

# The



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*Photograph from the Florida Aquarium website.  
See articles on pages 18-23.*

Volume 13, Number 2  
Second Quarter, 2019



**WHO ARE WE**

**MISSION**

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.

**OBJECTIVES**

- A. To serve aquatic veterinary medicine practitioners by developing programs to support and promote our members, and the aquatic species and industries that they serve;
- B. To be an advocate for, develop guidance on, and promote the advancement of aquatic animal medicine within the veterinary profession and with associated industries, governments, non-governmental entities and members of the public;
- C. To develop and implement aquatic veterinary education programs, certifications and publications, including a credentialing process to recognize day-one competency in aquatic animal medicine;
- D. To foster and strengthen greater interactions among: aquatic veterinarians, related disciplines, veterinary allied and supportive groups and industries, governments and animal owners.

*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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Sharon Tiberio, Treasurer	2015-2017

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**Editor’s Note**

This edition of *The Aquatic Veterinarian* is a little delayed being released because I wanted to wait for coverage of the WAVMA Annual General Meeting, which was held in Toronto, Canada, in association with the World Small Animal Veterinary Association convention, July 15-19, 2019. See the articles on pages 7, 12 and 16 about this event.

The next issue, Volume 13:3 will be out at the end of September. Please send me your articles, clinical case reports, news items or anything of interest by early September to be included in that issue. Our fourth quarter issue will be out in December. Start working on your case reports to include in that issue as well! They will be needed by November 15th.

For the year 2020—in honor of perfect vision—at least in hindsight—I would like to revise the cover and layout of *The Aquatic Veterinarian*. I am looking to you, our members, especially student members who often have keen artistic abilities, to send me ideas, artwork, and other suggestions for a new format for our journal.

As stated in almost every issue, we need the support of all our members to keep this association going and growing!

**Nick Saint-Erne, DVM, CertAqV**  
Executive Editor  
[TAVeditor@wavma.org](mailto:TAVeditor@wavma.org)



*Dr. Nick anesthetizing a spiny pufferfish for surgery to remove abnormal growths on its right pectoral fin at the Arizona Sonoran Desert Museum, in Tucson, AZ.*

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*.

The latest editions are available for download at <https://www.wavma.org/TAV-Current-Issues>.

Past years’ editions are available for download at <https://www.wavma.org/TAV-Archives>.

**Cover Photo:**

Photograph from the Florida Aquarium website. See pages 18-23 for articles about the aquarium.



*The Aquatic Veterinarian*

**The Quarterly Magazine of the World Aquatic Veterinary Medical Association**

**Consider promoting your products, services or programs to aquatic veterinarians, veterinary students, nurses & paraveterinary professionals throughout the world**

**Advertising Rates (per issue)**

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<b>1/2 page (~7" x 4.5") or 1 column (3.5" x 9")</b>	\$60	\$30
<b>1/4 page (~3.5 x 4.5")</b>	\$30	\$15

**WAVMA Members**

Free 1/8 page (business card size) advertisement  
Contact [TAVeditor@wavma.org](mailto:TAVeditor@wavma.org) for information on advertising and payment options.

### President's Report

Dear WAVMA members,

As I informed you in my first quarterly report, my goal is to focus on WAVMA as an organization with a view of strengthening its capacity to fulfil the mandate on which it was founded. [See the Mission and Objectives on page 2 of this issue.]

I am pleased to announce that all board members have signed the Conflict of Interest declarations and all are committed to serve taking into consideration the WAVMA Code of Ethics and Code of Conduct available at: <https://www.wavma.org/media/Documents-for-download/WAVMA%20Code%20of%20Ethics%20and%20Code%20of%20Conduct.pdf>.

Further, following the call I sent out asking for Certified Aquatic Veterinarians to join the Credentialing Committee, we now have 16 active members who together are working assiduously to ensure that new applicants and applications for CertAqV renewal are dealt with expeditiously. I am heartened by this since this program is one of the most important benefits that WAVMA offers to its members.

Our student members are important and many of our full members joined WAVMA initially as student members. One of decisions taken by the Executive Board in our March meeting was to approve an Education and Students committee, formed by both full members and student members, that would see them working together on the very important issues of education, training and capacity building. I do believe that this committee could also be the beginning of important outcomes, such as mentorship opportunities within our organization. An overwhelming response to a call I sent out to the general membership and students was certainly an encouraging start. The first meeting held by the committee in April saw the election of the Chair and Vice Chair and I wish them well in the work they set out to do.

On the other hand, the board approved a restructured membership committee that would be addressing membership issues and exploring ways of increasing and improving the benefits that WAVMA members can enjoy. An essential decision was to have the committee made up of a representative of all the other committees that exist in WAVMA. This is strategic since the committee is now poised to explore membership benefits from all angles within the organization and reinforces the fact that the work of each committee needs to be done with the interest of the general membership in mind. I remain positive that these initial steps will ultimately translate into improved member services.

At this moment, we are preparing for the annual general meeting in Toronto coupled with the aquatic stream, which will be held during the World Small Animal Veterinary Association conference and the pre-WSAVA 2019 workshop event dubbed Koiprax2.

Please be reminded that as a WAVMA member you are entitled in some cases to pay the special member registration fee or be exempted from paying a registration fee for these events and I encourage members to take advantage of these offers.

As the year continues to proceed, I expect to report more on the progress that we continue to make as an organization for the benefit of all members. I thank you.

**Devon Dublin** PhD, DMVZ, MSc, CertAqV  
 WAVMA President 2019  
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*Dr. Dublin addressing the AGM in Toronto, July 2019.*

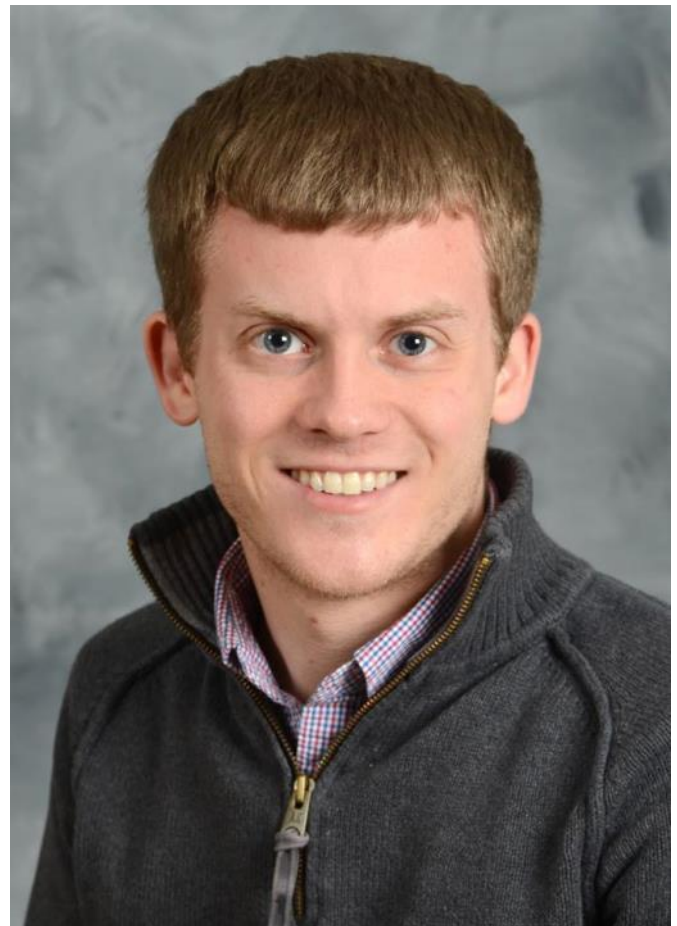
**Secretary's Report**

As you have likely noticed, the Communications Committee recently continued their efforts of updating our information systems infrastructure. This included transferring all WAVMA data to updated servers, as well as enhancements to our website security. These changes led to updates to the password requirements for WAVMA members. Stronger requirements for passwords are now in place and a more robust "forgotten password" system has been implemented.

These important changes will increase the security for our WAVMA members and serve as a springboard for future enhancements to the user interface. A sincere thanks to all WAVMA members for their patience during these changes and to our IT firm for all their work. Please reach out if you encounter any problems or have suggestions for future improvements.

As always, we welcome anyone interested in joining the Communications Committee. Please email me or the WAVMA President (President@wavma.org) if you would like more information.

**Stephen Reichley, DVM, PhD, CertAqV**  
WAVMA Secretary  
[Secretary@wavma.org](mailto:Secretary@wavma.org)



*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!

**TO SUPPORT FUTURE STUDENT SCHOLARSHIPS, PLEASE MAKE A DONATION TODAY TO THE SCHOLARSHIP FUND!**  
[WWW.WAVMA.ORG/SCHOLARSHIPS](http://WWW.WAVMA.ORG/SCHOLARSHIPS)

*Below: Cichlids from Dallas North Aquarium*



**WAVMA Annual General Meeting**

The 2019 WAVMA Annual General Meeting was held at the Stratus Hotel on July 15th, 2019 in downtown Toronto, Canada. The current president Devon Dublin discussed the progress of the association so far this year, then introduced the 2020 president Jena Questen. Good comradery was had by all.

**Nick Saint-Erne, DVM CertAqV**  
WAVMA Treasurer  
[Treasurer@WAVMA.org](mailto:Treasurer@WAVMA.org)



*Above: John Howe and Julius Tepper*

*Left: Jena Questen addresses the crowd.*

*Below: Diners view of Toronto out the window of the restaurant.*



## 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: Nick Saint-Erne, [Treasurer@wavma.org](mailto: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: Stephen Reichley, [Secretary@wavma.org](mailto:Secretary@wavma.org)

#### 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: David Scarfe, [dscarfe@ameritech.net](mailto:dscarfe@ameritech.net)

#### 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](mailto:cypcarpio@aol.com)

#### Membership Committee

This Committee oversees membership issues to optimally serve individual members and the organization. Chris Walster, [chris.walster@onlinevets.co.uk](mailto:chris.walster@onlinevets.co.uk)

#### Education & Student Committee

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

Chair: Bartolomeo Gorgoglione, [BartGorg@msu.edu](mailto:BartGorg@msu.edu)



### 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 <https://www.wavma.org/CertAqV-Pgm>).
- 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 93 aquatic veterinarians from 23 countries. Congratulations on our newest Certified Aquatic Veterinarians:

Farah GonulAydin  
Heather Barron  
Bryony Chetwynd-Glover  
Dondrae Coble  
Erika First  
Jan Linkenhoker  
Raphael Malbrue  
Victoria Maroun  
Chris Shirkey

There are an additional 48 other WAVMA members currently in the process of being certified. For more information, see the WAVMA website:

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

**David Scarfe, DVM, CertAqV**  
2019 Credentialing Committee Chair  
[dscarfe@ameritech.net](mailto:dscarfe@ameritech.net)

### Certified Aquatic Veterinarians

Jessica Allen	USA
Madison Barnes	St. Kitts & Nevis
Giana Bastos-Gomes	Australia
Jenice Bell	USA
Heather Bjornebo	USA
James Bogan	USA
Pierre-Marie Boitard	France
Erika Brigante	St. Kitts & Nevis
Michael Corcoran	USA
Emily Cornwell	USA
Rebecca Crawford	St. Kitts & Nevis
Nadav Davidovich	Israel
Darren Docherty	UK
Simon Doherty	UK
Devon Dublin	Japan
Jacqueline Elliott	USA
Ashley Emanuele	USA
Azureen Erdman	USA
Antonella Fabrissin	Italy
Ari Fustukjian	USA
Krystan Grant	USA
Miguel Grilo	Portugal
Stephanie Grimmett	UK
Orachun Hayakijkosol	Australia
John Howe	USA
Kerryn Illes	New Zealand
Jimmy Johnson	USA
Kasper Jorgensen	Denmark
Brian Joseph	Canada
Parinda Kamchum	Thailand
Fritz Karbe	Germany
Sherri Kasper	USA
Elizabeth Kaufman	Israel
Amy Kizer	USA
Jessica Koppien-Fox	USA
Jack Kottwitz	USA
Eric Littman	USA
Richard Lloyd	UK
Richmond Loh	Australia
Adolf Maas	USA
David Marancik	Grenada
Colin McDermott	USA
Matthijs Metselaar	UK
Haiitham Mohammed	Egypt
Alissa Mones	USA
Danny Morick	Israel
Ross Neethling	UK
Sally Nofs	USA
Brian Palmeiro	USA
Christine Parker-Graham	USA
Lily Parkinson	USA
Ayanna Phillips	Trinidad & Tobago
Jena Questen	USA
Atisara Rangsichol	Thailand
Aimee Reed	USA
Stephen Reichley	USA
Komsin Sahatrakul	Singapore
David Scarfe	USA
Khalid Shahin	UK
Galit Sharon	Israel
John Shelley	USA
Constance Silbernagel	USA
Melissa Singletary	USA
Esteban Soto	USA
Brittany Stevens	USA
Win Surachetpong	Thailand
Gillian Taylor	South Africa
Sharon Tiberio	USA
Greta Van de Sompel	Belgium
Claudia Venegas	Chile
Sarah Wahlstrom	USA
Scott Weber	USA
Marcus Webster	USA
Trista Welsh	USA
Peter Werkman	Holland
Howard Wong	Hong Kong
Taylor Yaw	USA
Irene Yen	St. Kitts & Nevis

### 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 the Fellows to advise the Executive Board with guidance on WAVMA 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  
Dr Nick Saint-Erne  
Dr Richmond Loh  
Dr Laura Urdes

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

As acting chair of the Fellows Committee, I would like to announce that **Dr. Laura Urdes** of Romania has been selected as our 2019 Distinguished Fellow inductee. Laura was president of WAVMA in 2017 and organized the fantastic WAVMA Conference and AGM in Romania during her tenure. She has been tirelessly working with WAVMA for many years, including as a member of the Executive Board, the Communications Committee and previously editing the WAVMA eNews emails. She is currently working with me as a co-editor of the text "Fundamentals of Aquatic Veterinary Medicine" to be published for the benefit of WAVMA. Please congratulate Laura Urdes as our newest Distinguished Fellow!

**Julius M. Tepper**, DVM, CertAqV  
Distinguished Fellow,  
World Aquatic Veterinary Medical Association

### 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](#).

### Education & Student Committee

ESC first meeting was held on 29th June 2019 as scheduled, with 23 members. The committee received and reviewed the application for the establishment of a WAVMA Student Chapter at Colorado State University. The full application package and approval recommendation letter was sent to President Dublin on 2nd July. The committee coordinated the review of a document with updated WAVMA ESC description. Chair Dr. Bartolomeo Gorgoglione coordinated ESC subcommittees for retrieving updated detailed info from each student chapter – work in progress.

The WebCEPD subcommittee is working on a list of people who could provide webinars for WAVMA to revitalize this valuable asset to our membership.

As a guideline for future requests, an event sponsorship request must include:

- Copy of proposed/confirmed program (with highlighted activities relevant to aquatic animals) and event schedule, logistic details, website (if available)
- Request from the interested WAVMA Student Chapter, illustrating the need and specifying their involvement

- Request for specification on how the event is supporting the educational aims of WAVMA, also including the potential number of attendees potentially interested in WAVMA membership

- Potential for WAVMA partnering with the event organizers (e.g. similar aims/membership)

Bartolomeo Gorgoglione, Chair  
[BartGorg@msu.edu](mailto:BartGorg@msu.edu)

### WAVMA VETERINARY SCHOOL CHAPTERS

<https://www.wavma.org/WAVMA-Student-Chapters>

There are 18 WAVMA Student Chapters in veterinary schools around the world. If you are a veterinary student, please join your school's WAVMA chapter, or start one if your veterinary school does not have one yet! Find out more about the veterinary school chapters on the WAVMA website, where you can download the WAVMA Student Chapter Guidelines to help create or run your own school's chapter.

Click here to get the [WAVMA Student Chapter Guidelines](#).

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**WAVMA Elections**

It's not too soon to think about standing for election for a 2020 officer or director on the WAVMA Executive Board. The positions of President-Elect, Secretary, Treasurer, and the Directors are up for election each year. We rely on our veterinarian members to run for positions on the Executive Board to help keep the organization moving forward. The Executive Board meets monthly via Skype and we have had board members from all around the world. It doesn't matter where you live—only that you are willing to help out! Nomination is now open and available until the end of September. To nominate yourself or another person for a WAVMA Executive Board position, go to: <https://www.wavma.org/elections>.

All of the great programs and features you get from WAVMA membership are provided by volunteers. We are always looking for more helpers, whether veterinarians, veterinary students or veterinary nurses, to join us on the committees as well. If you are not interested in running for office, but would like to provide your input and guide the future of WAVMA, join one of our committees (no previous experience necessary!). See a list of our committees on page 8. Contact our Secretary or the committee chair for more information about the committee and the dates of the next meeting (also done via Skype). All are Welcome!

Join a WAVMA Committee today!

**TO SUPPORT FUTURE STUDENT SCHOLARSHIPS, PLEASE MAKE A DONATION TODAY TO THE SCHOLARSHIP FUND!**  
[WWW.WAVMA.ORG/SCHOLARSHIPS.](http://www.wavma.org/scholarships)

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



*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](http://www.facebook.com).

[www.facebook.com/WAVMA](http://www.facebook.com/WAVMA)

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**DO YOU HAVE A STORY TO TELL ABOUT HOW YOU BECAME INVOLVED WITH AQUATIC VETERINARY MEDICINE?**  
 Send your article (<1,000 words) with pictures to [TAEditor@wavma.org](mailto:TAEditor@wavma.org).

**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](mailto:WebAdmin@wavma.org).

**Meetings Committee**

The Meetings Committee was very pleased with the response to our second Ornamental Fish Scientific session, KoiPrax2 which was held in Toronto, Canada on Monday, July 15, 2019. This follow-up to KoiPrax1, which was held in 2018, focused on the "Viral Diseases of Koi", and featured two world renowned fish veterinary virologists, Drs. Tom Waltzek of the USA and Pedro Viadanna of Brazil.

Selections from this session were recorded and will be available for members to review. Thanks to everyone who attended and to those who worked to put this event together. Planning has now begun for next year for KoiPrax3.

WAVMA also sponsored an Aquatic stream at the WSAVA 2019 conference in Toronto. These were held on July 16. Dr. Julius Tepper and Dr. Nick Saint-Erne were the speakers. Topics covered were water quality, basic diagnostic techniques, and anesthesia. These lectures provided a good insight for veterinarians seeking to include fish in their existing practices and introduce technicians into the world of aquatic veterinary medicine.

Dr. Devon Dublin represented WAVMA at the WSAVA General Assembly meeting and the Therapeutic Guidelines Group meeting of which he is a member. He also attended other meetings related to committees of WSAVA organized by the WSAVA leadership.

**Julius M. Tepper, DVM, CertAqV**  
Meetings Committee Chair  
[cypcarpio@aol.com](mailto:cypcarpio@aol.com)



**Viral Diseases of Pond Fish:  
Carp Edema Virus (CEV) / Koi Sleepy  
Disease (KSD)**

Pedro H. O. Viadanna, M.S., D.V.M., Ph.D.  
Thomas B. Waltzek, M.S., D.V.M., Ph.D.

UF College of Veterinary Medicine  
UNIVERSITY of FLORIDA

Wildlife & Aquatic  
Veterinary Disease  
LABORATORY



**World Small Animal Veterinary Association (WSAVA) Congress 2019 Liaison Report**

**Overall Importance/Value of the Meeting:**

Explore possibilities of incorporating aquatic veterinary medicine into the existing framework of WSAVA in a permanent way and increasing WAVMA's visibility within the WSAVA community.

**Issues of Importance to WAVMA of the Meeting:**

1. Participation in future WSAVA conferences.
2. Therapeutic Guidelines Group.
3. One Health.
4. WSAVA Membership Think Tank

**Recommendations for WAVMA Attention or Action:**

1. Participation in WSAVA 2020 conference with the possibility of a wetlab and/or our AGM held there. The 2020 conference will be in Warsaw, Poland. WAVMA has been invited to give at least one day of lectures there.
2. WAVMA partners with WSAVA in the area of One Health and Therapeutic Guidelines Group which has good linkages and a suitable entry point for aquatics.
3. WAVMA works with the WSAVA Membership Think Tank to change the focus from small animals to all companion animals, allowing for fish and other aquatics to be more visible within the organization.

**Other Important Issues for WAVMA's Attention:**

1. WAVMA can continue using the WSAVA congress venue for pre-conference activities that can provide more visibility to WSAVA members.
2. Devon Dublin currently sits on three committees, namely: One Health, Therapeutic Guidelines Group and the WSAVA Membership Think Tank.

**Dr. Devon Dublin**

WAVMA representative to WSAVA  
 WAVMA President 2019  
 201 Leopalace FONTEINE,  
 Hatsunegaoka 37-14, Hodogaya-ku,  
 Yokohama, Kanagawa  
 240-0016, Japan  
[President@wavma.org](mailto:President@wavma.org)

**The John L. Pitts Aquatic Veterinary Education Awards Program**

We are excited to announce recipients for the 2019 Award Cycle! The following ten individuals were selected to receive an award from a large pool of applicants. Please join us in congratulating them on this prestigious recognition.

**Bryony Chetwynd-Glover**; Bristol University, UK  
**Chris Gaudette**; North Carolina State Uni, USA  
**Laura Krogman**; Washington State University, USA  
**Kwamina Otseidu**; Cornell University, USA  
**Michael Palillo**; The Ohio State University, USA  
**Biplov Sapkota**; Agric. and Forestry Univ. Nepal  
**Elizabeth St. Germaine**; Western Uni of Health Sciences, USA  
**Holly Ward**; University of Cambridge, UK  
**Sarah Wright**; University of Illinois, USA  
**Kathryn Ziegner**; Colorado State University, USA

Since its inception in 2010, the John L. Pitts Aquatic Veterinary Education Awards Program has awarded over \$55,000 to 92 veterinary students and recent graduates from 43 colleges and universities across 4 continents. These funds, which have come from a small number of individuals and organizations, allow recipients to explore a career in aquatic veterinary medicine through participation in externships at public, private, and academic institutions and attendance at conferences, workshops, and short courses all over the world.

The Program was started 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. His 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. John also helped in the formation of the National Association of State Aquaculture Coordinators, the Aquaculture and Seafood Advisory Committee of the AVMA (now called the Aquatic Veterinary Medicine Committee), 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.

For more information regarding the Program and to make a donation for future awards, please visit [www.wavma.org/scholarships](http://www.wavma.org/scholarships). Please help us support the next generation of aquatic veterinarians, donations of all amounts help tremendously.

**Stephen Reichley, DVM, PhD, CertAqV**  
 Chair, John L. Pitts Aquatic Veterinary Education Awards Program  
[PittsEduAwards-Admin@wavma.org](mailto:PittsEduAwards-Admin@wavma.org)

**DO YOU HAVE A STORY TO TELL ABOUT  
 HOW YOU BECAME INVOLVED WITH  
 AQUATIC VETERINARY MEDICINE?**

Send your article (<1,000 words) with pictures to:  
[TAVeditor@wavma.org](mailto:TAVeditor@wavma.org).

**Fish Histology Seminar**  
 Murdoch Student Chapter  
 5 March 2019

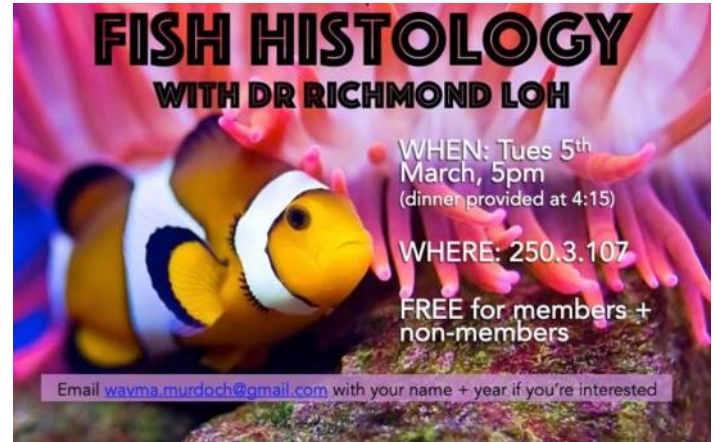
The event 'Fish Histology' was organized by WAVMA Murdoch Student Chapter and conducted by Dr. Richmond Loh and Dr. Susan Gibson-Kueh. The event started at 5 pm, and the enthusiasts stayed as late as 10 pm. It was well-attended with over 20 participants, and with several missing out because of space limitations.

Dr. Loh and Dr. Gibson-Kueh presented pathological histology findings in their clinical cases involving a wide variety of tropical fish species. Throughout the event, the importance of using histology as a diagnostic tool was emphasized, and a short video demonstrating the process of creating histology slides was presented. The bulk of the event comprised of the clinicians running through histology slides while pointing out the abnormalities that different diseases could cause in different body systems. These were complemented by case histories, videos and gross images of the histology case studies presented. Following the conclusion of each case, the slides were passed around to the participants, allowing them to examine each slide for themselves.

The fish histopathology case studies session covered the following subjects:

- Application in health monitoring/surveillance of fish populations
- Application for environmental health monitoring
- Differential diagnoses for granulomatous diseases
- Pathology associated with nutritional diseases
- Histology as a tool to investigate infectious diseases
- Interesting or incidental findings (even a section of fatty tuna sashimi to illustrate the marbling qualities of the flesh was shown)!

With aquatic veterinary medicine making advances, it is likely that the diagnosing of fish diseases in clinical practice would be an event that most vets would become more involved in. As such, this event was an excellent chance to obtain invaluable information on the presentation of common diseases in tropical fishes.



### 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 length).

#### News

Brief synopsis or information about aquatic veteri-

nary 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.

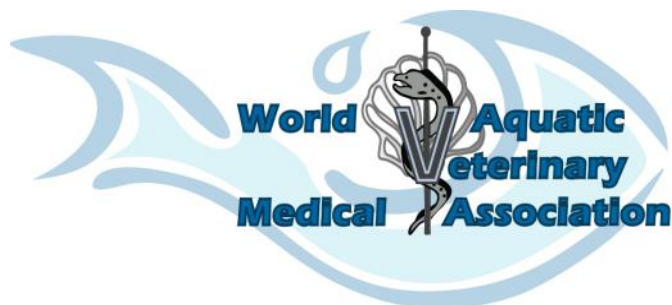
#### Please send articles, clinical reports, or news items to the editor by the following submission dates:

- 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.



#### QUICK LINKS TO WAVMA PROGRAMS & SERVICES:

(Press control then click on item using computer mouse)

- [Online Member Directory](#)
- [Certified Aquatic Veterinarian Program \(CertAqV\)](#)
- [WebCEPD](#)
- [The Aquatic Veterinarian Journal](#)
- [Aquatic Veterinary Jobs Listing](#)
- [WAVMA Student Chapters](#)
- [Veterinary Student Externship Listing](#)
- [John L. Pitts Aquatic Veterinary Education Awards Program](#)

**The WAVMA Annual General Meeting**

The 2019 WAVMA Annual General Meeting was held at the Stratus Hotel on July 15th, 2019 in downtown Toronto, Canada. The current president Devon Dublin discussed the progress of the association so far this year, then introduced the 2020 president Jena Questen. There was also some discussion about where to have next year's Annual General Meeting.

A special honor at the meeting was that both the president-elect of the AVMA (American Veterinary Medical Association), the current WSAVA president (World Small Animal Veterinary Association) joined us for our meeting, along with several members of the Australian Veterinary Medical Association.

We discussed how having a veterinarian familiar with fish medicine, Dr. Howe, as the AVMA President would be a great bonus for American aquatic veterinarians. We also discussed possibly collaborating with the Australian veterinarians to have next year's general meeting in conjunction with their meeting. Another option discussed was to have it at the WSAVA conference again, which will be held in Warsaw, Poland.

Overall it was a wonderful evening of fine food, terrific views from the 36th floor, and friendly camaraderie. Our thanks go to Julius Tepper and the Meetings Committee, who planned the events for the evening. Please plan to attend next year's Annual General Meeting as it will sure to be even better!

**Jena Questen DVM, CertAqV**

*WAVMA President-Elect Jena Questen with AVMA President-Elect John Howe at the AGM.*



**WSAVA 2019 – Toronto, Ontario, Canada**

Part of the WAVMA exposure at the World Small Animal Veterinary Association Conference in Toronto was a day of Aquatic Veterinary Medicine lectures presented by Dr. Julius Tepper and Dr. Nick Saint-Erne. Our WAVMA President, Devon Dublin was the moderator for all the aquatic sessions. On Tuesday, July 16, 2019, conference attendees had the opportunity to hear the following lectures:

- Water quality in Koi practice, by Nick Saint-Erne
- Basic diagnostic techniques for fish, by Julius Tepper
- Water biology for healthy freshwater aquasystem, by Julius Tepper
- Anesthesia induction and monitoring in fish, by Nick Saint-Erne

Later that afternoon, for the first time WAVMA presented lectures to Veterinary Technicians at the WSAVA Conference. These lectures were given jointly by Drs. Tepper and Saint-Erne and were also moderated by Dr. Dublin:

- WAVMA for Vet Techs: Performing water tests: what do they tell us?
- WAVMA for Vet Techs: Monitoring anesthesia in pet fish
- WAVMA for Vet Techs: Assisting the vet on a pond house call

The day of lectures for the WSAVA veterinarians, as well as the previous day of Koi Lectures (KoiPrax 2) and the Annual General Meeting on Monday night made the Toronto WSAVA meeting a huge success for our wet pet vets.

**Nick Saint-Erne, DVM CertAqV**





**AVMA President John Howe to focus on member needs, veterinary technicians and One Health**  
 AVMA, SCHAUMBURG, Illinois

Dr. John Howe, Grand Rapids, Minnesota, began his term as president during the American Veterinary Medical Association's (AVMA) 2019 Convention in Washington, D.C. in August. As he assumes his role as president, Dr. Howe is prioritizing communication within the profession and to the general public.

"Of course, our members' needs come first," said Dr. Howe. "The personal and professional health and wellbeing of the entire veterinary team during all stages of their careers is of primary concern. We have tools that enable you to develop a wellbeing plan for your entire team, a 24/7 cyberbullying hotline and economic tools to improve your practice's bottom line and so much more."

Veterinary technicians are a key area of focus for Dr. Howe. He supports the recent approval of a task force charged with examining the utilization of veterinary technicians, their financial and career sustainability, effective task delegation, and the wellbeing of both veterinary technicians and the practice.

"I have witnessed firsthand the importance of veterinary technicians and the key role they play in preserving animal health and welfare in every aspect of veterinary medicine," Dr. Howe said. "Our profession would not be what it is today without the support of veterinary technicians."

Veterinarians and veterinary technicians work hand in hand with other health professions to improve the health and welfare of people, animals and the environment. During his term, Dr. Howe wants to raise awareness of this collaborative approach—known as One Health—among fellow health care professionals and the general public.

"In my conversations with physicians, I find they are always amazed at our diagnostic capabilities and how ahead of the game we are on issues like tick-borne illnesses. We need to retain our leadership role in the One Health arena promoting the health of all species and the environment," Dr. Howe said.

In that same vein, Dr. Howe wants to see the general's star restored to the chief of the U.S. Veterinary Corps. A change in the National Defense Authorization Act of 2018 allowed an officer of lesser rank to be appointed corps chief, rather than the traditional rank of brigadier general. Dr. Howe believes the change back to brigadier general will provide the authority and status needed to carry out missions.

Dr. Howe has been an active leader in the veterinary profession for more than 30 years at the state and national level. He represented veterinarians living in Iowa, Minnesota, Missouri, Nebraska, North Dakota and South Dakota as the District VII representative on the AVMA Board of Directors.



During his tenure on the AVMA Board, Dr. Howe chaired AVMA's State Advocacy Committee and the Diversity and Inclusion Committee and served as AVMA Board liaison to several AVMA councils and committees, including the Aquatic Veterinary Medicine Committee. He has also served as vice chair of the AVMA Council on Veterinary Services and the Governance Performance Review Committee, and as a fill-in delegate or alternate delegate from Minnesota on the AVMA House of Delegates.

At the state level, Dr. Howe has served as executive board member, vice president and president of the Minnesota Veterinary Medical Association. He received the group's Veterinarian of the Year award in 2011 and Distinguished Veterinary Service award in 2015. Dr. Howe is also a member of the American Association of Equine Practitioners, the World Aquatic Veterinary Medicine Association and the American Association of Fish Veterinarians.

Dr. Howe began his career by starting a solo mixed-animal practice in North Branch, Minnesota. He then sold the practice and moved to Grand Rapids, Minnesota, where he established North Country Equine and Large Animal Medical Center. This practice evolved into North Country Veterinary Clinic, a five-doctor mixed-animal practice treating large and small animals, birds, exotics, cervidae, aquaculture and some large cats. North Country Veterinary Clinic became part of National Veterinary Associates in 2007. Dr. Howe retired from practice in December 2017. Dr. Howe is a 1977 graduate of the University of Minnesota College of Veterinary Medicine.

### An Interview With Dr. Ari Fustukjian

Senior Staff Veterinarian  
 The Florida Aquarium  
 Tampa, Florida, USA  
[afustukjian@flaquarium.org](mailto:afustukjian@flaquarium.org)

#### INSPIRATIONS:

When did you first become interested in Aquatic Veterinary Medicine (AVM)?

I actually became interested in aquatic animal medicine while I was still a veterinary technician back in 2001. I worked in a small animal GP hospital, but one of the vets did contract work for a large tropical ornamental fish distributor here in South Florida. I kept fish as a hobby at the time, and it was from him that I learned about some of the basics; skin/gill cytology, water quality, etc. Beyond that, I never put two and two together until my first semester of vet school almost a decade later.

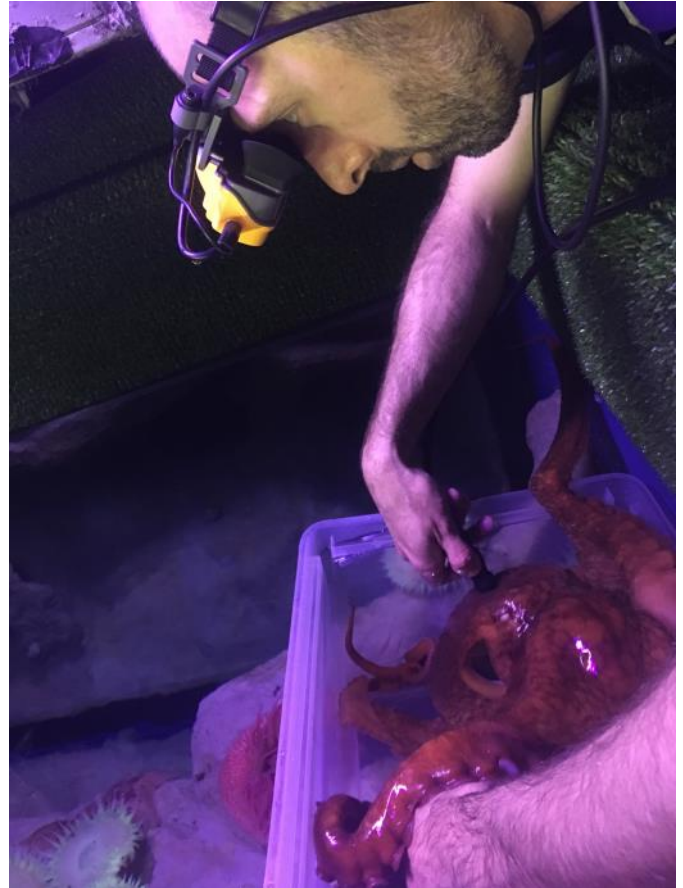
Who were your inspirations or instructors in AVM?

Drs. Paul Bowser and Rod Getchell at Cornell's Aquatic Animal Health Lab were instrumental in helping guide me onto this path, steering me towards the Aquavet® programs and mentoring me in fish anatomy and disease. I did all three Aquavet® programs with Dr. Don Stremme, and externed at half-a-dozen AVM-related facilities during vet school, which introduced me to a LOT of people in the field. It's a pretty small yet incredibly supportive field, and I can honestly say that there probably aren't many people in it I haven't gotten mentorship, advice, or encouragement from at some point in my career. I was also fortunate enough to complete a one-year internship at Mystic Aquarium, working under Dr. Allison Tuttle, and later Dr. Jennifer Flower, and they both had a big influence on how I practice clinical medicine.

#### EDUCATION:

Where did you receive your Veterinary Degree?

Cornell University, in Ithaca, New York.



Did your initial Veterinary training include Aquatic Veterinary Medicine classes?

It did. We had elective courses in Fish Anatomy and Physiology, as well as Fish Health Management.

What were your early resources (books, educational programs)?

Dr. Ed Noga's *Fish Disease*, Greg Lewbart's *Invertebrate Medicine*, and Stoskopf's *Fish Medicine* were often referenced early on. I'm an Aquavet® Alum through and through, and have been fortunate enough to go back and speak to students since graduating.

#### EXPERIENCE:

What steps led you to your present work in AVM?

I've been really fortunate. After applying for (and failing to get) an aquatic med internship out of vet school, I spent a year in private practice working with dogs/cats and exotic pets. The following year I got the Mystic Aquarium internship. After that, I had a lot of support and encouragement as I searched for a job, and applied to places all over the world (from public aquariums, to salmon aquaculture, to a crocodile farm in northern Australia). As these things work out, an associate vet position opened up at the Florida Aquarium, right in the middle of my job search – coincidentally, I grew up in Tampa, FL, and even volunteered at the Florida Aquarium as a high school student.

What kind of AVM are you involved in now (food fish, pet fish, research, teaching, government, aquaculture industry, public display aquarium, others)?

I manage animal health at a medium-sized public display aquarium, in addition to consulting on our land-based coral aquaculture operation, managing sea turtle rescue and rehab, and marine mammal field response.

What were some of the interesting cases you have worked on?

I've had the opportunity to work hands-on with some interesting species, including flamboyant cuttlefish, spotted ratfish, and leafy seadragons.

Most challenging case:

We had a batch of juvenile leafy seadragons born with a developmental swim bladder problem that required extensive prosthetic support over the course of more than a year.

Most exciting case:

One of our adult sand tiger sharks suffered a traumatic gill injury and was bleeding heavily (at 2 am, of course). We had to catch the animal, use endoscopy to go in and look around, locate the site of bleeding, and manually staunch the bleeding.

**OPPORTUNITIES:**

What changes have you seen in the field of AVM during your career?

There seem to be more opportunities now than ever before. There's still a lot we don't know, so while we're making huge strides, there's always new areas to explore.

What advice do you have for new vets or vet students interested in AVM?

Aquatic vet med encompasses a lot of different fields – being flexible can really open up the number of career options available to you.



What do you predict for the future of AVM?

I think it's only going to become more relevant. From global food security, to environmental stewardship, to animal welfare, aquatic vet med has a long way to go to catch up with our knowledge of other taxa, but we're headed there fast.

Should every veterinary practitioner have some basic knowledge about aquaculture?

At least to the point where they know what's possible, (even if they don't do it themselves), and can help refer to people who have the expertise to help.

What knowledge should that be? (first aid, how to euthanize a fish, other topic)?

Basic husbandry, especially water quality, is probably the number one issue related to illness in aquatic pets. Basic understanding of these issues, and knowing where to find resources on them are probably the most immediately relevant issues.







Photo from Florida Aquarium website:  
<https://www.flaquarium.org/>

**The Florida Aquarium, Inc.**

701 Channelside Drive

Tampa Florida, 33602

Aquarium Main Number - (813) 273-4000

<https://www.flaquarium.org/>

The Florida Aquarium enables you to get up close to many of Florida's aquatic and terrestrial animals and ecosystems, as well as others from around the world. More than a must-see attraction in Tampa, we are working to protect and restore our blue planet on many conservation fronts, including research and rescue efforts that help restore Florida's sea turtle and coral populations and to ensure that sharks continue to swim our seas.

rehabilitating and returning sea turtles to the ocean, and addressing the dwindling sand tiger shark populations. And that's just for starters...there's so much more, from educating and inspiring our community about conservation action to supporting swallow-tailed kite population research, African penguin nesting in South Africa, and Lemur conservation in Madagascar. We are working passionately every day to protect and restore our blue planet.

The Aquarium has educated more than 1.7 million students and rescued hundreds of animals since opening in 1995. There are about 14,000 animals in our facility. We care deeply about our animal family and hope you connect with them too.



The Florida Aquarium actively participates in and promotes stewardship of the natural environment as part of our mission of conservation. The Florida Aquarium team believes we can and must turn the tide on the threats now facing the oceans of the world.

Our efforts focus on coral reefs, sea turtles and sharks found in our blue backyard —Tampa Bay, the Gulf of Mexico, the Florida Keys and Cuba. Through scientific diving, research and rescue efforts, we are helping to restore Florida's disappearing coral reefs,

**ANIMAL HABITATS**

The Florida Aquarium experience is designed to take you on a journey, starting with a drop of water from one of Florida's many freshwater springs, all the way out to the open waters of the Florida Keys. Sights include a large simulated wetlands environment located under a tall glass atrium, shallow bays and beaches, and a coral reef ecosystem encompassed in half a million gallons of natural seawater.

The Florida Aquarium will go to great lengths to ensure our animals have a great quality of life. Recently, one of our geriatric male northern pin tail ducks underwent cataract surgery to restore sight in his left eye. This duck has lived at the Aquarium for many years. He had an injury in his left eye, which made him non-releasable. His home is in our Wetlands Gallery, where he lives with his girlfriend – a female pin tail duck.

Unfortunately, this duck developed a cataract in his left eye, which resulted in him becoming nearly blind. Since he lives in such a dynamic habitat with obstacles and other animals, we decided that surgery was the best option for his health.



The Aquarium has a great relationship with Blue Pearl Specialty & Emergency Pet Hospital of Tampa, which provided us with a veterinary ophthalmologist to come and take a look at the duck. The vet examined the duck and agreed it was a matured cataract and that he was blind. Surgery was recommended.

“The cataract procedure is pretty similar to a human getting Lasik eye surgery,” explained Dr. Ari Fustukjian, the Aquarium’s veterinarian. He continued, “They removed the cataract, but they do not put a replacement lens in. The duck will not be able to focus well, but he will be able to see.”



Dr. Ari reported that, “The surgery went really well; it was pretty challenging as the duck’s eyes are very small. There were special modifications to equipment to work on an eye this tiny. The plan from here on out is just management of health. He is eating well. He can see and has one more check-up in a couple of weeks. We will make sure the stitches have dissolved, and then he can go back on habitat in a few weeks.”

Luckily the duck’s girlfriend is keeping him company in recovery until he is ready to go back on exhibit. What a lucky duck!



**Coral Arks: Nurseries to Grow Endangered Species**

These living labs or “arks,” are home to various species of stony coral and long-spined sea urchins, which are all considered critical for coral reef building. In these greenhouse arks, we research and raise these animals for future ocean protection and restoration efforts.

**Shark and Ray Research Station**

Not much is known about many important species of sharks and rays, so we are designing a state-of-the-art facility to answer questions that will help create sustainable populations in managed care as well as ensure they also exist in healthy populations in the wild.



### 2019 Pitts Education Award Report

**Kathryn Ziegner**

Class of 2022, Colorado State University

Thank you to the John L. Pitts Aquatic Veterinary Education Awards Program for supporting my continued pursuit of a career in aquatic animal medicine. During the summer of 2019, I had the opportunity to participate in AQUAVET I, hosted by Cornell University, a four-week program providing lectures and wet labs regarding fish, marine mammals, aquatic invertebrates, and chelonians. There were many hands-on opportunities taught by an impressive array of leaders within the field. AQUAVET was an outstanding, immersive experience I would recommend to any veterinary student interested in exploring the world of aquatics.

Our hands-on work with invertebrates centered primarily on oysters, clams, crabs, and limulus. In a lab setting, I was able to practice drawing hemolymph as well as identifying anatomic structures. These activities were supplemented by extensive lectures regarding anatomy, physiology, disease, and aquaculture, providing important insight to the role of veterinarians in the care of invertebrates. From shrimp farming to coral restoration, lectures spanned a range of interesting topics and offered new perspectives.

Although AQUAVET addressed all groups of aquatic animals, fish were perhaps the most extensively covered. Clinical knowledge and technical skills were developed throughout the course. Earlier lectures covered anatomy and physiology, while later lectures offered clinical presentations of common diseases as well as usage of diagnostic tools.

After learning in lecture about fish hematology and gross pathology, our skills were reinforced by preparation of blood smears, gill clips, and skin scrapes. Proficiency in technical tasks is an excellent way to prepare for eventually seeing fish in practice. In addition, we practiced interpretation of histopathology, disease surveillance, and necropsy techniques.

At the end of the course, practical surgical and anesthetic techniques were discussed in lecture prior to the completion of a gonadectomy on a Striped Bass. An experienced aquatic animal veterinarian was present to mentor and assist. This experience was both my first surgery and my first time suturing a live animal. From setting up the surgical table to monitoring anesthesia, this was an unparalleled opportunity to put my theoretical knowledge into practice. I am so thankful to have participated in this incredible experience and feel confident in my desire to continue working with fish in the future.

My prior experiences in aquatic animal medicine included working in the marine mammal rehabilitation departments of two public aquaria. With career aspirations of working in an aquarium setting, I really



*Dr. Shane Boylan teaching fish surgery session*

looked forward to developing my veterinary knowledge of marine mammals from experts within the field. The opportunity to assist in the necropsy of several stranded cetacean and pinniped specimens offered an incredible insight into the anatomy of these unique creatures as well as an opportunity to assess anatomical landmarks for clinical purposes. We were also able to assist in the physical examinations of rehabilitating pinnipeds; it was interesting to gain insight to the differences and similarities in protocols between facilities.

With four full weeks of class – 12 hours a day, 6 days a week – AQUAVET was a whirlwind of information and networking opportunities. After participating in this program, I am even more assured of my intentions to contribute to our knowledge of the amazing animals inhabiting our oceans, rivers, and lakes. Thank you to WAVMA for supporting the pursuits of students hoping to enter this engaging, unique, and ever-growing field.



*2019 AQUAVET I class*





*Kathryn Ziegner with horseshoe-crab (above) and a penguin during AQUAVET I course.*

**IAAAM Meeting 2019:  
Ushaka, Durban, South Africa**  
By Gillian Taylor  
May 2019

Firstly, I would like to thank the Board and Meetings Committee for allowing me to attend this meeting on behalf of WAVMA. The conference extended over five days, and included two pre-conference workshops: one with focus on marine mammal stranding and necropsy, the other on diagnostic techniques in elasmobranchs.

**CONFERENCE SUMMARY:**

**Stranding and Necropsy Workshop Overview:**

*Introduction to KZN sharks board and overview of the bather protection program* -Sabine Wintner

*Overview of stranding response and research with by-caught dolphins in South Africa* -Dr. Stephanie Plön

*Overview over pathological findings of pinnipeds and cetaceans from the North and Baltic Seas* -Dr. Stephanie Gross, Institute for Terrestrial and Aquatic Wildlife Research (ITAW), Veterinary University of Hannover, Germany

*Live cetacean stranding response, including health assessment, decision-making, and satellite tagging* -Dr. Sarah Sharp, International Fund for Animal Welfare (IFAW), Cape Cod, MA, USA

*Basic necropsy procedure* -Dr. Karen Stockin, Strandings Coordinator, International Whaling Commission, UK

*Hygiene and zoonoses* -Dr. Gaby Hernandez, National Service of Animal Health- SENASA, Costa Rica

*Discussion-where is the field heading?*

*Animal Welfare Science* -Dr Karen Stockin, Bob Ker-ridge Animal Welfare Fellow, Massey University, NZ

**Key focal areas:**

Current key pathological findings in seals (Northern Hemisphere):

Bronchopneumonia (bacterial, lungworms)

Influenza AH10NT

Gastric ulcers- parasite induced

*Acanthocephalon* infestations of intestine.

Current key pathological findings in porpoises:

Pneumonia

Ear infections: parasites (Nematodes), fungi with associated inflammatory and cellular pathology

Brain pathology: haemorrhages and leptomeningitis

Parasitic impact (more of an issue in older animals)

Bacterial disease: *Brucella*, *Clostridia*, *Erysipelothrix*, *E. coli*, *Salmonella*, *Staphylococcus*, *Streptococcus*

Viral disease: *Morbilivirus*, *Influenza virus*, *Pox*, *Papilloma* and others.

Strandings:

Sarah Sharp's presentation focused on key intervention protocol in the event of stranding of marine mammals. She highlighted the need to do a site as-

essment before implementing any intervention plan. Various treatment and health maintenance options were suggested, which could be tailored to available resources. This was valuable in its application to undeveloped countries. The need for global collaboration was evident.

Zoonotic diseases:

Dr Hernandez highlighted the danger of zoonoses, particularly with respect to *Brucella* in dolphins and the danger to humans in stranding situations. Other zoonotic diseases like *Erysipelothrix*, *Leptospira*, *Mycobacterium*, *Parapox virus*, Influenza, and parasitic disease were also mentioned. She also drew attention to the impact of *Toxoplasma gondii* on marine mammals. There is need to educate the public on zoonotic disease and what to do when faced with a stranding.

Global collaboration:

Effort is being made to collaborate internationally in terms of using standardized necropsy protocol for marine mammals. Attention was drawn to the need to focus research on humane euthanasia protocols for large stranded marine mammals. The benefits of global stranding networks were emphasized, with respect for regional and cultural laws.

**Other topics:**

Key-note speakers were Dr Lauren Waller, speaking on her research on the African Penguin, and Dr David Huchzemeyer, speaking on his findings on pansteatitis and mortalities on Nile crocodiles in the Kruger National Park.

The Conference broadly covered sectional topics including:

Infectious diseases

Health and Eco-system assessments

Conservation medicine with focus on free ranging cetaceans

Pathology

Innovations in Marine Mammal Medicine

Stranding and Rehabilitation

Immunology and Toxicology

Pharmacology and Microbiology

Imaging

Fish Medicine

Reptiles, birds and invertebrates

Elasmobranchs

Case reports



*Sealion exam  
at Ushaka  
SeaWorld.  
Photo by  
Tasneem  
Anthony*

**Personal perspective:**

The conference was well organized with many fascinating topics presented, and my sincere thanks go to the IAAAM organizing committee and Ushaka Sea World for all the effort, as well as to all delegates who travelled from far and wide to attend. If I had to offer any “constructive” suggestions, it would be that, in future, a broader range of presentations were included, with more practical application and benefit to the host region. For Africa, and most other developing regions of the world, the focal needs of aquatic research will always be food security and aquaculture-related, with emphasis on practical and affordable diagnostic techniques. It would have been nice to see more focus upon a broader range of aquatics, especially fish, and aquaculture aspects. There seemed to be a weighted focus upon marine mammals and associated research.

Environmental issues were key. The impact of global warming, toxins, pollutants, plastics in water bodies, oiling, fish scarcity as food sources, eutrophication of inland water bodies, impact of increasing vessel numbers, water hypoxia, etc. were widespread. WAVMA, as an organization, should perhaps pay particular attention to these areas. I was reminded of Snieszko’s wonderful diagrammatic interlocking of host, pathogen and environment and how his environmental equation impact carries much more weight than the other two factors.\* Antibiotic resistance was highlighted as a factor of concern within aquatic animals like seabirds.

I was able to distribute some WAVMA pamphlets to some African delegates, but most international delegates were already aware of and members of WAVMA.

\*The Snieszko diagram can be found in several books, including this one:

**Diseases of Fish, Book 5:**

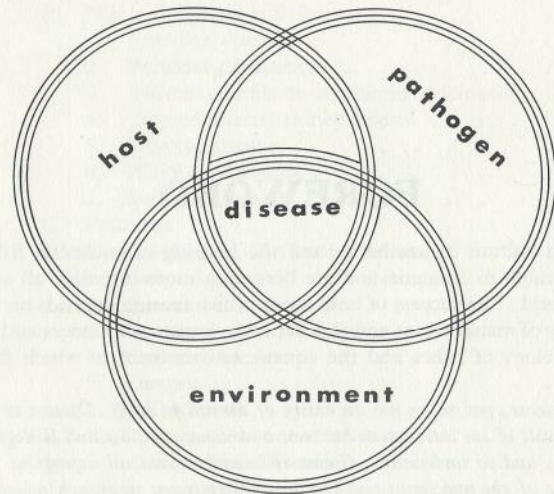
Environmental Stress and Fish Disease.

Edited by Stanislas F. Snieszko and Herbert Axelrod. TFH Publications; 1976. Page 6.

**Introduction**

Fishes are aquatic and poikilothermic; their existence and performance are dominated by the quality of their environment. While conditions in large bodies of water such as seas and oceans are very uniform, smaller bodies of water, such as hatchery ponds and aquaria in which fishes are raised, are subject to more variable conditions. All species of fishes perform best under certain optimal conditions. The amplitude of such conditions is usually quite narrow. Understanding the relationship between fishes, their environment, pathogens, and parasites is very important in fish culture and is the basis for rational management.

Severe outbreaks of diseases can result from the introduction of parasites or pathogens, from malnutrition, from chemical and physical alterations of the water, from the genetic makeup of the fish, and from the interrelationship of any or all these factors. This can be presented graphically as a set of circles representing the fishes, pathogens or parasites, and environment. If the circles intersect, the conditions are favorable for an outbreak of disease.



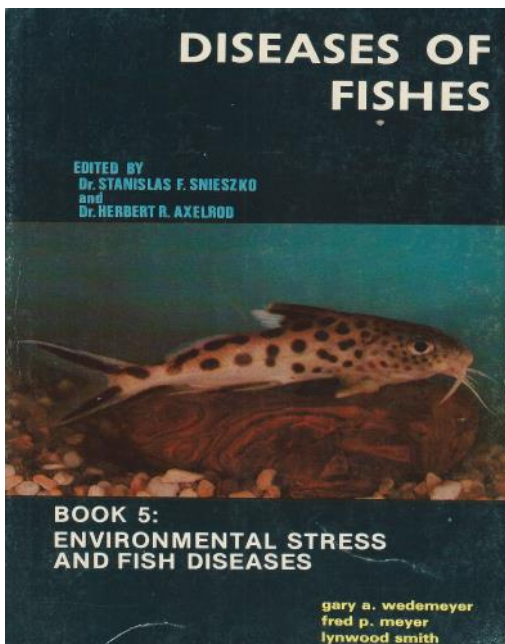
This relationship can also be presented in the form of an equation:

$$H + P + S^2 = D$$

“H” represents the host, “P” the pathogen, “S” the stress caused by environment and “D” the resulting disease. It is well known that stress caused by environmental changes increases very rapidly after the acceptable range for a particular species of fish is exceeded. Therefore, the effect of such a stress is given as a quantity which increases exponentially, while the environmental changes are expressed arithmetically, such as temperature by degrees or dissolved oxygen in parts per million. The stress produced by such changes and resulting mortalities are likely to increase geometrically or logarithmically.

This book has been undertaken with the hope that a better understanding of the relationship between the aquatic environment and the fishes will result in reduction of disease outbreaks through management based on a clearer understanding of such relationship.

Dr. S. F. Snieszko



See side panel for reference. – Editor

**Questions & Answers from the WAVMA Listserv**  
[WAVMA\\_Members-L@wavma.org](mailto:WAVMA_Members-L@wavma.org)

**Generator emissions and fish toxicity?**


Hi everyone,

Just wondering if anyone has ever encountered a case of fish mortalities associated with diesel generator emissions? I have a client who has just acutely lost 39 juvenile Koi. Unfortunately, I've not been able to work up the case beyond collecting bodies and running KHV PCR, which was negative.

Apparently he ran a generator in the garage with the fish pond overnight, due to power outages at the time. The generator exhaust was positioned right next to the pond and directed towards it.

He said he noticed that the water was yellowish in colour (see image 1), fish showed flaring of nostrils (see image 2), and gills showed whitened necrotic edges (see images 3-4). No water parameters were tested and unfortunately the fish were too autolyzed for histopathology.

I was suspecting this may be the effect of carbon monoxide emissions and acute drop in pH? Not sure if the carbon monoxide (or other chemical emissions) have a direct toxic effect on the fish. I'd be most grateful if anyone could offer some thoughts. Too late for the fish now, but worth advising clients going forward.



**Dr Gillian Taylor**  
 BVSc (UP) CertAqV (WAVMA)  
 SAVC 94/3495

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 www.aquaticvet.co.za

Thanks so much,

**Gillian Taylor**

[Gillian@aquaticvet.co.za](mailto:Gillian@aquaticvet.co.za)

Hi Gillian,

If the fish aerator was running simultaneously with a diesel (or gas, in this case it's not really different) generator within the same or shared air space, I think the deaths would probably be due to carbon monoxide poisoning.

Best,

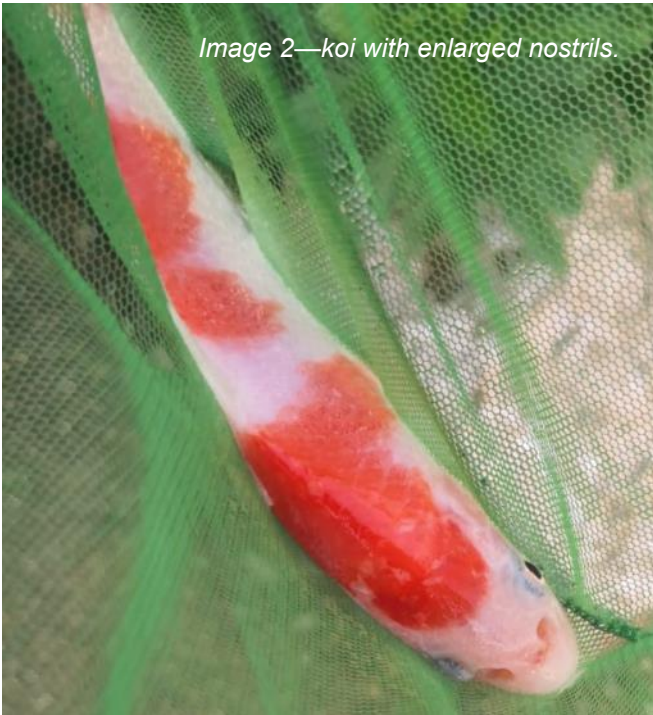
**Dušan Palić**, D.V.M., MVSc, Ph.D., Dipl. ECAAH  
 Professor and Chair of Fish Diseases and Fisheries Biology

Faculty of Veterinary Medicine, Ludwig-Maximilians University Munich

[d.palic@lmu.de](mailto:d.palic@lmu.de)



*Image 1—dead koi and yellow water.*



*Image 2—koi with enlarged nostrils.*



*Image 4—gill necrosis.*

I agree with Dusan. Generator fumes (CO and CO<sub>2</sub>) would settle near the floor and be picked up full strength by the aerator pump and be bubbled directly into the tank water.

**Julius Tepper, DVM, CertAqV**

Dear Gillian,

Considering your case description, it really sounds like the mortality is linked to the acute toxicity/hypoxia caused by the generator exhausts that contaminated the water. Although, according to the pictures you provided your differential diagnostics should be targeted to excluding the infection/involvement of Carp Edema Virus/Koi Sleepy Disease (a Poxvirus), rather than KHV.

Cheers,

**Bartolomeo Gorgoglione, DVM, MSc, PhD**



*Image 3—gill necrosis.*

Toxicity of carbon monoxide (CO) to fish has been studied for over 100 years! See article excerpt below:

**THE REACTIONS AND RESISTANCE OF FISHES TO CARBON DIOXIDE AND CARBON MONOXIDE**

By Morris M. Wells, Ph.D.

Illinois State Laboratory Natural History Bulletin

May, 1918

Carbon monoxide—which differs from the dioxide in that the carbon atom in the monoxide is holding in combination but one oxygen atom instead of two and is, therefore, chemically speaking, unsaturated—is a well-known poisonous gas, and its frightfully deadly effect when present in the atmosphere in even exceedingly small quantities has been vividly demonstrated by many investigators. Two to three per cent, of carbon monoxide in the air breathed by a mouse will cause the death of the animal in from one to two minutes.

Summary: 1. The introduction of either carbon dioxide or carbon monoxide into fish waters is certain to prove detrimental to the aquatic organisms, and especially to the fishes present in the water. 2. Both carbon dioxide and carbon monoxide are poisonous to fishes. Of the two gases, the monoxide is by far the more deadly. 3. Fishes are very sensitive to small changes in the carbon-dioxide content of the water, and tend to avoid detrimental concentrations of this gas by a very definite turning back from them. Fishes do not appear to detect the presence of carbon monoxide in the water, and will swim into concentrations of this gas that kill them in a few minutes.

Nick Saint-Erne, DVM, CertAqV—Editor

**Aquatic Veterinary Abstracts: Viral Diseases**

Compiled by David Scarfe

**Biocontrol in Australia: Can a carp herpesvirus (CyHV-3) deliver safe and effective ecological restoration?**

Biological Invasions

June 2019, Volume 21, Issue 6, pp 1857–1870|

**Abstract**

The Australian Government is considering Cyprinid herpesvirus 3 (CyHV-3) for biocontrol of invasive common carp (*Cyprinus carpio* L.). We review the evidence-base for its potential ecological risks, benefits and effectiveness. Lower carp abundance may boost native fish biomass and improve water clarity, but there is little evidence available to suggest that the virus, alone or used in combination with other methods, can deliver effective or safe biocontrol. Further, the virus may already be present in Australia. Overseas, the virus has caused sporadic and localized mortalities of carp in lakes and rivers, but has generally had no long-term measurable effect on wild carp or native fish populations. The temperature range of disease (18–28 °C), unknown co-factors causing outbreaks, and predictable re-colonization and recruitment boom of immune and virus-resistant carp, following a biocontrol release, remain formidable and unmitigated barriers to success. CyHV-3 infection trials on Australian biota have unexplained high mortality rates of recreationally-important and threatened fishes, and the role of asymptomatic carriers remains uncertain.

Finally, Australia has national and international obligations to ensure that there are no perverse outcomes from biocontrol actions. Despite political pressure, there is no environmental justification to rush the release of this virus. To achieve the Government goals of restoring native biodiversity we advocate that key uncertainties, risks and efficacy barriers first need to be addressed. It is only then that viral biocontrol could be considered a viable tool to complement broader ecological restoration strategies for Australia's waterways.

Keywords

Biological control Cyprinid herpesvirus 3 (CyH-3) Risks Invasive alien species River restoration Ramsar Murray–Darling Basin

The online version of this article (<https://doi.org/10.1007/s10530-019-01967-1>) contains supplementary material, which is available to authorized users.

**Phylogenomic characterization of red seabream iridovirus from Florida pompano maricultured in the Caribbean Sea.**

Arch Virol. 2019 Apr;164(4):1209-1212.

Epub 2019 Feb 11.

Koda SA<sup>1</sup>, Subramaniam K<sup>1</sup>, Poudel DB<sup>2</sup>, Yanong RP<sup>2</sup>, Waltzek TB<sup>3</sup>.**Author information**

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3 Department of Infectious Diseases and Immunology, College of Veterinary Medicine, University of Florida, Bldg. 1379, Mowry Road, Gainesville, FL, 32611, USA. [tbwaltzek@ufl.edu](mailto:tbwaltzek@ufl.edu).

**Abstract**

Between 2010 and 2016, six mortality events were observed in Florida pompano (*Trachinotus carolinus*) maricultured in the Dominican Republic. Histopathological examination and conventional PCR confirmed a megalocytivirus (MCV) infection in each case. Subsequently, next-generation sequencing and phylogenomic analyses confirmed that MCV DNA was present in the infected pompano tissue samples from 2010, 2014, and 2016, and each was determined to be red seabream iridovirus (RSIV).

Annotation of the RSIV genome sequences identified 121 open reading frames, and BLASTN analysis revealed the highest nucleotide sequence identity (> 99%) to a RSIV clade 1 MCV isolated from a moribund red seabream (*Pagrus major*) maricultured in Japan.

These cases represent the first fully sequenced RSIV genomes detected outside of Asia and are the earliest reports of MCV infections in Florida pompano. This recent geographical expansion of RSIV warrants further attention to determine its potential economic and ecological impact.

PMID: 30741339

DOI: 10.1007/s00705-019-04155-7

<https://www.ncbi.nlm.nih.gov/pubmed/30741339?dopt=Abstract>



**Carp Edema Virus/Koi Sleepy Disease:  
An Emerging Disease in Central-East Europe.**

Lewis E., B. Gorgoglione, K. Way & M. El-Matbouli. *Transbound. Emerg. Dis.*, 62:6–12 (2015).

**Abstract**

Koi sleepy disease (KSD), also known as carp edema virus (CEV), was first reported from juvenile koi carp in Japan in the 1970s. Recently, this pox virus was detected in several European countries, including Germany, France and the Netherlands. In England, in addition to koi carp, outbreaks in common carp are reported. KSD/CEV is an emerging infectious disease characterized by a typical sleepy behaviour, enophthalmia, generalized oedematous condition and gill necrosis, leading to hypoxia.

High mortality, of up to 80–100%, is seen in juvenile koi collected from infected ponds. In Austria, this disease had not been detected until now. In spring 2014, diagnostic work revealed the disease in two unrelated cases. In one instance, a pond with adult koi was affected; in the other, the disease was diagnosed in adult common carp recently imported from the Czech Republic. A survey was carried out on recent cases (2013/2014), chosen from those with similar anamnestic and physical examination findings, revealing a total of 5/22 cases positive for KSD/CEV.

In this study, two paradigmatic cases are presented in detail. Results together with molecular evidence shaped the pattern of the first diagnosis of KSD/CEV in fish from Austrian ponds. In the light of the positive cases detected from archived material, and the spread of the disease through livestock, imported from a neighbouring country, the need for epidemiological investigations in Austria and surrounding countries is emphasized.

**Detection of spring viraemia of carp virus in imported amphibians reveals an unanticipated foreign animal disease threat.**

Ip HS, JM Lorch & DS Blehert.

*Emerging Microbes & Infections*, 5, e97; (2016). doi:10.1038/emi.2016.94

An open access publication accessible at :

<http://www.nature.com/emi/journal/v5/n9/pdf/emi201694a.pdf>

**Abstract**

Global translocation of plants and animals is a well-recognized mechanism for introduction of pathogens into new regions. To mitigate this risk, various tools such as preshipment health certificates, quarantines, screening for specific disease agents and outright bans have been implemented. However, such measures only target known infectious agents and their hosts and may fail to prevent translocation of even well-recognized pathogens if they are carried by novel host species.

In a recent example, we screened an imported shipment of Chinese firebelly newts (*Cynops orientalis*) for *Batrachochytrium salamandrivorans* fungus, an emergent fungal pathogen of salamanders. All animals tested negative for the fungus. However, a virus was cultured from internal organs from 7 of the 11 individual dead salamanders and from two pools of tissues from four additional dead animals. Sequencing of a portion of the glycoprotein gene from all viral isolates indicated 100% identity and that they were most closely related to spring viraemia of carp virus (SVCV).

Subsequently, SVCV-specific PCR testing indicated the presence of virus in internal organs from each of the four animals previously pooled, and whole-genome sequencing of one of the viral isolates confirmed genomic arrangement characteristic of SVCV.

SVCV is a rhabdovirus pathogen of cyprinid fish that is listed as notifiable to the Office International des Epizooties. This discovery reveals a novel route for potential spillover of this economically important pathogen as rhabdovirus has not previously been documented in amphibians.



*A Chinese firebelly newt (Cynops orientalis), the salamander species recently found to be infected with the spring viraemia of carp virus, or SVCV.*

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#### Dr. Rob Jones

The Aquarium Vet

[www.theaquariumvet.com](http://www.theaquariumvet.com)

Veterinary Advisor to AZA Marine Fish TAG

### Some endangered frogs may be leaping back from extinction

by [Joel Achenbach](#)

May 17, 2018

Variable harlequin frogs (*Atelopus varius*) and many other amphibians in the lush forests of Panama have been slammed by a [globe-creeping fungus](#). The murderous pathogen attacks frogs, toads, salamanders and wormlike creatures called caecilians, and when it reached Panama early in this century the frogs vanished along streams where they had once been abundant. That's why the scientific community took notice this year when researchers announced that some of the vanished frogs were popping up again.

There's a simple explanation, potentially, for the apparent comeback: evolution. This might be natural selection working at lightning speed, an example of survival of the fittest frogs. That would have implications beyond Panama, beyond frogs, beyond amphibians. The planet's biodiversity is threatened by habitat destruction, climate change, hunting and fishing, the spread of invasive species and all the other ways that seven billion human beings alter and degrade the environment. Experts warn that we're witnessing a mass extinction event, the first such die-off since an object from space 66 million years ago hit the Earth and ended the long reign of dinosaurs. No one expects natural selection to solve a problem as massive as the loss of biodiversity, but it might save some animals and plants here and there.

The rebound of the frogs was reported in March in the journal [Science](#) by two scientists, Jamie Voyles of the University of Nevada at Reno and Corinne Richards-Zawacki of the University of Pittsburgh, who had had worked in Panama in the early 2000s amid abundant frogs species, only to see the fungus arrive and essentially destroy the objects of their research. Voyles and Richards-Zawacki went back to Panama in 2012, trekking through the forest on a search for frogs.

"We were really in the mud, long treks, pretty discouraged. Then we came across a brilliant yellow *Atelopus* sitting on a mossy boulder looking healthy and happy," said Voyles. They found more frogs. Nine species across three separate sites showed signs of a recovery from the die-off.

The frogs secrete infection-fighting proteins, and that's where classic natural selection could be showing its hand: the frogs with the best immune systems might have survived while less-resistant frogs were culled from the population. Laboratory tests showed that frogs captured recently were more resistant to the fungus than frogs bred from populations captured before the fungus arrived in Panama.

For full article, go to:

[https://www.washingtonpost.com/news/speaking-of-science/wp/2018/05/17/some-endangered-frogs-may-be-jumping-back-from-extinction/?noredirect=on&utm\\_term=.40c472a23904&wpisrc=nl\\_sb\\_smartbrief](https://www.washingtonpost.com/news/speaking-of-science/wp/2018/05/17/some-endangered-frogs-may-be-jumping-back-from-extinction/?noredirect=on&utm_term=.40c472a23904&wpisrc=nl_sb_smartbrief)

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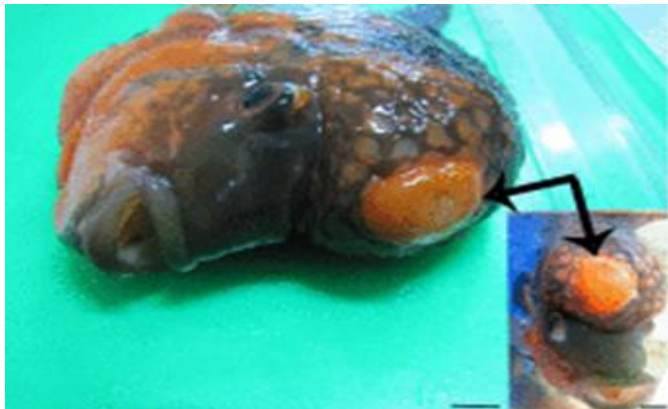


### Fibromyxoma in a flower horn cichlid

By Sara Shokrpour

Department of Pathology, Faculty of Veterinary  
Medicine, University of Tehran, Tehran, Iran

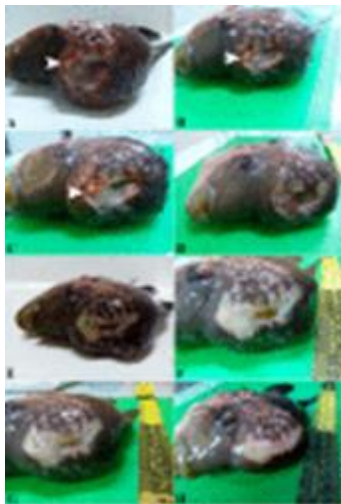
Published online: May 06, 2017



A 3-year-old male flower horn cichlid fish with a mass on the head protuberance was referred to the Ornamental Fish Clinic, Faculty of Veterinary Medicine, University of Tehran. On gross examination, the mass was approximately 4 × 15 × 25 mm in size.

The fish was anesthetized in 100 ppm MS-222 (Pars Imen Daru, Iran). The mass was removed surgically and the wound repair was monitored postoperatively in the Ornamental Fish Clinic for 40 days.

Tissue samples of the mass were fixed in 10% neutral buffered formalin, sectioned and stained with haematoxylin and eosin, periodic acid-schiff, and Masson's trichrome. Microscopically, as a consequence of the concomitant presence of collagenous areas infiltrating myxoid areas, the neoplasm was classified as a fibromyxoma.



*Male flower horn cichlid:  
(A-H) surgical wound  
healing over 40 days after  
removing  
the mass.*

*Wound healing on sur-  
gery day (A),  
1 day (B),  
3 days (C),  
8 days (D),  
18 days (E),  
23 days (F),  
28 days (G),  
and 40 days (H)  
after surgery.*

Key words:

[fibromyxoma](#), [head protuberance](#),  
[flower horn fish](#), [neoplasm](#)

DOI: <http://dx.doi.org/10.1053/j.jepm.2017.05.005>

### Evicted man who abandoned his ailing fish was charged with animal cruelty.

A family pet is being nursed back to health after it was found abandoned, malnourished and living in "deplorable" conditions, which had led to disease, authorities said. Authorities said the animal was discovered in a vacated home in Wilmington, a port city in North Carolina. The pet? A freshwater Oscar fish.

The former owner was arrested on three misdemeanor counts of animal cruelty. The man, who was released on a \$4,000 bond, is set to appear in court Thursday, according to the New Hanover County Sheriff's Office. Authorities say it is thought to be the first time that animal cruelty charges have been brought in the county in a case involving a fish.

Three days after the owner was evicted, deputies went to check on the home and discovered a fish tank in "deplorable" condition, said Lt. Jerry Brewer, a spokesperson for the New Hanover County Sheriff's Office. He said the Oscar fish that was living inside it was not in good health; it was later determined the fish was suffering from hole-in-the-head disease, which is commonly caused by a parasite, but can be due to poor water conditions. Authorities took the fish to the Fish Room, an aquarium store in Wilmington, where employees have been treating it. Fish Room employee Ethan Lane told NBC affiliate WECT that when this fish was brought in, "he was in pretty bad shape."

"Hole in the head is a parasite that starts in the intestines and works from the inside out, slowly killing the fish," he said. Lane told the State newspaper that the fish has since been put on a proper diet and is being treated with medication. Lane told the newspaper that the fish is suspected to have survived in its former home by eating cockroaches that fell into the tank, though police said that has not been confirmed.

For the full article, go to:


<https://www.pennlive.com/news/2019/04/an-evicted-man-abandoned-his-ailing-fish-police-say-he-was-charged-with-animal-cruelty.html>

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August 11-16, 2019

MDI Biological Laboratory, Bar Harbor, Maine

This is a short course for veterinarians, technicians, trainees, principal investigators, and core managers who utilize fish models in laboratory research. The course is directed by Michael Kent, Ph.D., College of Veterinary Medicine, Oregon State University. Course faculty include: Rodman G. Getchell, Ph.D., Cornell College of Veterinary Medicine; Christian Lawrence, M.S., Children's Hospital Boston; and Jan Spitsbergen, DVM, Ph.D., DACVP, Dept. of Microbiology, Oregon State University.

The course is offered at the MDI Biological Laboratory, located in Bar Harbor, Maine on Mount Desert Island, the home of Acadia National Park. It is intended to help laboratory technicians, researchers, and veterinarians monitor and maintain the health of a colony of aquatic organisms, focusing on zebrafish. This course is appropriate for veterinarians and veterinary trainees, as well as technical staff, students, postdocs, and investigators.

The course consists of lectures, laboratory exercises with a high faculty to student ratio, and discussion. During the course, there are ample opportunities for students to discuss unusual and/or unsolved diagnostic case experiences from their home laboratories as problem-solving exercises.

This course is now approved by the AAVSB RACE (American Association of Veterinary State Boards Registry of Approved Continuing Education) to offer a total of \*33 CE\* (Continuing Education) Credits to veterinarians and veterinary technicians. RACE approval is for the subject matter categories of both category 1 (Scientific) and 3 (Non-Scientific-Practice Management/Professional Development). For more information see the course webpage: <https://mdibl.org/course/health-and-colony-management-of-laboratory-fish-2019/>, or visit the MDI Biological Laboratory course page <<https://mdibl.org/education/courses/>> or email the Education Office at [education@mdibl.org](mailto:education@mdibl.org).

**AquaEpi II – International Scientific Conference on Aquatic Animal Epidemiology**  
November 4-6, 2019  
Amari Hotel,  
Hua Hin, Prachuap Khiri Khan, Thailand

With world class speakers, the **conference scientific sessions** will cover a wide range of topics including (but not limit to):

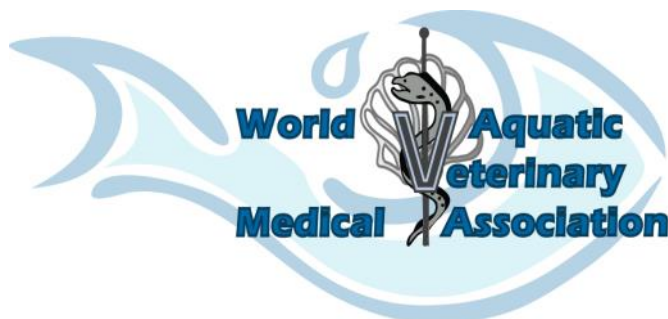
- Epidemiological investigations in clinical settings
- Risk assessment and management studies
- Molecular epidemiology
- Spatial and temporal patterns in prevalence and risk mapping
- Surveillance and disease detection
- Epidemiology of antimicrobial used and resistance
- Epidemiological based trans-boundary regulation
- Interaction of wild and farmed aquatic species - the challenges for disease control.
- Epidemiological enabling technologies; remote sensing; AI; eDNA
- Crowd sourced data: Human/social component

**Importance dates**

Abstract submission – open	March 15, 2019
Early registration – open	June 1, 2019
Deadline abstract submission	August 15, 2019
Announcement of abstract acceptance	Sept 30, 2019
Early registration – close	October 15, 2019
Regular registration	October 16, 2019

For more information, please visit the conference website at <https://www.aquaepi2019.com/> or contact the conference Secretariat at [aquaepi2019@gmail.com](mailto:aquaepi2019@gmail.com).

Visanu Boonyawiwat  
Secretary of the AquaEpi II-2019 Organizing Committee  
Department of Farm Resources and Production Medicine  
Faculty of Veterinary Medicine, Kasetsart University, Thailand



**ExoticsCon 2019:**  
**Association of Avian Veterinarians,**  
**Association of Exotic Mammal Veterinarians,**  
**Association of Reptilian and Amphibian**  
**Veterinarians, AAZV, and**  
**American Association of Fish Veterinarians**  
**Conference**

September 27–October 5, 2019  
St. Louis, Missouri USA

Join us for the **2019 AAFV Annual Conference** and **ExoticsCon** on Sept 27 – October 5, 2019. We are excited to be a part of this joint conference and hope you will be as well. This event will bring together the best exotic pet, zoo and wildlife veterinarians to contribute to the scientific, continuing education, networking and hands-on learning that make our careers enriching and fulfilling.

AAFV Annual Conference concurrent with ExoticsCon registration will be through AAZV. If you register for the Monday-Friday Conference, this includes the AAFV Monday sessions.

Visit <https://www.aazv.org/> for more information.

**American Fisheries Society Conference**

September 29-October 3, 2019  
Reno, Nevada  
<https://afstws2019.org/>

**23rd Biennial Society of Marine Mammalogy /**  
**2nd World Marine Mammal Science Conference**

Dec 9-12, 2019  
Barcelona, Spain  
[More info](#)

For more information go to: <https://www.wavma.org/Aquatic-Veterinary-Educational-Meetings-Conferences-Symposia-Workshops>



**DO YOU HAVE A STORY TO TELL ABOUT**  
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**INVOLVED WITH AQUATIC**  
**VETERINARY MEDICINE?**

Send your article (<1,000 words) with pictures to  
[TAVeditor@wavma.org](mailto:TAVeditor@wavma.org).

**19th International Conference on Diseases of**  
**Fish and Shellfish**

9 -12 September 2019  
Porto, Portugal

The Conference will provide a platform for all participants to take full advantage of the many opportunities for formal and informal interaction with colleagues from all around the world, sharing knowledge of the most recent advances on Fish and other Aquatic Organism's Pathology. The scientific programme will include distinguished key note speakers from countries across the world, as well as oral and poster presentations.

<https://www.eafp2019.com/>

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

**Future WSAVA Conferences**

45th WSAVA World Congress  
Dates: 23-26 September 2020  
Warsaw, Poland

[Visit the website here](#)

46th WSAVA World Congress  
Dates: 13-16 November 2021  
Hyderabad, India

[Visit the website here](#)

47th WSAVA World Congress  
Dates: 29-31 October 2022  
Lima, Peru



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