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The S.E.A. Aquarium, Singapore
See Clinical Case Report on pages 40-43

quatic



eterinarian

Public Aquarium Issue

Volume 10, Number 4
Fourth Quarter, 2016



WHO ARE WE

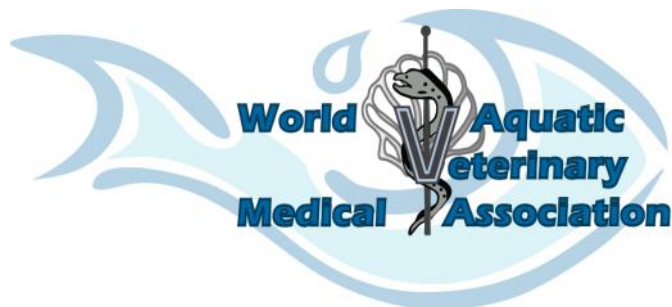
The mission of the World Aquatic Veterinary Medical Association is to serve the discipline of aquatic veterinary medicine in enhancing aquatic animal health and welfare, public health, and seafood safety, in support of the veterinary profession, aquatic animal owners and industries, and other stakeholders.

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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- Richmond Loh (Australia)
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Editor's Note

This issue of *The Aquatic Veterinarian*, focusing on fish in public aquariums, completes the year of 2016, which was a mixed year on all accounts, full of sad events, and joyous ones as well. I think we are all looking forward to 2017! It is the end of Volume 10, and WAVMA's 10th anniversary year. We had a very successful year for WAVMA, though, and more information about our year will be found in the President's Message (page 5).

This is my 35th issue, (Chris Walster edited Vol. 1 and Vol. 2, No. 1) and I have enjoyed being the editor and working with the contributors who send their original articles (several in this issue) and with the Communications Committee members, who help find information to use. As in every Editor's Note, I am asking members to send in information they find that might be of interest to other WAVMA members, to submit write-ups on their interesting aquatic animal clinical cases, and to allow us to publish your original research papers in this journal.

For 2017, we will continue with a theme for each issue, when possible. In the March issue (Vol. 11, No. 1), the theme will be Aquatic Invertebrates. Please start thinking about what information YOU have that you can contribute to this issue. If you have other ideas on themes for future issues, let me know that, too. The Aquatic Turtle issue (Vol. 10, No. 3) was a great success, and I have accumulated many more articles about turtles that might be used for an encore Aquatic Turtles #2 issue, if that would be liked by members. Let me know!

With best 'fishes' for a Happy and Prosperous New Year in 2017! God bless us, everyone.

Nick Saint-Erne, DVM, CertAqV
Executive Editor
TAVeditor@wavma.org



*The Editor at
OdySea Aquarium
in Scottsdale,
Arizona
December 2016.*

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 issues of *The Aquatic Veterinarian*.

Cover Photo:

Giant tank at the S.E.A. Aquarium, in Singapore, where the clinical case occurred, reported in this issue: *SURGICAL CORRECTION OF AN ABDOMINAL AVULSION IN A GIANT MORAY EEL.*

Photo from:

<http://www.rwsentosa.com/language/en-US/Homepage/Attractions/SEAAquarium>

See article on pages 40-43.

The Aquatic Veterinarian

**The Quarterly Magazine of the
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**Consider promoting your products, services
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veterinary students, nurses &
paraveterinary professionals
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WAVMA Members

Free 1/8 page (business card size) advertisement

Contact TAVeditor@wavma.org for information on advertising and payment options.

President's Report

This is the last of my President's Reports, and it has been a great honor for me to have served as the 2016 WAVMA President. I am grateful for all of the support provided to me by the other members of our Executive Board, and know that WAVMA will be in good hands with the 2017 Executive Board, under the leadership of our 2017 President, Laura Urdes, from Romania. Laura has been a great asset to WAVMA as a member of the Communications Committee for several years, and currently produces our monthly eNews that goes out by email to keep both members and non-members informed about the latest happenings in Aquatic Veterinary Medicine.

Laura Urdes, as 2017 President, is planning our Annual General Meeting for September, to be held in the heart of Transylvania, on September 12th-14th, 2017. The venue is the Plaza Hotel, Piata Trandafirilor in Tirgu Mures city, Romania. For more information about the conference venue, please [click here](#).

This will be an exciting conference, our second stand-alone WAVMA educational conference, and I am planning on attending. If you are planning to attend, and would like to be a speaker, be sure to submit your lecture information to the Meetings Committee.

We also are looking into an after-conference tour of Transylvania, to visit Dracula's castle! For more information about the 2017 Annual General Meeting and Conference, see pages 12-13.

For more information on Dracula's Castle, see: https://en.wikipedia.org/wiki/Bran_Castle

Bran Castle is a national monument and landmark in Romania. The fortress is situated on the border between [Transylvania](#) and [Wallachia](#). Commonly known as "Dracula's Castle" (although it is one among several locations linked to the [Dracula](#) legend), it is the home of the title character in Bram Stoker's novel *Dracula*.



In the previous President's Reports this year, I have reviewed the amazing work done each year by the past Presidents and Executive Boards. This year, we also had a great year and accomplished many things.

First, WAVMA was involved with the International Veterinary Students Association Welfare Conference (April 22-24, Utrecht, Netherlands), where members Chris Walster and Laura Urdes presented programs on Aquatic Veterinary Medicine to the veterinary students attending the conference.

In May, Past-President, Chris Walster, organized our first Virtual Conference—*A Veterinary Approach to Sustainability*—where lectures were presented in real time via internet video conferencing. The lectures are recorded and can still be accessed at: <https://www.wavma.org/wavma-virtual-conference-2016-information>. This conference will be of interest to any fish veterinarian or anyone interested in aquatic veterinary medicine. With over 20 internationally recognised speaker's presentations given over two days, and the chance to gain a years' worth of Continuing Education & Professional Development credit at minimal cost, this conference is one of the best values of the year.

Julius Tepper and the Meetings Committee planned a wonderful Annual General Meeting on August 6, in conjunction with the AVMA Convention in San Antonio, Texas. We also set up the WAVMA booth at the Exhibition Hall at the convention. We try to alternate our AGM between a location in the USA one year, and in another country the next year. The Meetings Committee is very active in putting together the events for conferences where WAVMA has a presence and is working with Laura Urdes on our Romania AGM in September 2016, as well as with David Scarfe for our planned 2018 AGM, to be held in conjunction with Ross University in St. Kitts, West Indies.

WAVMA is also represented on the AVMA Aquatic Veterinary Medicine Committee, which meets twice a year, and in the World Small Animal Veterinary Association and the World Veterinary Association. Our Secretary, Devon Dublin, attended the WVA meeting on October 3, 2016, in conjunction with the PANVET Congress in Panama City, Panama. He also attended, along with Director Richmond Loh, the WSAVA Conference, in Cartagena, Columbia, on Sept 27-30, 2016.

Board of Directors member Stephen Reichley has been our social media guru and has done an exemplary job on our Website and with Facebook, Twitter and LinkedIn. Our Facebook page currently has over 2000 'Likes':

https://www.facebook.com/WAVMA/?hc_ref=SEARCH

Our web team has also added an online Membership Directory that is accessible to members only. With this, you can find other WAVMA members by name, city or country. Access it here:

<https://www.wavma.org/directory>

President's Report—continued

Our WebCEPD team (part of the Communications Committee) of Richmond Loh, David Scarfe and Stephen Reichley have provided us with another year of outstanding monthly webinars. These cover a wide variety of topics in aquatic veterinary medicine, and are approximately an hour long each. These can be watched live when first presented, or viewed as recordings on our website. There are 30 webinars currently available to view on our website:

<https://www.wavma.org/WebCEPD>

The latest of the WebCEPD seminars was presented on December 6, 2016. The recorded WebCEPD B-1022 "[Koi Herpesvirus \(KHV\) as a Potential Control Agent for Australian Carp](#)" presented by Dr. Ken McColl, is now available at <https://www.wavma.org/Webinars/b-1029-koi-herpesvirus-khv-as-a-potential-control-agent-for-australian-carp>.

As WAVMA WebCEPD recorded webinars become available, they will be incorporated into the new *WAVMA e-Learning Portal*. With WAVMA now part of the *World Continuing Education Alliance (WCEA)*, a network of veterinary organizations and other educators that is being spearheaded by the World Veterinary Association, WAVMA's e-Learning Portal will serve as a source of web-based Continuing Education and Professional Development (CEPD) for veterinarians, veterinary students and veterinary technicians/nurses throughout the world.

Currently the recorded webinars can be viewed at no charge. However, because of the investment WAVMA has made to join the WCEA initiative, obtaining CEPD credit by taking a quiz associated with each webinar costs a nominal fee (US\$5.00 for WAVMA Student Members, \$15.00 for all other Members, and \$25.00 for non-members).

Speaking of Student Members, the number of Student Chapters in veterinary schools has grown, adding a chapter at the University of Minnesota this year. The list of eleven WAVMA Student Chapters can be found in this issue on page 14 and online: <https://www.wavma.org/WAVMA-Student-Chapters>.

On page 11, one will find a list of the 51 Certified Aquatic Veterinarians (CertAqV). These vets have documented a minimum of 150 hours of Continuing Education in aquatic veterinary medicine through University classes, veterinary conferences, clinical case reports, research articles or presentations, self study and practical experience to become certified. This is a program developed by the Credentialing Committee in 2013 to help document the expertise of veterinarians who work with aquatic animals, and is a good way to show your clients that you are skilled in working with aquatic animals.

Dr. Mohamed Faisal was on the Credentialing Committee when we developed the CertAqV Program and was also our 2013 President. He has been active in WAVMA since 2007 and worked on many of our committees. I am very pleased to announce that Dr. Faisal has been recently elected as a WAVMA Distinguished Fellow. Congratulations, Dr. Faisal!

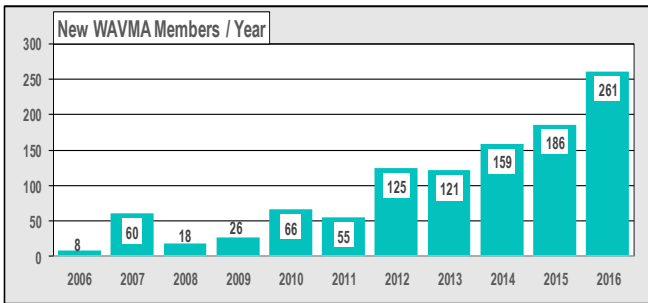
As a member of the Fellows Advisory Council, he and the other Fellows (see page 14 for list) will formulate, review, and recommend adoption of policies and programs that directly affect the practice of aquatic veterinary medicine and present them to the WAVMA Executive Board for consideration. The Chair of the WAVMA Distinguished Fellows will be on the Advisory Committee to the Executive Board and is invited to all the EB meetings. Currently Julius Tepper has been acting in this position.

Another important committee to WAVMA, the Communications Committee has been very active this year. This committee is responsible for all of the media available to members, including the website, social media, the eNews email, this journal, webinars and other communications sent out from WAVMA. The committee is currently revising our WAVMA brochure and will make it available in multiple languages. In addition to the WAVMA.org website, the committee is also producing a conference website for use with our future WAVMA Conferences and Annual General Meetings.

On a related topic, we signed a Memorandum of Understanding with the International Aquatic Veterinary Biosecurity Consortium (IAVBC) to allow them to use our new conference website for promoting their Aquatic Veterinary Biosecurity sessions at the World Aquaculture Conference in Cape Town, South Africa on June 29, 2017; and at a 2-day Aquaculture Biosecurity Workshop immediately after the conference on June 30 and July 1, 2017. Income generated from their use of our conference website will help defray some of the costs incurred for its development. Of course, the website will be used for WAVMA's conferences in Romania this year and in St. Kitts in 2018.

Another exciting collaboration for WAVMA this year was joining as a Partner Organisation the project titled "The Distribution and Determinants of Larval Eustrongylidosis in Fish Across the Danube Area" – acronym Fish Eustrongylides = FEDES. We look forward to collaborating with the network of organisations to provide the researchers with training and research skills on the topics of interest to the programme. Our President-Elect, Laura Urdes, has been working with this organisation and has previously published articles about the problems of Eustrongylides in Danube River fish. See the article "Overview of the larval eustrongylidosis in freshwater fish captured from the Danubian Delta, Romania," by Laura Daniela Urdes, in *The Aquatic Veterinarian* 7(1), 2013.

From a membership standpoint, our Treasurer, Sharon Tiberio, has reported the highest number of new WAVMA members and total membership ever this year. For 2016, WAVMA had 460 paid members to date, with 261 of those being first time members. Welcome to those of you who joined this year, and we hope you have found your membership valuable and are planning on renewing your membership in 2017! The chart below shows our growth from the 8 founding members in 2006, the 60 Charter Members who joined in 2007 (including me!), and then the new WAVMA members who joined each subsequent year.



For more financial information, see the Treasurer’s Report on page 9. And don’t forget to pay your 2017 dues! To renew your membership, simply click on <http://www.wavma.org/wavma-members/member-profile> and log in to your profile.

One last project of the Executive Board this year was a review and revision of our Bylaws, which had not been done since 2008. The revised Bylaws were submitted to members this month for comments and in January 2017 we will have electronic voting to approve the revised WAVMA Bylaws. This will help future Executive Boards run the association smoothly and efficiently.

As mentioned in the Editor’s Note (page 4), this issue focuses on fish in public aquariums. For me, that is one of the greatest opportunities for aquatic veterinarians. There are 232 AZA-accredited zoos and aquariums around the world, and these are considered among the best educational and entertainment venues (<https://www.aza.org/>). People typically spend 2-3 hours in a public aquarium looking at the fish, (more like all day for me...), which also helps them to understand the importance of conservation of the rivers and oceans. Thanks to those members who submitted materials for this special edition of *The Aquatic Veterinarian*. Keep on sending information for future issues! Best wishes for a peaceful and prosperous New Year!

Nick Saint-Erne, DVM, CertAqV
WAVMA President
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Phoenix, AZ USA

On a sad note, we recently lost one of our early members and a good friend, Dr. Peter J. Werkman, on December 15. David Scarfe has written an obituary for him, found on page 20.

PETER WERKMAN

1941 - 2016



Peter had been very helpful on the Communications Committee and as a Director on the Executive Board in the past. He visited me in Phoenix on two occasions and we always had a nice time. Earlier this year I took him to our Fish Distribution Center here in Phoenix, and then to local fish stores to see how fish were displayed and sold in America. He really loved fish (and tractors!). Notes of condolences can be sent to his children:

Peter Werkman (son) p.werkman@gmail.com
Tanya Werkman (daughter) t.m.werkman@gmail.com



Secretary's Report

Dear WAVMA members,

We have successfully come to the end of a relatively eventful year. To illustrate this, permit me to do a brief review. Before I do however, I must thank and recognize the dedicated and hardworking persons that sit on the WAVMA Executive Board, Communications committee, Meetings committee, Credentialing committee and Students committee. There are individuals that dedicate their time, energy and personal finances to ensure that the work of WAVMA continues. I am honored to work along with these dedicated colleagues.

First, I will begin with one of the most progressive member benefits, the WAVMA Certified Aquatic Veterinarian program; 51 persons have successfully been accredited and counting. The team of mentors is committed and remains available to assist new candidates.

WAVMA continues to plan and execute on-line *e-Learning* programs and courses to advance the knowledge and skills of its members. The very first Virtual Conference was held this year and we are examining the prospects of making this an annual feature. Members desirous of benefiting from continuing education that provides CE credits continue to do so especially through the *Web-CEPD*. Throughout the year a seminar has been offered on a monthly basis on a wide variety of interesting topics.

WAVMA, through its affiliation and membership in other international bodies such as the World Veterinary Association (WVA) and the World Small Animal Veterinary Medical Association (WSAVA), continues to actively pursue and explore other avenues for its members to receive discounted subscriptions to publications, meetings, and other benefits. Members are asked to take note of these initiatives and opportunities and take full advantage of them as they become available.

There are ongoing initiatives and work to expand and improve the utility of WAVMA's picture and video libraries, which can serve as a valuable resource for all members. The listserv is perhaps by far the most used and popular resources, especially since it allows for the much needed interaction between student members and veterinarians. It is somewhat a type of mentorship tool as well.

Students are certainly important to the organization, making up about 50% of the total membership. The establishment and existence of 11 WAVMA student chapters is also a welcome and prized aspect of our organization. WAVMA continues to offer Educational grants for vet students & new veterinary graduates through its support of the John L. Pitts Aquatic Veterinary Education Awards Program and will continue through the website and newsletter, to provide information to facilitate students finding world-wide externships, internships and residencies in aquatics.

As is customary, I always make appeals to our wider membership. The first is to encourage you to contribute to *The Aquatic Veterinarian*. As time progresses, it is increasingly being known as a credible publication in the field of aquatic medicine and we should therefore continue to nurture and support it, and secondly, to ask you our members to consider serving as an Officer or Director on the Executive Board or join one of the committees (Credentialing, Communications, Meetings, Membership, Students). I am certain that there is a pool of talent in our membership that could be tapped into, and whenever new persons take up leadership roles they bring the much needed fresh ideas and perspectives that are important for the future development of WAVMA and its member programs. Finally I ask that you inform us of ways in which we can serve you better.

In the New Year, under the guidance of our 2017 Present Dr. Laura Urdes, I envision WAVMA building on its experiences and using these successes to improve on the member programs being offered, while fulfilling its mission to serve the discipline of aquatic veterinary medicine through enhancing aquatic animal health and welfare, public health and seafood safety, to support aquatic veterinarians, aquatic animal owners and industries, and other stakeholders.

As we approach the close of 2016, I do hope that your reflections on personal lives would be bring to the fore pleasant memories and that you and your family will indeed have a wonderful season and the very best that 2017 has to offer.

Devon Dublin, PhD, DMVZ, MSc. CertAqV

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Treasurer's Report

2016 was a milestone year for WAVMA. In addition to celebrating the 10th anniversary of our wonderful organization, we reached an all-time high of 470 members which includes seasoned and new graduate veterinarians, veterinary students, vet techs, non-veterinarian affiliate members, as well as a university library membership! And our treasury has grown to the highest in our history: \$25,905.38. As always, your membership dues went a long way to support a variety of educational programs which allowed our members to share and expand their knowledge.

In addition to providing our ever popular WebCEPD webinars presented by leaders in the field of aquatic veterinary medicine, WAVMA hosted a virtual aquatic animal conference for the first time in 2016. WAVMA again sponsored the Pitts Education Awards Program which helped fund aquatic research and learning opportunities for 7 deserving veterinary students.

We currently have 51 veterinarians who have achieved the status of Certified Aquatic Veterinarian, which recognizes attainment of knowledge and skills in 9 areas essential to competence in aquatic veterinary medical practice. This honorific is important in defining ourselves as trained professionals in our field. In 2016, 35 more WAVMA members applied to the CertAqV Program.

The new year 2017 is near and I would like to remind members that WAVMA dues are for a calendar year. To renew your membership, simply click on <http://www.wavma.org/wavma-members/member-profile> and log in to your profile. Your user name is your primary email address. If you forgot your password, use the reminder system you'll see when you try to log in, or email a request to administrators@wavma.org. I continue to encourage the use of PayPal, since credit card fees charged by PayPal are less than those charged when a credit card.

I hope you find value not only in the outstanding educational benefits WAVMA delivers but also from the collegiality and support provided by a stellar group of colleagues.

Wishing everyone an outstanding 2017!



Best wishes,

Sharon Tiberio,
DVM, CertAqV
WAVMA Treasurer
Treasurer@wavma.org;
stiberio@att.net

New Members (4th Quarter 2016)

Members are the life-blood of any professional Association. Please join us in welcoming the following new WAVMA members:

Full Members

Sid Gustafson
Michael Stafford
Stacey Pulver
Michelle Schisa
Carlos Gonzalez
Colin McDermott
Yaoprapa Mathura

New Graduate Veterinarians

June Ang

Vet Student Members

Kim Fernandez
Luis Toro
Kristal Lebron
Dane Ratajski
Beatriz Solivan
Gregory Hartman
Melissa Vilar
Michael Grima
Anja Reckendorf
Svanhildur Jafetsdottir
Samantha Johnson
Christina Erdman
Roberto Ortiz
Erica Chang
Nadeige Giguere
Tania Roos
Manuel Kunzel
Anja Reckendorf
Adenike Babatunde
Patrick Biber
Nancy Royer
Andrew Cabrera
Bryony Glover

Veterinary Technicians/Nurses

Samantha Freeborn

New Members who join WAVMA in the 4th Quarter will have their membership automatically carry over to the next year. For others paying their 2017 dues, we encourage you to use the PayPal option to renew your membership – it is secure and allows you to use a credit card even if you don't have a personal PayPal account. Please note: for your records you will receive an email receipt, and a PDF receipt will be in your profile under the 'Payment History' tab.

COMMITTEE REPORTS

PRIVILEGES & BENEFITS OF WAVMA MEMBERSHIP

Aquatic Veterinary e-Learning

Supporting WAVMA's WebCEPD, PubCEPD
CertAqV & Clinical Cases Programs.



- Enjoy on-line e-Learning programs & courses to advance your knowledge & skills
- Get continuing education credit through WebCEPD, PubCEPD & Clinical Corner
- Discover core knowledge, skills & experience needed to become a WAVMA Certified Aquatic Veterinarian (CertAqV)
- Receive *discounted* subscriptions to publications & meetings
- Utilize WAVMA's picture & video libraries for your own presentations
- Join *listservs* to discuss clinical cases & other issues
- Mentor & be mentored to expand your and other's aquatic veterinary skills
- Publish your articles in WAVMA's quarterly journal: *The Aquatic Veterinarian*
- Find world-wide externships, internships, residencies & jobs in all aquatic vet areas
- Access *Member Directories* & have your Clinic/Hospital listed on-line
- Benefit from *Educational grants* for vet students & new veterinary graduates
- Form & participate in *veterinary school chapters* throughout the world
- Participate in veterinarian and client surveys
- Help build additional member programs by serving as an Officer, Director or Committee Member

WAVMA Committees

As a member-driven organization, WAVMA relies on volunteers to help implement programs useful for all members. Any WAVMA member can volunteer on a Committee to help shape the direction of the Association, meet new colleagues, forge valuable and lasting relationships, and help address key issues affecting aquatic veterinary medicine today. To find out more about serving on a Committee, please contact the Committee Chair or the WAVMA Parliamentarian.

Budget and Finance Committee

This Committee develops and regularly revises the Association's annual budget and assists the Treasurer, as necessary, in developing the Association's annual financial reports and tax materials.

This Committee shall consist of the Treasurer (Chair); the President-Elect; and one other member of the Executive Board who will volunteer to serve a one-year renewable term.

Chair: Sharon Tiberio, Treasurer@wavma.org

Communications Committee

This Committee manages the communications among members and others involved with aquatic veterinary medicine. It oversees the listservs, membership lists, publication of WAVMA's quarterly journal *The Aquatic Veterinarian*, e-News, Facebook, Twitter, LinkedIn and other social media accounts.

Chair: Devon Dublin, DevDub@yahoo.com

Credentialing Committee

This Committee oversees and administers the Cert-AqV Program for credentialing aquatic veterinary practitioners, and evaluates aquatic veterinary educational programs useful to members.

Chair: Tim Miller-Morgan tim.miller-morgan@oregonstate.edu

Meetings Committee

This Committee oversees and coordinates logistics for WAVMA-organized or sponsored aquatic veterinary educational meetings, including the Annual General Meeting.

Chair: Julius Tepper, cypcarpio@aol.com

Membership Committee

This Committee oversees membership issues to optimally serve individual members and the organization. Co-Chair: Chad Harris caharris24@yahoo.com

Student Committee

This Committee facilitates networking between student members and helps development of student programs and services.

Chair: Justin Krol, justkrol21@gmail.com

COMMITTEE REPORTS

Certified Aquatic Veterinarians

Last Name	First Name	Email Address	Country
Bastos-Gomes	Giana	giana.gomes@jcu.edu.au	Australia
Bjornebo	Heather	reptivet@gmail.com	USA
Bogan	James	thecritterfixer@gmail.com	USA
Cecil	Todd	waavs@aol.com	USA
Corcoran	Michael	mikecdvmcertaqv@gmail.com	USA
Cornwell	Emily	erc58@cornell.edu	USA
Docherty	Darren	dmdocherty@gmail.com	UK
Doherty	Simon	simon@blackwaterconsultancy.com	UK
Dublin	Devon	devdub@yahoo.com	Japan
Faisal	Mohamed	faisal@cvm.msu.edu	USA
Good	Christopher	c.good@freshwaterinstitute.org	USA
Hayakijkosol	Orachun	orachun.hayakijkosol1@jcu.edu.au	Australia
Johnston	Colin	brightwaterconsultingnz@gmail.com	New Zealand
Jorgensen	Kasper	kai@denblaaplanet.dk	Denmark
Joseph	Brian	brianjoseph522@gmail.com	Canada
Kottwitz	Jack	jack_kottwitz@hotmail.com	USA
Lloyd	Richard	richlloyd@gmail.com	UK
Loh	Richmond	thefishvet@gmail.com	Australia
Maas	Adolf	DrMaas@ZooVet.us	USA
Metselaar	Matthijs	matthijs.metselaar@fishvetgroup.com	UK
Miller-Morgan	Tim	tim.miller-morgan@oregonstate.edu	USA
Mohammed	Haitham	hhm0003@auburn.edu	Egypt
Neethling	Ross	Rossneethling@yahoo.co.uk	UK
Palić	Dušan	d.palic@lmu.de	Germany
Palmeiro	Brian	peffishdoctor@gmail.com	USA
Pasnik	David	chesapeakeaquatic@yahoo.com	USA
Questen	Jena	drquesten@gmail.com	USA
Reed	Aimee	reed@onid.orst.edu	USA
Reichley	Stephen	stephen.reichley@gmail.com	USA
Sahatrakul	Komsin	komsin.s@rwsentosa.com	Singapore
Saint-Erne	Nick	nsainte@icloud.com	USA
Sanders	Jessie	ncfishvet@gmail.com	USA
Scarfe	David	dscarfe@ameritech.net	USA
Shelley	John	thejohnnyshelley@yahoo.com	USA
Soto	Esteban	balasotom@gmail.com	USA
Tepper	Julius	cypcarpio@aol.com	USA
Tiberio	Sharon	srtiberio@att.net	USA
Urdes	Laura	laurau_2005@yahoo.com	Romania
Van de Sompel	Greta	johan.van.der.cruyssen@telenet.be	Belgium
Walster	Christopher	chris.walster@onlinevets.co.uk	UK
Weber	Scott	sharkdoc01@gmail.com	USA
Welsh	Trista	trista.welsh@gmail.com	USA
Werkman	Peter	piwerkman2@gmail.com	Holland
Wong	Howard	hkh Wong@cityu.edu.hk	Hong Kong

Credentialing Committee

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:

- Register for the Program (application at www.wavma.org).
- Identify a mentor to assist the registrant through the Program. The potential mentors would be 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.
- Be adjudicated by the Credentialing Committee for recognition of completion of all KSE requirements after the mentor has approved the documentation.
- Have the CertAqV certification approved by the WAVMA Executive Board.

The WAVMA Certified Aquatic Veterinarian (CertAqV) program has now certified 51 aquatic veterinarians. Please welcome our latest Certified Aquatic Veterinarians:

Dr Ari Fustukjian
 Dr Elizabeth Kaufman
 Dr Ayanna Phillips
 Dr Khalid Shahin
 Dr Melissa Singletary
 Dr Win Surachetpong
 Dr Gillian Taylor

There are an additional 38 other WAVMA members currently in the process of being certified. For more information, see the WAVMA website:

<http://www.wavma.org/CertAqV-Pgm>.

Tim Miller-Morgan, DVM, CertAqV
 2016 Credentialing Committee Chair

Meetings Committee

The Meetings Committee has been hard at work preparing for our exciting conference scheduled for September 12-14th, 2017 in Tîrgu Mureş, Mureş County, Romania. Titled "Current Concepts and Practices in Aquaculture and Ornamental Fish", this conference will provide a framework for discussion and reflection on the role of veterinarians in fostering aquaculture and ornamental fish industries' sustainable development in the Eastern Europe region.

The event primarily addresses veterinarians, veterinary technicians and students, as well as policy makers (*i.e.* government officials, Veterinary Medicine Faculty Directors/Administrators, the Romanian College of Veterinary Surgeons, Sanitary Veterinary Directorates etc.), professionals involved in seafood safety control, fishery farmers/owners involved in commercial aquaculture and ornamental fish, aquatic animal health biologists, and other related stakeholders.

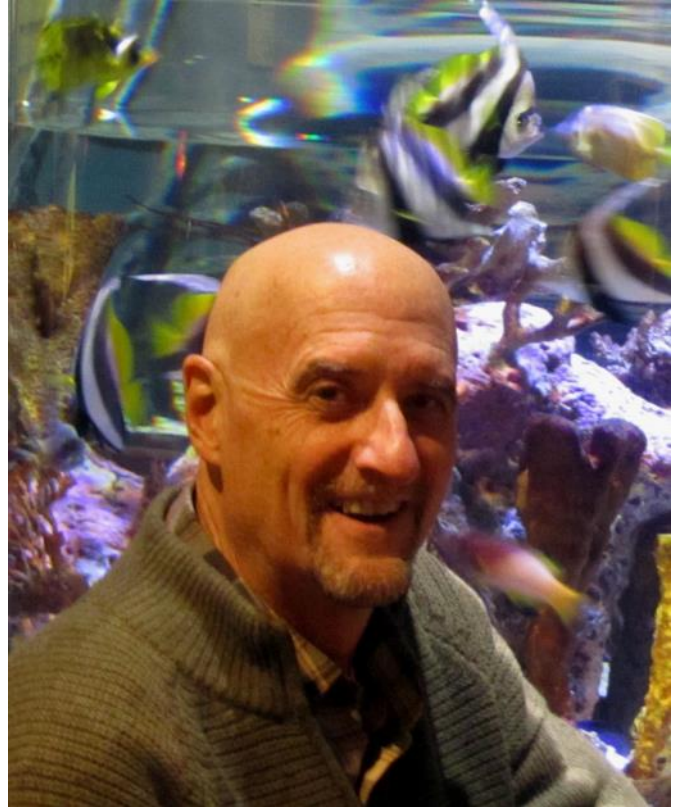
The objectives of this conference will be to increase awareness of the importance of aquaculture as one of the industry sectors able to help ensure sustainable seafood production and food security in Romania and other neighbouring countries, consistent with the E.U. and other global initiatives and objectives and to emphasize important developments in global aquatic veterinary education and practice and to encourage veterinarians and veterinary students to embark on aquatic veterinary medicine.

We are currently calling upon all those members who are interested in presenting either a live presentation or poster presentation to submit a CV and abstract as soon as possible.

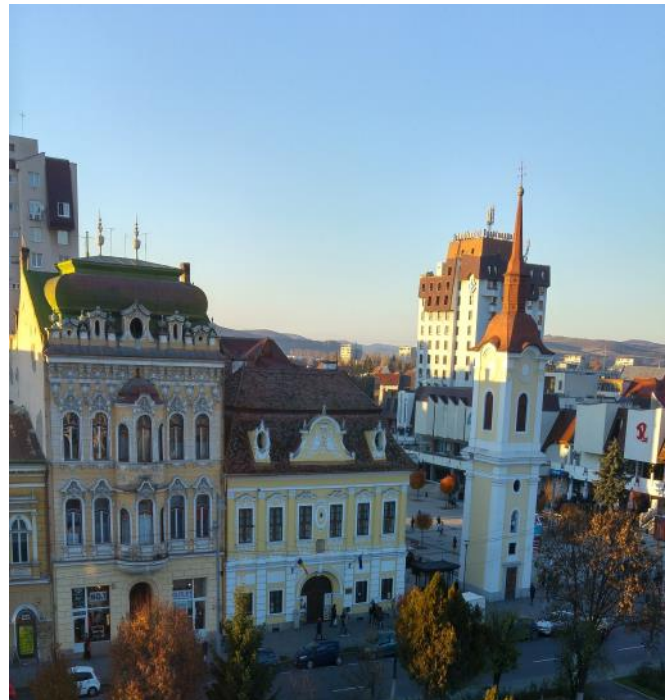
The WAVMA 2017 Annual General Meeting and dinner will be held in conjunction with this conference on September 13th, at the Plaza Hotel, Piata Trandafirilor 46-47, Tîrgu Mureş 540053

Information for presenters and attendees can be found at the conference website:

<http://conferences.wavma.org>



Julius M. Tepper, DVM, CertAqV
Meetings Committee Chair
cypcarpio@aol.com



2017 Annual General Meeting

It is a great pleasure to announce that we are planning WAVMA's 11th Annual General Meeting and the 2nd International WAVMA Conference, both of which will be held in the heart of Transylvania, on September 12th-14th, 2017. The venue is the PLAZA HOTEL, Piata Trandafirilor, nr. 46-47, Tirgu Mures city, Mures County, Romania 540053. For more information about the conference venue, please [click here](#).

While the AGM aims at strengthening collaborations between WAVMA and non-WAVMA members, the conference will provide a framework for discussion and reflection on the role of veterinarians - and related professions - in fostering aquaculture and ornamental fish industries' sustainable development in Europe and abroad. The event primarily addresses veterinarians, veterinary technicians and students, as well as governmental and non-governmental organisations, people involved in seafood safety control, fishery farmers/owners dealing with commercial aquaculture (including the ornamental fish sector), aquatic animal health biologists, and other related stakeholders.

This conference will provide opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relationships and to find global partners for future collaboration.

The organizing committee is gearing up for an exciting and informative conference program including plenary lectures and symposia on a variety of topics, poster presentations and various social programs for participants from around the world. The conference will welcome paper presentations from any interested participants willing to present their work.

More information is due to be released soon through WAVMA's communication channels, so make sure you won't miss it.

Please share the information with your colleagues. For more information please contact me.

Laura Urdes

2017 WAVMA President

laurau_2005@yahoo.com



The WAVMA Conference and Annual General Meeting, 2017, will be held in Romania, in a marvelous city located in the heart of Transylvania. Also known as "The City of Roses" or "Marosvásárhely", Tirgu Mures city is the place where Romanian and Hungarian cultures have blended to give rise to what the city is now, an important historical, cultural and educational center, acknowledged for its unique attractions, such as the city's fortress, dating back to the late 1400s, the Prefecture, built in the 17th century, and the Palace of Culture, dating back to the early 1900s.

To learn more about the city of Tirgu Mures, please click here: RomaniaTourism.com



Fellows Advisory Council

WAVMA has established a fellowship program to recognize those world-renowned veterinarians who have advanced aquatic veterinary medicine as a discipline and devoted their time and efforts to serve WAVMA's mission. The Fellows Advisory Council allows Fellows to advise the Executive Board with guidance on their initiatives, and mentor applicants for Aquatic Veterinarian Certification (CertAqV).

Our WAVMA Distinguished Fellows are:

Dr Peter L. Merrill
Dr Ronald J. Roberts
Dr A. David Scarfe
Dr Julius M. Tepper
Dr Christopher I. Walster
Dr Dusan Palic
Dr Grace Karreman
Dr Marian McLoughlin
Dr Mohamed Faisal

See: <http://www.wavma.org/wavma-fellows.cfm>

Executive Board Responsibilities

The Executive Board has the responsibility for charting the course of WAVMA, fiduciary oversight of all issues, and, with input of committees, provides the oversight and approval for all WAVMA programs and services that fulfill the Mission and Objectives of the organization. The Board generally meets once a month through teleconferences, to discuss and approve WAVMA programs, services, and policies that drive the organization and issues that affect aquatic veterinary medicine. Members may submit items for discussion at the next Executive Board by contacting the [WAVMA Secretary](#).

WAVMA Shop

A number of WAVMA branded items
(including shirts, mugs, caps) are available
at the WAVMA Store. Get yours today!



Go to: <http://www.wavma.org/Shop>

CURRENT VETERINARY SCHOOL WAVMA CHAPTERS

Auburn University, [College of Veterinary Medicine](#) (established 2013)
2016 Officers - Kate Butzen (President), Patricia Debow (Vice President), Erika Gibson (Treasurer), Lindsay Lawreck (Secretary); **Faculty Advisors** - Drs. Ray Wilhite & Jack Kottwitz; **Chapter Contact** - [click here](#).

Mississippi State University, [College of Veterinary Medicine](#) (established 2014)
2016 Officers - Elizabeth Works (President), Taylor James (Vice-President), David Mills (Treasurer), Madeleine Hendrix (Secretary); **Faculty Advisor** - Dr. Wes Baumgartner; **Chapter Contact** - [click here](#).

Murdoch University, [School of Veterinary & Life Sciences](#) (established 2014)
2016 Officers - Ming Jun Lim (President), Cheryl Tan (Vice President), Chermaine Lim (Treasurer), Jia Wen Lim (Secretary); **Faculty Advisors** - Drs. Lian Yeap & Richmond Loh; **Chapter Contact** - [click here](#).

Ross University, [School of Veterinary Medicine](#) (established 2015)
2016-2017 Officers - Larissa Menke (President), Erika Brigante (Vice President), Jean Fournier (Secretary), Robin Sayres (Treasurer), Michelle Sparks (Wetlab Coordinator), Mandy Murti (Fundraising Chair); **Faculty Advisors** - Drs. Don Bergfelt & Mark Freeman; **Chapter Contact** - [click here](#).

Tuskegee University, [School of Veterinary Medicine](#) (established 2012)
2016 Officers - Jacqueline Elliott (President), Jennifer Algarin (Vice President), Jennifer Algarin (Secretary), Aaron Judson (Treasurer), Ayxa Rosado (Historian), TBD (Fundraising Chair); **Faculty Advisor** - Dr. Kenneth Newkirk; **Chapter Contact** - [click here](#). View the Chapter's [Facebook](#) page.

University of Florida, [College of Veterinary Medicine](#) (established 2013)
2016 Officers - Haley Violetta (President), Riley Shugg (Vice President), Kaylee Brown (Treasurer), Megan Joyce (Secretary); **Faculty Advisor** - Dr. Tom Waltzek; **Chapter Contact** - [click here](#).

University of Georgia, [College of Veterinary Medicine](#) (established 2015)
2016 Officers - Kristina Pascutti / Laura Burns (Co-Presidents), Sara Collins (Vice-President), Jaclyn Levin (Treasurer); **Faculty Advisor**, Dr. Alvin Camus; **Chapter Contact** - [click here](#).

University of Minnesota, [College of Veterinary Medicine](#) (established 2016)
2016 Officers - Sarah Knowles (Chair), Angela Jackson (Secretary); **Faculty Advisor** - Dr. Amy Kizer; **Chapter Contact** - [click here](#).

University of Sydney, [Faculty of Veterinary Science](#) (established 2014)
2016 Officers - Ellen Rasidi (President), Arthur Chau (Secretary), Dr. Paul Hick (Treasurer); **Faculty Advisor** - Dr. Paul Hick; **Chapter Contact** - [click here](#).

University of Tennessee, [College of Veterinary Medicine](#) (established 2012)
2012/13 Officers - Wesley Siniard & Grace Normann (Co-Presidents), Krista Lipe (Vice President), Carrie Dobey (Secretary), Samantha Schraith (Treasurer), Bree Dell (Wetlab Coordinator); **Faculty Advisors** - Dr. Michael Jones & Dr. Debra Miller; **Chapter Contact** - [click here](#). View the Chapter's [Facebook](#) page or [website](#).

University of Wisconsin-Madison, [School of Veterinary Medicine](#) (established 2014)
2016 Officers - Katherine Hausmann (President), Nikki Wuestenhagen (Vice President), Geoffrey Gieni (Secretary), Jenna Newman (Treasurer), Jenna Epstein (Activities Coordinator); **Faculty Advisor** - Dr. Mike Collins; **Chapter Contact** - [click here](#).

Western University of Health Sciences, [College of Veterinary Medicine](#) (established 2014)
2016 Officers - Andrew Switaj (President), Alexis Wohl (Vice President), David Abolnik (Secretary), Hali Jungers (Treasurer); **Faculty Advisor** - Dr. Suzana Tkalcic; **Chapter Contact** - [click here](#). View the Chapter's [Facebook](#) page.

For information or assistance, please contact the **WAVMA Chapter Contact** for each school. To initiate a new Student Chapter see the "Guidance for Forming a New Student Chapter" ([click here](#) to download PDF).

COMMITTEE REPORTS

SCHOLARSHIP COMMITTEE:

John L. Pitts Aquatic Veterinary Education Awards Program Helps Students and Recent Graduates Increase Aquatic Veterinary Experience

The John L. Pitts Aquatic Veterinary Education Awards Program was started in 2010 to honor the late John L. Pitts, DVM, who was passionate about student involvement in the profession and a global approach to aquatic veterinary medicine. John's service to the profession began as a veterinary student in 1969 when he helped create a national chapter for the Student American Veterinary Medical Association. He also helped in the formation of the National Association of State Aquaculture Coordinators, the Aquaculture and Seafood Advisory Committee of the AVMA, and he worked tirelessly to shape and encourage the passage of the Minor Uses and Minor Species Act of 2004. To continue John's vision, a small, all-volunteer committee comprised of individuals representing private practice, academia, past recipients, WAVMA student members, and the Pitts family work to administer this program.

The Education Awards Program's goal is to assist veterinary students and new veterinary graduates in becoming more involved with aquatic veterinary medicine by providing financial support for activities that broaden their understanding of the varied career opportunities within the field. Since its inception in 2010, the Program has awarded over \$42,500 to 65 veterinary students and recent graduates from 37 colleges and universities across 4 continents. These funds have helped recipients participate in externships at public, private, and academic institutions and attend conferences, workshops, and short courses all over the world.

The Program accepts applications from veterinary students currently enrolled, or recent graduates (within the past 24 months), of any nationally recognized veterinary school or college throughout the world that awards a degree allowing the person to practice veterinary medicine. Applicants must submit an application form and resume or curriculum vitae. They must also have someone who can attest to their interest and/or involvement in aquatic veterinary medicine as well as their potential to contribute to the profession send a letter of recommendation on their behalf. **All application materials are due February 28, 2017; late or incomplete applications are not considered.**

Recipients will be notified by May 2017. After completion of their activity, all awardees must provide a written report for publication in *The Aquatic Veterinarian*, the quarterly publication of the World Aquatic Veterinary Medical Association (WAVMA), and are encouraged to give a presentation about their experience to other veterinary students.

For more information on this Program and to download an application form, please visit:

<http://www.wavma.org/scholarships>.

Previous Recipients' Countries

Australia	South Korea
Austria	Turkey
Canada	United Kingdom
Cayman Islands	United States
Nepal	West Indies

Previous Recipients' Universities

Agriculture and Forestry University
 Auburn University
 Cornell University
 Istanbul University
 Kansas State University
 Mississippi State University
 Murdoch University
 North Carolina State University
 Nottingham University
 The Ohio State University
 Oregon State University
 Purdue University
 Ross University
 Seoul National University
 St. George's University
 St. Matthew's University
 Texas A&M University
 Tribhuvan University
 Tufts University
 Tuskegee University
 University of Bristol
 University of Calgary
 University of California
 University of Florida
 University of Georgia
 University of Guelph
 University of Illinois
 University of Liverpool
 University of Minnesota
 University of Pennsylvania
 University of Prince Edward Island
 University of Saskatchewan
 University of Stirling
 University of Tennessee
 University of Wisconsin-Madison
 Vetmeduni Vienna
 Virginia-Maryland College of Veterinary Medicine
 Washington State University
 Western University of Health Science

2016 Pitts Education Awards Program Report

Following a Little Drop of Water in Chattanooga, TN

By Irene Yen, MPH

4th year veterinary student

Ross University School of Veterinary Medicine

My first day as a 4th year veterinary student extern at the Tennessee Aquarium began with scrubbing penguin excrement off the rocky landscape in the 45°F climate controlled enclosure. The task at times seemed endless because the supply was continuous and at times treacherous because the natural-looking rocky surface was slippery. However, I enjoyed every moment of it! Because, in reality, how many people can say they were less than arm's reach from 28 gentoo and macaroni penguins? Over time, I got to identify a few of my new penguin friends by their personality and the band color around their wings. For example, Cheddar (purple banded macaroni penguin) enjoyed a morning bird bath from a light spray with the water hose. He would even preen and rub his little face against my waterproof pants leg. This is an example of one of the fantastic activities I was allowed to be part of during my 2-week externship.

The beautifully built aquarium in Chattanooga, Tennessee is located right along the Tennessee River. It consists of 2 buildings and at the time it was built, was the largest freshwater aquarium in the world when it opened in 1992 (<http://www.tnaqua.org>). The first building, River Journey, starts at the top of the aquarium, which represents the Appalachian Mountains and follows the path of rainwater from there to the Gulf of Mexico. The second building, Ocean Journey, which opened in 2005, contains a 600,000 gallon saltwater tank that is home to 1 very old puffer fish, 2 rescued sea turtles, 4 always hungry stingrays, 6 large sharks, and a multitude of fish.

Boating on the Tennessee River with the Tennessee Aquarium River Gorges Tour



At the time I was there (mid October 2016), there was also a fascinating River Monsters exhibit, highlighting the largest freshwater fishes in the world. If you want to see a creature both prehistoric and magical looking, I recommend looking up the goonch catfish!

In addition, the aquarium takes part in many essential conservation efforts (<http://www.tnaqua.org/protecting-animals>), such as captive breeding and restoring endangered barrens topminnow to native habitats. Other conservation projects involve research, breeding, and saving critically endangered turtle species, sturgeons, and darter fish populations.

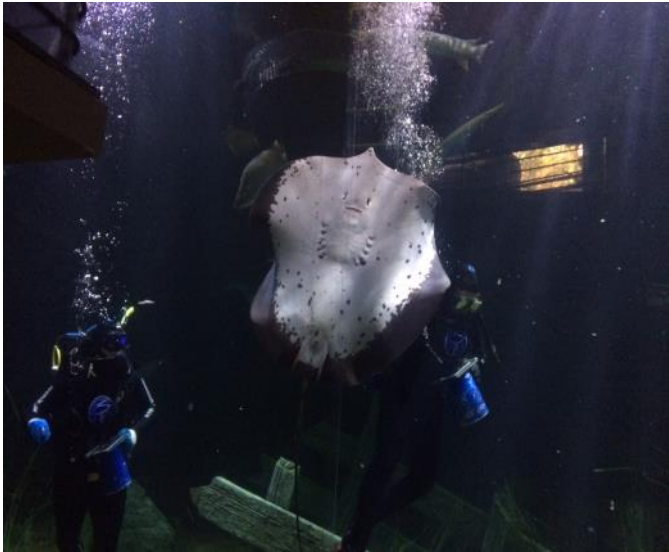
As a veterinary extern, I shadowed the head veterinarian, Dr. Christian Keller, and assisted with health check-ups and treatments of the aquarium's vast collection. The most important lesson I learned, was at times, "less is more". This means balancing the risk of stressing the animal patient when catching it for a health exam, versus the realistic benefits of available treatment options for that the individual animal. This includes using observational examination as a key assessment of animal health.

On days I was not working with Dr. Keller, I shadowed the aquarists and forestry staff and learned about basic husbandry for most of the aquarium's collection. This includes providing enrichment for the giant pacific octopus, testing water quality, wrangling rays to transport them to quarantine, learning about the delicate disposition of sea horses, getting acquainted with lemur training, target feeding turtles, admiring the beauty of little cherry darters, etc. etc. etc. Everyone I worked with was enthusiastic and patiently answered my questions. I am very grateful that the staff let me "help" out and do tasks that I took 3 times longer to do than if they themselves did it on their own.

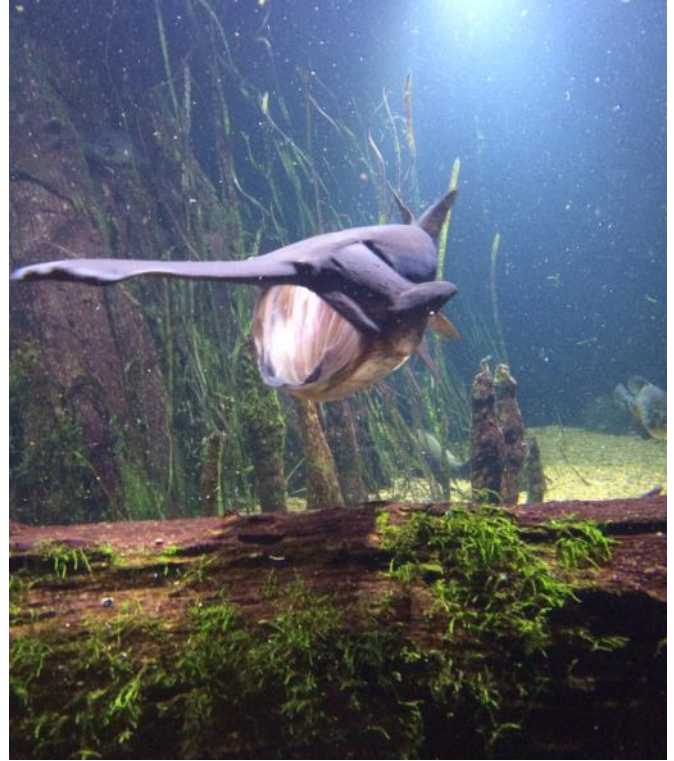
Lastly, I gained a newfound appreciation for the vast network of volunteers led by Chris Bowman. I was impressed with the donation of time by mostly elderly ladies and gentlemen who would come to the aquarium in

the morning “just to cut up 20 pounds of fish” once a week. Their generosity and friendliness moved me and, in my opinion, they are a large asset to the aquarium.

Overall, I had a memorable time, learned a lot about aquarium medicine, and enjoyed the hospitality of the Tennessee Aquarium nestled in the beautiful fall colors of the Tennessee River Valley.



Divers feeding rays at River Journey



Paddlefish filter feeding.



The Tennessee Aquarium
One Broad Street,
Chattanooga, TN 37402

We celebrate the rich biodiversity of the Southeast through our exhibits and are actively engaged in preserving and restoring that biodiversity through our work in the field. The Aquarium’s research arm, the Tennessee Aquarium Conservation Institute, has a focused expertise in restoring freshwater ecosystems and helping people appreciate the need for environmental health in our region.



Musk turtle waiting for prey.

2016 Pitts Education Awards Program Report

Sarah Wahlstrom,

Ohio State University, Class of 2017

With the support of the John L. Pitts Aquatic Veterinary Education Awards Program in 2016, I was able to complete a 4-week externship at Seattle Aquarium in Seattle, Washington. At Seattle Aquarium, I assisted the staff veterinarian Dr. Lesanna Lahner with medical procedures, physical exams and necropsies for birds, fish, marine invertebrates and pinnipeds. As an added bonus, I was able to help in the initial care and rehabilitation of Rialto, an adorable stranded sea otter pup who is currently at the Vancouver Aquarium (you can see cuter-than-life pictures of him on their Facebook page).

But the real motivation for returning to Seattle Aquarium for the third time, I was there for the summers of 2014 and 2015, was to continue research on sea stars, one of my favorite species of animals. Since 2013, millions of sea stars from over 20 species have died, and continue to die, along the Pacific coast from Alaska to Mexico in the largest marine wildlife die-off ever recorded, known as Sea Star Wasting Disease (SSWD). Sea star-associated densovirus has been associated with SSWD but the exact disease etiology remains unknown, so there's a lot of work to be done.

I was able to continue a research project to evaluate coelomic fluid, analogous to our blood, from healthy and wasting sea stars to evaluate the changes that happen with the disease process. I presented this project to several hundred zoo and aquarium veterinarians, technicians and students at the American Association of Zoo Veterinarians conference in Atlanta, Georgia.

During this same externship, I was also able to run an original research project on sea star pedicellariae. Pedicellariae are tiny pincher or claw-like appendages on the outside of certain species of sea stars that are believed to function to keep the outside of the sea star clear of debris. I noticed that they sometimes ended up on other species of sea stars and appeared to cause disease so I designed a study to look at the transfer and effect of pedicellariae from *Pisaster ochraceus*, the purple star, to *Dermasterias imbricata*, the leather star. While the results are still being analyzed, it appears we may have some interesting findings to publish and present soon.

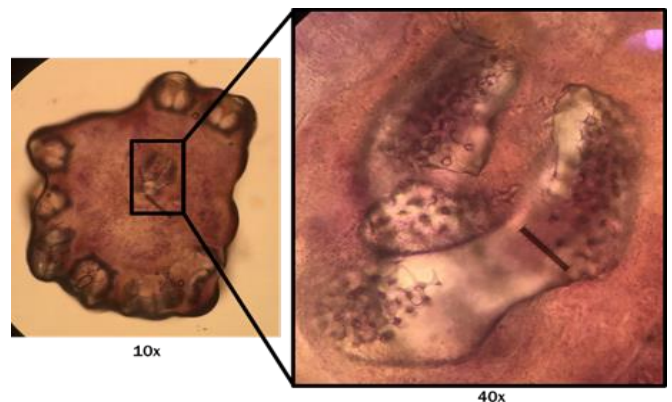
As a 4th year student with an interest in aquatic animal medicine at (landlocked) Ohio State University, I just accepted a position as a rotating small animal intern in California after graduation, then hope to complete a PhD in sea star and coral disease to eventually have a career in marine invertebrate research. This externship not only allowed me to gain clinical experience with a variety of aquatic species, but also allowed me to complete research projects which will advance our

knowledge of sea stars in the face of the devastating SSWD unusual mortality event while also preparing me for my PhD.

I was honored and extremely thankful to be able to have this valuable experience at Seattle Aquarium, made possible by the John L. Pitts Aquatic Veterinary Education Awards Program. Thank you to everyone who has donated, those who administer the program and everyone who made that possible. A special thank you to Dr. Lesanna Lahner for her excellent mentorship and to Dr. Nicole Stacy, Dr. Harley Newton, Dr. Carolyn Cray, and Dr. Christopher Mah for their expertise with the sea star projects.



Collecting coelomic fluid from a *Pisaster ochraceus*.



Photomicrograph of pedicellariae from *P. ochraceus*



The arrow is pointing to pedicellariae, the small purple dots on the underside of the Dermasterias in the photograph.



Giving my talk at the 2016 AAZV Conference.

Seattle Aquarium,

1483 Alaskan Way, Pier 59, Seattle, WA 98101

Phone: (206) 386-4300

Email: info@seattleaquarium.org

The Seattle Aquarium is the ninth largest aquarium in the U.S. by attendance and among the top five paid visitor attractions in the Puget Sound region. Since our opening, we've hosted over 22 million visitors and provided marine conservation education to over 1.6 million school children. We're proud to be accredited by the Association of Zoos and Aquariums.

Opened in 1977, the Seattle Aquarium was owned and operated by the City of Seattle Department of Parks and Recreation until 2010, when the nonprofit Seattle Aquarium Society assumed its management—a model used by most leading zoos and aquariums across the country. In 2007, the Aquarium opened a major expansion that added 18,000 square feet of space to the facility, including an impressive 120,000-gallon exhibit, a gift shop, café, meeting/event space and more.

Currently, the Aquarium's animal collection is housed within six major exhibits: Window on Washington Waters, Life on the Edge, Pacific Coral Reef, Birds & Shores, the Underwater Dome and Marine Mammals. The renovation of our harbor seal exhibit, opened in June of 2013, was the first step in our 20-year strategic plan, which includes a goal of significantly increasing our physical size and becoming the centerpiece of the City's revitalized waterfront. Our mission, *Inspiring Conservation of Our Marine Environment*, is reflected in everything we do: our exhibits, events, conservation programs, education, research activities and more.

<http://www.seattleaquarium.org/>

WAVMA is on Facebook!



"Like" WAVMA's Facebook Page and join the WAVMA Facebook group to keep up-to-date with WAVMA activities and aquatic veterinary medicine topics from around the world.

Search for WAVMA at www.facebook.com.

**Peter Jacob Werkman
Pioneer Fish Veteri-
narian Extraordinaire
(1941-2016)**

On December 15, 2016, we lost a good friend, colleague, and an early veterinary pioneer who convinced a number of young Dutch veterinarians that a private practice that focused on fish was a viable option. Despite being diagnosed with metastatic lung cancer in early 2014, with a positive attitude, as a fighter and explorer he was able to fulfill several life-time dreams of traveling to distant lands, supporting his family, continued to contribute to aquatic veterinary medicine, and pursuing his life-long hobby – old farm tractors!

As he said to me shortly before his untimely death: “At 75 my life has been well-lived and full of excitement.” With a name like Werkman, meaning craftsman, artisan, or builder, probably adopted as the family name many generations ago, what else could one expect.

Born July 2, 1941 during World War II, Peter grew up in Holland always wanting to be a farmer or farm mechanic. But veterinary medicine finally won out. Aside from his family, his real love was fish, coming, like many of us, from time spent fishing and caring for tropical fish in his early years.

After graduating from the University of Utrecht, Faculty of Veterinary Medicine in 1972, he joined a mixed animal practice servicing clients in and around Wageningen. But in 1978 he joined a mixed animal practice in Amersfoort and quickly expanded the practice's services to include fish. In 2001 Peter finally decided to open a practice exclusively devoted to fish (Dierenarts voor Visziekten) in Leusden. One of his greatest assets was not only working with veterinary students and new graduates, but he took time to show his clients what he did with fish patients.

In the early days, most of the practice ‘bread and butter’ came from livestock and companion animal medicine and surgery. Information on fish medicine was in short supply; Utrecht veterinary school offered little assistance. However, Peter's persistence in wanting to expand his knowledge in aquatic veterinary medicine took him to Canada, the UK, France, Hungary, the US and elsewhere, ‘fishing’ for courses he could take to learn new things to incorporate into his practice to service his clients and fish patients.



Peter Werkman surrounded by photographs of past veterinarians who graduated from his alma mater (the University of Utrecht), while assisting at the April 2016 International Veterinary Student Association Conference.

In 1984 he started a Dutch “Veterinary Aquaculture Working Group” and organized lectures and visits to fish farms for more than 30 veterinary students and veterinarians interested in aquatic veterinary medicine.

Shortly after WAVMA formed in 2006, he became a member and later served as a Director-at-Large (2009), and a member of WAVMA's Communications Committee for several years thereafter. With unselfish zeal, he regularly contributed presentations in WAVMA-organized symposia and conferences in Greece, the USA, and Canada, and was always ready to help out at a WAVMA booth, introducing students and other veterinarians to aquatic veterinary medicine.

His contributions also included a number of popular and scientific publication throughout the 2000s, largely focused on introducing veterinary students and veterinarians to aquatic veterinary medical issues, many of which were utilized by organizations he was a member of, including the Royal Dutch Veterinary Association (Koninklijke Nederlandse Maatschappij voor Diergeneeskunde), the UK Fish Veterinary Society, and the World Aquaculture Society.

As his reputation grew (one of his clients, Rob Groot, said, “Dr. Werkman is the best fish doctor in the Netherlands”), Peter was called on to help clients in Egypt, Greece, Italy, Georgia, Turkey, Vietnam, Nigeria, Malawi, India and elsewhere. His longing for helping and learning new things from people in countries around the world, lasted throughout his life.

After being diagnosed with cancer in 2014, this didn't change. In April 2016 he helped with promoting aquatic veterinary medicine at an International Veterinary Student Association conference where he graduated as a veterinarian 44 years ago. While continuing to work with clients, he also took the time for his hobbies by traveling to Aruba, Bonaire and Curaçao islands in the Caribbean to scuba dive and take underwater photos; he visited (for the third or fourth time) tractor shows in the US. His love for agricultural machinery never left him. At home, he kept many miniature tractors neatly in line; in a barn behind his home, he worked tirelessly on an antique John Deere tractor so he could drive it in classic and antique car parades.

While pre-deceased by his wife, Reit, his son, daughter and their families (Peter, Jr., Jolanda, Noa, and Tanya, Frank Madelief, Daan), will continue his legacy. In keeping with Peter's desire throughout his veterinary career to help encourage veterinary students and new graduates to consider a career in aquatic veterinary medicine, contributions in Peter's name can be made to the WAVMA Pitts Educational Award Program (<https://www.wavma.org/scholarships>).

Written by **A. David Scarfe**

Meet Dr. Joe Gaydosby **Tessa Gregory**

Interviewed October 26, 2016

Joe Gaydos, wildlife veterinarian and chief scientist with the University of California, Davis, School of Veterinary Medicine's SeaDoc Society, and colleagues investigated the impact of sea star wasting disease on species in the Salish Sea, which straddles the U.S.-Canada border and is home to a diverse number of sea star species. They found dramatic declines in the populations of sunflower sea stars, *Pycnopodia helianthoides*, along with several other sea star species. To learn more about the [study](#) and the significance of its results, I interviewed Dr. Gaydos via email.

What prompted you to study science as a career?

JG: I have always been interested in the natural world, wildlife in particular, and loved how much science could teach me about how wild animals live. Science was the perfect fit for me.

What drew you to studying sea stars?

JG: I love to scuba dive and always appreciated the diversity of sea stars we have here in the Salish Sea. I also study diseases of wildlife so when the sea star wasting disease hit, I just had to know which species were affected.

Why do you think more research has been conducted on predation rather than infectious diseases in marine ecosystems?

JG: For a long time, ecologists didn't really think that wild animals got diseases, so people didn't study them. Since people figured out that wild animals do get diseases, and that diseases shape ecosystems, scientists have learned loads. Because it is innately more difficult to study things in the ocean than on land, our understanding of marine diseases has lagged behind.

In your study you used long-term data from diver surveys as well as shorter-term sampling from strip-transect surveys. Why did you use both of these methods? What did each method reveal?

JG: We were stoked to be able to use 10 years of rigorously collected volunteer diver data. It allowed us to show that declines caused by the sea star wasting disease outbreak were not just some background population decline, but really connected to the outbreak. The strip transect surveys gave us data on disease prevalence that we couldn't get from the volunteer dive surveys. It also allowed us to investigate disease impact on a larger number of sea star species.

You found that sunflower sea stars have effectively disappeared from the Salish Sea. Were you surprised by this finding? What effect does their decline have on the ecosystem?



JG: We suspected this based on our own experience. We used to see sunflower stars on 90 percent of dives and could see 10 to 30 per dive. Now seeing one is like seeing a giant pacific octopus. We photograph it, we video it, and then we talk about it when we get back on the boat. This study showed that was happening all over. Sunflower stars are major predators. Having them gone will allow their competitor predators to thrive. It also will allow their prey to increase. We showed increases in red and green urchins here, but I think other prey species will become more abundant too.

What are the next steps for your research, and what impact do you hope it will have?

JG: We and other researchers are already having conversations with National Marine Fisheries Service about sunflower sea star declines. We're proposing they be listed as a Federal Species of Concern. This will help us keep a better eye on them so we know if we need to be actively working on their recovery or not.

Research Article: Montecino-Latorre D, Eisenlord ME, Turner M, Yoshioka R, Harvell CD, Pattengill-Semmens CV, et al. (2016) [Devastating Transboundary Impacts of Sea Star Wasting Disease on Subtidal Asteroids](http://dx.doi.org/10.1371/journal.pone.0163190). PLoS ONE 11(10): e0163190. doi:10.1371/journal.pone.0163190.

Image Credit: Joseph Gaydos; Janna Nichols <http://researchnews.plos.org/2016/10/26/sunflower-sea-stars/>.

GRAND ROUNDS CASES

Questions & Answers from the WAVMA Listserv
(WAVMA_Members-L@wavma.org)**Injectable Anaesthetics for Large Groupers, Rays and Sharks**8 Oct 2016, WAVMA_Members-L@wavma.org

Dear Aquatic Vet Community,

Does anyone out there have had experience with injectable anaesthetics / sedatives for large groupers (>80kg), large rays and sharks (e.g., nurse sharks exceeding 150kg)? We are trying to move some animals safely into a holding area from a large Oceanarium tank, while keeping divers safe too.

Thank

Fred Chua

Allpets and Aqualife Vets.

Hi Fred,

With most elasmobranchs I have found injectables very variable from great to no effect at all. Species variable results. I have greater consistency with bath results when possible. It is a trial and error approach from my experience.

Wishing you all the best.

Regards,

Rob Jones

"The Aquarium Vet"

PO Box 2327 Moorabbin,

Victoria, Australia, 3189

www.theaquariumvet.com

Home of the e-quarist course

My experience with large elasmobranchs mirrors that of Rob. Injectable anesthetics in large fishes are much less reliable than they are in terrestrial animals. Baths or directing anesthetics through the mouth and out the gills seem more predictable.

Thank you.

Brian E. Joseph DVM

[760 484 8994](tel:7604848994)email: brian.e.joseph6.mil@mail.mil

Thanks Rob and Brian,

Yes, I had tried injectable ketamine-xylazine in a large tawny nurse shark before and agree it can be quite unpredictable. I remember it took about 2 or 3 doses before it became manageable. Perhaps it was difficulty getting the full dose in or lack of perfusion at injected sites.

What about large groupers? Anyone attempted injectables on these before? There seems to be dearth of information in the literature.

And I agree totally that bath anaesthetics work better, like Clove oil near the mouth or gills, and once we have them in the holding area, it was quite feasible. But this is a large 1000 mt tank with numerous in-tank rock work and obstacles. We would normally coax these large fish into a holding area with a team of divers. And all had been uneventful for most of the past 20 years with an experienced team.

However this appeal goes out because we recently lost a diver (and I, an old friend) when a large whiptail leopard ray struck his thorax. The barb went in the right of his chest and out from the left, so it he didn't stand a chance. I was not with the team at that time. You can imagine the shock and sadness amongst our team. We are all doing a serious review of procedures, and I'm seeking any comments from experiences out there.

Fred Chua

BVSc (Melb), MRCVS, MSc (Aquatic Vet Studies, Stirling)

Attending Veterinarian

Underwater World Singapore.

fredchua@allpetsasia.com

Hi Fred,

I am sorry for your loss. I recently helped move a giant grouper from a large tank exhibit into a transport container, however the scenario is likely different for yours. The staff was able to drain the water down to about 3 ft (1 m) depth because the other animals had already been removed. We used MS222 in 1g/L concentration delivered via a 5 gal yard spray tank toward the fish's mouth and gills.

The fish was never completely sedated, but woozy enough that they could eventually corral him into a sling made of solid sailcloth and PVC piping. Once in the sling, he seemed content as though he had found a hiding spot, which made the move from there smooth, though we did intermittently spray his gills with the MS222 until he reached the transport container, just in case. These guys are monsters!

I have heard anecdotal reports of oral diazepam as premedication but do not have a dose for you. We only had oral trazadone available, and tried up to approximately 10 mg/kg without noticeable effect. I know you were asking for injectable suggestions, but I just thought I'd share my recent experience in case it might be helpful. Best of luck with your moves.

Jill Yoshicedo, DVM

Kailua Animal Clinic

111 Hekili St. Ste 104

Kailua, HI 96734

[808-263-8863](tel:8082638863)www.kailuaanimalclinic.com

Thank you Jill and Brian,

Yes, these guys are monsters. Danger points include their mouths, with immense negative suction pressure they can create, and the dorsal fin spines that spring up when they thrash about.

Unfortunately here, they are still in the large tank with lots of tank furniture. (Once we have them in the holding, we seem to have better control of the situation). So placing a net to seine the tank is not possible. Instead the giant trevallies, black tip reef sharks tend to become entrapped, with the risk of divers' getting entangled as well.

Maintaining visual with all divers and animals in water is also difficult. The Oceanarium was built 26 years ago, with little thought unfortunately of moving these large fellas out one day when time came to move all fish out. (Something for aquarium designers to think about!) Some large fish and elasmobranchs have already been moved out, but 'smarter ones' remain.

My thoughts these few days are:

- first trying with either propofol neat (10mg/ml) or MS222 (1g/l) or phenoxyethanol (neat), near the mouth of those we can manage, watching for effect. Might first run a trial on those we already have in the holding.

- for those we cannot successfully sedate that way, to use midazolam up to 0.5mg/kg IM using a pole syringe. (xylazine-ketamine has been too variable in my hands, but have used midazolam on mantas before).

We are still thinking and planning; and I continue to be grateful for any comments from out there. With Kind regards and many thanks to all who've replied.

Fred Chua

fredchua@allpetsasia.com

Fred,

Check out the limited information available that describes orally dosed ketamine. I've successfully fed ketamine laced trout to very large arapaima that needed to be moved out of a large, complex freshwater tank.

Chris Keller

Tennessee Aquarium

Dear Chris,

Thank you for your suggestion. So far, I moved Arapaimas by lowering the water right down to below their DV height and just getting them into a stretcher and wrapping over with cloth like a mummy. But I certainly will try ketamine if that's going to help us win the wrestling match.

Fred Chua

Dear Aquatic Vet Community,

Just a note to follow up on injectable anaesthetics on fish and elasmobranchs. Yesterday we conducted a capture operation in large tanks (1000mt) on 11 sting rays (6-60kg), one shovel nose ray, 3 large groupers (163-183kg) and thank God, all went well, no one got hurt.

We ended up using hand net catching on the sting rays (Plan A; Plan B was to sedate with a jab stick) But for the groupers we used 1-2mg/kg Midazolam. After using ketamine-xylazine and related drugs in the past, my sense now is that Midazolam for sedation seems to work the safest, although large volumes are required. Hence repeated injections, assisted by stunning them in the dark with torch lights directed into their eyes. Plus lots of good teamwork.

If you get it in, it'll work quite nicely, and for deeper sedation probably up to 4mg/kg. Took about 30min for adequate sedation to hand net catch. Uneventful recoveries. All relieved now that the most dangerous ones are out.

Cheers, and thanks to Rob, Chris, Jill and Brian.

Fred Chua

Allpets and Aqualife Vets

24 Jalan Kelulut Singapore 809041

fredchua@allpetsasia.com

Hi Fred,

Glad to hear everything went as smoothly as it did. Definitely sounds like a harrowing situation. I was wondering if you used any reversals with the large groupers treated with midazolam, and what your times to recovery looked like?

Thanks!

Ari Fustukjian, DVM

Florida Aquarium

afustukjian@flaquarium.org

Ari Fustukjian, DVM

FishGuy@dvm.com

(727) 421-8067

Recovery times were hard to determine, but by 6 hours they would have been back to normal.

Fred Chua

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INVOLVED WITH AQUATIC
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GRAND ROUNDS CASES

Anesthesia of Fish

Excerpted from *Advanced Koi Care*, 2nd Ed. (2010).
By **Nicholas Saint-Erne**, DVM, CertAqV

When handling fish for examination or disease treatment, it is often desirable to use an anesthetic agent to calm the fish in order to reduce stress and trauma. Surgery can also be performed on anesthetized fish to repair wounds, remove skin and fin tumors, or to remove abdominal masses. Many chemicals have been used to induce anesthesia in fish. All have some element of risk, but when used carefully they have successfully induced sedation or anesthesia.

Anesthetics are usually added to clean well-oxygenated water in a suitable glass or plastic container. The water is thoroughly mixed to ensure all of the chemical is dissolved and dispersed evenly. The water containing the anesthetic solution should be the same temperature and pH as the fish's water.

After the procedure is accomplished, the fish is placed into clean, aerated fresh water without any anesthetic in order to recover safely. Never leave a fish unattended while it is under anesthesia.

Monitor the respiration rate (opercular movements) to assess the depth of anesthesia. The fish will lie on its side and the respiratory rate will slow as the chemical induces anesthesia. Introduce fresh water into the container with anesthetic if the level of anesthesia becomes too deep.

Anesthetic Dosages**Alfaxalone -**

Dose at 1-2 milligrams/Liter (mg/L) for sedation, 1.5-4.0 mg/L will achieve anaesthesia. Induction time is 5 minutes with recovery in 3-10 minutes.

Benzocaine (ethyl p-aminobenzoate) –

Dose at 50–500 mg (may need to dissolve in ethanol first) / liter of water. Induction time is 1 minute, recovery in fresh water occurs in 3-15 minutes.

Carbon dioxide (CO₂) –

A dose of 100–400 mg/L will cause unconsciousness, excessive exposure will cause death. Use with caution, under constant observation to prevent death! Carbon dioxide is approved by the AVMA for fish euthanasia. Induction is in 1-2 minutes and recovery in 5-10 minutes in fresh water.

Diazepam (Valium) –

A sedative and muscle relaxant, that is used as a preanesthetic agent. Can be injected intramuscularly at 0.1-0.5 mg/kg, or mixed in food.

Ethanol (ethyl alcohol) –

1% added to the water will produce sedation, 3% or more will result in euthanasia. Using 20 ml of 100-proof (50%) grain alcohol in 1 liter of water will produce a 1% solution.

Ether (dimethyl ether) –

Dose at 10-15 ml/L water. Induction occurs in 2-3 minutes, recovery in clean water in 2-3 minutes. HIGHLY EXPLOSIVE! Do not use near flames or sparks! Keep tightly sealed, store in a cool area.

Eugenol, Isoeugenol (clove oil) –

Use 40-80 mg/L (1-2 drops/liter of water). Mix in the water vigorously to evenly disperse. Induction occurs in 2-3 minutes and recovery in 5 minutes in fresh water.

Isoflurane

(1-chloro-2,2,2-trifluoroethyl difluoromethyl ether) –
Dose at 0.5-1 ml/L water. Spray the required dose through a 25-gauge needle under the water while mixing. Induction in 2-8 minutes, recovery in clean water in 3-30 minutes. The longer the time under anesthesia, the longer it takes to regain consciousness.

Ketamine hydrochloride –

Dose at 1 g/L added to the water, or 66-100 mg/kg injected intramuscularly. Provides sedation and immobilization for handling or transportation. Does not produce analgesia.

Propofol (2,6-diisopropylphenol) –

Anesthesia induction dose is 1.5-2.5 mg/kg intravenously. Use parentally only. Induction time is 5 minutes, recovery in 60-75 mins.

Quinaldine sulfate (2-methylquinolinesulfate) –

Dose at 25-200 mg/L. Induction in 2-6 mins, recovery in fresh water in 5-20 mins. Acidifies low alkaline water, use buffer in water as necessary.

Tricaine methane sulfonate, MS-222

(3-aminobenzoic acid ethyl ester) –
Dose at 10-40 mg/L for sedation (handling/shipping). Dose at 50-100 mg/L for anesthesia. Induction in 1-5 minutes, recovery in 3-15 minutes in clean water. Acidifies water – use buffered or hard water.

Xylazine –

10 mg/kg IM or IP. May cause cardiac arrhythmias. Xylazine at 6 mg/kg can be given in combination with Ketamine at 12 mg/kg. IV injections of Doxapram or Yohimbine have been used to produce anesthetic reversal in sharks.

AUTHOR'S INSTRUCTIONS

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.

Advertising

See advertising rates on page 4.

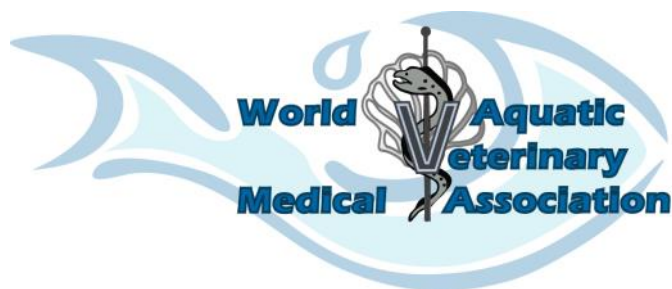
Please send articles, clinical reports, or news items to the editor by the following submission dates:

- 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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Is it worthwhile to get a fish vet?

By **Ming Jun Lim** (President, WAVMA Student Chapter, Murdoch University) & **Richmond Loh** (The Fish Vet, Australia)

Many fish keepers have wondered if fish vets even exist, and for those who do know, they might avoid calling one due to several reasons, such as cost, credibility, or even just thinking that they can solve the problem by themselves. Fish owners generally look towards the Internet, other hobbyists, and pet shop staff as a first port of call for advice regarding their fishes' health. Thus these fish owners then purchase the recommended medicines from the pet shop or order them online via the Internet, based on the advice of the aforementioned sources.

The availability of over-the-counter medicines can be helpful, but at the same time, hamper aquatic veterinary medicine. Incorrect drug choice, dosing, and treatment regimen without first obtaining a diagnosis will lead to more morbidity and mortality, and interfere with diagnostics. There are several disadvantages associated with obtaining advice and medication in this manner, namely the risk of the wrong treatment, the risk of misdiagnosis, and the lack of a professional veterinary opinion, exacerbating the disease.

Having the opinion of a professional veterinarian is important as they are trained in methods of diagnosing diseases based on the various presenting factors. To have a standard point of comparison, this article will be looking at the costs of different over-the-counter medications while referring to the water volumes of average aquarium and pond systems.

The most common reason that people do not call a fish vet, would probably be the assumed excessive economic cost of hiring one. For example, a client has spent over \$5,000 on ornamental fishes, and he loses the fish due to unforeseen, but preventable, circumstances. If he had spent a fraction of that amount to employ a vet's services, he could have potentially saved all of his fishes, learning valuable information through the process as well. Though calling a vet to look at your fish might seem expensive, it is still relatively cheap compared to the money lost due to dead fish.

The tables in this article outline several over-the-counter products available for fish owners in Perth, Western Australia, and the cost of each product to treat an average aquarium of 300L, or a pond of 4000L. Bettafix, Melafix, and Pimafix have also been included, even though they are not drugs but botanical oils, as they are commonly recommended products with parasitocidal properties (Carlota et al 2014; Valladão et al. 2016). They are also "safe" products that can be used in both fresh and saltwater aquariums (Shivappa et al. 2015, pp. 188-192).

As seen from the table, the most expensive treatments over-the-counter are for the treatment of diseases caused by bacteria and flukes, assuming that people will make the correct diagnosis for their fishes, and hence get the correct product for the specific diseases. However, there is a false economy in going to the nearest pet store, purchasing the cheapest medications there, and not knowing what the effects are. Though some money might be saved initially, the fishes might not be treated appropriately, or the disease might even be exacerbated, resulting in a decreased survival rate and welfare state for the fishes. More money will be lost as the fishes eventually die, due to the lack of a proper diagnosis and treatment. Thus it makes economic sense to have a vet conduct a proper diagnosis, and prescribe a proper treatment. Even more so, for expensive systems such as marine tanks or outdoor ponds.

In the situation where an incorrect diagnosis is made, such as through browsing internet forums, asking misinformed pet shop owners, or even not bothering to do any research, the dangers of random administration of drugs such as achieving drug toxicity and death, are substantial. The dangers are compounded if multiple drugs are administered simultaneously or sequentially, without caution for the fish species, or water parameters. Additionally, some drugs, such as formaldehyde and malachite green, have the potential to be highly toxic and hazardous, which may result in dead fish (Intorre et al. 2007, pp. 590-595; Witeska, Kondera and Belniak 2013, pp. 245 - 251). Inadequate dose rates suggested by the label are also a problem, as some of the labels prescribe dosages that are insufficient to completely eradicate the pathogen or parasite populations. This may also cause the secondary development of drug resistance, which makes complete treatment more difficult, since the infectious agents are now more resistant to the drugs. As such, it would be good to have someone around who knows their drugs and dose rates, like a veterinarian, to greatly reduce or even eliminate the chance of any drug-related mishaps occurring.

By engaging the services of a veterinarian, one can be assured that the vet will examine all aspects of the water system to figure out the underlying cause of the problem. Veterinary investigation and treatment takes the whole system into consideration, such as the tank itself, the quality of the water, and the species of fishes present. Clients who try to diagnose a disease without the help of a veterinarian, might base their thought process off a single aetiology. However, multiple agents of disease might be present in the system, which can be compounded or masked by environmental factors. A veterinarian with the appropriate training, has a better skillset that enables him or her to make the correct diagnosis, and prescribe the correct drugs,

Product Name	Active ingredient/s	Label Claims to Treat	Active Ingredient/s actually treats...	Warning!
Algae Cure	3g/L simazine	Algae	Algae	
Aquari-cycline	375mg tetracycline hydrochloride/tablet = 346mg/kg tetracycline	White Spot disease (<i>Ichthyophthirius multifiliis</i>), Mouth and Body Fungus (<i>Columnaris</i> spp), fin and tail rot, external bacterial diseases in fresh and saltwater aquariums.	Bacterial infections susceptible to tetracycline.	No effect on fungus, or protozoa. Dose rate insufficient for hard water or marines (chelated), and does not mention about repeat treatments for AB course: favouring antibiotics resistance. Antibiotics can kill biofilter.
Tri-Sulfa	153.5mg sulfadiazine, 154.7mg sulfadimidine, 154.1mg sulfamerazine	Bacterial infections: Haemorrhagic septicaemia (blood streaks in fins and body and localised swelling), bacterial gill disease, fin and tail rot, cotton mouth disease, body slime and eye cloud for both fresh and saltwater fishes.	Bacterial infections susceptible to sulphonamides.	Antibiotics can kill biofilter.
Fluke and Tapeworm Tablets	100mg praziquantel/tablet	Flukes and tapeworms in fresh and saltwater fishes.	Ectoparasitic flukes. Unlikely to be effective on tapeworms (internal).	Poorly water soluble. May need repeats for oviparous flukes.
Paracide	20mg trichlorfon/tablet	External fish parasites: Anchor worm (<i>Lernaea</i> sp.), skin flukes (<i>Gyrodactylus</i> sp.), gill flukes (<i>Dactylogyrus</i> sp.), fish lice (<i>Argulus</i> sp.) in fresh and saltwater aquariums.	May be ineffective at this dose rate in water of high pH (≥ 8).	Do not use on fishes that are chemically sensitive to organophosphates.
Fungus Cure	2mg/mL acriflavine, 0.4mg/mL malachite green	Fungal diseases in freshwater, tropical freshwater fishes.	Superficial fungal and bacterial infections.	MG is a carcinogen, banned for use in foodfish (residues persist). MG is more toxic in acidic and high temperature conditions. Toxic to characins, catfish, loaches, some marines and amphibia.
Multi Cure	0.4mg/mL malachite green, 4mg/mL methylene blue, 2mg/mL acriflavine	White Spot disease (<i>Ichthyophthirius multifiliis</i>), Velvet disease (<i>Oodinium</i> spp.), fungal diseases.		MG (see above). MB will harm biofilter.
Rapid White Spot Remedy	37mg/mL formaldehyde, 0.32mg/mL malachite green	White Spot disease (<i>Ichthyophthirius multifiliis</i>) in freshwater and tropical freshwater aquariums.	Effective against most protozoal diseases.	See notes on MG.
Bettafix	Tea tree oil (<i>Melaleuca</i> spp.)	All natural antibacterial medication for Bettas. For use on wounds, ulcers, mouth fungus, and fin and tail rot. Also helps heal open wounds and tissue damage. Promotes rapid re-growth of damaged fins and skin. Contains the healing power of Melaleuca.	Dubious efficacy. Commonly given as a "natural treatment", under the premise of "as long as it doesn't do any harm".	Strong odor and can cause foaming at water surface.
Melafix	9.23g/L Cajeput oil (<i>Melaleuca</i> spp.)	All natural treatment and protection of bacterial infections. Heals wounds and promotes regrowth of damaged tissue. For fresh or saltwater aquariums.	As above.	As above.
Pimafix	9.8g/L Bay oil (<i>Pimenta racemosa</i>)	All natural, antifungal remedy for fresh and saltwater fishes. Benefits: Quickly treats fungal infections on body and fins.	As above.	Do not use in marine aquariums, active ingredient is highly toxic when ingested. Most marine fishes drink water around them to regulate osmotic pressure, increasing potential for accumulation of active ingredient, and hence potential for toxicity.

Product Name	Label dose rates	Label Dose (mg/L or ml/L)	Fish Vet's Dose	Retail Price (AUD\$)	Units (ml or mg)	Treatment Price (300L aquarium)	Price (4000L pond)
Algae Cure	1mL/4L water. Repeat treatment after 14 days if necessary.	0.25	1-2 mg/L	\$22.90	500	\$3.44	\$45.80
Aquari-cycline	1 tablet/20L water.	17.3	(20 to 40 mg/L oxytetracycline)	\$23.90	8650	\$57.36	\$764.80
Tri-Sulfa	1 tablet/ 40L water. Severe infection: 1 tablet/ 20L water. Repeat treatment in 3 days if necessary.	23.12	(24mg/L trimethoprim sulphamide)	\$16.90	6750	\$69.45	\$925.97
Fluke and Tapeworm Tablets	1 tablet/20L water. Repeat treatment after 7 days to prevent re-infestation.	5	2 to 10, with 3-4 repeats for oviparous flukes.	\$23.80	1500	\$71.40	\$952.00
Paracide	1 tablet/40L water. Repeat treatment after 7 days to prevent re-infestation.	0.5	0.5 to 2, with 3-4 repeats for oviparous parasites.	\$13.50	500	\$12.15	\$162.00
Fungus Cure	5mL/20L water. Reduce to 5mL/40L for Tetra species, baby fish, and scaleless fish (loaches, etc.). Repeat treatment after 3 days.	0.25	MG: 0.1-0.25mg/L; Acrifl.: 0.02-0.1mg/L..	\$28.46	500	\$8.54	\$113.84
Multi Cure	5mL/20L water. Reduce to 5mL/40L for Tetra species, baby fish, and scaleless fish (loaches, etc.). Repeat treatment after 3 days.	0.25	MG: 0.1-0.25mg/L; Acrifl.: 0.02-0.1mg/L; MB: 1-5mg/L.	\$22.90	500	\$6.87	\$91.60
Rapid White Spot Remedy	0.25mL/L water. Reduce to 1mL/8L water for Tetra species, baby fish, and scaleless fish (loaches, etc.). Repeat treatment after 3 days.	0.25	0.15-0.25	\$22.90	500	\$6.87	\$91.60
Bettafix	9 drops/473mL (pint) water, 2.5mL/3.8L (gallon) water	0.66	-	\$10.15	50	\$40.07	\$534.21
Melafix	5mL/40L water SID x 7 days (disease, wound treatment), 5mL/40L water SID x 3 days (adding new fish, handling fish)	0.13	-	\$32.18	473	\$17.86	\$238.12
Pimafix	5mL/40L water SID x 7 days (disease, wound treatment)	0.13	-	\$32.18	473	\$17.86	\$238.12

with regard to the entire water system. This results in a comprehensive treatment that is better for the overall well-being of the fishes and client, saving the client both stress and money.

In conclusion, by looking at the cost-benefit analysis of hiring a fish vet, veterinary treatment is the most cost-effective for systems with large water volumes, and fishes of high value. In fact, one can even argue that a positive net gain might be seen if the vet manages to treat the fishes and nurse them back to full health, instead of having a mass fish kill. On the other hand, if the fish are living in a small home aquarium, and are able to be cheaply obtained, perhaps a vet would not be the most economical choice. Though perhaps vets may indeed be the wisest choice in the terms of the fishes' welfare, as no animal should undergo unnecessary suffering, including fish.

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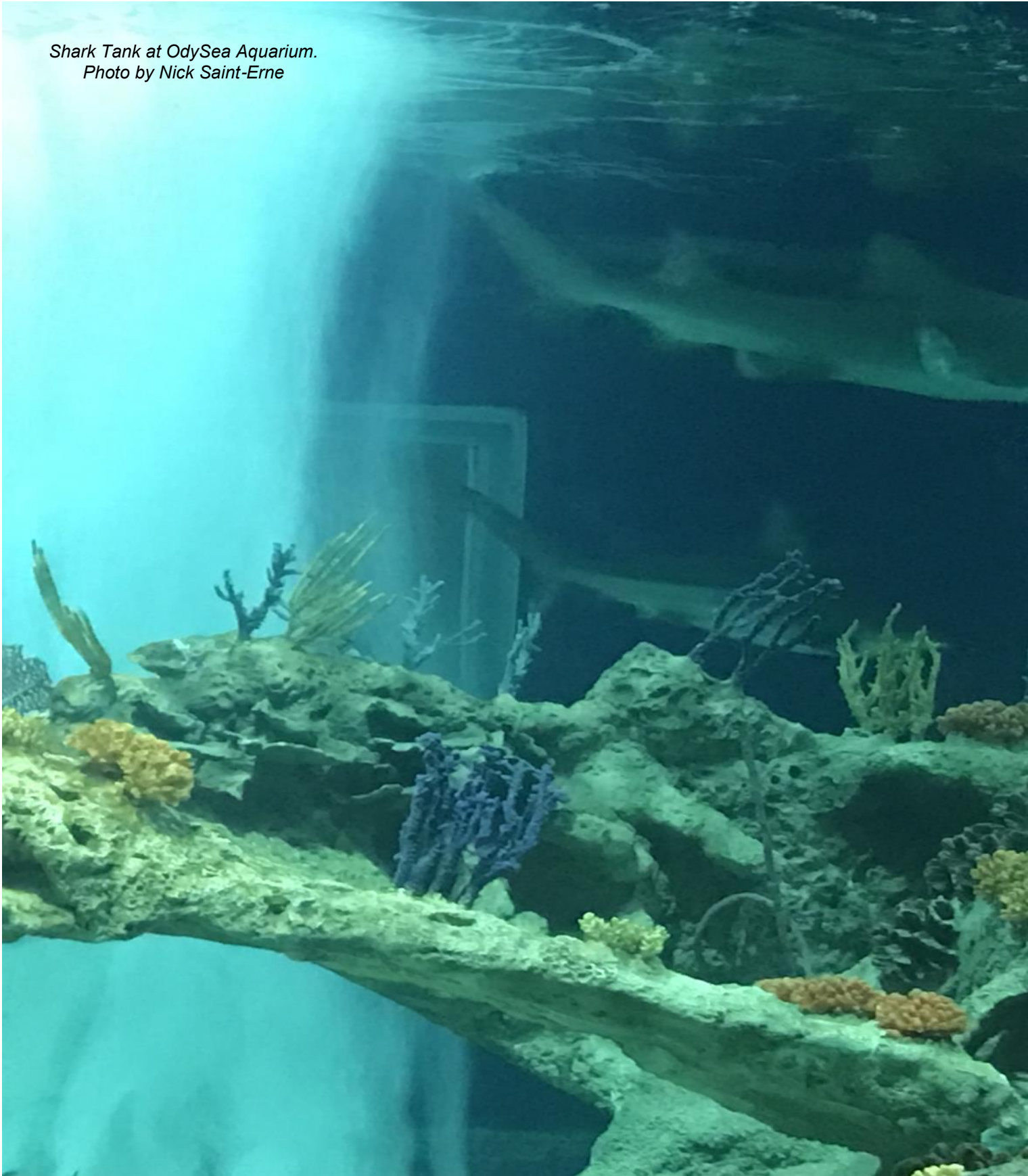
ODE TO A FISH

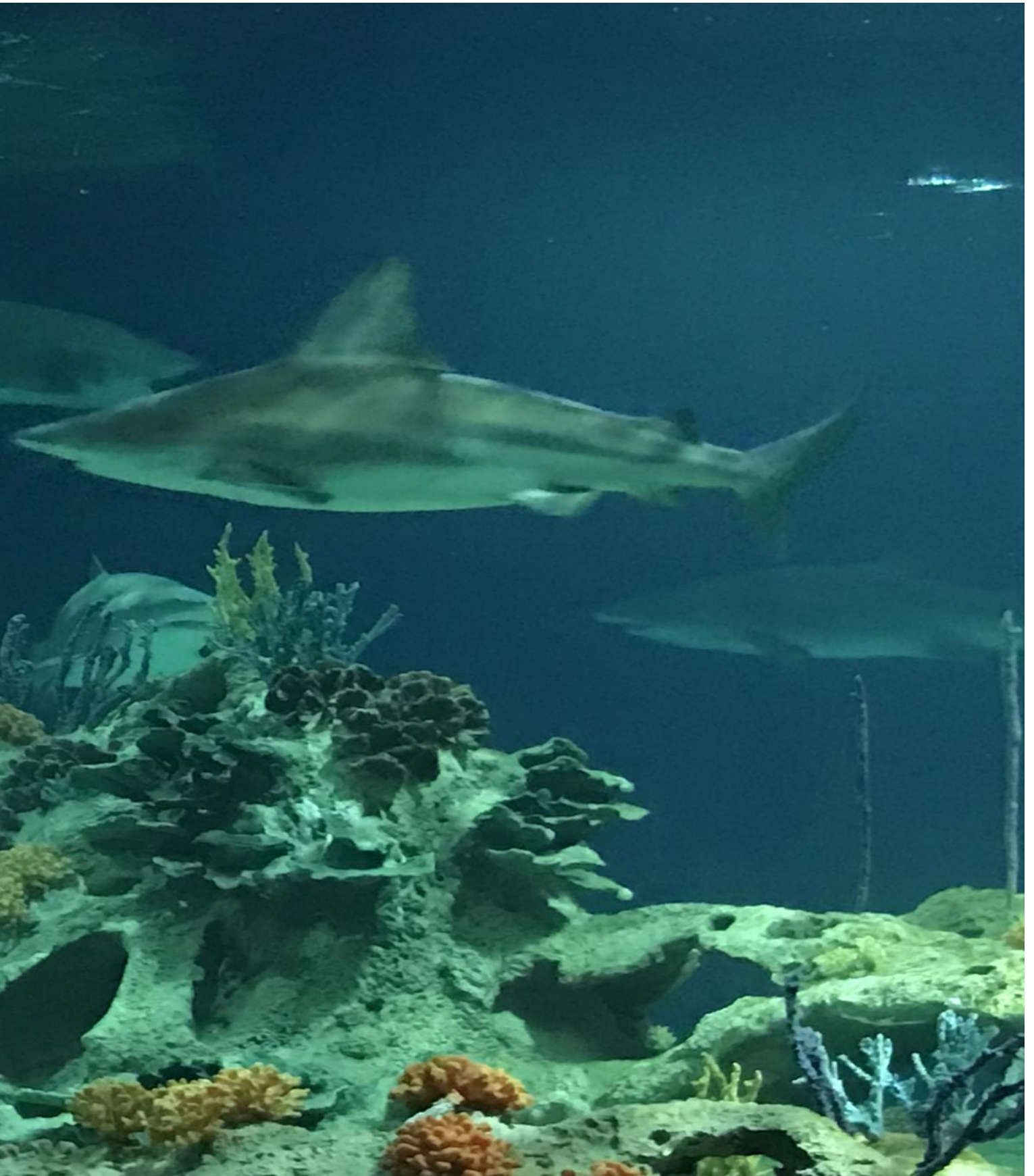
By Nick Saint-Erne

Born within my aquarium's glass walls,
Never to know what it's like to live free,
Is a beautiful little fish that we call
A green swordtail (*Xiphophorus helleri*).
His parents were from the local fish store:
A long-tailed father and live-bearing mother.
But he was the only baby she bore,
Never to have a sister or brother.
Yet, he likes all the fish in the tank that they share.
There's a pair of rainbow cichlids in there,
As well as an albino corydoras,
An upside-down catfish, and some rasboras.
He's growing so fast, he's doing so great,
When he's full grown, I'll buy him a mate!



*Shark Tank at OdySea Aquarium.
Photo by Nick Saint-Erne*





A Tour of OdySea Aquarium

By **Nick Saint-Erne**, DVM, CertAqV
December 27, 2016

This new aquarium complex opened in Scottsdale, Arizona (East Phoenix area) in September 2016. While we had family visiting us for the holidays, we had the opportunity to finally visit OdySea. We have previously visited the Butterfly Wonderland attraction next door to it, which is also wonderful and has some nice aquarium exhibits in it as well. The information on their website (<https://www.odyseaaquarium.com/>) describes the aquarium as follows:

“OdySea in the Desert, Scottsdale’s new entertainment destination, is a 35-acre, multimillion-dollar complex that is reminiscent of popular tourist boardwalks throughout the country. It features three major attractions: OdySea Aquarium, Butterfly Wonderland, and Dolphinaris, and approximately 20 restaurants, retail and amusement establishments that showcase the local flavor of the region. All of this encircles a one-acre, bustling courtyard that has multiple water features and a lively center stage with entertainment that is free to the general public.”

Shops, restaurants and the attractions surround the central courtyard. (photo from website)



The main entry way (Aqua Lobby) has large globes hanging from the ceiling containing African Cichlids! These nine globe-shaped aquariums, each weighing 1,000 pounds, represent ‘drops of waters’ that guests will follow through the course of the aquarium, from water droplets falling from the sky, into rivers, then finally to the ocean.



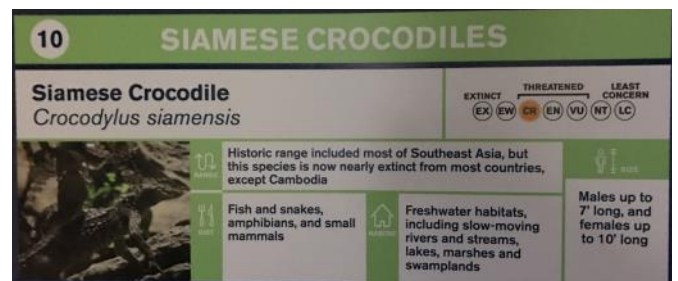
My nephew Jason, in the restroom on the first floor, where instead of a mirror, you look into a shark tank!

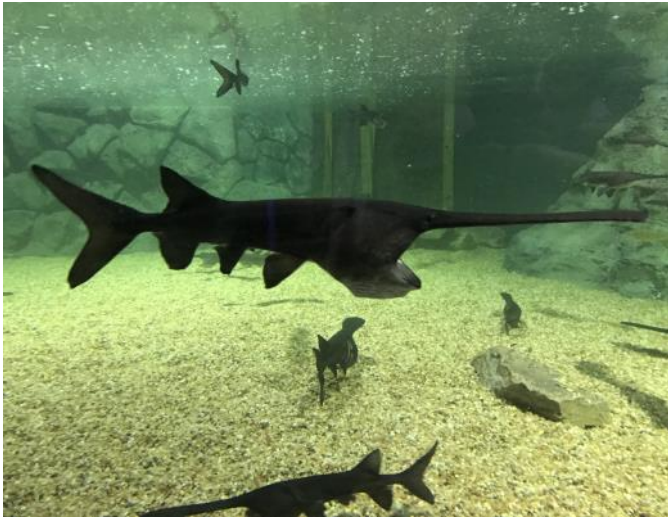
Ascending from the Aqua Lobby on an escalator leads to the second floor exhibits of river systems from around the world: American Rivers, South American Rainforests, and Asian Rivers.



Signs and video screens provide educational information at each exhibit.

Besides fish, the river exhibits include fresh water turtles and a beautiful habitat with several critically endangered Siamese Crocodiles





Paddlefish feeding by filtering plankton in the water.

11 TROUT STREAM	
Apache Trout <i>Oncorhynchus apache</i>	11 White Mountains of Arizona that flow through forests and meadows, also native to the Gulf River and Little Colorado River subdrains. 12 Freshwater and saltwater: bass, white crabs, and snappers. 13 Streams, creeks, forests, and meadows. 14 6 to 24" long and 6 lbs.
Rainbow Trout <i>Oncorhynchus mykiss</i>	15 North America 16 Insects, snappers, and small fish. 17 Rivers and lakes. 18 10" to 24" long and 8 lbs.



Display of Arizona's native Apache Trout (our state fish!), along with the introduced Rainbow Trout.

After all the River displays containing paddlefish, gars, carp, piranhas, archer fish, fresh water stingrays, and an exhibit of Asian small-clawed otters, guests reach the ocean shore to view tide-pool creatures and interact in a touch pool with stingrays. Next, guests go through the Antarctica to see the penguins. Special tours are available for interaction with the penguins, and also to don a wet suit and "SeaTREK" diving helmet and actually go underwater in Stingray Bay!



AQUARIUM BY THE NUMBERS

LARGEST AQUARIUM IN THE SOUTHWEST

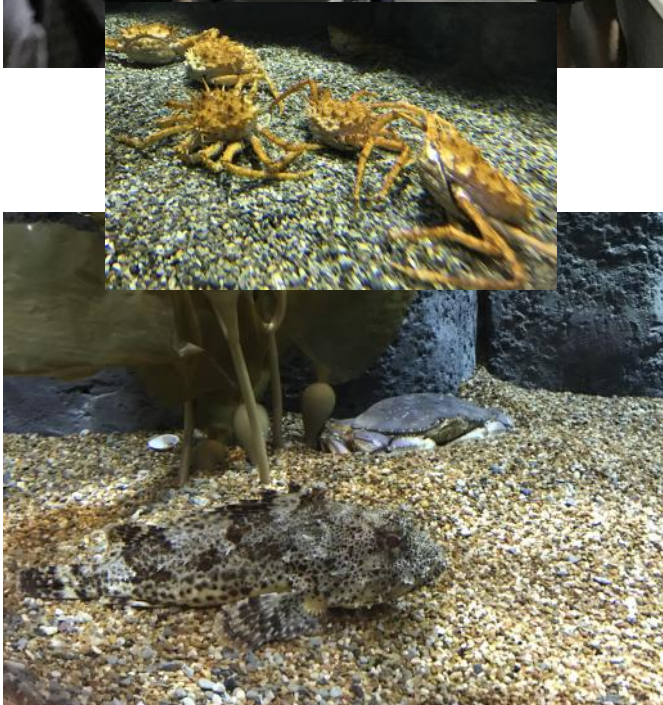
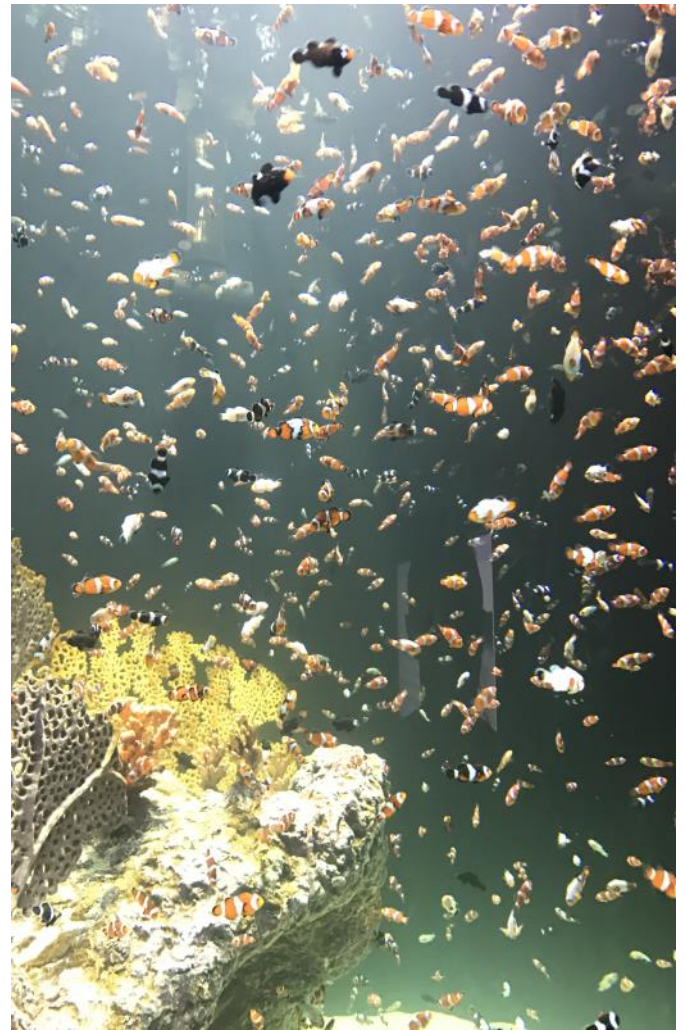
- 200,000 SQUARE FEET OF SPACE
- MORE THAN 2 MILLION GALLONS OF WATER
- 5,455 SQUARE FEET OF ACRYLIC OBSERVATION WINDOWS
- MORE THAN 80 OBSERVATION WINDOWS
- MORE THAN 50 EXHIBITS
- OVER 60 SHARKS
- 3 MILES OF UNDERGROUND PIPING
- OVER 500 DIFFERENT SPECIES
- AVERAGE LENGTH OF VISIT: 2.5 - 3 HOURS
- MORE THAN 30,000 ANIMALS
- ACCOMMODATES OVER 10,000 PEOPLE DAILY

Photo of an informative sign in the aquarium.

Map of the OdySea Aquarium from their website.



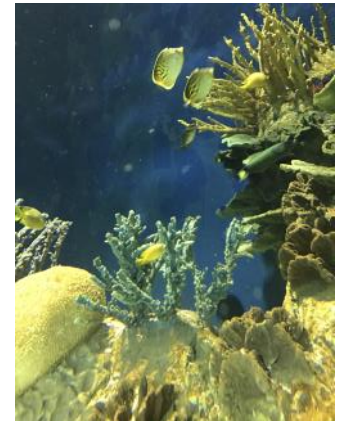
From the penguin exhibit, guests go down an escalator and through a tunnel inside an aquarium back to the first floor. The lower level has the salt water exhibits, including sharks, moray eels, shrimp, crabs, lobsters, octopus, chambered nautilus, lionfish, an amazing clownfish tank, seahorses and a giant grouper.



There is also a 3D movie theater that is showing a film about whales, *Underwater Giants*. This makes for a nice break after walking through all the upper level exhibits. The room has a window to an aquarium in the front, and when the movie is ready to begin, a screen drops down covering the aquarium.



Aquarium seen before movie and then screen drops to show the 3D movie.



An interesting exhibit that I have not seen before is the Living Sea Carousel, another theater where guests sit and look at an aquarium with open ocean denizens, but then the SEATS move to another aquarium with sea turtles, then rotate again to view another tank containing sea lions, then to the giant shark tank, and finally back to the original location to leave to go to the next display. During this session, guides describe what is in each aquarium, and there is even a visit by a diver using the SeaTrek helmet (ours was one of Santa's helpers, it seems).

The final section includes sea jellies, sea nettles and other coral reef displays. It is a beautiful aquarium with great exhibits.

OdySea Aquarium
9500 Via De Ventura
Scottsdale, AZ 85256



All photos in this article were taken by Nick Saint-Erne, unless otherwise indicated.

KSWA KOI SHOW 2016: ACUTE APNEA IN A KOI

By **Ivan Lim**, Final Year Veterinary Student, Murdoch University
& **Richmond Loh**, The Fish Vet, Australia

SIGNALMENT

6-years-old, female, Sanke koi (*Cyprinus carpio*), 4kg.

HISTORY

It was the Koi Society of Western Australia (KSWA) Koi Show 2016 held in June (winter). Fish were transported to the venue in the morning, and the water in the tanks was trucked in (all fish share the same water). The Sanke was put together with five other koi (four of them smaller, and one larger, than the Sanke) in a round show container about 1.5m in radius. There were many other containers adjacent to each other showcasing other competitors' koi. Each tank was aerated from a shared generator.

There was contention over the Sanke koi's length as to whether it could be judged in the Jumbo category of >70cm. The fish was difficult to measure, and so it was routine that they manually tumbled the fish to disorientate her, facilitating measurement. Ten minutes after this incident, the koi stopped ventilating, became listless, and laid in lateral recumbency, motionless on the tank floor and her skin was diffusely hyperaemic (Figure 1). She was observed to have occasional body twitches. The other koi in the container remained normal.



Figure 1:

Female Sanke koi with apnoea, could not be revived.

PRELIMINARY DIFFERENTIAL DIAGNOSES

Stress (e.g., physical, environmental, physiological), ketosis, poor water quality (e.g., ammonia, nitrite, nitrate, pH, O₂, CO₂, temperature, chlorine), chemical insult (e.g., contaminants, toxins, including trace metals and pesticides), exacerbation of gill infection or infestation (e.g., *Flavobacterium* spp., monogeneans, protozoa).

DIAGNOSTICS

Water quality assessment and tissue sampling of the fish were not performed. On gross examination all the koi in the container were in good nutritional body condition with the female Sanke koi being slightly over-conditioned. In addition, they had no observable abnormalities of the skin or gills.

TREATMENT

Initially the koi was held over an airstone, and then a water pump was positioned in front of the koi's mouth to help ventilate. The fish promptly received doxapram (0.5ml, 20mg/ml), adrenaline (1ml, 1:1000 ampoule), and vitamin B complex (0.4ml), all intramuscularly (Figure 2). The koi was kept ventilated with the water pump, however there was no appreciable response after 15 minutes.



Figure 2: A series of medicines injected intramuscularly, given in the sumi (black colored skin).

The owner of the koi had a smaller container that he used to transport his koi. The koi was then transferred to this because it had greater aeration capacity (Figure 3) and was more private. Here, the koi received diazepam intraperitoneally (0.1ml, 5mg/ml) as an anxiolytic (Figure 4).



Figure 3: Koi moved to transport tank with more vigorous aeration.



Figure 4: Intraperitoneal injection of diazepam.

OUTCOME

Soon after the diazepam administration, the aquarist who was manually supporting the koi in the smaller container noted that there was increased muscle tone in the koi's body. Within 10 minutes of the diazepam administration, the koi was able to stay upright and swim again (Figure 5). She then went on to win Jumbo A and Variety Champion at the show!



Figure 5: Koi, fully recovered from shock. Notice there is still a slight pinkish hue to the white (shiro) parts, a sign of stress.

DISCUSSION

The combination of doxapram, adrenaline and vitamin B complex was chosen as a multi-modal attempt to stimulate the fish. Doxapram is a respiratory stimulant and is used in fish anaesthesia when fish become too deeply anaesthetised with subsequent respiratory depression. Adrenaline is an adrenergic agonist which provides cardiovascular support. Vitamin B complex was given to support metabolism and energy production, nervous system function, and red blood cell function.

The intramuscular route for these three drugs was chosen as muscles are very well vascularised which enabled rapid absorption of the drugs into the systemic circulation. It is prudent to note the site of injections in koi or other fish with colour variations. Skin discolouration or inflammatory reactions can occur after injections, so giving them in the black or dark coloured parts of the fish will minimise visibility of the defects, and is especially pertinent in show fish.

The concurrent use of the water pump to assist with aeration of the koi was done to stimulate the buccal-heart reflex, which increases heart rate by increasing water flow rate through the mouth. This is achieved either by moving the fish through the water or by placement of a water pump in the oral cavity of the fish, as done in this case.

Due to the muscle spasms earlier (which looked similar to the 'death throws' when fish are about to die), there was consideration of administering diazepam as an anxiolytic, and for its anticonvulsant and muscle relaxant properties. However, diazepam can cause respiratory depression which may exacerbate the koi's apnoea. As the koi was not given any drug that would cause respiratory depression, after having discussed and sought the owner's consent, the decision was made to administer diazepam via the intraperitoneal route. This route was chosen as absorption of drugs in the peritoneum is typically much slower than for intravenous and possibly intramuscular injections. It was anticipated that the low dose of diazepam, as well as its intraperitoneal injection site, would minimise the risk of respiratory depression.

A differential that was taken into consideration was ketosis. Given that the koi was slightly overweight, and because fish are usually fasted for about 3 days before transportation to a show, the koi might have mobilised its fat stores to produce ketone bodies for energy. This is likened to ketosis as a cause of 'downer cows' where it causes lethargy, poor gut motility, and nervous dysfunction. However, considering that it was winter when fish are fed less frequently and may not be fed for up to a week prior to a show, ketosis was placed lower on the differential list.

The tumbling of the koi in the water was suspected to have incited severe stress-response, presenting as acute onset of apnoea and listlessness (shock). Other differentials included water quality problems like temperature stress, low dissolved oxygen, nitrite and nitrate poisoning, low pH and hypercarbia that may lead to dyspnoea. However as the other koi in the same container were unaffected, problems with water quality were dismissed. In addition, infectious diseases such as parasitic infestations with monogeneans (*Gyrodactylus*, *Dactylogyrus*) and protozoan ectoparasites, together with bacterial or viral infections, were considered. However, this fish showed no previous signs of disease, and the acute onset of illness soon after 'tumbling' suggests a severe stress response.

Environmental stress can cause changes in the fish known as the general adaptation syndrome (GAS). The changes are non-specific physiological and biochemical alterations which occur in three phases: the alarm reaction, the stage of resistance and the stage of exhaustion. Stressors like infection, fright, anoxia, forced exercise and anaesthesia can elicit the

GAS in fish. The events in the GAS are mediated by hormonal and nervous control via cortisol, ACTH and catecholamines. There is evidence that in all fish there is no standard response to stress. For example, fish that have previously been exposed to environmental pollutants may become more sensitive to stressors like infection, drugs and husbandry procedures.

The affected female koi was relatively large at 71cm which could have had some implications on her susceptibility to stress. Studies have shown that the largest fish are often the most prone to hypoxia. The female Sanke koi could have reached the stage of exhaustion when her homeostatic mechanisms were unable to compensate for environmental stress. This may be a possible explanation for her apnoea and listlessness.

In conclusion, the stress from tumbling the female Sanke koi could have led her to become acutely apnoeic and motionless. Medical intervention (doxapram, adrenaline, vitamin B complex, and diazepam) coupled with the increased aeration, assisted in the recovery of the koi. To avoid causing excessive stress, it was recommended that in future, koi are sedated with anaesthetics, rather than the use of the tumbling method. Current literature does not explain the reasons for acute onset of apnoea in fish. Further investigation into, and documentation of, such occurrences will expand our knowledge of apnoea in fish and its predisposing causes.

Please find a link to the video of this case at <http://tinyurl.com/koishock>

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Class 6 - Jumbo



Class 6 - Jumbo A
1st - Allan Bennett

Class 6 - Jumbo, Taisho Sanke (71cm)

*Hall of Fame:
Patient wins Best
in Class award!*

Excision and Subsequent Treatment of a Leiomyoma from the Periventricular of a Koi

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DOI: <http://dx.doi.org/10.1053/j.jepm.2016.04.011>
Published Online: April 29, 2016

Abstract

A 10-year-old female koi (*Cyprinus carpio*) was presented with bilateral, asymmetric, sessile masses of the periventricular tissue. The owner had first observed the masses for approximately 1 year before seeking a veterinary evaluation of the fish. Over the past year, the sessile masses continued to grow and develop in size.

An incisional biopsy was performed under general anesthesia to further assess the abnormal tissue structures. Based on the histologic evaluation of the submitted biopsy sample, the growth was determined to be a benign spindle cell neoplasm. The koi also was diagnosed with a concurrent genital tract infection based on cytological examination of the reproductive tract fluid.

Following transport to the Veterinary Medical Teaching Hospital for further evaluation, a coelomic ultrasound revealed local infiltration of the tissue to the surrounding tissue. To decrease the risks of recurrence following surgical debulking, chemotherapy was recommended to treat the tissue adjacent to the tumor. Cultures obtained from the genital pore resulted in the isolation of *Aeromonas* spp. susceptible to ceftiofur, which was elected as a preemptive antibiotic.

Surgical debulking of the mass was performed, and bleomycin was administered intralesionally and at the periphery of the surgical site. The koi recovered successfully from anesthesia and was discharged later the same day and prescribed an analgesic regimen of meloxicam. After further histological examination of the submitted tissue samples from the periventricular growths, the tumor was identified as a leiomyoma. No recurrence of the mass was detected 6 months following the surgical procedure and chemotherapy.

For full article and images, go to:

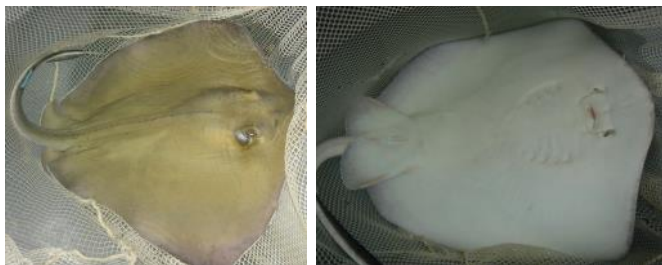
<http://dx.doi.org/10.1053/j.jepm.2016.04.011>

Southern Stingray Website

By **Krystan Grant**, DVM, PhD
krystan19@yahoo.com

I've been working at or associated with the Downtown Aquarium in Denver for over 10 years. I conducted my research there for my PhD, which I just completed this semester! Part of my dissertation included a website I created on Southern Stingrays: <http://southernstingray.businesscatalyst.com/>.

The studies conducted on the southern stingrays were exhibited at [Downtown Aquarium in Denver](#). A huge thank you to all of the curators (Ken Yates, Tom Fenske, Rob Brynda, Meiling Roitz and Jessica Miller). There were also several individuals that contributed to this project in order to perform physical exams and necropsies; have access to equipment and interpret ultrasound imaging; collect blood samples, interpret counts and morphology; and prepare and interpret tissue samples for histology. We hope the information provided on the website helps other facilities maintain and care for their stingrays.



Dorsal Anatomy

Ventral Anatomy

Each stingray is given a unique identification with an implanted passive integrated transponder (PIT) tag or microchip. Males (identified by their claspers) are typically injected in their right wing and females are injected in their left wing. The needle is a large gauge therefore it should be inserted at an angle and embedded into the muscle to avoid it falling out.



Some readers are sensitive to water and precautions should be taken (protecting it with a plastic cover).

Denver's Downtown Aquarium (700 Water Street, Denver, CO 80211) was purchased by Landry's Restaurants, Inc. in 2003, when it was Colorado's Ocean Journey Aquarium.



On July 14, 2005, Landry's reopened the redesigned complex as Downtown Aquarium. The entertainment and dining complex features a public aquarium boasting more than a million gallons of underwater exhibits that highlight fascinating ecosystems around the world. Downtown Aquarium houses over 500 species of animals, the interactive Stingray Reef touch tank, Aquarium Restaurant, Dive Lounge, the Nautilus Ballroom and amusements for the entire family.

Hematology

With the stingray in dorsal recumbency, isolate the tail (an experienced handler with gloves should restrain if necessary to avoid injury from the barb). For most southern stingrays a 25- or 23-gauge needle with a 3 mL syringe should suffice. With the needle and syringe at an approximate 90-degree angle to the tail, insert the needle through the skin on the ventral mid-line of the tail. Once the needle has penetrated the skin, begin gentle negative pressure. Advance the needle until it hits cartilage and then gently back it off the cartilage. When a flash of blood is noticed, stop advancing or backing off and collect the blood sample until a desired amount is in the syringe



Ultrasound

The heart is located just cranial to the pectoral girdle within a separate cavity from that of the coelom. It consists of four chambers - sinus venosus, atrium, ventricle, and conus arteriosus, which pumps the deoxygenated blood in a caudal to cranial direction from the coelomic organs to the gills (Tota, 1999).

By placing the transducer in a transverse position over the cavity, a cross section of the ventricle is imaged (thick ring-like structure at the top of the image). The ventricular walls of the heart can be seen contracting which allows the user to obtain the heart rate.



SURGICAL CORRECTION OF AN ABDOMINAL AVULSION IN A GIANT MORAY EEL (*GYMNOTHORAX JAVANICUS*)

Alfonso Lopez, DVM
 Komsin Sahatrakul, DVM, CertAqV
 Christopher Torno, DVM, MS
 Hazel Tan, BVSc

Animal Health & Research, S.E.A. Aquarium,
 Resorts World Sentosa, Singapore

HISTORY

A Giant Moray Eel (ca. 15 kg) was apparently bitten by a conspecific and had a severe traumatic abdominal rupture. This moray was housed in the Moray Dome exhibit of the S.E.A. Aquarium, Resorts World Sentosa (RWS) in Singapore. The exhibit contains 43,060 m³ of water and houses ca. 30 moray eels belonging to three species which include Spotted Moray (*G. moringa*), Tessellate Moray (*G. favagineus*) and Giant Moray (*G. javanicus*).



*Giant Moray Eel (above)
 and apparent bite wound (below)*



CASE DIAGNOSIS AND TREATMENT

The injured eel was isolated into a 160L tub and prepared for thorough physical examination under general anesthesia. Tricaine methanesulfonate, MS-222 (Tricaine-S®, Western Chemical, Inc., USA) immersion at 100 mg l⁻¹ was used to induce stage III anesthesia (total loss of reaction to massive stimulation) in ten minutes. Respiration rate was significantly reduced during anesthesia.

The Giant Moray was anesthetized with MS-222.



For ease in the conduct of the surgery, the water level was decreased to expose the surgical site. Because prolonged surgical anesthesia was required, surgical plane of anesthesia was maintained by delivering the aerated anesthetic solution into the buccal cavity using a 1 cm diameter rubber tube that was connected to small water pump.

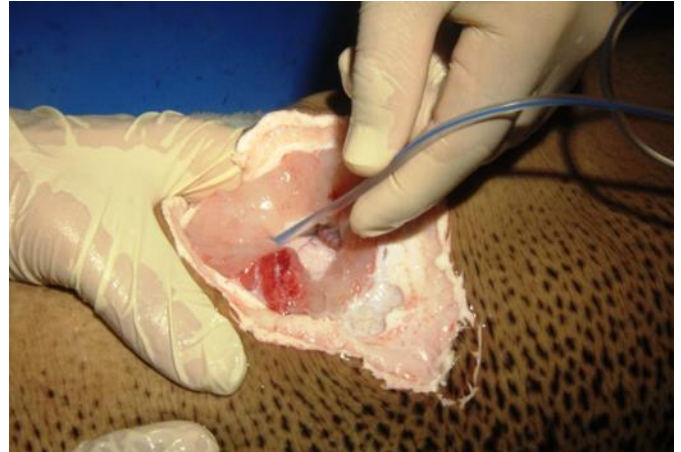
The avulsion was located at the ventral mid-abdominal area, the wounds had a circular shape with approximately 15 cm in diameter exposing the underlying muscle layers, peritoneal cavity, and some organs. Bleeding was not observed.

The skin flaps were severed using surgical disposable scalpel size 20. The abdominal cavity was flushed with 200 mL of an abdominal lavage solution (1% enrofloxacin [Baytril®, Bayer Corp., USA] in sterile water) using a sterile feeding tube 10FR 100 cm length (Multigate Medical Products Pty Ltd., Australia). The peritoneum was closed using simple continuous suture with a 3-0 polyglactin absorbable suture (Vicryl®). The muscular layer was closed using cruciate sutures with a 2-0 polyglactin absorbable suture (Vicryl®). The wound was flushed with sterile water followed by 5 mL of 1% enrofloxacin (Baytril®, Bayer Corp., USA), and then sprayed with 0.01% hypochlorous acid (Vetericyn® VF Hydrogel spray [Innovacyn, Inc., USA]). The procedure lasted for nearly 45 minutes. The animal was later transferred into anesthetic-free water. Within a few minutes, the animal recovered from anesthesia.

Enrofloxacin was administered at 10 mg kg⁻¹ body weight IM SID X 7D and Carprofen (Rimadyl®, Pfizer Animal Health, Australia) at 4 mg kg⁻¹ body weight SC SID X 3D. The surgical site was irrigated by sterile saline irrigation, dried by sterile cotton gauze, and then sprayed with 0.01% hypochlorous acid (Vetericyn® VF Hydrogel) QID X 10D.



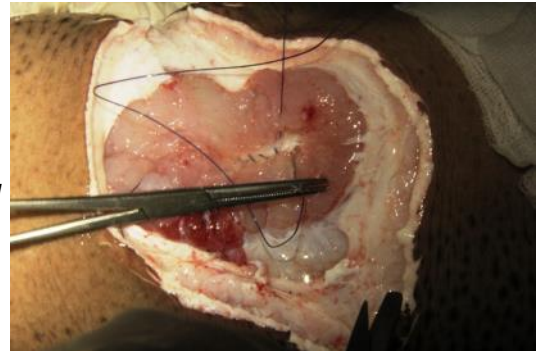
Injured Giant Moray with severe traumatic abdominal rupture. The avulsion exposed the underlying muscle layers, the peritoneal cavity, and some organs.



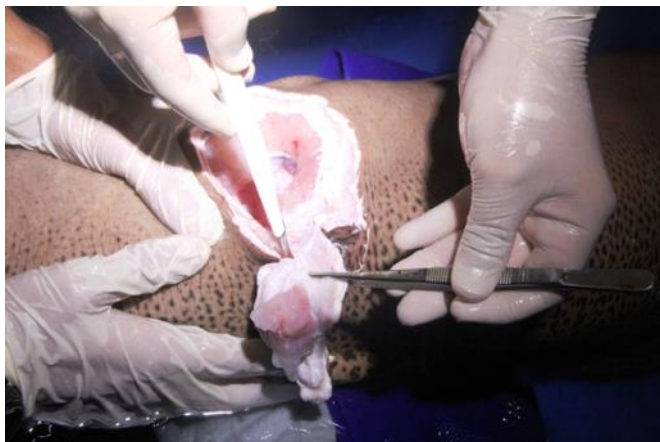
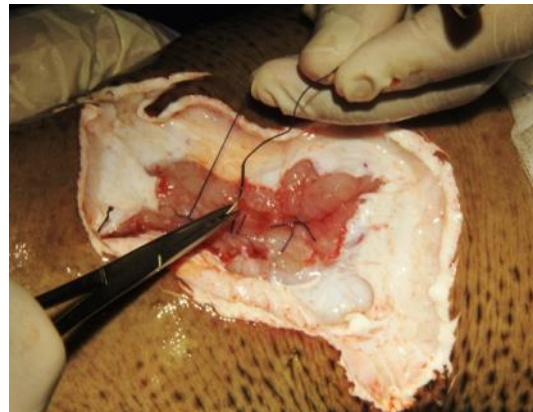
A catheter was used to perform abdominal lavage.



Closure of the peritoneal cavity.



Apposition of the muscular layer



The dangling skin flap was severed.

Right: The skin was left to heal by secondary intention.



RESULTS

No signs of infection and bleeding were observed at the surgical incision site. Tissue regeneration (as evidenced by granulation tissue formation and vascularization) were also seen, and the wound was completely healed at 21 days. The animal started feeding on its own two months after surgery.



Seven days post-surgery



Ten days post-surgery



Three weeks post-surgery

DISCUSSION

The avulsion was apparently caused by a bite from another moray eel in the exhibit. Bite wounds are a common clinical finding in moray exhibits. When the injury is minor, it can be left alone to heal on its own. However, medical intervention may be necessary for severe cases to prevent sepsis.

Enrofloxacin is a fluoroquinolone broad-spectrum bactericidal antibiotic which is reported to be effective in treating aquatic animals. Post-operative treatment using Enrofloxacin via intramuscular injection can cover opportunistic bacterial infection. Caprofen is a non-steroidal anti-inflammatory drug (NSAID) that veterinarians prescribe as treatment for short-term post-operative pain and inflammation. Carprofen reduces inflammation by inhibition of COX-2 and other sources of inflammatory prostaglandins. The use of NSAIDs for pain relief in aquatic animals has not been established at this time. Nevertheless, Caprofen has been used previously as a pain killers in Cownose Rays.

Overcrowding of moray eels in this exhibit may have led to aggressive behaviors. Reduction of the moray eels population in that exhibit and addition of hiding places has helped to prevent further aggression brought about by territoriality.

CONCLUSION

Intramuscular antibiotic administration and subcutaneous Caprofen administration is a good option for preventing secondary bacterial infection at post-surgical incision site in giant moray eel and to reduce pain and inflammation. This report may be a valuable to fish veterinarians who experience similar conditions.



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No other place brings you closer to a more diverse collection of marine life than the Open Ocean experience. This magical realm is home to gentle giants of the sea including the leopard shark, goliath grouper, saw fish, mahi mahi and a never-before-seen squadron of magnificent manta rays.

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The warm waters of the Arabian Sea and the Persian Gulf make up one of the largest marine sanctuaries in the world. Viewed from the rugged and harsh Rocky Shore of the Gulf, you will encounter blue-spotted stingray and be mesmerised by schools of glistening sweeper and silver batfish.

Red Sea

Often called the "rainforest of the sea", the Red Sea is home to a diverse range of soft and hard corals because of its warm waters and high salt content. Watch in wonder as warm-water fish like fairy basslet, yellow boxfish, orange striped triggerfish, fire shrimp and long-horned cowfish swim amongst sea fans and corals.

East Africa

As you travel across the Great Lakes of East Africa, be awestruck by the tremendous diversity of fish, many of which evolved within the lakes and are found nowhere else in the world. The two freshwater lake habitats of Africa, Lake Victoria and Lake Tanganyika, are home to the African cichlids.

South China Sea

The colourful bright stripes on the lionfish serve as a warning to all, as they swim by confidently displaying their poisonous outstretched barbs. The moray eel habitat is not to be missed. Kids can crawl into a "cave" and pop their heads through a dome for up-close views of the moray eels in their niches and crevices.

Shark Seas

Be transported right into an exciting world of various shark species. There are many that you will see for the very first time together with endangered species such as the scalloped hammerhead shark, the powerful and aggressive silvertip shark, and the sandbar shark.

For enquiries regarding S.E.A. Aquarium, please contact Guest Services:

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AQUATIC VETERINARY ABSTRACTS: FISH IN PUBLIC AQUARIUMS

Compiled by David Scarfe

Disseminated Fungal Infection in Two Species of Captive Sharks

Marancik DP, AL Berliner, JM Cavin, TM Clauss, ADM Dove, DA Sutton, BL Wickes & AC Camus (2011).

J. Zoo Wildlife Med., 42 (4): 686-693.

Abstract

In this report, two cases of systemic mycosis in captive sharks are characterized. These cases were progressive and ultimately culminated in terminal disease. *Paecilomyces lilacinus*, an uncommon pathogen in human and veterinary medicine, was associated with areas of necrosis in the liver, heart, and gill in a great hammerhead shark (*Sphyrna mokarran*). Fungal growth was observed from samples of kidney, spleen, spinal fluid, and coelomic cavity swabs.

Dual fungal infection by *Exophiala pisciphila* and *Mucor circinelloides* was diagnosed in a juvenile zebra shark (*Stegostoma fasciatum*). Both fungi were present in the liver, with more severe tissue destruction associated with *E. pisciphila*. *E. pisciphila* also produced significant necrosis in the spleen and gill, while *M. circinelloides* was associated with only minimal tissue changes in the heart. Fungal cultures from liver, kidney, and spleen were positive for both *E. pisciphila* and *M. circinelloides*.

Identification of *P. lilacinus* and *M. circinelloides* was based on colonial and hyphal morphology. *E. pisciphila* was identified by sequence analysis of the 28S rRNA D1/D2 region and the internal transcribed spacer (ITS) region between the 18S and 28S rRNA subunit.

These cases, and a lack of information in the literature, highlight the need for further research and diagnostic sampling to further characterize the host-pathogen interaction between elasmobranchs and fungi.

Mixed Metazoan and Bacterial Infection of the Gas Bladder of the Lined Seahorse—A Case Report

Anderson PA & BD Petty (2013).

J. Aquatic Anim. Health, 25 (1): 42-52.

Abstract

Five wild-caught Lined Seahorses (*Hippocampus erectus*) from an aquarium system presented with altered buoyancy and distended upper trunks. Radiography of one specimen revealed a reduced air volume in the gas bladder. Pneumocystocentesis revealed a brown exudate of numerous leukocytes, parasite ova, and Gram and acid-fast-positive bacilli under wet mounts and stains.

Necropsies revealed enlarged, friable kidneys and distended gas bladders containing copious purulent exudate, necrotic tissue, and adult digeneans *Dictysarca virens*.

Bacterial isolates from exudate cultures grown on Lowenstein–Jensen medium were identified as *Gordonia* sp. and *Mycobacterium poriferae* by high-performance liquid chromatography and 16S ribosomal DNA sequencing.

Histopathology demonstrated a histiocytic response in kidney and gas bladder exudate, inflammation of the gas bladder wall, and infection of the gas bladder lumen with parasite ova and acid-fast-positive and Gomori's methenamine silver-positive bacilli.

Praziquantel is prescribed for digenean infections but dissolves incompletely in seawater and is toxic to this host. Eradication of intermediate host vectors is a management option. Treatment of *Gordonia* infection has not been addressed in nonhuman animals, and there is no known effective treatment for *Mycobacterium* spp. infection in fishes.

This is the first case report of digenean infection of the gas bladder in a syngnathid, *Gordonia* sp. infection in a nonhuman animal, and *M. poriferae* infection in a fish.

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<http://www.wavma.org/CertAqV-Pgm>.

Know Your Fishes

Mummichog



Mummichog is a relatively small fish that belongs to the family Fundulidae (killifishes and topminnows). The family includes 4 genera and about 37 species, but most are found in the *Fundulus* genus. The Seafood List records 3 species with the market name killifish, including the Mummichog (*Fundulus heteroclitus*), marsh killifish (*Fundulus confluentus*) and the striped killifish (*Fundulus majalis*); however, there are also other related families of killifish species (e.g., Cyprinodontidae). It is also believed that there may be 2 subspecies of mummichog: *Fundulus heteroclitus macrolepidotus* is considered to be the northern form of the species that is distinguished from *F. heteroclitus heteroclitus* by egg structure and spawning behavior. The species is not a highly sought food fish, but has some research interest for embryological, physiological, and toxicological studies and other utilization value.

Physical Description

Max length: 15.0 cm TL male/unsexed;

Common length: 8.9 cm TL male/unsexed;

The mummichog is sexually dimorphic. Breeding males can be distinguished from females by their more brilliant and intense pigmentation. Males also have vertical stripes along the sides, not found in females. Females, in general, tend to be paler than males. Very small fish of both sexes have dark transverse line on their sides, which disappear as they mature. Species color can vary by environment.

Mummichogs are benthopelagic and can be found in both fresh and marine environments along the western Atlantic Ocean from Canada to north-eastern Florida, including the lower Chesapeake and Delaware bays. They are a shallow living fish, found mostly in saltwater marshes and tidal creeks. They are a hardy species and can survive in most habitats. They travel in large schools that may contain hundreds of individuals. They are able to breathe air when out of water. They are often caught in seines and traps and sold as live bait. Commercial landings for mummichogs are modest, usually 1 to 2 tonnes per year, (latest landing data tables are available in the forthcoming 2017 edition). Most have usually been caught in the Long Island Sound area. The species is commonly found in many locations and is not presumed to be endangered.

Mummichogs are used as bait and as a food fish. They are considered an underutilized species and have been tested cooked in cans as a sardine-like product (Univ. of Delaware). They might qualify as pet food as well.

The mummichog can also be used as an environmental marker as it is sometimes the only species that can survive in polluted and/or oxygen-deprived waters. Its unique biology has made it valuable for classroom teaching and scientific experiments.

Mummichogs become sexually mature at two years and typically live for three years. Mummichog are oviparous; they spawn on new and full moons in the spring and summer, laying eggs near the high tide line in empty shells or dead vegetation. They are omnivores, feeding on plant matter and preying on benthic invertebrates, worms, fish eggs and small fish and are preyed on by bluefish, striped bass, sharks, and rays.

See more on killifishes, morphology, life cycle and commercial importance in the forthcoming new edition of **The Commercial Fisheries of the United States and Canada** (2012 edition out of print. 2017 edition coming soon: www.CMPpublications.com/).

CMP Publications is not affiliated with any particular environmental agendas. Our goal is simply to provide what we believe to be relevant information on topics of marine or fisheries concern and advances in science that might affect these topics.

Ornamental Fishes and Aquatic Invertebrates: Self-Assessment Color Review, Second Edition

By Gregory A. Lewbart

Paperback

September 2, 2016

by CRC Press \$35.16

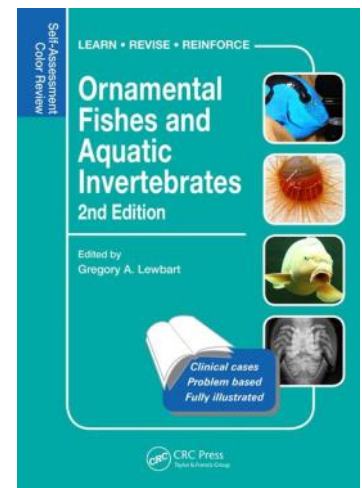
Reference -

236 Pages

366 Color

ISBN 9781482258868

CAT# K24157



This is a new edition in the Self-Assessment Colour Review series that covers ornamental fish. It includes 200 colour illustrated cases in random order, as they would be presented in practice. It presents questions based on each case with answers that fully explore the disease/disorder. This new edition contains 250 new cases. The book should appeal to candidates preparing for examinations and to practitioners in their continuing education.

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The Aquatic Veterinarian is meant to be read as a 2-page spread (like a paper magazine!). To view it this way on your computer, open the pdf document using Adobe Acrobat or Adobe Reader, then go to the menu bar at the top of the computer screen and click on View, then Page Display, then Two Page View. That will allow you to scroll through the issue seeing the cover page by itself first, followed by two pages side by side for the rest of the issue. Doing this, you will be able to see the Centerfold picture in all its ginormous glory!

Rambo the pet alligator can stay, Florida officials say

LAKELAND, Fla. (AP)

A Florida woman is being allowed to keep her 6-foot-long pet alligator at home following a fight with state wildlife officials over the growing size of the reptile. A spokesman for the Florida Fish and Wildlife Conservation Commission said Thursday that the agency had reached an agreement with Mary Thorn, allowing her to keep her 125-pound reptile named Rambo at home. Wildlife officials say alligators that measure more than 6 feet must have 2.5 acres of land.

Rambo has earned local celebrity status in Lakeland, which is located between Tampa and Orlando. The alligator has been with Thorn for more than 11 years and wears clothes. Rambo was recently seen wearing a Santa hat.

Woman bitten by crocodile while trying to take selfie with it

By Jared Leone
Cox Media Group

A crocodile bit a woman on the thigh after she fell trying to take a selfie with the carnivorous reptile at a national park in Thailand. Benetulier Lesuffleur, 41, was with her husband visiting Khao Yai National Park when they ignored warning signs and walked off a designated path to take a photo with the sunbathing crocodile, Metro reported.

Did you know?

WAVMA maintains an aquatic vet video library.

Currently the videos cover a wide range of topics, including surgical procedures, diagnostic methods and guidance on how to be an aquatic veterinarian.

The videos can be accessed at:

<http://www.wavma.org/WAVMAs-Aquatic-Vet-Video-Library>

In addition, if you have a video that you would like to make available to other WAVMA members, kindly contact

WebAdmin@wavma.org.



New website catalogs thousands of deep-sea animals and seafloor features
by **Judith Connor**

A new online tool makes it easy for anyone to search a treasure trove of information about deep-sea animals and scientific observations. The [Deep-Sea Guide](#), created by the Monterey Bay Aquarium Research Institute (MBARI), provides easy access to the institute's database of millions of records of deep-sea animals, seafloor habitats, geological features, and research tools. Previously only available for internal use, the Deep-Sea Guide is now available for scientists and the general public.

MBARI sent its first remotely operated vehicle (ROV) equipped with a video camera into Monterey Bay in 1988. Since then MBARI has recorded over 24,000 hours of underwater video, along with related information such as water depth, temperature, and oxygen concentrations. With all this data and video flowing in, researchers needed a way keep track of everything that was recorded and to make the information accessible and useful for continuing scientific study.

MBARI video analysts and software engineers responded to this challenge by developing the Video Annotation and Reference System (VARs)—a software package that technicians use to annotate video, describing animals and other objects recorded during ROV dives. What began as a box of notes and Polaroid prints of common deep-sea animals eventually developed into a rich electronic reference guide. As of November 2015, the VARs database held nearly five million annotations.

At the heart of the Video Annotation and Reference System is the knowledge base—a catalog of biological, geological, and technical terms that allows researchers to describe the underwater scenes quickly and consistently.

The Deep-Sea Guide contains a wealth of images of seldom-seen deep-sea animals. The Deep-Sea Guide allows anyone to search for concepts from the VARs knowledge base. A user can search for a particular deep-sea animal by its common name or by its Latin name, or even for groups of animals, geological features, or research tools.

The results of a search using the Deep-Sea Guide can include images, physical descriptions, and range information, as well as graphs of the depths and times of year the animal or object was observed.

<http://phys.org/news/2016-01-website-thousands-deep-sea-animals-seafloor.html>

The critical role sea otters play in the environment
By **Mallory Gianola**

Take a deep breath! Do you smell the ocean? Maybe not, but scientists agree there's oxygen from ocean plants in every breath we take. And there's a good chance you have sea otters like Ellie to thank. Most of Earth's oxygen comes from ocean plants, called phytoplankton. Kelp forests are also some of the most efficient absorbers of carbon dioxide known to conservation researchers. Sea otters play a critical role in these marine ecosystems by keeping sea urchin populations in check, allowing kelp forests to flourish. Healthy kelp forests support thousands of other organisms, amplifying their positive effect.

When Shedd Aquarium rescued sea otter pup Ellie earlier this year, adoring fans called her "cuddly" and "cute," but don't let her looks fool you. She's a climate-change champion too!



By donating to support #AnOtterYear of care for Ellie, you can contribute to Shedd Aquarium's expanding body of knowledge on sea otters.

Click on this link [to contribute to Shedd's expanding body of knowledge on sea otters](#).



Onetime Navy seal dies at National Zoo

By **Christina Barron**

November 10, 2016

The National Zoo lost one of its gray seals: Selkie, part of the American Trail exhibit, died at age 43. Selkie was among the oldest zoo residents. But her age wasn't noteworthy just in Washington. Selkie was the oldest gray seal "living in human care," according to zoo officials. Female gray seals often live close to 40 years old in zoos but only 25 to 30 years in the wild. In her youth Selkie was part of a secret government program.



(Chelsea Grubb/Smithsonian's National Zoo)

Selkie was born in Iceland and spent her early years in a secret program at the Naval Ocean Systems Center in San Diego, California. A real-life Navy seal, she was trained to retrieve equipment from the ocean floor. She also learned how to use a screwdriver and turn a large wheel valve. In 1979, the Navy stopped working with animal seals (Human SEALs are part of a special Navy combat unit). Selkie and a male seal named Gunnar were sent to the National Zoo. After arriving in Washington, she and Gunnar had four female pups. Pups Kara and Kija, along with granddaughter Rona can be seen on American Trail. Gunnar died in 2012.

In recent years, Selkie was unable to see because of cataracts. She often used ramps to get out of the pool. For the past several months, zookeepers and veterinarians had been watching growths on her abdomen, according to a zoo statement. She had an exam Tuesday but had seemed to recover well and behave normally. Doctors will look into how and why Selkie died, the zoo said.

https://www.washingtonpost.com/lifestyle/kidspost/onetime-navy-seal-dies-at-national-zoo/2016/11/10/df50a9a-a775-11e6-ba59-a7d93165c6d4_story.html?utm_term=.6b4cb33d73c6&wpisrc=nl_sb_smartbrief

Unknown virus or toxin likely killed Aurora the beluga says Vancouver Aquarium

By **Karin Larsen**, [CBC News](#)

Nov 28, 2016



The Vancouver Aquarium's beluga Aurora swims in her enclosure in January 2012. (Meighan Makarchuk/Vancouver Aquarium)

A virus or toxin was likely responsible for the death of Aurora the beluga whale Vancouver Aquarium staff revealed, although early necropsy results are inconclusive as to a specific cause of death. Chief veterinarian Dr. Martin Haulena did say significant liver damage was detected in the 30-year-old female beluga.

"The liver was dramatically compromised, although interestingly enough that did not show up on any blood work that we did on Aurora, and we had blood work done every day," said Haulena. "The most likely culprit for this is a virus or a toxin given the course of disease and the lack of significant findings in clinical diagnostics [and] early postmortem results," he said.

Aurora died Nov. 25, nine days after the death of her 21-year-old calf, Qila — the first beluga whale conceived and born in captivity at a Canadian aquarium.

Vancouver Aquarium president Dr. John Nightingale says it appears the deaths are connected.

"We're still seeking clarity as to why the two whales displayed similar symptoms during the very sudden onset of their illnesses," he said.

Haulena says early test results have ruled out bacteria and fungus as a cause of death, and tissue testing continues at numerous locations in Canada and the U.S.A.

Haulena also said the beluga pool would remain empty until the aquarium could determine how the whales died. The Vancouver Aquarium has six belugas on loan to other marine facilities.

"We will leave no stone unturned," he promised.

<http://www.cbc.ca/news/canada/british-columbia/unknown-virus-or-toxin-likely-killed-aurora-the-beluga-says-vancouver-aquarium-1.3870728>

Snooty: The Oldest Manatee Living in Captivity

By **Kacey Deamer**

October 22, 2016



Sixty-eight-year-old Snooty is the oldest manatee living in captivity. Photo Credit: Guinness World Records.

Snooty is now the world's oldest manatee living in captivity, the Guinness World Records recently announced. The sea cow was brought to South Florida Museum as an 11-month-old calf in 1949. Now 68 years old, Snooty has earned the world record title.

"We felt it was important to apply on Snooty's behalf, because we wanted people to understand that manatees can live for a long time," Marilyn Margold, director of living collections at South Florida Museum, said in a video for the Guinness World Records. "Taken proper care of, paying attention to their habitats, those things can help with their longevity. They are hearty animals overall."

Though they may look hearty, most manatees living in the wild die before they reach the age of 10. Algae blooms, fishing debris and boat strikes threaten these gentle giants, which are listed as "vulnerable" by the International Union for Conservation of Nature (IUCN).

According to the Florida Fish and Wildlife Conservation Commission, which monitors manatee populations, the oldest wild manatee in Florida was 59 years old, with the next oldest having reached 48 years old.

Snooty's longevity is credited to the fact that he lives in a controlled environment, a 60,000-gallon (230,000 liters) pool he shares with two other manatees at South Florida Museum.

The manatee breeding program at the museum offers visitors an educational opportunity to see that manatees do have personalities and a level of intelligence, Margold said.

<http://www.livescience.com/56593-oldest-manatee-living-in-captivity.html>

Pregnant manatee scooped from the waters off Cape Cod in September released in Florida.

By **Mary Ann Bragg**

Washburn, the pregnant manatee scooped from the waters off Cape Cod in September, swam away easily when released from a boat ramp at River Breeze Park in Oak Hill, Florida.

"She's been a really good girl," SeaWorld veterinarian Lara Croft said a few minutes before a team of 12 people carried the blue tarp that held the now 890-pound manatee into the water. Manatees, which are mammals, breathe air and are able to be out of the water for several hours, although they need to have their skin wet down, Croft said.

Manatees typically don't thrive in waters below 68 degrees, and pictures at the time of Washburn's rescue showed symptoms of cold stress syndrome, Croft said. The animal's pale color, her thinness and her tendency to stay near the water's surface were all signs of distress, she said. Her pregnancy was discovered by veterinarians at Mystic Aquarium. On Oct. 18, the manatee was flown by the U.S. Coast Guard to Orlando, Florida, and then taken to SeaWorld, where she stayed for further care for a little over two weeks.

"We really fed her up," Croft said of the manatee's weight gain of 90 pounds during her rehab at Mystic Aquarium and at SeaWorld. "That's a great sign."

The Sea To Shore Alliance, based in Sarasota, Florida, will monitor the manatee's progress as part of their East Coast manatee study group, said Teresa Calleson of the U.S. Fish and Wildlife Service.

"She's been a bit of an ambassador for her species," Calleson said about the manatee's popularity. SeaWorld's live video had 24,000 views on Facebook in the early afternoon Tuesday. There are about 6,500 manatees in the Southeastern U.S. and Puerto Rico. They are protected under the federal Endangered Species Act and the federal Marine Mammal Protection Act.

Follow Mary Ann Bragg on Twitter:
[@MaryAnnBraggCCT](https://twitter.com/MaryAnnBraggCCT).

For full article, see:

<http://www.capecodtimes.com/news/20161101/manatee-captured-off-cape-released-in-florida>

The pregnant manatee rests on a tarp just before its release in Florida.

Photo courtesy of SeaWorld.



Researchers Probing the Beneficial Secrets in Dolphins' Proteins

by Medical University of South Carolina
10/14/2016



Dolphins may help researchers find a way to protect humans' kidneys during a heart attack, stroke or acute kidney injury. Photo: MUSC.

Why reinvent the wheel when nature has the answer? That's what researcher Michael Janech of the Medical University of South Carolina has found to be true, drawing from the field of biomimicry where researchers look to nature for creative solutions to human problems.

In Janech's case, his natural inspiration is coming from dolphins who seem to have protective proteins that may contain clues to treatments for aging-associated diseases in humans. A recent study published in Nature's *Scientific Reports* September 26 issue found dolphin serum contains very high levels of an antioxidant protein.

Janech, director of MUSC's Nephrology Proteomics Laboratory, said he was surprised by the finding and excited about how this might be used in future studies to help humans. Dolphins survive dives that deprive vital organs of oxygen without causing damage and that for humans would be lethal. During dives that can last as long as 90 minutes, marine mammals restrict blood flow to their kidneys, liver, heart and lungs to shunt more oxygen to the brain.

When marine mammals resurface, oxygenated blood flow is restored to those organs without the organs suffering damage. In humans, though, the same phenomenon of hypoxia or being deprived of oxygen followed by re-oxygenation, such as experienced during heart attack, stroke and acute kidney injury, causes the release of free radicals thought to damage human organs. Janech, a kidney researcher and expert in proteomics, was curious what gives dolphins this advantage.

Proteomics is the study of all proteins that are encoded by the genes, he said. "We attempt to analyze all the proteins at once rather than individual proteins at one time in a cell or a tissue or an organism. It's just like genomics - when people are looking at 20,000 genes and seeing if they are high or low in certain disease states. We're doing the same thing with certain proteins." That's no small feat.

"There are more than 100,000 protein variants, but each protein can be modified. We have more than a million different protein variants based on modifications."

Because the diversity of proteins is so large, researchers usually require mass spectrometers that perform at high resolution, allowing investigators to accurately determine the identity of proteins and other molecules of interest. This expertise came in handy in how the current study came about.

While Janech was working with the Marine Mammal Center in Sausalito, California, and the National Marine Mammal Foundation in San Diego, California, to identify biomarkers in sea lions affected by toxic algae blooms on the west coast, he learned that some of the managed dolphins in the U.S. Navy Marine Mammal program were living much longer than wild ones.

They were developing insulin resistance and fatty liver disease as they aged, a process consistent with the development of metabolic syndrome in people. This observation presented a rare opportunity.

"That's not a model that anybody sees in nature, because dolphins usually don't get this old in nature," said Janech.

Janech joined forces with Stephanie Venn-Watson, director of the National Marine Mammal Foundation's Translational Medicine Research Program in San Diego, and Randall Wells, director of the Chicago Zoological Society's Sarasota Dolphin Research Program in Florida. Venn-Watson is a veterinary expert of the Navy's managed dolphin populations, while Wells is an internationally respected expert of wild dolphin biology. Together the group is attempting to determine the cause for insulin resistance in managed dolphins, and then use knowledge of human and dolphin similarities to find clues for treating the condition in both species. With funding provided by the Office of Naval Research, the Janech laboratory began to track adiponectin in the serum of the managed and wild bottlenose dolphin populations.

Levels of adiponectin, an insulin-sensitizing hormone, were predicted to be different in managed dolphins with metabolic syndrome in comparison with those in the wild. In order to verify the relevance of their work to human metabolic syndrome, they also performed simple proteomic analyses in human and dolphin serum samples.

Given that the major proteins in mammals are constant across species, they expected the highest concentration of proteins to be similar in both species. What they found when they looked just below the threshold, however, was surprising, he said.

Eleven proteins were at least 100-fold more prevalent in dolphin serum than in humans. At first, the group wrote this off as a difference in genetic ancestry: at some phylogenetic branch in the evolutionary tree of development, some mammals branched off and developed into two-toed ungulates and some went on to become primates.

Bottlenose dolphins are mammals descended from even-toed ungulates such as pigs, deer, and giraffes. To check that this was the case, they also mapped the serum proteome of the pig, and were again surprised. The 100-fold rank differences in 5 of the proteins, including vanin-1 and adiponectin, could not be explained away by simple phylogenetic differences.

While adiponectin is known to be higher in dolphins, as a way to control glucose storage during feeding, very high vanin-1 was a novel finding. Interestingly, excessively high vanin-1 levels were correlated with decreased liver function in the wild dolphins, which suggests they provide a protective effect in avoiding metabolic syndrome. But Janech, Venn-Watson, and Wells also noticed another potential need for vanin-1. The function of vanin-1 is to make vitamin B5 and in doing so it releases an antioxidant that has been shown to protect tissues from injury like that which occurs after the hypoxia and re-oxygenation of diving and resurfacing.

The question is if this could work also to help humans resist the hypoxia that causes acute kidney injury, which Janech has applied for a grant to the National Science Foundation to study. He and colleagues are gathering samples from a number of different diving and non-diving marine mammals, and land-bound mammals, and mapping their proteomes as well. They have continued their current collaboration, and also included graduate students from the College of Charleston's Grice Marine Laboratory and investigators from the National Institutes of Standards and Technology at Hollings Marine Laboratory to help with their measurements.

Janech said there's much to learn from the field of biomimicry, especially paired with proteomics.

"Proteins are the workhorses of the genes. It is how the gene provides function to the cell. The action of the cell happens through the proteins. That's why we want to study the proteins. These are your enzymes," he said.

<https://www.laboratoryequipment.com/news/2016/10/researchers-probing-beneficial-secrets-dolphins-proteins>

21 animals dead at John Ball Zoo

By **Matt Vande Bunte** | mvandebu@mlive.com

The Grand Rapids Press

July 11, 2016

GRAND RAPIDS, MI – Eighteen stingrays and three bamboo sharks died overnight at John Ball Zoo, the zoo announced. A mechanical malfunction that left the Stingray Lagoon pool low on oxygen is the likely cause of death, according to zoo officials. A circuit malfunction caused one of two pumps for the pool to shut down, zoo officials said. A backup alarm that could have alerted zoo staff to the problem also failed to work, the zoo said.

"We are currently performing a thorough investigation to confirm the cause of this tragic incident as well as a comprehensive system review of all the zoo's aquatic life support systems," said Andy McIntyre, the zoo's chief administrative officer, in a prepared statement.

The stingray pool is one of the more interactive exhibits at the zoo, giving visitors a chance to touch the animals in the water. A new stingray exhibit is part of a new master plan for the zoo.

The Zoo is currently discussing the best way to honor and memorialize these amazing special animals who brought so much joy and amazement to so many people. We appreciate the support of our members, donors and community as we work through this difficult situation.



Zoo visitors check out the stingray lagoon at the John Ball Zoo in 2006.



MEETINGS OF INTEREST TO AQUATIC VETERINARIANS

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

2017 AQUAVET® I & II & III

The College of Veterinary Medicine at Cornell University is pleased to announce the 2017 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, Rhode Island, USA in June 2017 and one on aquarium medicine held in three venues.

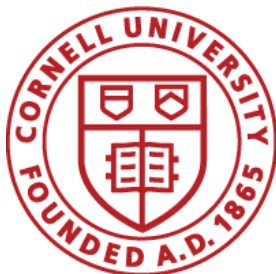
AQUAVET® I: An Introduction to Aquatic Veterinary Medicine is a 4-week course (28 May - 24 June 2017) intended primarily for veterinary students.

AQUAVET® II: Comparative Pathology of Aquatic Animals is a 2-week course (28 May - 10 June 2017) 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: 25 June - 30 July 2017) and is limited to a small number of students. The venues include GA Aquarium, U of GA and Dolphinaris, Cancún, México.

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

More detailed information and applications for admission (due by January 15, 2017) are available on the web site www.aquavet.org.



4th International Symposium on Ranaviruses

June 7-10, 2017
Budapest, Hungary



Planning is currently underway for the 4th International Symposium on Ranaviruses, which will take place from June 7th to June 10th, 2017 in the beautiful city of Budapest, Hungary. The venue of the meeting is the historical campus of the University of Veterinary Science, in the heart of the city of Pest. The meeting will include a joint day with the 10th International Symposium on Viruses of Lower Vertebrates (ISVLV), which will take place from June 4th to 7th. Field trips are planned at the end of the meeting, with excursions to nearby local nature reserve areas.

Check out the conference website at <http://www.rana-2017.com/>

If you have any questions or want to help, please contact Rachel Marschang
(marschang@laboklin.com <<mailto:marschang@laboklin.com>>)

All the best,
Dr. Amanda L. J. Duffus, BSc.H. (SSP, Biology), MSc., Ph.D.
Associate Professor of Biology
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Office: Instructional Complex (IC) 227

Web Page: <http://www.gordonstate.edu/Faculty/aduffus/>



Aquatic Veterinary e-Learning
Supporting WAVMA's WebCEPD, PubCEPD
CertAqV & Clinical Cases Programs.

Aquaculture America 2017

Feb. 19-22, 2017
 San Antonio, Texas, USA



AA 2017 returns to one of the favorite tourist spots in the world for the only [major national aquaculture conference](#) and [exposition](#) held in the U.S. The U.S. Aquaculture Society (formerly U.S. Chapter of WAS) joins with National Aquaculture Association and the Aquaculture Suppliers Association to produce the annual Aquaculture America meetings. These sponsors are joined by the annual meetings of Aquacultural Engineering Society, American Tilapia Association, Striped Bass Growers Association, US Trout Farmers Association, US Shrimp Farming Association and many more associations to make Aquaculture America 2017 the one meeting in the U.S. that you don't want to miss! www.was.org. See schedule on pages 60-61.

5th Euro Global Summit on Aquaculture & Fisheries

March 30-April 1, 2017
 Madrid, Spain

The theme is "Recent Advances in Aquaculture & Fisheries". Luci Radcliff, Program Manager, Aqua Europe-2017, 2360 Corporate Circle, Suite 400, Henderson, NV 89074-7722, USA.

World Aquaculture 2017

June 27-30, 2017
 Cape Town, South Africa

The International Aquaculture Conference and Exhibition in 2017 will be held in Cape Town, South Africa. This is the International Annual event organized by the World Aquaculture Society and moving around the globe. WA17 brochure [here](#).

The WA17 committee likes to invite all African producers and other Aquaculture associations to hold their annual meeting, to organize an industry session, during WA17. Please contact Mario@marevent.com for more information.

Time to submit [your abstract](#). [Booths](#) available, just contact mario@marevent.com.

Asian-Pacific Aquaculture 2017

July 25-27, 2017
 Kuala Lumpur, Malaysia

Asian-Pacific Aquaculture 2017 is the place to learn about the latest in aquaculture, see the newest technology in the trade show with exhibits from around the world and enjoy the many tourist sites in Malaysia. APA 2017 will have a large exhibition featuring international companies showcasing the latest in products,

services and all aquaculture related information. Click here for [more details](#).

Don't miss this opportunity to see the items that will enhance your aquaculture operation. [Booths](#): contact: mario@marevent.com.

More info on www.was.org.



World Small Animal Veterinary Association

September 25-28, 2017
 Copenhagen, Denmark
<http://www.wsava2017.com/>

The WAVMA Annual General Meeting

September 13th, 2017
 Plaza Hotel, Piata Trandafirilor 46-47,
 Tirgu Mures 540053.
<http://wavma.ro/>

Aquaculture Europe 2017

October 17-20, 2017
 Dubrovnik, Croatia

EAS and our Aquaculture Europe 2017 event will be held in Dubrovnik, Croatia from October 17-20 next year. We will very soon be making the web page for AE2017. Meanwhile you can see the AE2017 brochure at http://www.easonline.org/images/stories/Meetings/AE2017/AE2017_flyer_web.pdf. Kind regards, Alistair Lane - Executive Director, European Aquaculture Society



World Veterinary Congress to be an Annual Event

In its July conference call, the WVA Council approved the proposal from the Standing Committee for the World Veterinary Congress to hold the WVC as an annual event. Following the 33rd World Veterinary Congress that will take place in Incheon, Korea on 27-31st August 2017, the WVA Council agreed to hold the 34th WVC in Barcelona, Spain in April 2018. WVA and Korean Veterinary Medical Association already started to prepare the WVC in Korea in 2017.

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

Atlanta, Georgia

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 (6-8 weeks)

Baltimore, MD

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 (6-8 weeks)

Boston, MA

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.

See list of externships on the WAVMA website at:

www.wavma.org/externships



Veterinarian and MBL Scientist
MARINE BIOLOGICAL LABORATORY
WOODS HOLE, MA 02543

https://mbl.simplehire.com/postings/search?query=&query_posted_at=&387=&query_organizational_tier_3_id=any&389=&query_job_detail_lookup_job_type_id=5&commit=Search

JOB SUMMARY:

Primarily responsible for leading a marine resources service core, directing an independent research program, and providing veterinary oversight to the MBL, including IACUC leadership.

MAJOR DUTIES:

Lead a marine resources service core and be an active participant and collaborator in research efforts related to marine organisms at the MBL.

Serve as the Attending Veterinarian for the institution as outlined in the USDA Animal Welfare Act (AWA) and Public Health Service (PHS) Policy. Assist in assuring regulatory compliance and participate in IACUC activities.

Oversee clinical care to a wide variety of marine, aquatic, and vertebrate animals; assist in rodent colony health management.

Train vivarium staff and research personnel.

Provide consultation and collaborative support to MBL staff and scientists.

Perform other duties as required and/or assigned.

SKILLS REQUIRED:

Leadership skills, excellence in verbal and written communication, collegiality, and the capacity to direct a professional service center at a leading research institution. Must have an established scientific background, with appropriate research experience in marine biology, molecular biology, and/or cellular physiology.

Must be licensed to practice veterinary medicine in Massachusetts and have USDA accreditation in Massachusetts. ACLAM board eligibility or certification preferred.

EDUCATION/EXPERIENCE:

The ideal candidate will hold D.V.M. and Ph.D. (or equivalent) degrees and have at least five years of related experience. Must have an established scientific background and research experience in marine biology, molecular biology and/or cellular physiology. Experience and knowledge in the cultivation and management of a wide variety of marine organisms is highly desirable, as well as clear evidence of independent scientific productivity. Strong knowledge of regulatory issues, especially related to AWA, PHS and IACUC is required.

Aquatic Veterinary - Fish Health Manager
Employer: [Ocean Blue Sea Farms](#) (Panama)

Summary:

Operating to support Ocean Blue's revolutionary sustainable open ocean mariculture system, the veterinarian will oversee and supervise fish health monitoring, prevention, control & treatment programs; develop relationships with external service providers, including laboratories, additive suppliers, and fish health consultants; and, collaborate with the R&D Director in nutrition, genetics, vaccines, and other programs. Primary responsibilities include monitoring and diagnostic sampling of offshore and inshore sites for normal and abnormal pathology, bacteriology & histology, developing full diagnostic reports, and working with staff to develop preventive and corrective SOPs for all routine health-related procedures.

For More Information & to Apply: [Click here](#)

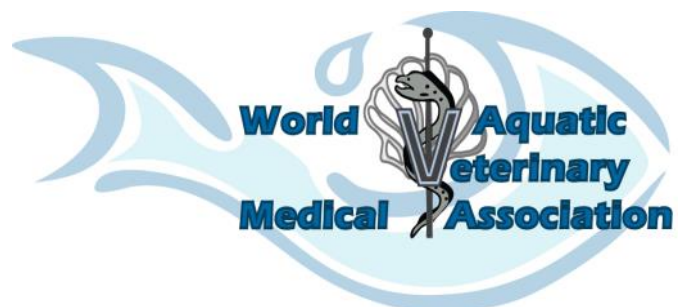
Part-Time/Relief Aquatic Veterinarian

Aquatic Veterinary Services
Santa Cruz, CA (USA)

Brief Description:

Aquatic Veterinary Services is seeking a driven, enthusiastic part-time/relief aquatic veterinarian. Our all-aquatic veterinary practice is undergoing considerable growth and we are looking for a self-motivated individual to regularly cover a few days a week, and full weeks when our chief veterinarian is out of state. This position has the potential to grow to a full-time position with the right candidate. We are a unique specialty veterinary hospital catering to fish and other aquatic patients. Our services are 90% ambulatory and 10% in-house. Given our specialty nature, we are seeking clinicians experienced with aquatic animals, preferably a WAVMA Certified Aquatic Veterinarian, although new graduates with experience will be considered. CA veterinary license required.

Please submit resume to cafishvet@gmail.com or fax to (831) 454-8175.



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WAVMA Annual General Meeting Reports

- Washington, DC, USA - July 18, 2007; AVN 1(1):1-2
- Vancouver, BC, Canada - July 27, 2008; AVN 2(3):1-6
- Seattle, WA, USA - July 14, 2009; AVN 3(3): 6-7
- Athens, Greece - July 14, 2010; AVN 4(3): 26-27
- St. Louis, MO, USA - July 18, 2011;
- San Diego, CA, USA - August 6, 2012; AVN 6(3): 5
- Prague, Czech Republic - September 18, 2013; TAV 7(3): 7, 10-11
- Denver, CO, USA - July 24, 2014; TAV 8(3): 4-6
- Istanbul, Turkey - September 15, 2015; TAV 9(4): 12-15
- San Antonio, Texas USA – August 6, 2016; TAV 10(3):12-13

**Index to WAVMA Member Profiles in the
Colleagues' Connection and Student
Committee Reports**

AVN = *Aquatic Vet News* (2007-2012)
TAV = *The Aquatic Veterinarian* (2013-2016)
SC = Student/Scholarship Committee Report
Key = Volume(Issue): Page number

Listed in alphabetical order by last name

Kurt Arden – TAV 9(3): 20 SC
Barry Baker – AVN 6(1): 6 SC
Kendra Baker – TAV 9(2): 18 SC
Meg Baker – TAV 10(1):14 SC
Elizabeth Bamberger – TAV 8(4): 19
Wes Baumgartner – TAV 8(3): 17
Brandon Boren – AVN 5(2): 6 SC
Lydia Brown – TAV 8(2): 18; TAV 8(3): 18
Hui Nee Chin – TAV 8(4): 18 SC
Lori Corriveau – AVN 3(1): 7
Brett De Poister – AVN 6(3): 6 SC
Emily Denstedt – AVN 6(2): 6 SC
Jessica Dewar – TAV 8(2): 16 SC
Kyle Donnelly – TAV 7(3): 12 SC
Devon Dublin – AVN 4(2):9; AVN 4(3):11; TAV 8(3):16
Mohamed Faisal – TAV 9(4): 24
Susan Fogelson – TAV 8(3): 14 SC
Ian Gardner – AVN 5(3): 13
John Griffioen - 10(3):15 SC
Chad Harris – TAV 8(3): 18; TAV 9(4): 25
Ashley Heard-Ganir – TAV 9(4): 20 SC
Joe Gaydos – TAV 10(4): 21
Nora Hickey – TAV 8(1): 16-17 SC; TAV 9(4): 21 SC
Rob Hildreth – AVN 2(3): 29
Elizabeth Hodges – TAV 8(3): 14-15
John Howe – AVN 6(2): 10
Sara Huckabone – TAV 8(2): 15 SC
Colin Johnston – AVN 3(3): 11
Timothy Jones – AVN 5(1): 9 SC
Kirstin Kamps – AVN 4(4): 6, SC; AVN 5(1): 7 SC;
Myron Kebus – AVN 2(4): 14-15; TAV 7(4): 12-13
David Kestenman – AVN 5(1): 18-19
Sangwha Kim – TAV 10(2): 18 SC
Ashley Kirby – TAV 9(3): 18 SC
Sarah Knowles – TAV 9(3): 23 SC
Austin Leedy – TAV 8(1): 10-12
Shelby L. Loos – TAV 9(4): 18-19 SC
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Doug Mader – TAV 10(3): 18-19
Christina McKenzie - 10(3):16-17 SC
Peter Merrill – AVN 5(2): 12-15; TAV 10(2): 19

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Jenny Munhofen – TAV 8(2): 14 SC
Michael Murray – TAV 9(3): 28-30
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Brian Palmeiro – AVN 3(2): 8
Samara Parker – AVN 5(3): 5 SC
Anna Penacchi – TAV 10(2): 17 SC
Kaylee Perry – TAV 9(3): 22 SC
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Jen Wilson-Cohen – TAV 8(3): 13 SC
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Aquaculture America: Aquatic Veterinary Medicine CEPD Session Schedule

“Aquatic Veterinary Practice & Aquaculture Production”

Aquaculture America 2017—San Antonio, Texas, USA

Tuesday February 21, 2016

Time	Speaker*	Session Topic & Presentation Title
		General Aquatic Veterinary Medicine & Animal Health (Moderator – P. Gaunt)
9:00	Angela Williamson*	PRELIMINARY INVESTIGATION TO DETERMINE A SAFE CONCENTRATION OF TRICHLORFON FOR TREATING PARASITES OF THE RAYS <i>Dasyatis sabina</i> AND <i>Rhinoptera bonasus</i>
9:15	T. Yatabe*, et al.	EVALUATION OF THE EFFECT OF SUPPLEMENTED DIETS WITH A PHYTO-PHARMACEUTICAL PREPARATION FROM HERBAL AND MACROALGAL ORIGIN ON DISEASE RESISTANCE IN FARMED ATLANTIC SALMON AGAINST <i>Piscirickettsia salmonis</i> UNDER FIELD CONDITIONS
9:30	Katie Haman*, et al	FIELD DETECTION OF <i>Renibacterium salmoninarum</i> USING A HANDHELD qPCR SYSTEM
9:45		
10:00 - 11:00 Break		Programs Assisting Veterinarians & Aquaculture Producers (Moderator P. Gaunt)
11:00	Mark Braceland*, et al.	SELECTIVE PRECIPITATION REACTION: A NOVEL DIAGNOSTIC TEST FOR TISSUE PATHOLOGY IN ATLANTIC SALMON (<i>Salmo salar</i>) INFECTED WITH SALMONID ALPHAVIRUS (SAV3)
11:15	Chris Good*, et al.	ASSESSING PERACETIC ACID AS A MEANS TO CONTROL POST-VACCINATION SAPROLEGNIASIS IN ATLANTIC SALMON PARR IN RECIRCULATION AQUACULTURE SYSTEMS
11:30	Ashley Emanuele*	WEN TRIMMING TO CORRECT BUOYANCY ISSUES IN AN ORANDA
11:45	Myron Kebus*	AMERICAN ASSOCIATION OF FISH VETERINARIANS - YEAR FIVE PROGRESS
12:00	David Scarfe*	WORLD AQUATIC VETERINARY MEDICAL ASSOCIATION PROGRAMS & SERVICES
12:15	David Scarfe*	EDUCATION, TRAINING AND CREDENTIALING OPPORTUNITIES FOR AQUATIC VETERINARIANS
12:30 - 1:30 LUNCH		Programs Assisting Veterinarians & Aquaculture Producers (Moderator D. Scarfe)
1:30	Pat Gaunt*	USING VETERINARY FEED DIRECTIVE DRUGS IN AQUACULTURE
1:45		
2:00	Jennifer Matysczak*	BE IN THE KNOW: WHAT'S NEW REGARDING DRUGS FOR AQUATIC SPECIES
2:15		
2:30	Tim Kniffen*	AN OVERVIEW OF THE CHANGES FOR VETERINARY FEED DIRECTIVE (VFD) DRUG USE & IMPLICATIONS FOR VETERINARIANS, PRODUCERS, & FEED MILLS / FEED DISTRIBUTORS IN THE AQUACULTURE INDUSTRY
2:45		
3:00 - 3:30 Break		Programs Assisting Veterinarians & Aquaculture Producers (Moderator P. Gaunt)
3:30	Ron Lane*	ELECTRONIC SOFTWARE SOLUTIONS ENABLE VFD COMPLIANCE FOR VETERINARIANS
3:45		
4:00	Speakers / Audience	VETERINARY FEED DIRECTIVES – Q&A / DISCUSSION
4:15		
4:30	Ron Lane & Tim Kniffen	Vets/Producer Signup for Wednesday one-on-one meeting with GVL/Merck for e-VFD instructions

Aquaculture America: Aquatic Veterinary Medicine CEPD Session Schedule
“Aquatic Veterinary Practice & Aquaculture Production”

Wednesday February 22, 2016

9:00-3:00	Ron Lane & Tim Kniffen	GVL/Merck to work on-on-one with individual vets & producers to demonstrate e-VFDs
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Time	Speaker*	Session Topic & Presentation Title
		Programs Assisting Veterinarians & Aquaculture Producers (Moderator: D. Scarfe)
8:30	Kathleen Hartman*	COMMERCIAL AQUACULTURE HEALTH PROGRAM STANDARDS (CAHPS)
8:45		
9:00	Kamina Johnson*, et.al.	COST-BENEFIT ANALYSIS OF COMMERCIAL AQUACULTURE HEALTH PROGRAM STANDARDS (CAHPS) PILOT PROJECTS
9:15	Alicia Morse* & Kathryn MacDonald	INTERNATIONAL MOVEMENT GUIDELINES FOR ACCREDITED VETERINARIANS REGARDING AQUACULTURE RELATED LIVE ANIMAL AND PRODUCTS
9:30		
9:45	David Scarfe* et al.	THE CAHPS “HEALTH TEAM”: OPTIMAL UTILIZATION OF LICENSED/ ACCREDITED VETERINARIANS, PARA-VETERINARY PROFESSIONALS & DIAGNOSTIC LABS
10:00 - 11:00 Break		Programs Assisting Veterinarians & Aquaculture Producers (Moderator: D. Scarfe)
11:15	David Scarfe*	HISTORY & AIMS OF THE NATIONAL VETERINARY ACCREDITATION PROGRAM
11:30	Lynn Creekmore*	NATIONAL VETERINARY ACCREDITATION PROGRAM MODULE # 15: PREVENTING DISEASE INTRODUCTION AND SPREAD IN AQUACULTURE
11:45		
12:00		
12:15		
12:30 - 1:30 LUNCH		Programs Assisting Veterinarians & Aquaculture Producers (Moderator D. Scarfe)
1:30	Kathleen Hartman*	NATIONAL VETERINARY ACCREDITATION PROGRAM MODULE # 28: SIGNIFICANT AND EMERGING VIRAL DISEASES OF CARP, KOI AND GOLDFISH
1:45		
2:00		
2:15		
2:30	Speakers / Audience	IMPLEMENTING CAHPS & NVAP PROGRAMS TO MEET THE NEEDS OF AQUACULTURE PRODUCERS – Q&A / DISCUSSION
2:45		



BREAKTHROUGH PRODUCTS FOR AQUATIC TURTLES

HABITATS



NUTRITION



ORIGINAL ITEMS



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