from the trees into the canoes enticed by a banana. Boat guide, Ezaquiel, is in center.

This was a really great opportunity to work on a fascinating project with two extremely successful fish veterinarians. Not only did I learn about fish health assessments from Drs. Miller-Morgan and Saint-Erne, I also learned about the career paths they took to get where they are now. This is invaluable information for any student on a non-traditional track in veterinary medicine. This project also opened the door for some potential research opportunities that I hope to pursue in the future. For any students looking for a good externship opportunity, I highly recommend considering the Project Piaba expedition next year.

Nora is a second year veterinary student at the University of Wisconsin-Madison's School of Veterinary Medicine. She is interested in pursuing a career in the aquaculture industry. Along with fellow second year students Will Mustas, Maria Arndt, and Jimmy Tarrant, she worked to create the UW-Madison's Veterinary Medicine Aquaculture Club (VMAC). VMAC has hosted a variety of fish health professionals as speakers and wet lab instructors with the purpose of preparing students for careers as aquatic animal practitioners. Nora's favorite Rio Negro fish is *Corydoras davidsandsi*.



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Project Piaba was established (in 1991) to understand the ecological and socio-cultural systems of the Rio Negro basin, Amazonas, Brazil, in order to conserve and maintain the renewable live ornamental fishery at commercially feasible and ecologically sustainable levels. More than 40 million live fish are exported from the Rio Negro basin annually, worth in excess of \$100 million in worldwide retail value. The municipality of Barcelos is the principal trading post where trade in ornamental fishes now contributes over 60% of the local revenue.

Project Piaba aims to generate data relating to a wide range of issues, from population of species diversity, to the function and structure of the ecosystem, in addition to developing measures that will help improve the livelihood of the riverine people of Barcelos, Brazil. The ultimate goal is to promote ornamental fish collection at commercially and ecologically sustainable levels, and to help to reduce environmentally destructive land use and rural-to-urban migration in the Rio Negro basin of the Amazon rainforest.

Annually at the end of January, which coincides with the end of the fish collecting season, the Project Piaba team visits the fisheries of the Rio Negro, the sixth largest river in the world at 1550 miles long. Where the Rio Negro joins the Solimoes (Amazon) River in Brazil is over 1000 miles inland from the Atlantic Ocean. The industrial city of Manaus is on the northeast shore of this fluvial junction. The black but clear water of the Rio Negro runs alongside the milky white water of the Solimoes for six miles before they intermix completely.

The annual rainfall in this area of the Amazon averages 70 inches, and the year has two seasons: rainy and more rainy. The river water level here fluctuates about 30 feet seasonally. The forests in the flood plain along the rivers, called *igapo*, are

dry during low water seasons and flooded at high water. The fish enter the *igapo* to feast on the fruits of the forest; and to breed. Millions (billions?) of new fish are produced annually during the high water season, and then as the water level recedes, they concentrate in the permanent water channels (*parana*), where as much as 80% of them die due to crowding and lack of food. Collecting the fish after the spawning season removes fish that would otherwise likely die, but leaves enough behind to repeat the cycle the next year.

The humic matter from the forest makes the water dark colored, like tea, but full of tannic and humic acids that keep the water clear by inhibiting microorganisms and sediment. When we tested the water, the pH was 4.5! The ammonia, nitrite and nitrate were all zero. The hardness and alkalinity were below 25 mg/L. The water temperature was 86 degrees Fahrenheit.

Because of the low nutrient density in the Rio Negro, most of the fish species there are small, extremely suitable for home aquariums. There are many species of cichlids, tetras, especially the beautiful cardinal tetra (*Paracheirodon axelrodi*), pencilfish, knife fish, corydoras catfish and plecostomus (Loricariidae). Many of the species are not commonly found in the pet trade, but could be in the future with the help of this organization!

See: <http://projectpiaba.wordpress.com/about/>



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Scott Dowd from the New England Aquarium examines a fish trap held by a Piabeiro. The ship *Dorinha* is in background.

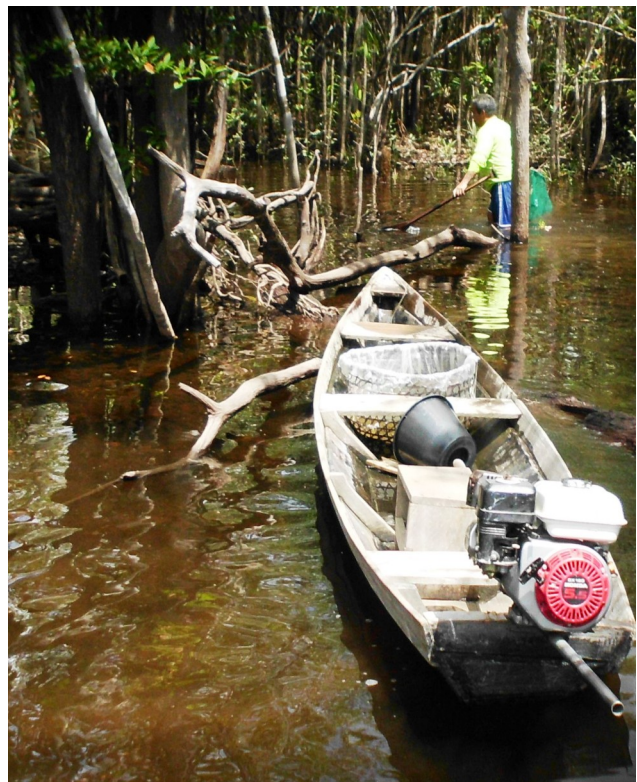
Piabeiros collect fish with traps or hand nets and transport them in baskets by wooden canoes.



The whole family travels by wooden canoes to the fish collecting sites among the shallow canals through the seasonally flooded forest.

Fish collecting occurs when the water is receding after the fish invade the forest to feed and breed.

The Piabeiro uses his canoe paddle to herd the fish into his hand held dip net, then transfers them into the plastic lined woven basket in the canoe.

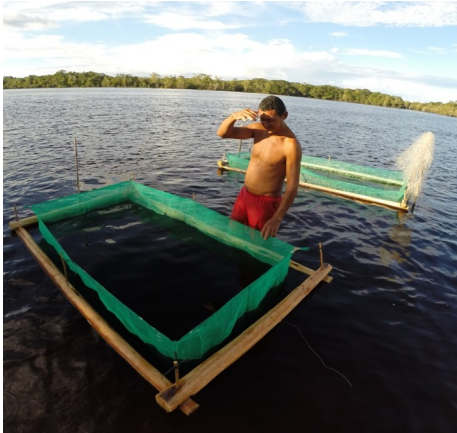


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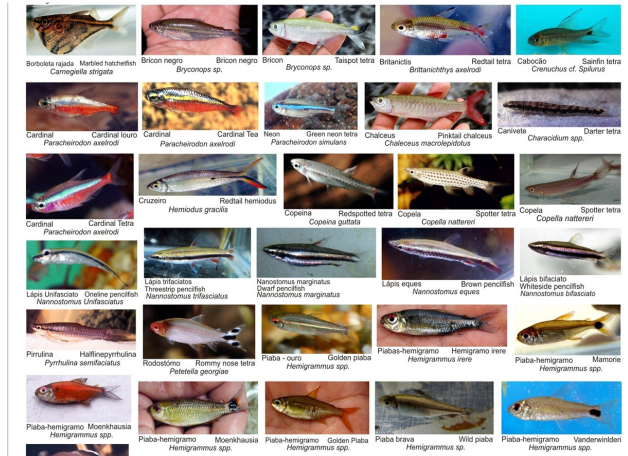


Fish are housed in floating pens in the river until transported by barge in plastic tubs to the export station in Manaus.



Tubs of fish are loaded onto a barge that transports them to Manaus for export – a two day journey by boat down the river.

One of many beautiful Loricariidae species commonly found in the Rio Negro waterways.



About 500 fish species occur in the Rio Negro – the most diverse river system in the world.



Black ghost knifefish (*Apteronotus albifrons*) in plastic tub of water on the barge.

Green discus cichlids (*Symphysodon aequifasciatus*) in a tank at the fish exporter in Manaus.



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CLINICAL REPORTS

First Quarter 2014

Wide spread presence of calcareous bodies attached to the gills of largemouth bass (*Micropterus salmoides*) in Higgins Lake

By Mohamed Faisal

Aquatic Animal Health Laboratory (AAHL)

College of Veterinary Medicine

Michigan State University

East Lansing, Michigan 48824, USA

Abstract:

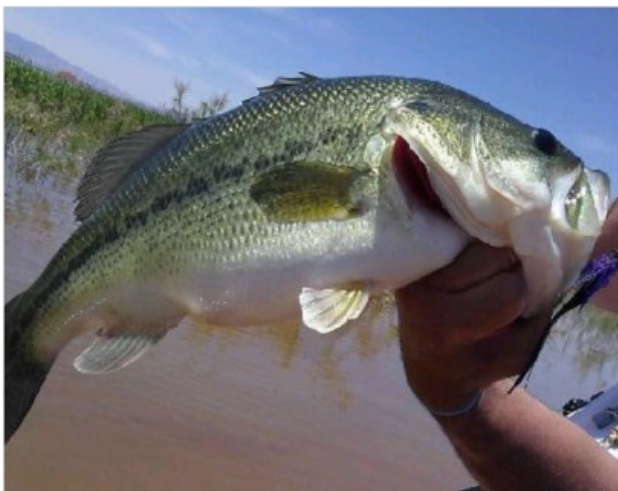
Heavy infection with glochidia was noticed in the gills of largemouth bass in Higgins Lake, Michigan.

Introduction:

Higgins Lake is a recreational and fishing lake in Roscommon County, in the U.S. state of Michigan. The lake is very popular as it provides public boat launches and camping. The lake is 9900 acres (40 km²) and is known for its deep, clear waters. The largemouth bass (*Micropterus salmoides*) is one of the most common freshwater gamefish species. It is native to North America.

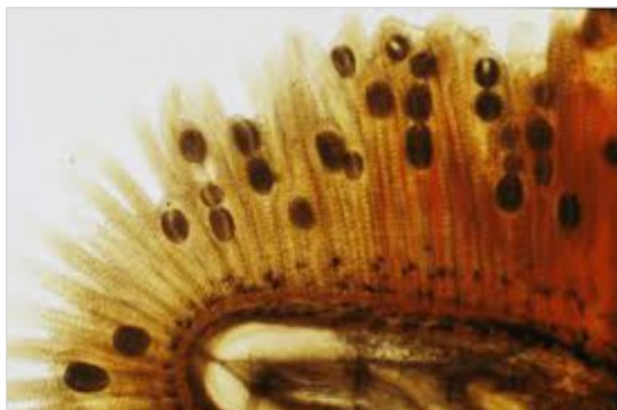
Case presentation:

The Michigan department of Natural Resources launched a survey to determine the spread of largemouth bass virus in the inland lakes. Through this survey, we have examined hundreds of largemouth bass (Figure 1).

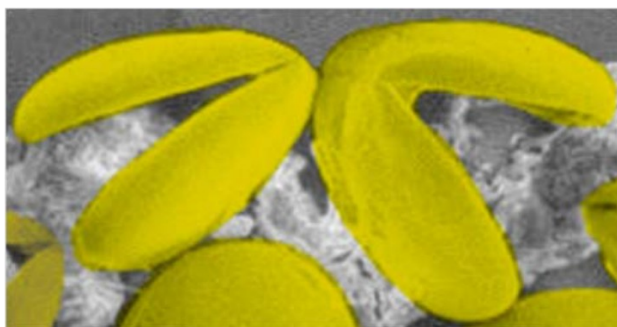


Clinical and laboratory examination:

In ~50% of Higgins Lake fish, non-motile calcareous bodies were found attached to the gill filaments (Figure 2) of affected fish. Otherwise, fish appeared clinically normal with no external or internal lesions.



Additional examination with scanning electron microscopy revealed the presence of microscopic bivalve mollusc-like bodies (Figure 3) that consisted of two identical halves. The case was diagnosed as heavy infection with glochidia. A glochidium is a microscopic larval stage of some freshwater mussels.



The glochidium (plural glochidia) is the parasitic larval stage of freshwater bivalve mollusks in the families Unionidae and Margaritiferidae.



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GRAND ROUNDS CASES

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Floating Koi Treatments

Dear WAVMA Members,

I've a case of a large female koi that's been negatively buoyant for 2-3 months and in the last month became inappetent. Naturally, there are pressure ulcers on the ventral aspects and blood tests showed an inflammatory leukogram (subjective haematology). On biochemistry she had elevated liver enzymes.

At the moment, we're using topical antiseptics every 1-2 days and injectable antibiotics. We'll also give her some diazepam (my colleague says that mirtazapine is used in small animals to avoid sedative effects and can this be used in fish and at what dose?) as an appetite stimulant and failing that, we'll start gastric tube feeding.

May I please have your suggestions about where to go from here?

Thank you.

Dr Richmond Loh

DipProjMgt, BSc, BVMS, MPhil (Pathology) Murdoch, MANZCVS (Aquatics & Pathobiology), CertAqV.

Veterinarian | Adjunct Lecturer [Murdoch University](#) | Secretary Aquatic Animal Health Chapter - [ANZCVS](#).

[The Fish Vet](#),

Perth, Western Australia, AUSTRALIA.

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<http://www.thefishvet.com.au>

Ph: +61 (0)421 822 383

Hi Richmond,

We see this phenomenon quite often, from small to large koi. Usually the koi battle with swim bladder problems mainly in spring and autumn, with changing temperatures and in winter (water temp +/- 4°C). Usually, the swim bladder is filled with either yellowish, clear liquid or rather reddish turbid ("purulent") liquid.

If possible do an x-ray: it helps to make sure the swim bladder is still intact and in the correct location (sometimes, especially in large female koi the caudal swim bladder is misplaced or too small). Then we use a large gauge needle (50-75mm long) and puncture the swim bladder and get rid of as

much liquid as possible (up to 2 dl per swim bladder in a large koi). Then we pump air into the bladder (about the same volume as liquid sucked out) and inject florfenicol (e.g. Nuflor® 0.2ml/kg) directly into the swim bladder. If necessary, repeat treatment after 1 week for up to 3 times. If after 3 times the koi isn't ok, the prognosis isn't that good.

We try to keep the koi in a **shallow** quarantine pond, temp +/- 25°C, salt 3-5 ppt for up to 3 weeks. We usually treat fish like this on site so don't have the option of x-ray, but if the hobbyists are prepared to pay for it, it is always good to have an x-ray taken.

I am not sure of the reasons for swim bladder problems: bacterial infection can obviously be a problem but the clear, yellowish liquid that we see most of the time are rather a transudate not an exudate. If the ductus pneumaticus is involved or not is hard to say,

Regards,

Ralph Knüsel

Dr. med. vet.

fishdoc GmbH

Schaubhus

CH-6026 Rain

Schweiz

fon: +41 79 820 42 43

fax: +41 41 458 12 00

email: info@fishdoc.ch

web: www.fishdoc.ch

Hi Richmond,

I have successfully placed air in the oesophagus and intestines (koi and goldfish have no stomach) using a bird crop needle or small urinary catheter, with their head down and tail up position in the water column. I usually am only putting in 1 to 5 mls of air depending on the size of the goldfish.

My theory is that as they are physostomous and so some of the air may go into the gas bladder from the oesophagus through the pneumatic duct.

Have done this in large goldfish and it seems to work (we do not have koi in Victoria).

Regards,

Rob Jones

"The Aquarium Vet"

PO Box 2327 Moorabbin,

Victoria, Australia, 3189

www.theaquariumvet.com.au

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GRAND ROUNDS CASES

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Saltwater Worm Treatments

Hello WAVMA Members,

I had a phone call from a client who comes here often with all her animals, including large macaws. She stood in a store and the lady of the store said there were worms on the shrimp. How do I treat the shrimp? I didn't realise she had a seawater aquarium. She just started it and was asking me a lot of questions...

I just want to learn, because I hardly know things from a seawater aquarium. I'm following the e-aquarium course of Rob Jones, but it struck me not to know how to treat worms on shrimp in general.

Greta Van De Sompel
johan.van.der.cruyssen@telenet.be

Dear Greta,

A good start may be a book from our colleague Prof. Greg Lewbart, 'Invertebrate Medicine'. However, they do not list much on shrimp parasites except "Parasitic diseases include fouling organisms that attach to the shell or gills, obstructing function of these tissues". There is no mention of 'worms'. Did you have a chance to see any of the creatures under a microscope? Did they resemble nematodes? Tapeworms?

Crustaceans have been mostly studied as intermediary hosts of parasites, but of course they have parasites themselves. Catching a stage in a life cycle in an intermediary host may be tricky to diagnose properly.

So, how do you know if they are even parasites, since they may be just a fouling organism that dropped from the shell? Also for example in crabs, there are parasites that are actually also crustaceans and may resemble worms (but are not). One of the extreme examples is a *Sacculina* sp. Although *Sacculina* is more of an inspiration to Alien movie sequels than a worm-like parasite.

Unfortunately, there is not much about internal parasites of crustaceans in this section of the book, but there are number of other chapters that may give you some guidance (e.g. spiders, insects, scorpions, etc). However, it looks like there is more than just 'worm' problems with this client. Some recommended treatments for the external parasites of crustaceans (shrimp, lobster, crabs) are formalin

25-30 ppm in water for one day and potassium permanganate 20-30 ppm for 30-60 min baths. Change in salinity also may help.

Dušan Palić, D.V.M., MVSc, Ph.D.
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Hi Greta,

For bacterial diseases, most antibiotics are safe to use in reef tanks but you've to take into account how the pH and hardness affects the dose rate you use (e.g. oxytetracycline, chloramine T). For protozoal diseases, Dusan's listed formalin. Quinines are possible and perhaps some of the anticoccidials. Potassium permanganate may be useful for superficial fungal and bacterial infections.

I'm unsure of the safety of products like praziquantel and levamisole for flatworms and roundworms in marines. Likely to be safe, but I'd recommend trying on a subset first.

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Book Review

Clinical Cases in Avian and Exotic Animal Hematology and Cytology

Terry W. Campbell & Krystan Grant (2010/11). Wiley-Blackwell Publishers. Available as a 392 page e-Book (ISBN 978-0-470-96179-7) for \$119.99, Hardcover (ISBN 978-0-8138-1661-6, 392 pages, \$142.99), and a new "Wiley e-Text" (ISBN 978-0-8138-2342-3, 376 pages, \$142.99).

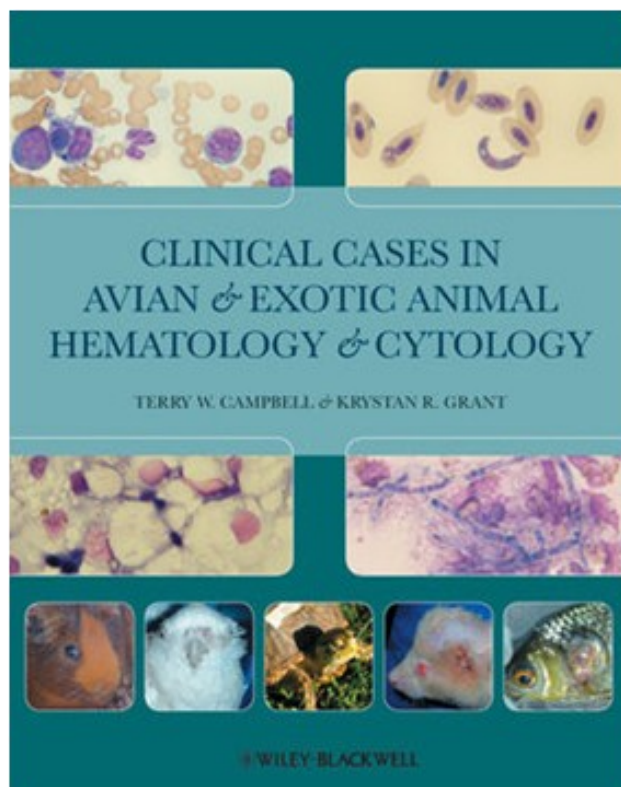
Reviewed by A. David Scarfe, PhD, DVM, MRSSAf, CertAqV

Well written by an Associate Professor and a Post-Doctoral Fellow in the Department of Clinical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, Colorado, *Clinical Cases in Avian and Exotic Animal Hematology and Cytology* is a fascinating compilation of clinical cases drawn from those presented at the University veterinary hospital. It conjures up fond memories of clinical rounds presented at veterinary schools around the world – and something that well versed aquatic veterinarians and senior veterinary student would both get a lot out of.

While not a perfect replacement for clinical rounds, this book offers a wonderful insight into what veterinarians might encounter in practice other than the traditional companion animal (cat and dog), large animal or mixed animal practice. Not just that, but it offers important reference information on clinical pathology and cytology that is critical for evaluating not just fish, but a number of "exotic" mammals, birds, amphibians and reptiles that "exotic animal" veterinarians might encounter in assessing their patients.

While traveling through nearly 100 actual clinical cases, the book may focus on hematology and cytology, but the hands-on, practical approach, facilitates learning and comprehension. It is well illustrated and is organized with sections dealing with **Exotic Mammalian Hematology** (8 cases) and **Cytology** (19 cases), **Avian Hematology** (13 cases) and **Cytology** (17 cases), **Herptile Hematology** (6 cases) and **Cytology** (14 cases), **Fish Hematology** (2 cases) and **Cytology** (15 cases).

Each clinical case offers a typical and very pertinent signalment and history, physical exam findings, hematological or cytological results and interpretation, and other appropriate diagnostic results



that help readers form a complete picture of the case. Particularly useful is that it includes the final diagnosis and any follow-up that occurred making the book an extremely practical resource for anyone.

Clinical Cases in Avian and Exotic Animal Hematology and Cytology is a helpful guide for any veterinarian interested in "exotic animal" private practice species, zoos and aquarium, or the veterinary diagnostic lab pathologist. It is well worth the cost and I'm certain that the copy on any "exotic animal" veterinarian bookshelf will be well worn.

Are you starting out in fish histopathology and you're not sure what organ is what, or if those cells are normal?

The Penn State University's **Zebrafish Atlas** is an excellent online resource for veterinary fish pathologists and for researchers. The best part is that it's free for all.

Check out the Zebrafish Atlas at this link - <http://zfatlas.psu.edu/reference.php>

Use of blood culture as a nonlethal method for isolating bacteria from fish.

Klinger R, R Francis-Floyd, R Riggs & P Reed (2003). *J. Zoo. Wildl. Med.*, 34(2):206-7.

Abstract

Simple nonlethal blood culture methodology, an alternative to euthanasia for diagnosing systemic bacterial infections in fish, is described. Blood was extracted from the caudal vein of 20 individuals of five fish species, incubated in brain-heart infusion broth, and then plated onto enriched blood agar. Nine of these fish were subsequently euthanized and necropsied for confirmatory tissue cultures. Five species of bacteria were isolated from the blood cultures from nine fish, and the tissue culture results in euthanized, necropsied fish agreed with the blood culture results in all cases. All the fish that were not euthanized survived for 24 hr, although two heavily parasitized fish subsequently died.

Fin and gill biopsies are effective nonlethal samples for detection of Viral hemorrhagic septicemia virus genotype IVb

Cornwell ER, CA Bellmund, GH Grocock, PT Wong, KL Hambury, RG Getchell & PR Bowser (2013). *J. Vet. Diag. Invest.*, 25 (2): 203-209.

Abstract

Nonlethal sampling is becoming a common method to diagnose fish diseases, especially with the availability of molecular testing. *Viral hemorrhagic septicemia virus* (VHSV) is a viral pathogen of finfish distributed worldwide. Although VHSV has been known to occur in some parts of the world for decades, a new genotype, IVb, recently emerged in the Laurentian Great Lakes of northeastern North America. Golden shiners (*Notemigonus crysoleucas*; Mitchell, 1814) and fathead minnows (*Pimephales promelas*; Rafinesque, 1820) were exposed to VHSV-IVb doses between 10^2 and 10^6 plaque forming units per fish by intraperitoneal injection at 10°C.

Both species experienced significant mortality after exposure, ranging from 38% to 52% in golden shiners and from 35% to 95% in fathead minnows. In golden shiners, a fin or gill sample was somewhat less sensitive at detecting VHSV-IVb by quantitative reverse transcription polymerase chain reaction (qRT-PCR) than a pooled organ sample (consisting of liver, anterior and posterior kidney,

spleen, and heart), however the relative sensitivity increased when a fin and gill sample were tested in parallel. In fathead minnows, a fin or gill sample tested alone or in parallel was relatively more sensitive than a pooled organ sample by qRT-PCR. Specificity was 100% for all sample types in both species. The results suggest that fin and gill biopsies are useful tools to test for VHSV in live fish.

Evaluation of the effects of tricaine methanesulfonate on retinal structure and function in koi carp (*Cyprinus carpio*).

Bailey KM, JE Hempstead, JR Tobias, LB Borst, AB Clode & LP Posner (2013). *J. Amer. Vet. Med. Assoc.*, 242 (11): 1578-1582.

Abstract

Objective: To determine whether repeated exposure to clinically relevant concentrations of tricaine methanesulfonate (MS-222) would alter retinal function or induce histologically detectable retinal lesions in koi carp (*Cyprinus carpio*).

Procedures: 2 fish were euthanized at the start of the study, and eyes were submitted for histologic evaluation as untreated controls. Anesthesia was induced in the remaining 16 fish with 200 mg of MS-222/L and maintained with concentrations of 125 to 150 mg/L for a total exposure time of 20 minutes daily on 1 to 13 consecutive days. On days 1, 7, and 13, electroretinography of both eyes was performed in all fish remaining in the study, and 2 fish were euthanized immediately after each procedure for histologic evaluation of the eyes. Median b-wave amplitudes were compared among study days for right eyes and for left eyes via 1-way repeated-measures ANOVA with a Bonferroni correction for multiple comparisons.

Results: Median b-wave amplitudes on days 1, 7, and 13 were 17.7, 20.9, and 17.6 μ V, respectively, for right eyes and 15.1, 16.9, and 14.3 μ V, respectively, for left eyes. No significant differences in b-wave amplitudes were detected among study days. No histopathologic abnormalities were identified in the retinas of any fish treated with MS-222 or in control fish.

Conclusions and Clinical Relevance: Short-term exposure of koi carp to clinically relevant concentrations of MS-222 daily for up to 13 days was not associated with changes in retinal structure or function as measured in this study.

Plasma Biochemistry Values of Recently Wild-Caught Purple Mouth Moray Eels (*Gymnothorax vicinus*)

Erlacher-Reid C, WE Hoffman, M. Priede, R Pulver & AD Tuttle (2011). *J. Zoo Wildlife Med.*, 42 (4): 671-679.

Abstract

The primary purpose of this study was to establish plasma biochemistry parameters for healthy recently wild-caught purple mouth moray eels (*Gymnothorax vicinus*) to provide a baseline of data for improved medical care in an aquarium or zoologic setting and for wild health assessments. Thirty-one clinically healthy purple mouth moray eels of unknown age and sex were caught from the wild, and were anesthetized 50 days following capture for blood collection from the ventral coccygeal vein.

The median plasma biochemistry values were as follows: hematocrit = 21%, creatinine kinase = 2,100 U/L, lactate dehydrogenase = 97 U/L, aspartate aminotransferase = 88 U/L, alanine aminotransferase = 51 U/L, alkaline phosphatase 3,939 U/L, gamma-glutamyl transpeptidase = 1 U/L, amylase = 40 U/L, blood urea nitrogen = <11 mg/dl, glucose = 21 mg/dl, calcium = 12.5 mg/dl, triglyceride = 206 mg/dl, creatinine = 0.1 mg/dl, cholesterol = 334 mg/dl, total bilirubin = <0.1 mg/dl, phosphorus = 6.5 mg/dl, total protein = 4.2 g/dl, albumin = 1.5 g/dl, globulin = 2.7 g/dl, albumin/globulin ratio = 0.6, sodium = 185 mmol/L, potassium = 3.7 mmol/L, and chloride = 175 mmol/L. Alkaline phosphatase isoenzyme results indicate that the majority of the plasma alkaline phosphatase is the liver isoenzyme.

The data acquired in this study also provide baseline values for cholesterol and triglycerides in recently wild-caught moray eels to aid in monitoring elevations to these values in an aquarium setting over time so adjustments to the dietary regime may be utilized to prevent or improve conditions such as lipid keratopathy.

Evaluation of critical care blood analytes assessed with a point-of-care portable blood analyzer in wild and aquarium-housed elasmobranchs and the influence of phlebotomy site on results

Naples LM, ND Mylniczenko, TT Zachariah, RE Wilborn & FA Young (2012). *J. Amer. Vet. Med. Assoc.*, 241(1): 117-125.

Abstract

Objective—To establish reference ranges for critical care blood values measured in wild and aquarium-housed elasmobranchs by use of a point-of-care (POC) blood analyzer and to compare values on the basis of species category (pelagic, benthic, or intermediate) and phlebotomy site.

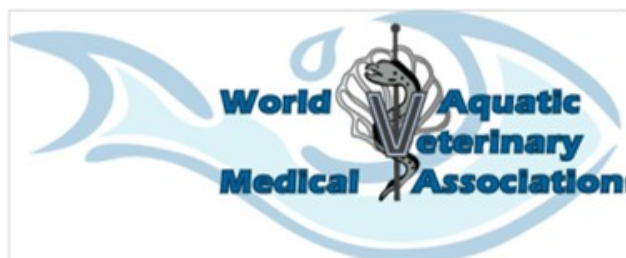
Design—Cross-sectional study.

Animals—66 wild and 89 aquarium-housed elasmobranchs (sharks and rays).

Procedures—Aquarium-housed elasmobranchs were anesthetized for sample collection; wild elasmobranchs were caught via hook and line fishing, manually restrained for sample collection, and released. Blood was collected from 2 sites/fish (dorsal sinus region and tail vasculature) and analyzed with the POC analyzer. Reference values of critical care blood analytes were calculated for species most represented in each population. Values were compared on the basis of species categorization (pelagic, intermediate, or benthic) and collection site.

Results—Oxygen saturation and circulating concentrations of lactate and glucose were significantly different among aquarium-housed pelagic, intermediate, and benthic species. Lactate concentration was significantly different among these categories in wild elasmobranchs. Significant differences were detected between samples from the 2 collection sites for all blood analytes. In both study populations, pH and lactate values were infrequently < 7.2 or > 5 mmol/L, respectively.

Conclusions and Clinical Relevance—Brevity of handling or chemical restraint may have reduced secondary stress responses in fish because extreme variations in blood analyte values were infrequent. Sample collection site, species categorization, acclimation to handling, and restraint technique should be considered when assessing values obtained with the POC analyzer used in this study for blood analytes and immediate metabolic status in elasmobranchs.



Effect of nutritional status and sampling intensity on recovery after dorsal aorta cannulation in free-swimming Atlantic salmon (*Salmo salar* L.)

Djordjevic B, T Kristensen, Ø Øverli, BO Rosseland & A Kiessling (2012). *Fish Physiol. Biochem.*, 38 (1):259–272. (Open Access publication available at <http://link.springer.com/journal/10695/38/1/page/1>.)

Abstract

Recovery from implantation of a cannula in the dorsal aorta (DA) of Atlantic salmon (*Salmo salar*) was studied in relation to nutritional status and sampling intensity. The incentive for the study was the inconsistency between published reports and our own experience of recovery and longevity of fish exposed to this protocol.

In two studies using starved fish, blood (0.3 ml) was sampled 0, 1 and 24 h after DA-cannulation, and thereafter at 48 and 72 h and thereafter once weekly for four weeks. In a third study using fed fish, four consecutive samples (0, 3, 6 and 12 h after a meal) were obtained twice a week over a four-week period.

All fish displayed a sharp increase in pCO₂ and haematocrit (Hct) during surgery, followed by a marked raise in cortisol, glucose, sodium and potassium (1 h). pCO₂, pH and Hct approached baseline levels as early as the 1 h post-surgery sample, while this was not the case for cortisol and electrolytes before the 24 h post-surgery sample. Glucose did not display any significant changes post surgery. From then on, all variables displayed minor but non-significant ($P[0.05]$) changes indicating a steady state close to baseline values for unstressed fish.

This pattern was independent of sampling procedure, i.e. repeated single or multiple samples and thus volume of blood removed. Nutritional status (fed vs. starved) did not affect post-surgical recovery pattern. Only K⁺ and Hct displayed consistent and significant post-prandial patterns. We found marked differences between baseline level of cannulated fish and uncannulated control fish, in pH, K⁺ and Hct indicating that cannulation may be the preferred method to obtain representative resting values in fish.

Serum Electrolyte and Nonelectrolyte Status in Freshwater Juvenile Persian Sturgeon (*Acipenser persicus*).

Asadi F, A Hallajian, A Shahriari, P Asadian & M Pourkabar (2010). *J. Aqua. Anim. Health*, 22(3): 167-173

Abstract

Status of serum electrolyte and nonelectrolyte variables can be used for managing sturgeon species cultured in freshwater or living in seawater. The aim of the present study was to evaluate serum biochemical variables in clinically healthy juvenile Persian sturgeon *Acipenser persicus* cultured in freshwater.

Serum samples from 11 females and 10 males were analyzed, and levels (mean \pm SD) of the following variables were compared between sexes:

glucose (Glc; 5.58 ± 1.25 mmol/L for females and 8.56 ± 1.80 mmol/L for males),

total cholesterol (TC; 2.50 ± 0.45 and 2.40 ± 0.65 mmol/L),

triglyceride (TG; 7.13 ± 2.68 and 5.14 ± 1.27 mmol/L),

blood urea nitrogen (BUN; 1.28 ± 0.2 and 1.01 ± 0.2 mmol/L),

total protein (TOP; 55.84 ± 8.77 and 41.44 ± 8.62 g/L),

inorganic phosphate (P_i; 6.19 ± 1.02 and 5.23 ± 0.49 mmol/L),

calcium (Ca; 2.80 ± 0.43 and 2.63 ± 0.32 mmol/L),

magnesium (Mg; 0.9 ± 0.23 and 0.99 ± 0.22 mmol/L),

sodium (Na; 152.80 ± 13.81 and 156.38 ± 12.67 mmol/L),

potassium (K; 2.64 ± 0.58 and 2.27 ± 0.39 mmol/L), and

chloride (Cl; 143 ± 13.85 and 151.67 ± 21.08 mmol/L).

There were no differences in TC, Ca, Mg, Na, K, or Cl between sexes. The Glc value was lower in female Persian sturgeon than in males, whereas the values of TG, BUN, TOP, and P_i were higher in females than in males. Freshwater adaptation may affect serum ion concentrations in juvenile Persian sturgeon.

THE AQUATIC VETERINARIAN

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NEWS AND VIEWS

First Quarter 2014

On-line Amphibian Medicine Tutorials

On-line amphibian medicine tutorials have been recently uploaded to YouTube. Each short 10-15 minute video is designed to provide basic background information in various topics of amphibian medicine. The tutorials are available in 3 languages: English, Spanish, and French.

The material is generally designed for use by veterinarians, but the information will be helpful to anyone involved in ex situ amphibian conservation programs. The tutorials are designed as an introduction, rather than a complete summary of all topics regarding amphibian medicine, and additional resources are listed in each tutorial. Tutorials can be viewed as a stand-alone course, but will also be helpful for reviewing concepts taught at various amphibian husbandry and medicine workshops given around the world by organizations such as the AZA and the Amphibian Ark.

A list of the tutorials can be found on the ARAV website at: www.arav.org

Link to the Amphibian Tutorial YouTube Channel:

<http://www.youtube.com/channel/UCaOhxmTP7asO5zyZQwYzh-A/videos>

Easy to use playlists:

English: http://www.youtube.com/watch?v=oz64nOs452I&feature=share&list=PLVDi5N401GbHJe_8gfER06P6AfM1uRWU3

Español: <http://www.youtube.com/watch?v=KBmflzu4cw&list=PLVDi5N401GbFbEQHocZRjnhW7utsjiOEN&feature=share>

Français: http://www.youtube.com/watch?v=gPQe6Ghnp3w&feature=share&list=PLVDi5N401GbEVEEqzMqqvJiL-3Tm_fP_o

If you find errors, or have problems viewing the videos, please let me know at jsykes@wcs.org

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SOS – We Need Your Help to Save our Salamanders and Wildlife Habitat

Charlotte, Vermont, USA –

The Town of Monkton and other partners are excited to announce the launch of this one-time social media campaign on Indiegogo. We hope to raise \$45,000 by the end of April for the installation of two Wildlife Crossing Structures in Monkton, Vermont. Other partners include the Vermont Agency of Transportation, Vermont Department of Fish and Wildlife, University of Vermont's Gund Institute of Ecological Economics, Middlebury Area Land Trust, Trans Wild Alliance, Defenders of Wildlife, The Vermont Reptile and Amphibian Atlas and Peregrine Productions.

If we reach our critical fundraising goal by this spring, two tunnels will be constructed under the Monkton-Vergennes Road to provide safe crossing for the annual migration of thousands of amphibians. Each spring the salamanders and frogs move from their winter habitat on rocky forested hillsides to their breeding habitat in an adjacent swamp. This requires them to move across a busy road. Later, the adults and their young will need to return back across the road to the hillsides. At this site over half of the animals attempting the migration are run over by vehicles.

We are now reaching out to the worldwide community who value diversity and understand the vital importance of protecting wildlife habitat and corridors. The VT Department of Fish and Wildlife and others have recognized this extraordinary wetland site for its importance as significant breeding habitat for a large and diverse population of amphibians, including Blue-spotted, Jefferson, and Four-toed salamanders. Wing-walls on both sides of the road will act like funnels to direct the amphibians and other wildlife into four-foot wide tunnels under the road, allowing the animals to safely cross in all seasons. By preserving Vermont's amphibians, we can help save important populations in the Northeastern United States and help lay the groundwork for future projects throughout the world. Construction is scheduled to begin in 2014 with your help!

Please visit our indiegogo site at:

<http://www.indiegogo.com/projects/monkton-road-wildlife-crossing>

We hope you will then be convinced to make a tax-deductible donation on line.

Contact: Andrea Morgante,
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First Quarter 2014

A New, More Humane Way to Euthanize Stranded Whales

By Jane J. Lee

[National Geographic](#) [Excerpt]

Published February 5, 2014

If you saw an animal slowly suffocating to death—and there was no hope of saving it—what would you do? This is a question faced by the researchers, veterinarians, and trained volunteers who respond to whale strandings around the world.

"Most large whales, when they come to shore, they're already dead," says [Craig Harms](#), an aquatic animal veterinarian at North Carolina State University in Morehead City. But the ones that strand alive and can't get back out to sea face a slow, painful death unless someone intervenes. Some groups use explosive charges to kill the animal as quickly as possible. Others use exsanguination, which involves cutting a major artery where the tail meets the body, and the animal bleeds out. Some use drugs.

A [new study](#) published in the *Journal of Wildlife Diseases* identifies a mixture of sedatives, pain relievers, and a euthanasia drug that can make things easier for those dealing with a stranded whale—and is much gentler on the whale itself. The primary goal is to relieve a whale's suffering, says Harms, one of the researchers involved in developing the new method.

Without that intervention, a stranded whale is left to the mercy of sunlight, scavengers, and gravity. Exposure to sunlight causes a whale's skin to blister and peel, almost like a third-degree burn. And their prone position makes them easy pickings for scavengers like seagulls. In the end, without the buoyancy of seawater, a beached whale is crushed to death under the weight of its own organs and blubber. It can take from several days to a week for a stranded whale to die, the veterinarian explains. "It's a long, slow suffocation."

Harms says he was spurred to try to come up with a better way after dealing with a stranded two-year-old right whale calf in 2009. It was in a hard-to-reach part of a beach in North Carolina, and by the time he and colleagues reached the animal, its skin was peeling and seagulls had been picking at its flesh. Since they couldn't use pentobarbital to euthanize the whale, they de-

cided to kill it as quickly as they could by exsanguination.

Harms, Rowles, and colleagues developed a new mix of four drugs—midazolam, acepromazine, xylazine, and potassium chloride—that, when administered sequentially, can euthanize a stranded whale more humanely without being toxic for other creatures in the environment or dangerous for people to work with. Midazolam is commonly used to relax people, and acepromazine to calm horses and dogs, Harms says. Once the whale is quiet, xylazine is administered. If xylazine is given after midazolam and acepromazine, the whale doesn't thrash, which makes it much safer for people to work around it.

"The xylazine offers pain relief and anesthesia to the point where we can give the final drug, potassium chloride," Harms says. Potassium chloride stops the heart.

The researchers also came up with a new way of administering those drugs using a garden sprayer connected to custom-made needles. The pressurized sprayer enables delivery of the right quantities of the necessary drugs. And the needles allow workers to access veins near the fins, which keeps them away from the dangerous tail end of the whale. They distributed their new protocol and equipment to stranding groups around the country. For the complete story, go to:

[National Geographic News \(free registration\)](#)

A Washington Department of Fish and Wildlife technician examines a baleen whale that washed ashore dead in June 2013.

PHOTOGRAPH BY DAN AYRES, WASHINGTON DEPARTMENT OF FISH AND WILDLIFE via AP.



Freshwater turtles from wetlands can transmit *Salmonella* to humans

January 13, 2014

Asociación RUVID

Professors from the University CEU Cardenal Herrera studied 200 specimens of freshwater turtles from eleven Valencian wetland areas, to determine the prevalence of *Salmonella* and *Campylobacter* in these animals, because of their potential risk of transmitting gastrointestinal diseases to humans, especially children. According to the results, published in the journal *Plos One*, 11% of the analysed specimens of freshwater turtles were found positive for *Salmonella*. However, *Campylobacter* was not detected in any of them. This is the first study to rule out terrapins as transmitters of campylobacteriosis to humans.

The research group has used specimens of the native *Emys orbicularis* and of the exotic species *Trachemys scripta elegans*, found in eleven wetlands of the Valencian Region (Spain), including the marshes of Pego-Oliva, Xeraco, Cabanes or Peníscola, among others. In eight of the eleven wetlands the researchers found terrapins carriers of the bacteria *Salmonella* with moderate prevalence but none with the *Campylobacter* bacteria.

As pointed out by Veterinary Professor Clara Marín, who led the study, campylobacteriosis and salmonellosis are common infections in humans: there have been 212,064 cases of the first and 99,020 cases of the second registered in the European Union during last year. Moreover, both are the two most frequent zoonosis worldwide, and thus represent an important public health problem in many countries which are interested in designing methods of preventing transmission of these infections from animals to humans. *Salmonella* can cause human gastroenteritis and meningitis, especially in children and elderly. Complications of campylobacteriosis can lead to arthritis and other diseases.

While previous studies had confirmed the risk of transmitting *Salmonella* in the case of pet turtles, in higher percentages than those recorded in this research, there are few studies on wild ones. The project of the University CEU Cardenal Herrera is the first to extend the analysis to the prevalence of *Campylobacter* in these wild animals.



Freshwater turtles from wetlands can transmit *Salmonella* to humans

Credit: Asociación RUVID

Another novel aspect of the study was the combination of three different samples. The work has shown that collecting water samples where the turtles have remained for 48 hours after capture is as effective as sacrificing them or taking swabs directly from the rectum. This finding is especially helpful for sampling protected species.

Professor Clara Marín, head of the research group "Improving food safety in the production system and its derivatives" at the Institute of Biomedical Sciences of the university, has directed the team composed of Sofía Ingesa Capaccioni, Sara González Bodí y Santiago Vega García. Francisco Marco Jiménez, from the Institute of Animal Science and Technology at the Universitat Politècnica de València, has also taken part in the study. This research was awarded best paper at the International Symposium on Freshwater Turtles Conservation held in May in Portugal, and has been funded by the Regional Government through the European Programme LIFE09.

Story Source:

The above story is based on [materials](#) provided by [Asociación RUVID](#).

Journal Reference:

Clara Marín, Sofía Ingesa-Capaccioni, Sara González-Bodí, Francisco Marco-Jiménez, Santiago Vega. **Free-Living Turtles Are a Reservoir for *Salmonella* but Not for *Campylobacter***. *PLoS ONE*, 2013; 8 (8): e72350 DOI: [10.1371/journal.pone.0072350](https://doi.org/10.1371/journal.pone.0072350)

Researchers develop blood test for devastating disease of boas and pythons

Jan 29, 2014

University of Florida researchers have developed a simple immune-based screening test to identify the presence of a debilitating and usually fatal disease that strikes boas and pythons in captivity as well as those sold to the pet trade worldwide. Known as inclusion body disease, or IBD, the highly infectious disease most commonly affects boa constrictors but pythons and other snake species in the boid family are also occasionally infected with the virus that causes the disease. IBD was first seen in snakes in the late 1970s, said Elliott Jacobson, D.V.M., Ph.D., a professor emeritus of zoological medicine at the UF College of Veterinary Medicine and co-author of a study that appeared in December in *PLOS ONE*.

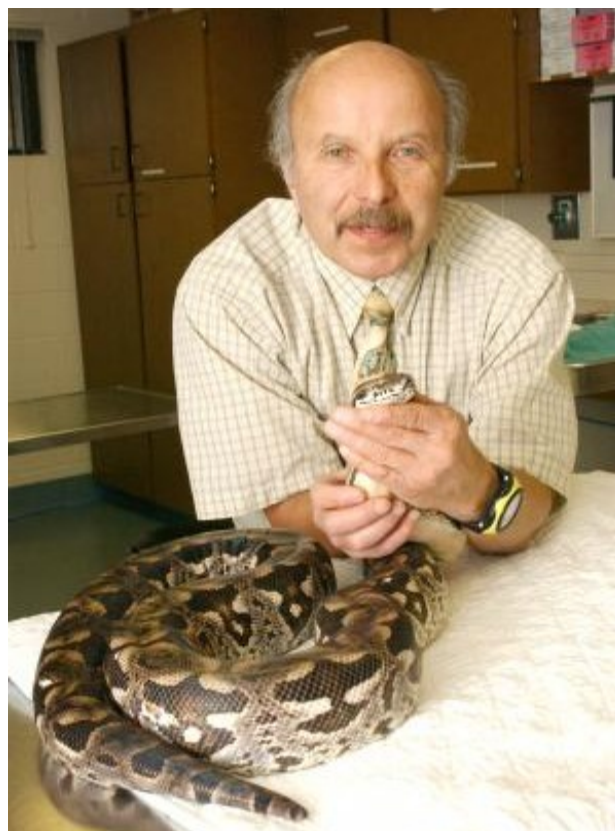
"We don't know the prevalence, but we see more of IBD in the United States because there are some 2 million boas being kept as pets in this country," Jacobson said. "This simple blood test will help determine whether or not an animal has this disease and potentially will help clean up colonies of snakes that will ultimately be disease-free."

Although snakes infected with IBD may display neurological signs, such as head-tilting, chronic regurgitation or disequilibrium, there is also a population of snakes that are subclinical, meaning they are infected but otherwise appear healthy.

"That's a big problem, because healthy-seeming animals that are affected with IBD are being sold and sent around the world," he said. "However, they may develop the disease sometime later and may be the source of infection for other snakes."

On Jacobson's research team at the UF veterinary college were his former graduate student, Li-Wen Chang, B.V.M., Ph.D., the principal investigator in the study, and Jorge Hernandez, D.V.M., Ph.D., a veterinary epidemiologist.

To develop the test, the researchers studied a monoclonal antibody produced in response to a unique protein that accumulates in cells of snakes having IBD. They then sequenced the protein in an effort to further understand the nature and cause of the disease. Although the cause of IBD is unclear, the UF team found genetic links of this unique protein are associated with a family of viruses that primarily infect rodents but may infect humans. However, there is no evidence to indicate that the virus that causes IBD can infect people.



Dr. Elliott Jacobson is shown with a Dumeril's ground boa, a snake species affected by inclusion body disease. Credit: University of Florida

University of California-San Francisco researchers identified the Golden Gate virus in 2012 and scientists now consider it to be a potential cause of IBD. The research was performed at the UF's Interdisciplinary Center for Biotechnology Research through the university's veterinary diagnostic laboratories, where the new test is now offered. In addition, the test's ease of use and simplicity will offer veterinary practitioners a good first-line diagnostic tool to screen for IBD in snake species that show signs of the disease, or even before these signs occur.

"We know now that this disease exists in multiple collections and populations," Jacobson said. "It is important to determine why some snakes are not showing clinical signs of the disease."

Journal reference: [PLOS ONE](https://doi.org/10.1371/journal.pone.0198888)

Provided by [University of Florida](https://www.universityofflorida.edu/)

<http://phys.org/news/2014-01-blood-devastating-disease-boas-pythons.html>

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Hawaiian monk seal hospital to open this summer

By Associated Press

POSTED: Feb 25, 2014



This file photo shows an orphaned monk seal KP2 that was treated at the Marine Mammal Center.
STAR-ADVERTISER ARCHIVE

KAILUA-KONA, HAWAII

The Marine Mammal Center's new hospital for critically endangered Hawaiian monk seals at the Hawaii Natural Energy Laboratory in Kona will be opening to patients this summer. The California-based nonprofit veterinary hospital broke ground on the \$3.2 million Hawaiian Monk Seal Hospital in Kailua-Kona in 2012. The facility includes rehabilitation pens and pools, quarantine areas and a medical lab.

Marine Mammal Center Executive Director Dr. Jeff Boehm says the hospital is being built to help save a species. There are fewer than 1,100 Hawaiian monk seals left in the world, and their population is declining about 4 percent per year.

The Marine Mammal Center is working with the National Oceanic and Atmospheric Administration, the Hawaiian Monk Seal Recovery Team and the Hawaii Wildlife Fund to operate the hospital.

For more information go to: [Star Advertiser](#)

Historic shark pup's premature arrival

Source: AAP

March 12, 2014

Melbourne Aquarium's latest addition is making a splash as the first shark born in Australia through artificial insemination - but its aquarists nearly missed the historic birth.



Not content with one record, the pioneering brown banded bamboo pup is also the first shark worldwide to be born via live semen sample that has been transported between facilities. Yet despite its significance, aquarists and veterinary staff almost missed its first day on March 3, 2014. Sea Life Melbourne Aquarium veterinarian Robert Jones said brown banded bamboo sharks usually had a 140-170 day gestation period. They were caught off guard when the pup hatched after just 112 days.

"We thought we had a few weeks to go, but luckily we set up the webcam to monitor the egg the day she was born," Dr Jones told AAP. Dr Jones says the female pup is not expected to have developmental issues despite its premature birth.

The process began on September 23 last year at Sea Life Mooloolaba when aquarists collected a semen sample from a male shark and took it to Melbourne Aquarium where the mother was inseminated the same day. Research consultant Jon Daly said the successful artificial insemination could potentially save some of Australia's endangered shark species.

"With each insemination attempt, we continue to learn about the reproductive behaviours of Australian shark species," Dr Daly said.

"Hopefully we can use this technology as a basis for breeding grey nurse sharks in captivity and, in years to come, boost the species' dwindling numbers in the wild," Dr Daly said. It's believed that as few as 1500 grey nurse sharks remain along Australia's east coast, the aquarium says.

For more information go to:

<http://www.news.com.au/national/breaking-news/historic-vic-shark-pups-premature-arrival/story-e6frku9-1226852546500>

THE AQUATIC VETERINARIAN

Volume 8, Number 1 **LEGISLATIVE & REGULATORY ISSUES** First Quarter 2014

Exploring The Antibiotic Resistance Debate

From the FDA: "Certain drugs are deemed important because they are also used to treat human disease and might not work if the bacteria they target become resistant to the drugs' effects."

Since December 2013, the FDA (US Food & Drug Administration) has been working with pharmaceutical companies, veterinarians and food producers to implement its voluntary plan "to phase out the use of certain antibiotics for enhanced food production."

According to an [FDA Consumer Update](#) issued on December 11, 2013: "Because all uses of antimicrobial drugs, in both humans and animals, contribute to the development of antimicrobial resistance, it is important to use these drugs **only when medically necessary**. Governments around the world consider antimicrobial-resistant bacteria a major threat to public health. Illnesses caused by drug-resistant strains of bacteria are more likely to be potentially fatal when the medicines used to treat them are rendered less effective."

The issue has caused major debate regarding the use of "certain antibiotics" and antibiotic resistance in animals and people. The FDA mentioned that certain drugs are "deemed important because they are also used to treat human disease and might not work if the bacteria they target become resistant to the drugs' effects."

The pharmaceutical community is responding with action. In an [Animal & Veterinary update](#) issued on March 26, 2014, the FDA reported that "The following sponsors have agreed in writing that they intend to engage in the judicious use strategy by seeking withdrawal of approvals relating to any production uses and **changing the marketing status of their products from over-the-counter to use by Veterinary Feed Directive or prescription**, and have consented to allow FDA to publicly acknowledge their participation:"

- ADM Alliance Nutrition, Inc.
- Agri Laboratories, Ltd.
- Bayer Healthcare LLC, Animal Health Division
- Boehringer Ingelheim Vetmedica, Inc.
- Contemporary Products, Inc.
- Cross Vetpharm Group Ltd.
- Elanco Animal Health, A Division of Eli Lilly & Co.

- First Priority, Inc.
- G.C. Hanford Manufacturing Co.
- Huvepharma AD
- Intervet, Inc.
- Med-Pharmex, Inc.
- Merial Ltd.
- Micro Beef Technologies LTD
- Novartis Animal Health US, Inc.
- Pennfield Oil Co.
- Phibro Animal Health Corp.
- Quo Vademus, LLC
- Ridley USA Inc.
- Sparhawk Laboratories, Inc.
- Strategic Veterinary Pharmaceuticals, Inc.
- Veterinary Services, Inc.
- Vetoquinol N.-A., Inc.
- Virbac AH, Inc.
- Zoetis Inc.

For complete details on these developments, visit the two website links noted above, as well as these additional FDA resources:

[FDA Resource Page on Antimicrobial Resistance](#)

[Press Release: FDA Receives Strong Industry Commitment for its Antibiotic Resistance Strategy](#)

Information Source:

<http://navc.com/newsletter/exploring-the-antibiotic-resistance-debate/>



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MEETINGS OF INTEREST TO AQUATIC VETERINARIANS

Veterinarians attending these meetings may be awarded veterinary CEPD credit towards annual re-licensure or re-registration to practice veterinary medicine. Individuals should check with the organizers to see if CEPD certificates are provided.

16th International Symposium of Fish Nutrition and Feeding

May 25, 2014 - May 30, 2014

Cairns, Australia

The International Symposium on Fish Nutrition and Feeding is the premier international forum for researchers, academics and industry concerned with the nutrition and feeding of aquatic animals. The Symposium typically attracts 300–700 researchers, academics and industry representatives from throughout the world. The venue of the International Symposium on Fish Nutrition and Feeding ("ISFNF 2014") will be the award winning facilities at the Cairns Convention Centre—Australia's gateway to the Asia Pacific. This world acclaimed convention centre is everything you would expect from an international standard purpose-built venue located amidst the World Heritage Great Barrier Reef and ancient tropical rainforests.

For more information see: www.ISFNF2014.org

International Congress on the Biology of Fish

Aug 3, 2014 - Aug 7, 2014

Heriot-Watt University,
Edinburgh, United Kingdom

This is the biannual meeting of the Physiology Section of the American Fisheries Society. 300-500 delegates are expected from North America, UK, Europe and farther afield, covering everything from Physiology of fish Aquaculture, nutrition, parasites and disease to swimming and migratory physiology, ecological physiology, environmental stress and toxicology, in both fresh and sea-water environments.

For more information see: ICBF2014



Systemic Pathology of Fish

26-28 May 2014

Oniris - Chantrerie - Nantes, France

- Extend your knowledge of disease in fish through in-depth lectures and practical sessions on fish histopathology,
- Develop an appreciation for the benefits and the limits of histopathological interpretation.

Audience

Veterinarians, diagnosticians, and researchers working in fish diseases.

A basic knowledge of pathological processes and associated terminology are expected

Programme

Gross and histopathological lesions of common and emerging diseases of fish in farmed, wild and aquarium environments,

- Approach interpretation of histopathological lesions from a systemic perspective,
- Participants are encouraged to bring with them interesting case material (H&E slides only please) for group review and discussions.

Course instructors

Prof. Hugh W. Ferguson, BVM&S, PhD,
Diplomate ACVP, MRCVS, FRCPath.

Dr Sophie Labrut, DVM, DESVAP, PASAP/LHA
Laboratory in Veterinary Histopathology-Oniris
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Fax +33 (0)2 51 78 55 01

formation.continue@oniris-nantes.fr

Cost

500,00 €

See for more information:

[http://formation-continue.oniris-nantes.fr/
file.php/97/Ichtyopathologie/
Systemic_Pathology_Of_Fish.pdf](http://formation-continue.oniris-nantes.fr/file.php/97/Ichtyopathologie/Systemic_Pathology_Of_Fish.pdf)

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2014 AQUAVET® I & II & III

The University of Pennsylvania School of Veterinary Medicine and the College of Veterinary Medicine at Cornell University are pleased to announce the 2014 AQUAVET® I, II & III course offerings. They are aquatic veterinary medicine education programs that currently consist of two courses that will be presented at Roger Williams University in Bristol, RI in June 2014 and one on aquarium medicine which is at three venues.

AQUAVET® I: An Introduction to Aquatic Veterinary Medicine is a 4-week course (25 May - 21 June 2014) intended primarily for veterinary students.

AQUAVET® II: Comparative Pathology of Aquatic Animals is a 2-week course (27 May - 7 June 2014) that is oriented toward the pathology of diseases of aquatic invertebrates and fish that are used in biomedical research, encountered in display aquaria and are of importance in commercial aquaculture.

AQUAVET® III: Clinical Aspects of Captive Aquatic Animal Medicine is a 5 week course (following AQUAVET® I) and is limited to a small number of students. The venues include Georgia Aquarium, U of GA (Athens, GA) and Dolphinaris, Cancún, México.

Veterinary students can receive credits for the course and graduate veterinarians can receive CE credits.

More detailed information and applications for admission (due by January 15, 2014) are available on the web site www.aquavet.info.

PHOTOS from AQUAVET III—2013



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2014 INTERNATIONAL SYMPOSIUM ON AQUATIC ANIMAL HEALTH

Aug 31 – Sept 4, 2014

Portland, Oregon, USA

I am pleased to announce that this meeting will be held in Oregon! Late summer is a beautiful time to be here and Portland is a wonderful city with lots to offer.

Stay tuned for details as meeting planning progresses. I do promise a great venue and fun events – of course the scientific program will be outstanding. Please visit the ISAAH-7 website for more information: <http://microbiology.science.oregonstate.edu/content/isaaah>



Sealice 2014

August 31-September 3, 2014

Portland, Maine, USA

Hosted by University of Maine, Aquaculture Research Institute & University of Stirling. Holiday Inn By The Bay & Westin Portland Harborview Hotel in Portland, Maine, USA.

For more information visit:

<http://sealice2014.businesscatalyst.com>.

39th World Small Animal Veterinary Association Congress

16-19 September, 2014

Cape Town, South Africa.

Abstract Submission Opens: November 1, 2013

<http://www2.kenes.com/wsava/pages/home.aspx>

Join us for both the stimulating sessions and the special flavor of Cape Town, a city filled with unique flora and surrounded by beautiful beaches, vineyards and natural beauty.

Cape Town is one of the world's most stunning locations, and is a popular tourist destination filled with natural beauty and a rich variety of stimulating activities. Safari adventures depart regularly from the area.

9th Symposium on Diseases in Asian Aquaculture (DAA9)

November 24-28, 2014

Ho Chi Minh City, Vietnam

The Fish Health Section of the Asian Fisheries Society was founded in May 1989 with the goal to improve regional knowledge on fish health management and to support sustainable aquaculture development in Asia Pacific. FHS strives to promote interaction by bringing together fish health researchers to share their knowledge and experience. The FHS is credited with holding triennial symposia on "Diseases in Asian Aquaculture" (DAA) where members and aquatic animal health professionals meet to discuss broad issues and specific topics related to aquatic animal health. FHS has conducted earlier symposia in Bali, Indonesia (1990); Phuket, Thailand (1993); Bangkok, Thailand (1996); Cebu, The Philippines (1999); Gold Coast, Australia (2002); Colombo, Sri Lanka (2005); Taipei, Taiwan (2008) and Mangalore, India (2011). Each of these symposia brought together more than 300 aquatic animal health scientists, students, government researchers and industry personnel from over 30 countries to discuss issues pertaining to aquatic animal disease, their diagnosis, prevention and control. In keeping with the tradition of previous DAA symposia, DAA9 in Vietnam is going to be a unique experience that you don't want to miss. For more information on DAA9 and FHS, go to <http://www.fhs-afs.net>.

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Association of Reptilian and Amphibian Veterinarians/Association of Exotic Mammal Veterinarians/American Association of Zoological Veterinarians Concurrent Annual Conferences

October 18-24, 2014

Walt Disney World/Orlando, Florida, USA

CALL FOR TITLES

The ARAV and the AEMV invite submissions of titles for their joint Annual Conference, concurrent with the AAZV Annual Conference. Proposals on all aspects of reptilian, amphibian, and exotic mammal medicine are welcome. These include results of original research, case reports, clinical studies, and review articles. Clinicians are particularly invited to submit papers for an "In My Experience" session.

SUBMISSION PROCESS

Proposals must be submitted online through the joint ARAV/AEMV submission site (<http://precis2.preciscentral.com/Link.aspx?ID=D653D13C47D4E263>). The link for the site can also be found at the ARAV website (www.arav.org) and the AEMV website (aemv.org). Please send a title, a short description, your preference for delivering an oral or poster presentation, and contact information for the primary author by April 4, 2014. All proposals should be submitted as word documents. All presentations will be reviewed by a scientific committee.

Authors will be informed whether their presentation has been accepted by May 1, 2014. Full abstracts will then be invited for submission online. Final submissions will be due by June 15, 2014.

All abstracts must be in English. Proposals should be limited to 3-5 sentences.

More information online at www.arav.org.

International Conference on Avian, Herpetological and Exotic Mammal Medicine" (ICARE)

April 18 - 23, 2015

Paris, France

After a very successful and exciting "1st International Conference on Avian, Herpetological and Exotic Mammal Medicine" (1st ICARE) in Wiesbaden, Germany in 2013, all participating organisations have decided that this important veterinary symposia should continue every two years touring through Europe.

We are proud that the European Committee of the Association of Avian Veterinarians (EAAV), the Association of Exotic Mammal Veterinarians (AEMV), the Association of Reptilian and Amphibian Veterinarians (ARAV) and the European College of Zoological Medicine (ECZM) have decided that the 2nd International Conference on Avian, Herpetological and Exotic Mammal Medicine (2nd ICARE) will be held in 2015 in Paris, France (April 18 - 23, 2015). All organizations (EAAV, AEMV, ARAV, ECZM) are participating in a newly formed ICARE Steering Committee to select suitable locations and support the local organising committees for future conferences.

In preparation of the 3rd upcoming ICARE in 2017 the ICARE Steering Committee seeks proposals! If interested in organising ICARE 2017 please send your proposal before **31.03.2014** via email to Dominik.fischer@vetmed.uni-giessen.de.

On behalf of the ICARE Steering Committee, Dominik Fisch



European Committee
of the Association
of Avian
Veterinarians



Association
of Exotic Mammal
Veterinarians



Association
of Reptilian and
Amphibian
Veterinarians



European
College of
Zoological Medicine

THE AQUATIC VETERINARIAN

Volume 8, Number 1 **INTERNSHIPS, EXTERNSHIPS & RESIDENCIES** First Quarter 2014

SeaWorld (3-4 weeks)

SeaWorld offers externships at each of its 3 locations. There is one common application where you rank each park. Externs get to work with the wild birds that are brought for rehabilitation, even surgery! You are required to give a small presentation to the veterinary staff on the last week of your rotation. Housing is not provided, but there are lots of hotels in the area, including an extended stay hotel with a small kitchenette for around \$50/night.

The Marine Mammal Center (3-4 weeks)

Located in Sausalito, CA, the Marine Mammal Center is in the front-running for marine mammal rehabilitation and research. It is very seasonal, with more animals in the spring and summer. You will work with the veterinary staff 3-4 days per week, and then on crew, doing basic husbandry and feeding once or twice a week. Housing is provided with the veterinary intern and any other externs at one of the old fort houses nearby. It is highly recommended that you get a car for driving around. It is a beautiful area with lots of beach coast and hiking.

Mystic Aquarium

Mystic Aquarium in Mystic, CT, right near the coastal Rhode Island border, houses a large collection of marine mammals, fish and invertebrates. You work primarily with the veterinary intern, shadowing and assisting on procedures. You will also get very proficient in taking and processing analog radiographs. A presentation is required during this externship. No housing is provided, but you may want to ask if they know of anyone working at the aquarium who can provide you with a room for the time you are there. This is another rotation where you'll want a car to check out all the beaches nearby.

Georgia Aquarium

Georgia Aquarium is one of the newest aquariums in the US. It has a new procedure suite and one of the most outstanding tanks in the world. Housing is not provided. You may not need a car since the aquarium is located in downtown Atlanta, GA.

Navy Marine Mammal Program (4 weeks)

The US Navy trains marine mammals to perform tasks underwater that cannot be performed by humans. This is a high priority for those interested in marine mammal medicine. This program is based in San Diego, CA and is highly competitive.

Vancouver Aquarium (2-4 weeks)

Located in Stanley Park of Vancouver, Canada, Vancouver Aquarium takes externs to work with their collection of mammals, birds, amphibians, reptiles and fish. A literature review project is required. Housing is not provided but they provide a guide on their website. Make sure your passport is up to date!

Georgia Sea Turtle Center (2-6 weeks)

The Georgia Sea Turtle Center is located on Jekyll Island along the southern coast of Georgia. They rehabilitate both sea turtles and native land turtles at their center. If turtles are your interest, this is one of the best facilities to participate in the latest research and rehabilitation techniques. A research project is required for non-4th year students that is financed by funding through your school. Housing available based on seasonality. A car is recommended.

National Aquarium

Baltimore, MD (6-8 weeks)

National Aquarium is located in Baltimore, MD and houses a large collection of fish, mammals, amphibians/reptiles and birds. This rotation gives hands-on experience with fish, birds, reptiles and amphibians. There is some work with mammals and other critters, but it is largely observational. Applications are accepted year round. A small presentation is required. No housing is available but there are lots of hotels in the area.

New England Aquarium

Boston, MA (6-8 weeks)

Located in Boston, MA, the New England Aquarium hosts a large collection of fish, birds, marine mammals and turtles. Their chief veterinarian, Dr. Charles Innis, is one of the most knowledgeable about cold stun in turtles and has made a significant contribution to researching their rehabilitation. Externs are required to prepare a case report and research paper with presentations for both. No housing is available, but there are lots of options nearby.

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JOB OPPORTUNITIES

First Quarter 2014

Clinical Veterinarian Position (Exotic Animal Medicine) - NC State, College of Veterinary Medicine Teaching Hospital

Posting Number: 20111072EP - This is a time-limited position with a duration of 1 year. This position will work with a team of clinicians within the exotic animal medicine service.

Salary: \$70,000 - \$80,000

Minimum Requirements:

DVM or equivalent degree.

Clinical expertise with birds, reptiles and exotic small mammals is required.

Position Responsibilities:

Provide high quality effective and efficient patient care for a variety of exotic animal species. Clinical responsibilities will entail all of the duties associated with case management (client and referral veterinarian communication, development of a diagnostic and treatment plan, interpretation of diagnostic findings, implementation of a treatment plan, surgery, post-operative care, development of a home care plan, fiscally responsible management).

The individual will participate in the emergency roster.

Provide clinical expertise with strong skills in exotic companion mammal medicine.

Participate in high quality clinical teaching for veterinary students and house officers.

For more information and to apply, go to <https://jobs.ncsu.edu/postings/26460>.

Underwater World Langkawi

Underwater World Langkawi has a position for a senior in-house aquatic veterinarian available to assist with penguins, seals, otters, fishes and many more marine animals. The position requires a Degree in Veterinary Medicine, a minimum of 3 years of related experience, English language proficiency, and good interpersonal and communication, planning and organizing, and good oral presentation skills. Please contact:

Noordini Mohd Ariff

noordini@edenzil.com

Senior Manager,

Human Resource and Administration

Eden Inc. Berhad

Tel: 603-79577781 Fax: 603-79574793

Website: www.edenzil.com

Aquatic Ecotoxicologist Position

The AquaBioTech Group is seeking a motivated individual to lead and evaluate our aquatic ecotoxicology work within the ABT Innovia division of the company. This position requires the selected candidate to direct ecotoxicological studies in aquatic ecosystems following international guidelines and up-to-date scientific standards. The selected candidate must possess strong organisation and time keeping skills in order to adhere to the company's project deadlines.

Working with a team of international biologists, ecologists and engineers, the AquaBioTech Group is seeking a highly motivated individual to lead our ecotoxicology work within the ABT Innovia division of the company. We are seeking an experienced person with knowledge of desk studies, designing and conducting of experiments to validate and develop new assay methods. All works undertaken and reporting of the trial results are undertaken in accordance with international and European regulations at the company's licenced aquatic testing facilities. The selected candidate must possess strong organisation and time keeping skills in order to adhere to the company's deadlines.

The AquaBioTech Group operates a diverse business portfolio and anticipates other opportunities into which the successful candidate may expand their portfolio over time, including (but not limited to) supervising junior members of staff or interns, designing and administering an e-learning course, etc.

The successful candidate should have a good background in environmental / marine biology and experience in running trials. Ideally, the person should have an MSc level of education with at least two years of industry experience or industry related cooperation. Familiarity with a wide range of aquatic ecotoxicology models and species, as well as good statistics skills will be considered assets. The selected candidate will have to be a good communicator, capable of speaking, reading and writing English fluently. Knowledge of any other languages would be considered an asset although not essential.

More information is available at http://www.aquabt.com/vacancies#.U1EGr_IdWSq.

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WAVMA SPONSORSHIPS

First Quarter 2014



The screenshot shows the 'Fish Welfare Dialogue' website. At the top, there is a navigation bar with links for 'Home', 'Fish Welfare Conference', 'Dialogue Forums', and 'Join the Dialogue'. A search bar is located on the right. Below the navigation bar, the page is divided into two main sections. On the left, under the heading 'Collaborating & Supporting Organizations', there are logos for the 'World Aquatic Veterinary Medical Association', 'WVA WORLD VETERINARY ASSOCIATION', 'FVE Federation of Veterinarians of Europe', and two other circular logos. On the right, under the heading 'In celebration of World Veterinary Day 2014', there is a paragraph: 'Bringing people together for an animal relationship and approaches for the welfare of' followed by a circular logo and the text 'educational dialogue on the human-realistic, practical and optimal aquatic animals and mankind.' Below this, the text 'The aim of Fish Welfare Dialogue:' is followed by a paragraph: 'Engaging veterinarians, industries, regulators and other stakeholders, throughout the world, in discussions on ethical, practical and science-based alternatives to promote awareness of, and offer for realistic alternatives and approaches for optimal aquatic animal welfare that will benefit industries and society at large.' Another paragraph follows: 'Starting on World Veterinary Day (April 26, 2014) with a free global webinar delivered by a prominent and well-recognized scholar in aquatic animal welfare to outline the most important issues facing aquatic animal welfare. To be followed by 6 months of web-based discussions and periodic webinars on current thinking on identifiable welfare and other issues, sharing of published studies and information, and culminating in an International Fish and Aquatic Animal Welfare Conference (September 2014 in Munich, Germany) to present the current findings and workshops that outline optimal approaches and offer recommendations for implementing these around the world.'

We invite you to join us for the 7th *International Symposium on Aquatic Animal Health (ISAAH-7)* in Portland, Oregon (August 31 – September 4, 2014). Stemming from its inauguration as the 'International Fish Health Conference' in Vancouver, BC (1988), the ISAAH has developed into a much anticipated gathering of international fish health professionals, occurring every 4 years.

Building on the resounding success of its predecessors, including Seattle (1994), Baltimore (1998), New Orleans (2002), San Francisco (2006), and Tampa (2010), the 2014 ISAAH promises to combine intellectual stimulation among international fish health professionals with the bustling culture and Pacific Northwest beauty of the 'Rose City'. You will not want to miss this iteration of the ISAAH, the preeminent meeting of international fish health professionals. --2014 ISAAH Organization Committee