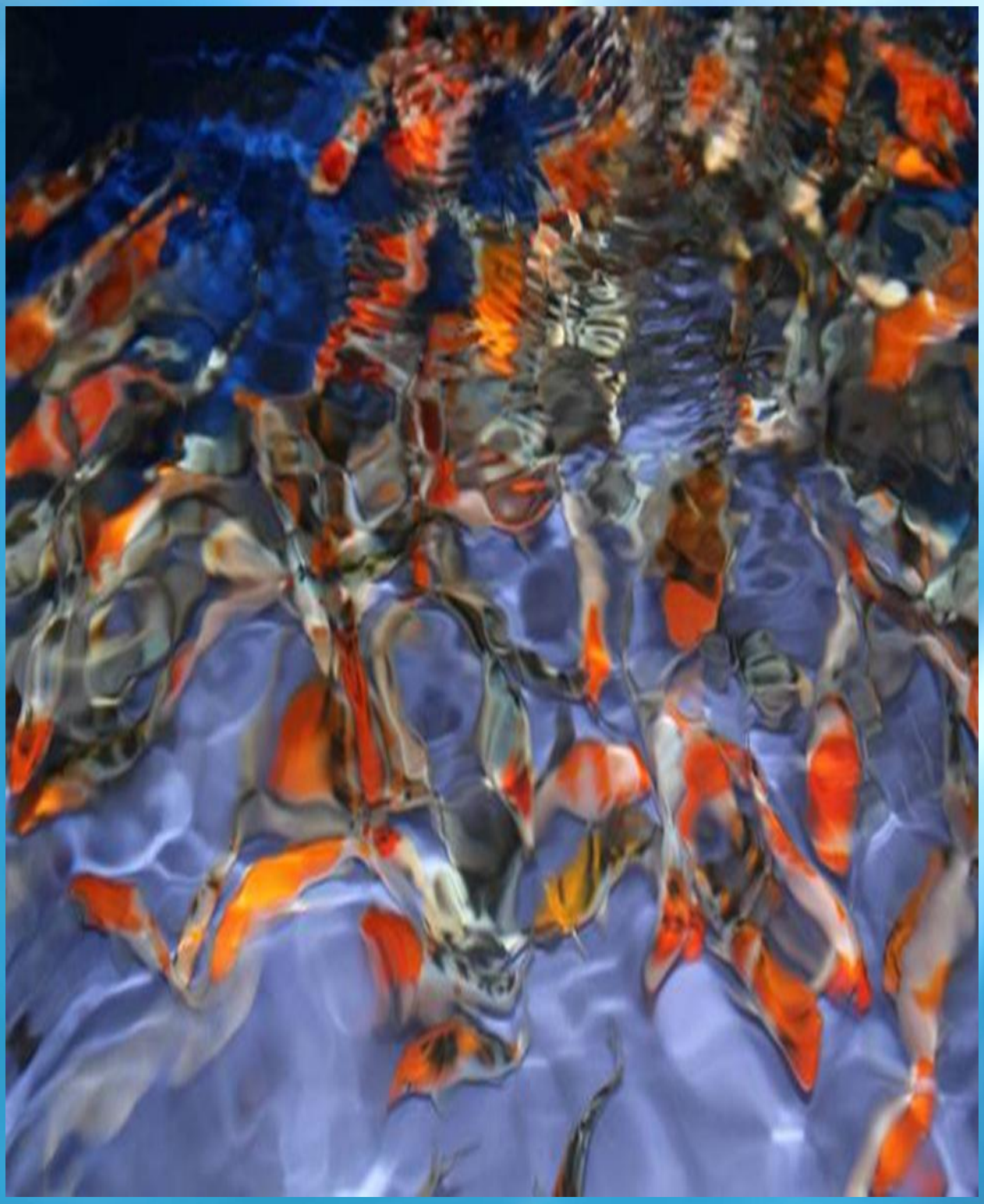
The Aquatic Veterinarian

Journal of the World Aquatic Veterinary Medical Association



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WHO ARE WE

MISSION

The Mission of the 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.

To fulfill this Mission, the World Aquatic Veterinary Medical Association has established the following:

Objectives

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

The ideas presented in this publication express the views and opinions of the authors, may not reflect the view of WAVMA, and should not be implied as WAVMA recommendations or endorsements unless explicitly stated.

Information related to the practice of veterinary medicine should only be used within an established valid Veterinarian-Patient-Client Relationship.

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ISSN 2329-5562

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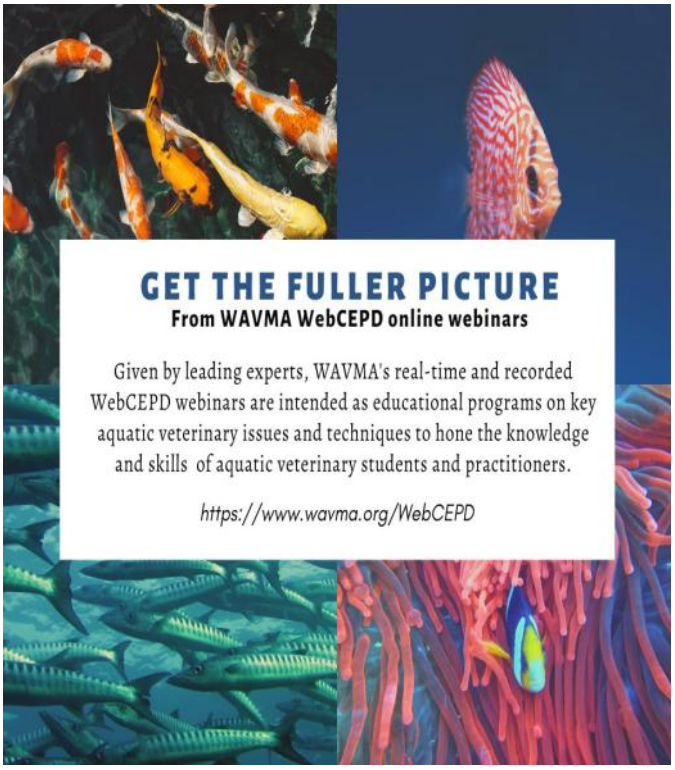
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Cover photo:

Water motion casing light distortion makes an abstract image of koi in a pond.

Photograph by David Kless



Discover core knowledge, skills & experience needed to become a WAVMA Certified Aquatic Veterinarian *(CertAqV)*

Did you know that WAVMA's ***CertAqV Program*** offers members the opportunity to become recognized and certified as having competency in 9 core areas deemed necessary to practice aquatic veterinary medicine? Find out more information online at: http://www.wavma.org/CertAqV-Pgm.

EDITORIAL

Editor's Note

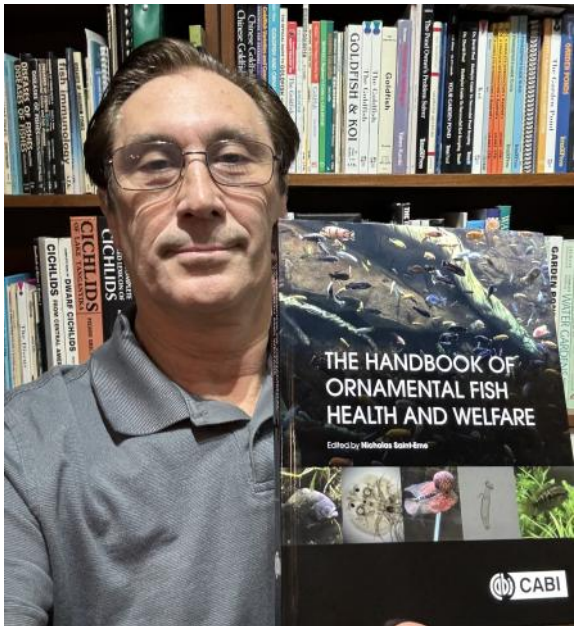
This edition of *The Aquatic Veterinarian* Journal starts my eighteenth year as editor. The first edition of the *Aquatic Veterinary Association Newsletter* was produced by Secretary Chris Walster in June of 2007, announcing the inaugural Annual General Meeting to be held in Washington, DC, USA on July 18, 2007. The second issue was called *Aquatic Vet News,* Volume 1, Number 1, September 2007. This issue was edited by Professor Ron Roberts. The third issue was *Aquatic Vet News* Volume 2, Number 1, January 2008.

My first issue as editor was *Aquatic Vet News*, Volume 2, Number 2, in the second quarter of 2008. Since that edition, I have produced nineteen quarterly issues of the *Aquatic Vet News,* and now forty-four additional issues of *The Aquatic Veterinarian* journal that it became with Volume 7, Number 1 in the first quarter of 2013. All of these past issues are available to WAVMA members to download from the website: https://www.wavma.org/TAV-Archives.

There is a plethora of great information on Aquatic Veterinary Medicine, as well as the history of our organization, in these old issues. Please take a look at them and see what you can learn! To make it easy to access some of the past information, this year I will be reprinting articles from previous issues that appear to be relevant today. On pages 18-19 there is a case report on koi surgery that was originally published in TAV 12:1, and another Grand Round Case about a bloated koi on page 25 from TAV9:1. If you have any case reports, please submit them to me for future issues.

Wishing all WAVMA members a great 2025!

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



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.

World Aquatic Veterinary Medical Association

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

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

WAVMA Members can place a free 1/8 page (business card size) advertisement in the TAV. Contact TAVeditor@wavma.org for information on advertising and payment options.

EXECUTIVE REPORTS

President's Report

Dear WAVMA Members,

The value of aquatic animals to society and the planet is not doubted. The prevailing global demographic changes, socioeconomic pressures, environmental degradation, pollution, antimicrobial resistance and climate-change have however, begun taking a toll on the health, welfare and productivity of aquatic animals with subsequent concerns for seafood safety, public health, and the sector's long-term sustainability.



Veterinarians are widely recognized as being crucial stewards of animal health and welfare, the animal's production environment, and the health of animal carers and consumers of animal products. The expansion of the aquaculture sector and emerging prospects for the aquatic animal sector in the Blue Economy under the current circumstances, places an unequivocal demand upon aquatic veterinarians to assist stakeholders maintain the integrity of aquatic ecosystems irrespective of the production systems used, to achieve aquatic animal health, welfare and seafood safety. Aquatic veterinarians need to stay current and retain professional proficiency regardless the tides and shifts within sector. A diverse amount of information and knowledge from the practical experiences of practitioners is required to achieve this.

The mission of WAVMA, is to serve the discipline of aquatic veterinary medicine to enhance aquatic animal health and welfare, public health, and seafood safety by developing programs to educate and provide guidance to the veterinary profession, aquatic animal owners and industries, and other stakeholders. As an altruistic organization with global reach, it is uniquely positioned as a conduit of information and knowledge generated from the practical experiences of a diverse profile of aquatic veterinary practitioners for the benefit of the sector, and global community as a whole.

Noteworthy accomplishments, such as WAVMA's organization of aquatic veterinary educational programs in various fora around the world since the World Veterinary Association Congress in 2005, demonstrate this. This has helped build bridges between numerous veterinary and non-veterinary organizations around the world, both national and international. WAVMA's aim is, and will be, to further develop these links, through the promotion of aquatic veterinary medicine practice and policy, based on One Health while emphasizing the attributes of the United Nations Sustainability Development Goals (SDG). By so-doing, WAVMA envisages providing its members with the support and requisite skills required to deliver quality aquatic veterinary services irrespective of the domain, aquatic environment or subsector they serve.

This year, WAVMA consequently aims to evolve into a more robust and dynamic organization that effectively networks and partners to harnesses its members' aggregate experiences and expertise to generate and share information, knowledge and skills for the benefit of the health and welfare aquatic animals, communities and the sector at large.

I look forward to your collective support as we chart the course for WAVMA's future.

Nelly Isyagi
President@wavma.org
WAVMA President
(Uganda)

EXECUTIVE REPORTS

Secretary's Report

Dear WAVMA Members,

Congratulations to the new WAVMA Executive Board Members for 2025:



Nelly Isyagi
President
(Uganda)



Claudia Venegas
President-Elect
(Chile)



Matthijs Metselaar
Immediate Past President
(UK)



Bart Gorgoglione
Secretary
(United States)



Wes Baumgartner
Treasurer
(United States)

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EXECUTIVE REPORTS

Directors—continued



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Oceania
(Australia)

Win Surachetpong
Director-at-Large for Asia
(Thailand)



Executive Board Responsibilities

The WAVMA Executive Board consists of the President, Immediate-Past President, President-Elect, Secretary, Treasurer and Directors. The Executive Board will provide oversight and approve all fiscal and administrative activities of WAVMA and its committees, programs and services in accord with the Bylaws, and facilitates the development and implementation of WAVMA programs.

The President will: Schedule, draft agendas and preside over the Executive Board meetings; Monitor and facilitate implementation of all active WAVMA and Committee programs, services and other initiatives; serve on the Budget Committee; Provide an update of WAVMA activities for the association's quarterly publication; Work with the Meetings Committee to finalize and implement the WAVMA Annual General Meeting; Preside over the WAVMA Annual General Meeting.

The President-Elect will: Assume the President's responsibilities in the absence of the President; Serve as a member of the Budget Committee; Identify at least one new WAVMA program or initiative to implement during his/her 3-year tenure; Assist in facilitating and implementing active WAVMA programs and initiatives during his/her 3- year tenure;

The Immediate Past-President will: Assume the President's responsibilities in the absence of the President and President-Elect; Assist the President-Elect and other Board members in developing or implementing new or existing WAVMA initiatives and programs.

The Secretary will: Serve as the primary WAVMA point of contact for the public; Inform members of WAVMA programs & initiatives; Assist the developments and distribution of WAVMA official correspondence; Serve as Chair of the Communications Committee;

The Treasurer will: Maintain all WAVMA bank accounts and bookkeeping, receive all payments, and pay all approved expenses; Chair the Budget Committee and facilitate the development of an annual budget

Directors will: Represent individual WAVMA member's general interests in their geographical regions.



EXECUTIVE REPORTS

WAVMA Annual General Meeting 2024
By Win Surachetpong
Director for Asia

The joint annual meeting of the Thai Aquatic Veterinary Association (TAVA) and the World Aquatic Veterinary Medical Association (WAVMA) was held in Bangkok, Thailand, on December 13, 2024. The event attracted approximately 100 participants and featured expert presentations on a range of topics, including aquatic animal health management, the application of AI technology, and industry expectations for veterinarians specializing in aquatic animal care.

During the session on collaboration between TAVA and WAVMA, the WAVMA President, Dr. Matthijs Metselaar, provided an overview of the association, emphasizing the benefits of membership and introducing the CertAqV program. The presentation sparked significant interest among attendees, with several expressing a desire to join WAVMA and pursue CertAqV certification.











EXECUTIVE REPORTS

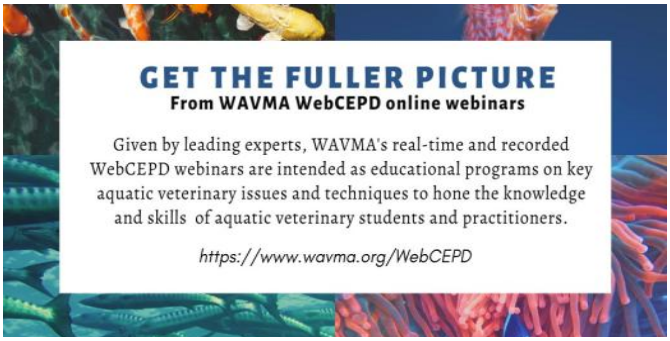
WebCEPD Program

Since 2013, WAVMA has produced over 180 Webinars that are available to watch on our website: https://www.wavma.org/WebCEPD, and conference recordings on the Video page: https://www.wavma.org/video-library. You may be able to use these for continuing education credit for veterinary licensing, and you will also sure learn a lot!

Lectures are given by leading experts, and WAVMA's WebCEPD webinars are intended as educational programs on a variety of aquatic health issues and veterinary techniques to hone the knowledge and skills of aquatic veterinarians and veterinary students. To earn Continuing Education and Professional Development (CEPD) credit, you will need to complete a short Knowledge and Skills Assessment (KSA) to ensure you have met the learning objectives. On successful completion, you will receive a CEPD Certificate, which may be useful for licensure/registration to practice veterinary medicine and to earn credit towards becoming a WAVMA Certified Aquatic Veterinarian.

Recent WAVMA WebCEPDs

WebCEPD videos available:
 B-1085 When seafood is ´fishy´ in more ways than one – Foodborne illnesses of marine origin
by Dr Carla Phillips Savage, (September 5, 2024)
 B-1086 Genetic improvement and Disease resistance: Applications in Aquatic Veterinary Medicine
by Dr Liane Ney Bassini Joint webinar WAVMA & MEVEA (October 14).
 B-1087 The Need for a New Normal—Why We Need to Rethink Feeding of Salmon and
Trout for Better Fish Health Outcomes
by Dr Jesse Trushenski (November 14).
 B-1088 Aquaculture is not agriculture under water – So what?
by Dr Karin Pittman (December 5).
 B-1089 Fish ER medicine
by Dr Robert Martinez (January 30, 2025).



WAVMA's Member Programs and Services

Find a Fish Vet Directory - a directory for the public to find aquatic veterinarians

Member Directory - a members-only tool to locate other members and for vet students to locate mentors

The Aquatic Veterinarian - a quarterly publication with news, peer-reviewed contributions, clinical cases, jobs, meetings and more

Certified Aquatic Veterinarian (CertAqV) Program - a program identifying and certifying veterinarians with competency in core subject matter necessary for practicing aquatic veterinary medicine

WebCEPD Program - live and recorded webinars, courses, and presentations;; many are available for CEPD credit

John L. Pitts Aquatic Veterinary Education Awards Program - an international program that provides financial support for veterinary students and new graduates to increase their experience in aquatic veterinary medicine

Employment Opportunities - a list of available aquatic veterinary jobs, available to members only

Image Library - a collection of images useful for presentations, diagnostic interpretations, and more

Video Library - a collection of videos to help members and others understand aquatic veterinary techniques and issues

WAVMA Student Chapters - WAVMA chapters formed by veterinary students and faculty mentors at veterinary schools and colleges around the world

Members-L - (WAVMA_Members-L@.wavma.org). A members-only listserv for discussions on any topic of interest. To post to it, you must be a current member and ticked the appropriate box in your Member Profile Preferences tab.

Students-L - (WAVMA_Student-L@wavma.org). A discussion listserv for WAVMA student members. you must be a current member and ticked the approrpiate box in your Member Profile Preferences tab.

Leadership Roles - All members (including students) have the opportunity, and are encouraged, to serve on any WAVMA Committee. All full members may also be nominated for a position on the Executive Board. If you are interested in more information, please contact the WAVMA President.

COMMITTEE REPORTS

Credentialing Committee

The WAVMA Aquatic Veterinarian Certification Program identifies the core competency or subject matter areas needed to practice aquatic veterinary medicine, and recognizes those veterinarians who have acquired the necessary knowledge, skills and experience (KSE) from a variety of sources. It is over 10 years since WAVMA introduced the CertAqV and since then hundreds of veterinarians around the world have achieved the qualification. Originally the process was manual, but during 2023 WAVMA introduced an online system and also the CertAqVNT for veterinary nurses and technicians. Currently around 30 VN's/VT's have signed up for the certificate, with 11 having achieved the qualification. It is a globally recognized qualification.

The certificates demonstrate to your employer that you have achieved the competence of at least a new graduate, with each of the modules reflecting the areas needed to be competent in aquatic veterinary medicine.

Recently, WAVMA updated the online system to make it easier for all to complete the process, in response to user comments. Most of these changes are visual, making it easier to see where you are in the process. There were also changes to the logic and automation of the system which had caused some confusion among reviewers. Overall, these changes will enhance all users experience of the system.

Whilst the changes were tested first before going live, the real world can throw in some unknowns. If you are currently going through the process and have any questions then please contact the WAVMA Administrators for advice or use the Contact Us page on the website.

All current CertAqV and CertAqVNT are listed on the appropriate pages of the WAVMA website as well as all the information you need to decide if the certificate is right for you. If you are interested in aquatic veterinary medicine, wherever you are in your career, whether student, recently qualified, wishing to take a change in career direction, or simply interested in adding to your knowledge, then the certificates are well worth looking at.

If you have questions about the Certification process, please send me an email, or refer to the website: How to use the automated CertAqV, CertAqVNT system.

Dr. Matthijs Metselaar DVM PhD CertAqV MRCVS
Credentialing Committee Chair
CertAqV-Admin@wavma.org

Certified Aquatic Veterinarians

Samah Abdelrazek	United States
Ali Anwar Ahmad	Singapore
Jessica Allen	United States
Sara Alves	United States
Chelsea Anderson	United States
June Ang	Singapore
Farah Gonul Aydin	Turkey
Romualdo Balagapo	Philippines
Benjamin Balducchi	Canada
Sarah Balik	United States
Marcello Balzaretti	Italy
Madison Barnes	United States
Christa Barrett	United States
Heather Barron	United States
Julia Bauer	Germany
Trista Becker	United States
Jenice Bell	United States
Heather Bjornebo	United States
James Bogan	United States
Pierre-Marie Boitard	France
Rachel Brown	United Kingdom
Faith Burgos	United States
Shraddha Cantara	United States
Christian Capobianco	United States
Todd Cecil	United States
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Prakan Chiarahkhongman	Thailand
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Michael Dutton	United States
Ashley Emanuele	United States
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Antonella Fabrissin	Italy
Mohamed Faisal	United States
Erika First	United States
Julie Fithian	United States
Ari Fustukjian	United States
Danielle Godard	United States
Giana Gomes	Singapore
Emmanuel Gonzalez Rueda	Mexico
Bartolomeo Gorgoglione	United States
Krystan Grant	United States
Michelle Greenfield	United States
Miguel Grilo	Portugal
Stephanie Grimmett	United Kingdom
Katharina Hagen-Frei	Switzerland
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Eileen Henderson	United States
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Chelsea Hester	United States
Kelsey Hoag	United States
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Katrina Murray	United States
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Lucie Nedved	Australia
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Lily Parkinson	USA
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Melanie Peel	USA
Sarah Pellett	United Kingdom
Ayanna Phillips Savage	United States
Maximilian Polyak	United States
Jena Questen	USA
Eva Quijano Cardé	USA
Janis Raines	USA
Atisara Rangsichol	Thailand
Zachary Ready	USA
Aimee Reed	USA

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Nuno Ribeiro	Portugal
Julianne Richard	USA
Camille Richie	USA
Michelle Rivard	USA
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Komsin Sahatrakul	United Arab Emirates
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Sonja Saksida	Canada
Maria Eugenia Sancho Santos	United States
Sasha Saugh	South Africa
David Scarfe	USA
Neha Shah	India
Khalid Shahin	UK
Galit Sharon	Israel
John Shelley	USA
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Tanatporn Tantiveerakul	Thailand
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Marcus Webster	USA
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Michael Wenninger	USA
Laura Whalen	USA
David Wilbur	USA
Sarah Wilson	USA
Howard Wong	Hong Kong
Sarah Wright	USA
Taylor Yaw	USA
Irene Yen	USA

COMMITTEE REPORTS

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 Secretary.

Communications Committee
This Committee manages the communications among members and others involved with aquatic veterinary medicine. It oversees the e-News, Facebook, Twitter, LinkedIn and other social media accounts.
Chair: Claudia Venegas, Secretary@wavma.org

Credentialing Committee
This Committee oversees and administers the CertAqV Program for credentialing aquatic veterinary practitioners, and evaluates aquatic veterinary educational programs useful to members.
Chair: Matthijs Metselaar CertAqV-Admin@wavma.org

Education & Students Committee
This Committee facilitates networking between student members and helps development of educational programs and services. It is composed of three subcommittees: WebCEPD, Education Resources, and Student Support.
Chair: Bartolomeo Gorgoglione, BartGorg@msu.edu

Meetings Committee
This Committee oversees and coordinates logistics for WAVMA-organized or sponsored aquatic veterinary educational meetings, including the Annual General Meeting.
Chair: Julius Tepper, cypcarpio@aol.com

Membership Committee
This Committee oversees membership issues to optimally serve members and the organization. It oversees the listservs and membership lists.
Chair: Chris Walster, Administrators@WAVMA.org

Publications Committee
This committee oversees the publication of WAVMA's quarterly journal, *The Aquatic Veterinarian*, and other occasional publications.
Chair: Nick Saint-Erne, TAVeditor@WAVMA.org

A variety of items (mugs, t-shirts, hoodies, bags) are available for purchase at WAVMA's Store.

Items in the Zazzle store can be purchased in a variety of sizes, colors, and can even be customized to include your name, clinic name, or to include WAVMA Student Chapter information. For help with customization, please contact the WAVMA Administrator.

https://www.zazzle.com/store/wavma788

WAVMA Shop

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



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



COMMITTEE REPORTS

Fellows Advisory Council Annual Report

The Fellows Advisory Council is actively working on the WAVMA Strategic plan. We have revised the December version of the plan, and prioritized changes of WAVMA programs and activities. We are creating a "Road map" for implementing the strategic plan and assigning roles to committees.

To ensure optimal improvement of the current draft of the strategic plan, and to raise awareness among WAVMA members, the document will be sent to the Executive Board for consultation and approval. The committees and the members at large will also be approached for feedback. The feedback from all parties will be used by the Fellows' Council to finalize the strategic plan (estimated, by June 2025).

The following veterinarians were nominated for the Distinguished Fellow for 2025:

Bart Gorgoglione
Nelly Isyagi
Tim Miller-Morgan
Gillian Taylor
Claudia Venegas
Roy Yanong

The Fellows will review their applications and CV and propose a recommendation to the Executive Board for approval later this year. Congratulations to all of these well-deserved nominees. Winner will be announced at the Annual General Meeting.

Laura Urdes, PhD DVM CertAqV
Fellows Advisory Council Chair

Fellows Advisory Council

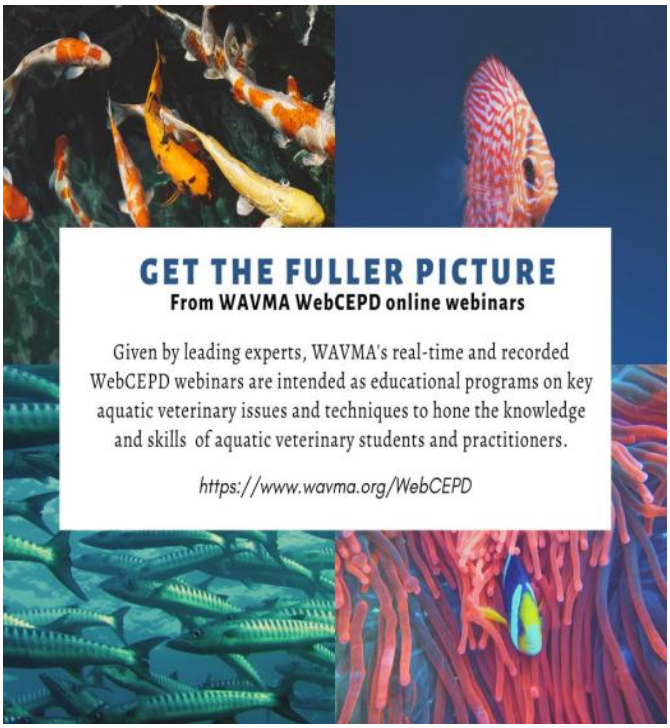
A WAVMA Fellow is someone who has conferred on them the honorific: *WAVMA Distinguished Fellow*. The Fellows Advisory Council is composed of WAVMA Distinguished Fellows who are current WAVMA members and who wish to contribute to the development of WAVMA. The Chair of the Fellows Committee will be the Fellows Representative to the Executive Board.

WAVMA Distinguished Fellows are:

Peter Merrill (2012)
Ronald Roberts (2012)†
David Scarfe (2012)
Julius Tepper (2012)
Christopher Walster (2012)
Grace Karreman (2013)
Marian McLoughlin (2013)
Dusan Palic (2013)
Mohamed Faisal (2016)
Nicholas Saint-Erne (2017)
Richmond Loh (2018)
Laura Urdes (2019)
Devon Dublin (2020)
Gregory Lewbart (2021)
Matt Metselaar (2022)
Stephen Reichley (2023)
Simon Doherty (2024)†

Laura Urdes, PhD DVM CertAqV
Fellows Advisory Council Chair





COMMITTEE REPORTS

WAVMA Student Chapter Guidelines

To initiate a new Student Chapter, download the *WAVMA Student Chapter Guidelines*
A Spanish version of the Student Chapter Guidelines can be *downloaded from the WAVMA website.*

Examples of available Student Chapters programs:

- Assistance in organizing and promoting Chapter programs and activities.
- MiniGrants of up to $500 USD are available to assist official WAVMA Student Chapters with conducting activities intended to engage students in opportunities related to aquatic veterinary medicine. Download the Flyer here and the application form here.
- Access to recorded webinars and live web-based presentations from experts around the world.
- Low annual WAVMA Student Membership ($25)
- 50% Chapter member's dues may be available to support Chapter-organized activities. Get more information here and a Spanish version here.
- Reduced rate (50% off) WAVMA Full Membership the year after graduation.
- John L. Pitts Aquatic Veterinary Education Awards Program
- Access to the latest editions of WAVMA's quarterly journal, *The Aquatic Veterinarian*.
- Access to WAVMA member-only webpages.
- Aquatic veterinary externship and job listings.
- Participation in the WAVMA Certified Aquatic Veterinarian (CertAqV) Program.
- Access to WAVMA e-mail listservs, including Members-L, and Student-L.

A list of all current WAVMA Student Chapters is available on the website:
https://www.wavma.org/WAVMA-Student-Chapters

Consider joining the ***WAVMA Chapter Facebook Group*** to find out what's happening in other Chapters.



WAVMA Student Chapters

University of Pretoria, Onderstepoort Faculty of Veterinary Science, South Africa (established 2017)

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

University of Sydney, School of Veterinary Science, Australia (established 2014)

Auburn University, College of Veterinary Medicine, USA (established 2013)

Colorado State University, College of Veterinary Medicine & Biomedical Sciences, USA (est. 2019)

Cornell University, College of Veterinary Medicine, USA (established 2019)

Michigan State University, College of veterinary Medicine, USA (established 2021)

Mississippi State University, College of Veterinary Medicine, USA (established 2014)

The Ohio State University, College of Veterinary Medicine, USA (established 2018)

Oregon State University, College of Veterinary Medicine, USA (established 2017)

Ross University, School of Veterinary Medicine, St. Kitts & Nevis, West Indies (established 2015)

St. George's University, School of Veterinary Medicine, Granada, West Indies (established 2018)

University of California, Davis School of Veterinary Medicine, (Established 2020)

University of Florida, College of Veterinary Medicine USA (Established 2013)

University of Georgia, College of Veterinary Medicine, USA (established 2015)

University of Illinois, College of Veterinary Medicine, USA (established 2018)

University of Pennsylvania, School of Veterinary Medicine, USA (established 2020)

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

University of Edinburgh, Royal (Dick) School of Veterinary Studies, Scotland UK (established 2020)

University of London, Royal Veterinary College, England UK (established 2021)

Ankara University, Faculty of Veterinary Medicine, Turkey (established 2022)

Makerere University College of Veterinary Medicine Animal Resources and Biosecurity (established 2022)

St. Matthew's University School of Veterinary Medicine West Bay, Cayman Islands (established 2022)

University of Bristol, Bristol Veterinary School, England (established 2023)

University of Calgary, Canada (established 2023)

COMMITTEE REPORTS

Education and Students Committee

The newest WebCEPD videos are available:
B-1089 “Fish ER Medicine”, January 30th
by Dr Robert Martinez (USA).
B-1090 “Biotechnological strategies to avoid antibiotic use in managing bacterial infections in farmed fresh-water fish”, February 27th
by Dr Paola Barato (Colombia.

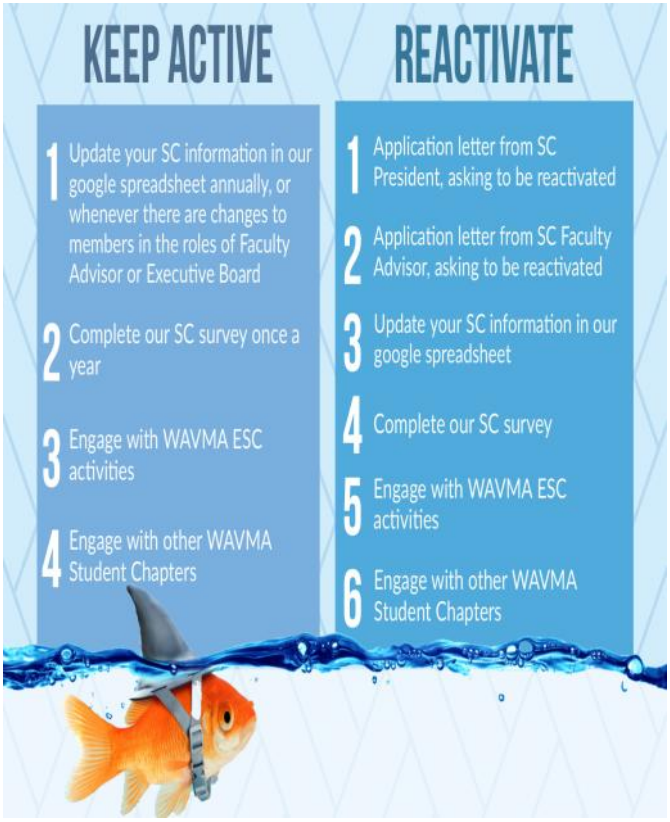
The next webinar is:
B.-1091 “Cetacean stranding response”, April 30th
by Dr Natalie Arrow (UK).

WAVMA ESC Vice Chair **Rachel Feeney**
at rzf3@msstate.edu

Bartolomeo Gorgoglione, DVM, MSc, PhD, CertAqV
Chair of WAVMA Education and Students Committee

Robert Martinez, DVM CertAqV
Education Resources Subcommittee Leader

Maribel Escobedo Mondragón,
Student Support Subcommittee Leader



Aquatic animal health and welfare, aquatic animal ecosystem health and sea food-safety

World Aquaculture Safari, June 2025

THEME/ABSTRACT TITLE:

One Health Aquaculture

Authors: Nelly Isyagi, Claudia Venegas, Matthijs Metselaar, Wes Baumgartner, Marina Delphino, Farah Gonul Aydin, Stephen Pyecroft, Stephen Reichley, Win Surachetpong, Kunda Dashe, Bartolomeo Gorgoglione, Julius Tepper, Laura Urdes, Chris Walster and Nick Saint-Erne.

The world has come to acknowledge that the health and welfare of mankind is interconnected with the health and welfare of animals, plants and the environment as a whole. As such, the productivity, quality and safety of products derived from terrestrial or aquatic animal resources depends on the level of harmonious synchrony sustained between these components, the circular economy.

This presents a paradox for the world’s rapidly aquaculture sector, that is rapidly growing and transforming while at the same time aquatic ecosystems are in a state of flux due to environmental and climate changes. The pivotal role played by aquatic ecosystems for life on earth presents key questions as the aquaculture sector seeks to transform into a sustainable yet resilient blue food system that contributes comprehensively to human welfare and SDG14 ‘Life Below Water’.

The questions and opportunities at hand consequently infer that aquaculture need s to become intrinsic to One Health, as opposed to the current situation where the application of One Health in aquaculture is largely as an external intervention to safeguard the health, welfare and safety of farmed aquatic animals and their products for economic gain. Can the global status of information, knowledge, technology and training and education enable us achieve this?

This is a last call for papers, posters and exhibits to share your personal experiences, knowledge and technology in all aspects to promote ‘One Health Aquaculture.’

For more information:

https://was.org/meeting/code/afraq25

COLLEAGUE'S CONNECTION

Meet Dr. Claudia Venegas, DVM, PhD, CertAqV
WAVMA President-Elect



Dr. Claudia Venegas has been the WAVMA Secretary for the last two years. This year she is our President-Elect, and will serve as WAVMA President in 2026. Dr. Venegas is from Chile and has been active in WAVMA and other veterinary and aquaculture associations. She is the co-author of many scientific papers with an emphasis on salmon nutrition and diseases.

Education:
Veterinarian (Médico veterinario)
Facultad de Ciencias Veterinarias y Pecuarias, Universidad de Chile, Santiago, Chile (1996)
PhD, Faculty of Applied Biological Sciences Graduate School of Biosphere Science, Hiroshima University, Higashi Hiroshima Saijo cho, Japan (2000)
Master Clinical Veterinary Trials - Professional Master Program - Technological University (December 2023)

Professional Memberships:
Japanese Society of Fish Pathology (JSFP)
European Association of Fish Pathologists (EAFP)
World Aquatic Veterinary Medical Association (WAVMA)
MEVEA (Chilean Association of Aquatic Veterinarians)
COLMEVET (Colegio Médico veterinario - Chile)

Relevant Aquatic Veterinary Experience:

With more than 25 years of professional experience, I have been engaged in the academia as a lecturer (Universidad de Chile, Universidad Andres Bello), researcher and in management. In the private sector, I had roles in salmon farming practice and diagnostics lab for the salmon industry in Chile. Since 2008, I was part of a joint venture of research institutions from Chile and Norway, with a focus on research projects for the aquaculture sector in Chile dealing with fish health and diseases, feed and feeding, engineering, and technology.

Afterward, I took the role of Scientific coordinator - Station veterinarian and Project manager at VESO CRO with the main offices and facilities in Norway and Chile, dealing with clinical trials and R&D to develop new treatments (vaccines, VMPs, etc) for the Aquaculture industry, both in Chile and Norway. Currently I´m into specialized independent consultancies in aquatic health solutions.

I have served as President of the National Scientific and Technical Committee for Aquaculture - Sanitary issues within the umbrella of the Undersecretariat of Fisheries and Aquaculture, Ministry of Economy, Chile (2018-2021), and currently I'm Vice-chair of this Committee.

Since 2019, I have been an active member of the Technical Advisor Group (TAG) of the Aquaculture Stewardship Council (ASC).

I became a WAVMA Certified Aquatic Veterinarian in 2018, with approved renewal in 2023. I have served as WAVMA Director-at-large for the Americas during 2020, 2021, 2022 periods; and as WAVMA Secretary during 2023 and 2024. I'm a current member of the Education and Students Committee, leading the WebCEPD Sub-Committee.

I serve in the Technical Committee of MEVEA and as Treasurer in COLMEVET, both veterinary associations in Chile.

Vision for WAVMA

As in previous years, my intent is to represent and support WAVMA members and to help expand WAVMA's presence in my country, Chile, and in other countries of the Americas, being known as a leading organization on aquatic animal health, control and prevention of diseases. I´m especially interest in fostering continuous education opportunities to already experienced colleagues to provide updated information and in-depth discussions opportunities.

I would like to create synergy with other veterinary and non-veterinary organizations (societies/ associations) regarding topics on aquatic animal health in order to generate a concrete impact on improvement, promotion and expansion of aquatic veterinary medicine and fish health and welfare, which in part we have done with the current Executive Board.

My experience as WAVMA Secretary provides a lot of background as to how WAVMA functions. As Chair of the Communications Committee, I would use both positions to foster and expand communications to members and collaborating organisations with the aim to strengthen WAVMA's prominent position in aquatic veterinary medicine.

LEGISLATION REPORT

President Trump signs executive order to boost U.S. seafood industry
By Liza Mayer and *Aquaculture North America* staff

President Trump's administration has released an executive order to restore American seafood competitiveness. The order states that the United States imports nearly 90 percent of its seafood and has a seafood trade deficit that stands at over $20 billion. The country must establish an America-First Seafood Strategy to boost its seafood production, sales, and exports.

The executive order directs the Secretary of Commerce to consider taking actions on regulations that overly burden America's commercial fishing, aquaculture, and fish processing industries. The National Marine Fisheries Service (NMFS) was directed to:

- Incorporate better, cheaper, more reliable technologies and cooperative research programs into fishery assessments.
- Expand exempted fishing permit programs to promote fishing opportunities nationwide.
- Modernize data collection and analytical practices to improve the responsiveness of fisheries management to real-time ocean conditions.

The order also calls for the development of a seafood trade strategy to address unfair competition, low environmental and labor standards, and illegally imported seafood.

In response, the National Fisheries Institute (NFI) commended the administration for taking a "thoughtful, strategic approach to supporting American seafood production and consumption." The NFI, in a press release, expressed its readiness to support the administration in its cause to improve the industry.

Growing more seafood locally and growing the jobs and food security that come with it are critical to "chip away" at the United States' seafood trade deficit, according to Chris Oliver, head of NOAA Fisheries.

"It's the perfect time to highlight NOAA's larger 'Blue Economy' initiative as an important guiding force for our seafood future," Oliver wrote on NOAA's website. "Despite the historic success of our wild-capture fisheries, we import almost 90 percent of the seafood we consume, at least half of which is farmed. We would like to shift that dynamic and farm more seafood here in the United States," he said.

He said aquaculture is a growing priority for the agency and for Congress and both are actively promoting and expanding marine aquaculture. He cited a number of actions that support the advancement of seafood farming in the US, including NOAA's work with US Senator Roger Wicker (R-Miss.) for the introduction of the "AQUAA Act" legislation (short for Advancing the Quality and Understanding of American Aquaculture). The legislation, if passed, is expected to streamline the permitting process in aquaculture and fund industry efforts.

NOAA releases 2024 aquaculture report
By Aquaculture North America staff

The National Oceanic and Atmospheric Administration (NOAA) has released its 2024 "Aquaculture Highlights" report, showing its commitment to improving the U.S. seafood industry. It highlights the agency's mission to create conditions for the opportunity and growth of sustainable aquaculture in the country.

"NOAA's Aquaculture Program supports cutting-edge science and strategies to grow sustainable aquaculture in the United States, working to make America a global leader in aquaculture," an excerpt from the report states. From 2018 to 2022, NOAA's federal investment resulted in a yearly average of $69.6 million in economic impact, supporting 572 businesses, 1,147 jobs, and 71 scientific publications.

Besides investing $20 million across its national, state, and territorial competitive funding opportunities and establishing 86 projects in 2024, some of the agency's highlights include:

- Launching a Northeast Oyster Breeding Center to develop superior oyster strains for commercial growers in the Northeast
- Pioneering a new fish species, sablefish, to commercial viability for U.S. farmers
- Developing new technologies to monitor harmful algal blooms responsible for paralytic shellfish toxins, helping improve safety and helping shellfish farmers

The NOAA also worked across the federal government to prepare an aquaculture framework in the National Aquaculture Development Plan that strengthened food security and jobs, and addressed the seafood deficit. Together with partners in Washington, NOAA prepared a new guide enhancing transparency for shellfish permitting. It also provided a nationwide siting analysis to find suitable locations for commercial aquaculture development.

Excerpt from:
https://www.aquaculturenorthamerica.com/

Download the NOAA document at:
https://www.fisheries.noaa.gov/resource/document/aquaculture-highlights-growing-american-seafood



CASE REPORT

Mouth brace to stabilise premaxillary bone fracture in a koi fish (*Cyprinus rubrofuscus*).

By Cheryl Tan & Dr. Richmond Loh, the Fish Vet
Full video: https://www.youtube.com/watch?v=ELdh_kfd5nc

Case

Koi (*Cyprinus rubrofuscus*) presented with an injured mouth that collapses on inspiration. This was confirmed as a premaxillary bone fracture. The mouth of a fish serves to feed and breathe, and is highly mobile, thus surgical intervention was necessary to prevent deformities when healing that may compromise function.

Procedure

To stabilise the fracture, a 'mouth splint or brace' was fashioned out of metal wire threaded through silicone airline tubing. The silicone tubing allowed cushioning from the hard metal, and allowed purchase for sutures.



Figure 1: Positioning of the mouth splint.

The patient was transferred into an anesthetic bath to prepare for surgery. Anti-inflammatory (flunixin 0.5 mg/kg body weight) was given for post-operative pain relief. A simple interrupted pattern technique, using monofilament nylon suture material, was used to secure the brace to the premaxillary bone and the silicon air tubing of the wire.

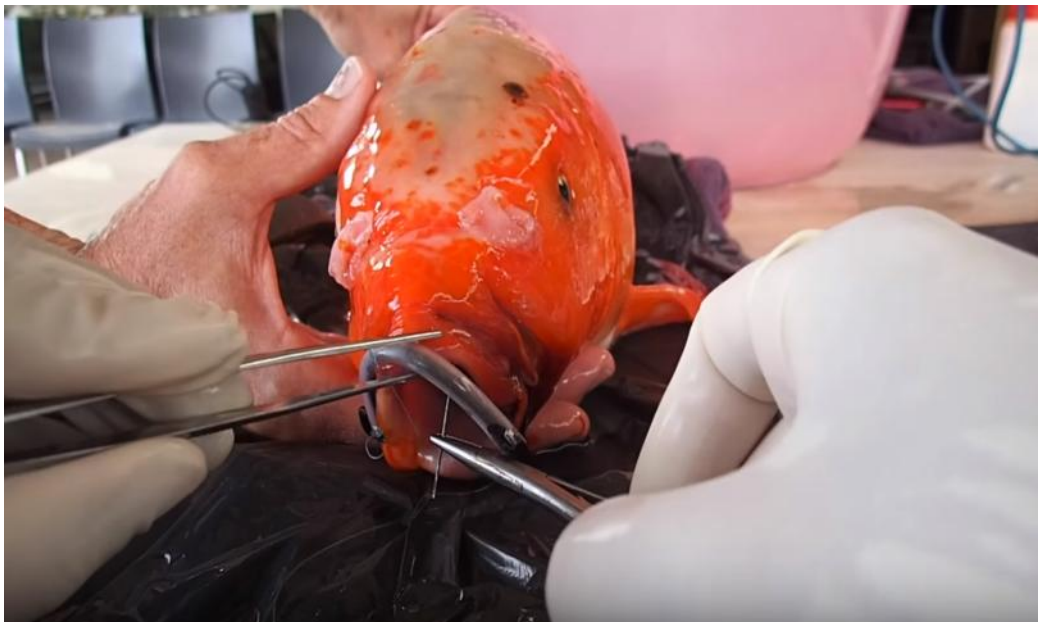


Figure 2: Stitching the mouth splint around the lips.

Betadine solution was sprayed onto the wound to prevent bacterial infection. The patient was recovered from anaesthesia in his pond, under the waterfall.



Figure 3: Moved back and forth to wake up.

Discussion

5-day-post-surgery

The patient's relationship with other fish, swimming behaviour, and feeding habits were observed and recorded as good. The brace was examined to be in position, and no infection was found around the lips.

16 days post-surgery, removal of mouth brace

Light sedation was used. Scissors were used to remove all sutures. Finally, betadine spray was applied topically to prevent infection. The patient's mouth healed and had good apposition; he could use his mouth to create suction for the prehension of food, and breathing.



Figure 4: Cutting the sutures with a curved cutting-edge scissors.

Figure 5: Patient fully recovered from surgery.



Biokos®, a novel natural bacterial extract with broad spectrum antiprotozoal efficacy

By Sebastian Valentin Bucerzan and Giovanni Salerno
www.sundew.bio

History

In 2020, Dutch researchers at the Netherland Institute of Ecology (NIOO) isolated a *Pseudomonas* bacteria from the surface of Atlantic salmon eggs, the extract of which proved lethal to *Saprolegnia* sp., an opportunistic oomycete pathogen that affects both fish and their eggs. The extract was found to contain a cyclic lipopeptide (CLP) that due to its strong surfactant properties disrupts and perforates certain cellular membranes.

Subsequently, the Dutch group started working with fish pathologists at the University of Copenhagen, Denmark, in the EU Horizon project PARAFISH-CONTROL. The goal of the collaboration was to test a series of possible lead compounds against *Ichthyophthirus multifiliis* ("Ich"), a ciliate fish parasite that causes "white spot disease," and is one of the most contagious parasites affecting many farmed fish species, e.g., trout, channel catfish, largemouth bass, tilapia, and carp (Dickerson, 2006; Matthews, 2005).

The newly discovered CLP was found to be by far the best compound tested against Ich. The lipopeptide molecule kills all free-living life stages of *I. multifiliis*: theronts, tomonts and tomocysts (Al-Jubury *et al.,* 2018). The Danish team named the naturally produced lipopeptide Biokos.

Later, NIOO and University of Copenhagen jointly submitted a patent application for the molecule to be used as an antiparasitic. Sundew, based in Søborg, Copenhagen, licensed the technology from these institutions and developed improved strains, production processes, and scaled up their facility in order to produce Biokos through fermentation at an industrial scale, starting in 2021. Biokos is now a registered trademark.

Mechanism of Action

Cyclic lipopeptides (CLPs) are amphiphilic molecules, composed of a fatty acid tail linked to a short oligopeptide, which forms a macrocyclic ring structure. The substantial structural diversity of lipopeptides suggests different natural roles, some of which may be unique to the biology of the producing organism. The proposed primary mode of action of CLPs is pore formation in membranes, leading to an imbalance in transmembrane ion fluxes and cell death (Raaijmakers, *et al*., 2010).

Biokos® acts with a similar mechanism and once dissolved in water Biokos® perforates the cellular membranes of many species of unicellular eukaryotes ("protozoa"), thereby compromising the membrane integrity and killing the treated cell (see figure 1).



Figure 1. *Biokos dissolved in water perforates the membrane of Ichthyophthirius multifiliis tomonts causing the release internal material by Osmotic pressure. (Al-Jubury, et al., Journal of Fish Diseases 41:1147-1152.).*

Marana *et. al* in 2023 found that *I. multifiliis* tomonts were inactivated after only a few seconds at the highest concentration (160 µg/mL), but also found, very importantly, that half of the tomonts were deactivated (showing no motility or movements of cilia) within 30 min at the very lowest concentration of Biokos (2.5 µg/mL). The exposed tomonts showed changes in their rotation and cytoplasmic movements, and specifically, at the lower concentrations (2.5–40 µg/mL), the characteristic rotation motions gradually became slower after the exposure and eventually the parasite stopped rotating and died with evident perforation of the parasite plasma membrane, followed by detachment of cilia (figure 2) and extrusion of the cell content.

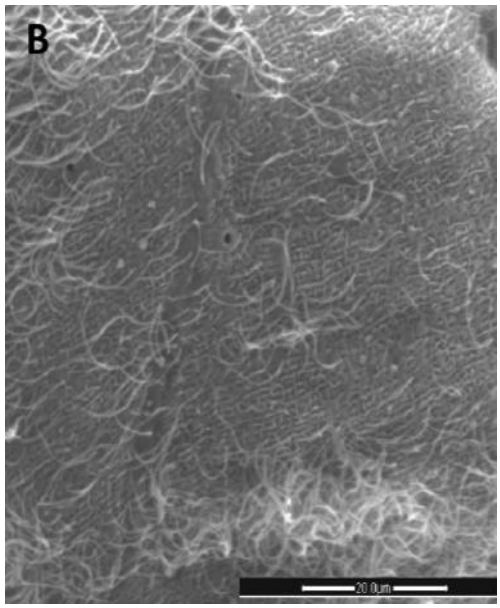


Fig. 2. *Scanning electron microscopy (SEM) of I. multifiliis tomont exposed to the surfactant SPH6 at a concentration of 40 µg /mL, showing partial deciliation and membrane perforation (from Marana et. al in 2023).*

The adverse effects of Biokos on fish are minor, with eco-toxicological studies showing high tolerance in many organisms, like cyanobacteria, plants, crustacea, and zebrafish. Also, Biokos does not harm nitrifying bacteria, and can therefore be considered "biofilter friendly."

In a study conducted at Copenhagen University, in accordance with OECD test guideline 236, zebrafish embryos (*Danio rerio*) exposed to various concentrations of Biokos showed no mortality and 100% hatching success at concentrations lower than 12.6 µg/mL. In this highly sensitive study, no detrimental effects were seen near typical use concentration of CLP (6.3 µg/mL) with an LC_{50} of 17 µg/mL for the acute toxicity test in zebrafish embryo post 96 hrs exposure.

Biokos® degradation has been tested in various conditions and water types (both freshwater and salt water) with similar results. Once dissolved in water, Biokos degrades in 24-48 hours into amino-acids and fatty acids, likely by bacterial esterases, which cleave the cyclic structure of the CLP and it becomes inactive.

Parasites Targeted

Although the active ingredient has shown efficacy against a large variety of pathogens (from both saltwater and freshwater), most research and trials studies have been conducted against the ones affecting fish in the ornamental and the aquaculture sector. Treatments being used are tailored to protozoa such as *Ambiphrya, Ichthyobodo, Epistylis, Chilodonella, Trichodina, Tetrahymena, Ichthyophthirius multifiliis* and *Cryptocaryon.* Below, we can see the main parasite species and the fish affected by on which Biokos® has activity.

Table 1. *List of parasites and affected species on which Biokos shows activity.*

Safety Data

In 2024, Sundew conducted a standard acute toxicity study (6 packs) on Biokos®. The studies were performed by Product Safety Labs (NJ, USA) according to US EPA, OECD, Japanese and EU guidelines.

See Table 2 on next page.

Table 1. Parasite or Disease	Example of Affected Species (major species in bold)
Ambiphrya	**Carp, Tilapia,** pond fish
Amoebic Gill Disease	**Salmon,** Trout, Bass, Turbot, Wrasse, Crabs
Chilodonella	Barramundi, Murray Cod
Costia (Icthyobodo)	**Salmon, Tilapia,** Juvenile fish
Cryptocaryon	**Most marine spp**. inc grouper, flounder, sea bream
Cryptosporidium	**Humans,** Cattle, Sheep, Fish
Epistylis	**Tilapia, Shrimp,** Barramundi
Ich/White Spot	**Carp, Tilapia, Catfish,** Trout, Koi
Philaster/Philasterides	Turbot, Flounder, Sharks, Sea Urchins
Tetrahymena	Guppies, other "Livebearers"
Trichodina	**Tilapia, Salmon,** Trout
Unidentified ciliate sp.	**Kelp**
Uronema	Turbot, Fugu, Flounder
Vorticella	**Shrimp, Tilapia**
Zoothamnium	**Shrimp,** Horseshoe Crabs

Table 2. Study	Results	Conclusion
Primary Skin Irritation	PDII Score = 0.3	Slightly Irritating*
Acute Dermal Toxicity	100% Survival	LD_{50}>5000mg/Kg**
Dermal sensitization	No sensitization at 2,5%, 5% and 10% concentrations	Not a contact sensitizer
Acute Inhalation Toxicity	100% Survival	LD_{50}>2.22mg/L***
Primary Eye irritation	MMTS: 45.7 (Avg. Irritation score)	Severely Irritating
Acute Oral	100% survival up to 5000 mg/kg	LD_{50}>5000 mg/Kg**

**PDII classification:*
0 non-irritating (water); 0.1-2.0 slightly irritating;
2.1-5.0 moderately irritating; >5.0 severely irritating

***5000 mg/Kg = max dosage allowed to be used (for ethical reasons) for this study.*

****2mg/L – max dosage allowed to be used (for ethical reasons) for this study.*

The results show that Biokos® has a high degree of safety, especially if we compare to more traditional products available today (please refer to Table 3 below).

Table 3. *Comparative table between various chemicals used in the ornamental and aquaculture sector shown as a traffic light system (Green-positive, Red-negative).*

PARAMETER	Ich-Away™	Formalyne-F	Malachite Green	Paramove-50 (H_2O_2)	Formalin-Malachite Green (FMG)
Shelf Life (years)	3+ years	2 years	5+ years	2 years	2-3 years
Ease of use	Pre-dosed effervescent tablet	Needs use of PPE, requires dose calculation & measurement.	Needs use of PPE, requires dose calculation & measurement.	Needs use of PPE, requires dose calculation & measurement.	Needs use of PPE, requires dose calculation & measurement.
Mode of Action	Biological. Disrupts protozoan membranes.	Chemical fixative. Binds proteins and amino acids.	Fungicidal/dye disrupts metabolism	Oxidising agent, damages membranes	Disrupts metabolism,
LC_{50} (Zebrafish Embryo mg/l)	17	12.7	0.03	20-40	0.03
Safety Margin	5x margin in juveniles	Narrow sublethal effects common	Low toxicity to eggs/juveniles	Moderate, species dependant	Low
Skin Irritation Score	Slight (score 0.3)	Severe irritant	Toxic and carcinogenic	Mild to moderate	Toxic and carcinogenic
Oral Toxicity	>5000	Severe (corrosive if ingested)	Highly Toxic	Low	Highly Toxic
Inhalation Toxicity	>2.22 100% survival	0.51	Carcinogenic in dust form	Low to moderate	Carcinogenic
Biodegradability	Naturally degrades (1-2 days)	Persistent if not neutralised	Persistent, bioaccumulates	Degrades to water and oxygen	Persistent
Regulatory status	US indexing pending	Restricted in many areas	Banned in aqua-culture and many countries	Approved for specific claims but regulated	Banned in some places, restricted in others

CASE REPORTS

Availablility

Biokos® is manufactured by Sundew in Denmark via a proprietary fermentation process. It is available on the ornamental market in the form of easy-to-use effervescent tablets under the Sundew Ich-Away™ brand and other private labels in Europe, USA, Brazil, Singapore and Australia.

The Sundew Ich Away™ package contains one tube with 8 effervescent tablets designed to treat a total of 400 litres of aquarium water.



Discussion

Although it has initially entered the market as an anti-parasitic treatment in the ornamental fish market, Biokos® holds great potential for the aquaculture sector, where the need for selective, effective and environmentally benign treatments is high.

Sundew has been consistently developing the Biokos® fermentation processes at the Danish production site which, in the next 2 years, will be able to satisfy the demand for the ornamental and initial aquaculture market (hatcheries, small scale studies). At the same time Sundew if also gearing up for expanding the production site in order to enter the much larger aquaculture market.

With its broad range of efficacy on parasites, being a natural product that is biodegradable into harmless component in 48 hours, and being biofilter friendly with no effects on the denitrifying bacteria, Biokos has the potential to be a game changer for the control of fish parasites in both aquaculture and ornamental markets. Our product benefits are in line with the sustainable development needed in a sector that has been relying on hard chemicals such as formalin, peracetic acid, potassium permanganate and various antibiotics.

Additional Studies

We have an extensive list of studies we did both in-house for our own use but also published papers done with various institutions and researchers, as can be seen below:

Diversity of Aquatic Pseudomonas Species and Their Activity against the Fish Pathogenic Oomycete Saprolegnia
Liu Y., E. Rzeszutek M., van der Voort C. Wu, E. Thoen, I Skaar, V. Bulone, P.C. Dorrestein,J.M. Raaijmakers and I. de Bruijn, 2015.

Impact of Pseudomonas H6 surfactant on all external life cycle stages of the fish parasitic ciliate Ichthyophthirius multifiliis
Al-Jubury A., Lu C., Kania P.W., von G. Jørgensen L., Liu Y., de Bruijn I., Raaijmakers J., and Buchmann K. 2018.

Inflammatory reactions in rainbow trout fins and gills exposed to biocides
Mathiessen H., Haahr Marana M., Korbut R., Wu B., Al -Jubury A., Karami A.M., Kania P.W. and Buchmann K. 2021.

Toxicity of the antiparasitic lipopeptide biosurfactant SPH6 to green algae, cyanobacteria, crustaceans and zebrafish.
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Figure 4. Biokos tablets dissolving in an aquarium. Photograph by Nick Saint-Erne.



GRAND ROUNDS CASE

Egg Bound Koi (reprinted from TAV 9:1)

Hi WAVMA,

I've this koi (*Cyprinus rubrofuscus*) that's egg-bound. No response to 0.5ml/Kg Ovaprim. Water temperature has been 23-25 deg C for a couple of months. The fish in this pond have never bred for years. Welcome your advice?



Yours sincerely,

Dr **Richmond Loh**
DipProjMgt, BSc, BVMS, MPhil (Pathology) Murdoch, MANZCVS (Aquatics& Pathobiology), CertAqV, CMA-VA, NATA Signatory.
THE FISH VET, Perth, Western Australia.
Veterinary Medicine for fish.
W: http://www.thefishvet.com.au
E: thefishvet@gmail.com
P: +61 (0)421 822 383
2014 President WAVMA.org

Time for surgery

Vulcan Veterinary vulcanveterinary@gmail.com

I totally agree. I would probably suggest surgery at this point.

Chad Harris, DVM

Agreed. Cut for the cure...

Adolf Maas DrMaas@zoovet.us

Likely at this point since the fish has not bred for years, in my experience, is that the fish has an ovarian sarcoma. Ovaprim will not have any effect on that. It may need to be surgically removed, and a radiograph would help identify a dense mass is present if it were a tumor. Often it will push the intestines ventrally and the chambers of the gas bladder cranially, which can be seen on radiograph. Using barium administered orally with a feeding tube will help visualize the intestinal tract on radiographs.

I have also seen abnormally enlarged gas bladders cause abdominal swelling, and the difference between the gas bladder and a mass in the abdomen will be easy to discern on a radiograph.

As Adolph succinctly summarized the surgeons' creed: A chance to cut is a chance to cure!

Nick Saint-Erne, DVM CertAqV
Certified Aquatic Veterinarian

You could try metoclopramide twice with Ovaprim with a day interval. I've had pretty good results with metoclopramide and HCG, since I am not allowed to use Ovaprim in Belgium.

Section is the last option since the shock with such a lot of eggs could be fatal in my humble opinion

Greta Van de Sompel
Dierenartsen Vander Cruyssen - Van De Sompel
johan.van.der.cruyssen@telenet.be

Suggested causes for the condition include the fish being too obese (fed diet too high in carbohydrates, fat builds up within the cavity and prevents healthy development of the eggs and ultimately their exit), "hybrid" koi, ovarian neoplasm or out-of-season.

In this case, the owners had been feeding a low quality, high carb diet for years. They have only just in the last 1 year, moved to Hikari and Koi King Pro. So, perhaps the suggestion of a high carb diet may be true. They are also pet koi, and not bred from pure lines.

All responses lead to action, because to leave her as she is might predispose her to septicaemia. This season, there've been several members in the koi club report sudden deaths of gravid females.

For management/treatment of this case:

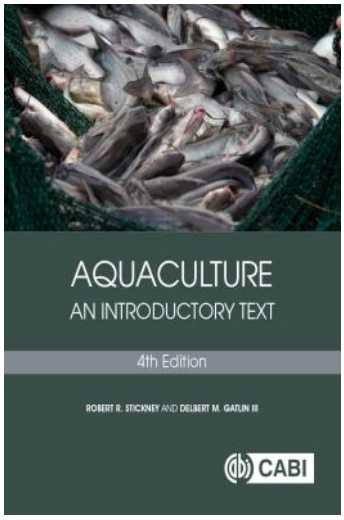
- Most suggest surgical removal of ovaries, but this can be tricky because of the delicate ovarian membrane.
- One suggested using a product called Alizin (an anti-progesterone for aborting bitches from 0-45 days post-mating). Constituent = Algepristone 30 mg/ml & each vial contains 300 mg/10 ml. Dose for bitch is 10 mg/kg by injection twice, 24 hours apart. The product is marketed by Virbac.
- And another suggested metoclopramide twice with Ovaprim or HCG with a day interval.

LITERATURE REVIEW

CABI Aquaculture Books

CABI publishes a number of books in aquaculture, fish welfare, and fisheries that may be of interest to WAVMA members. These books can be viewed here: https://www.cabidigitallibrary.org/action/showPublications?pubType=book&ConceptID=780213&sortBy=TitleSort&startPage=

These include 15 recently acquired titles that are new to CABI and published as eBooks for the first time. You can find out more about the acquisition here. Previously published in print by 5m Books, the titles are available digitally and as a collection for the first time on CABI Digital Library. Publication in eBook format makes them accessible to a wider audience, both for individual purchase and for libraries.

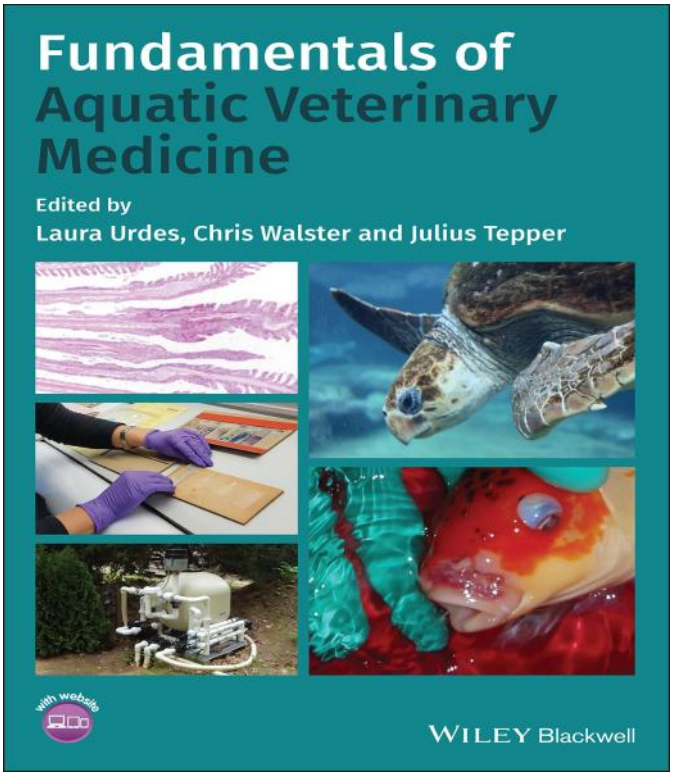




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In addition to the books focused on aquaculture here CABI also publishes information on One Health, which CABI is quite heavily involved in. There is an open access journal, CABI One Health and One Health Knowledge Bank – take a look and see if anything is of interest.

CABI
Nosworthy Way,
Wallingford, Oxfordshire, OX10 8DE, UK



Fundamentals of Aquatic Veterinary Medicine provides systematic, highly practical guidance on the treatment of aquatic mammals, amphibians, fish, and invertebrates in veterinary practice. Mapping to each of the nine core areas of the WAVMA Certified Aquatic Veterinarian (CertAqV) Program, this comprehensive clinical reference covers taxonomy, anatomy and physiology of aquatic species, water quality and life support systems, diagnostics, treatment, and prevention of aquatic diseases, and more. Designed to help readers acquire and demonstrate the necessary knowledge, skills, and experience to be competent in aquatic veterinary medicine, this authoritative guide:

- Focuses on "Day One" competencies outlined by the World Organization for Animal Health (OIE)
- Covers pathobiology and epidemiology of aquatic diseases, public health, zoonotic diseases, and seafood safety
- Provides up-to-date information on relevant legislation, regulations, and policies

Fundamentals of Aquatic Veterinary Medicine is a must-have reference and review guide for veterinary students and practitioners interested in practicing aquatic veterinary medicine, as well as for aquatic veterinarians looking to become WAVMA certified or wanting to acquire OIE "Day One" competency.

Available from:
https://www.wiley.com/en-us/Fundamentals+of+Aquatic+Veterinary+Medicine-p-9781119612704

LITERATURE REVIEW

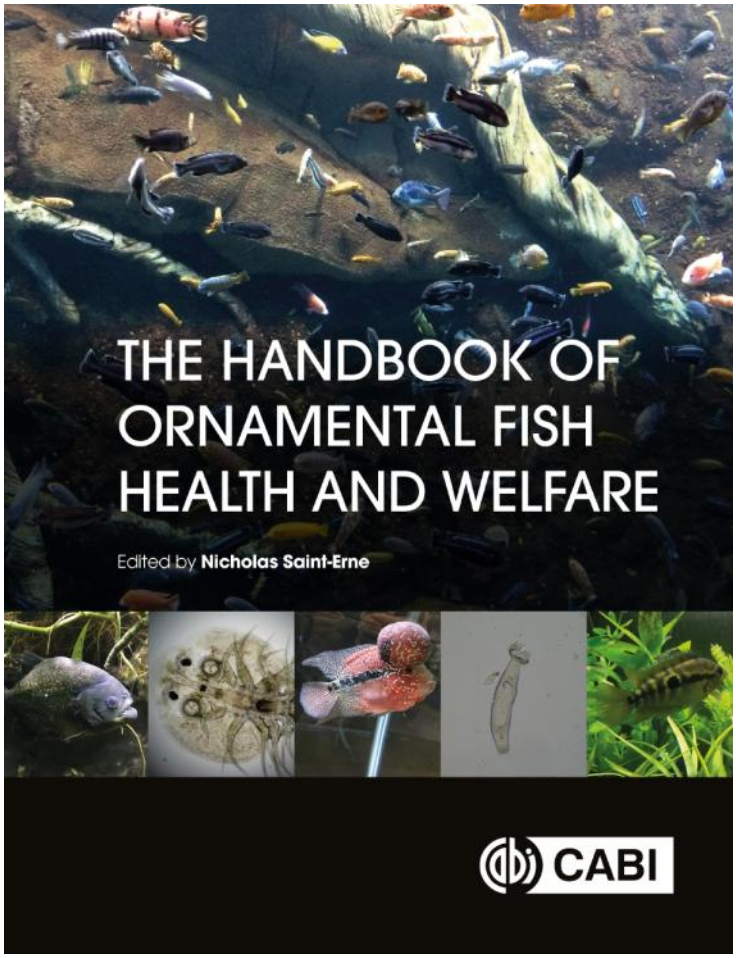
***The Handbook of Ornamental Fish Health and Welfare* (2024)**

Edited by **Nicholas Saint-Erne**, DVM, CertAqV
Certified Aquatic Veterinarian
WAVMA Distinguished Fellow

This book forms a complete resource covering ornamental fish health and welfare from a recognized expert on the topic. Beginning with an overview of the tropical fish industry and aquarium keeping, it covers all the key elements of care, including water-quality testing and maintenance, filtration systems, nutrition, husbandry, handling and transportation of fish, disease diagnosis, treatments and medications, and disease prevention. It also reviews areas of wider interest, such as biosecurity and zoonoses.

Chapters include:
1 A Brief History of Keeping Fish in Aquariums
2 Overview of the Ornamental Fish Industry
3 Fish Taxonomy, Anatomy, and Physiology
4 Aquarium Care
5 Water Quality
6 Filtration Systems
7 Fish Pond Care
8 Fish Nutrition
9 Equipping the Veterinary Hospital to Treat Fish Patients
10 Clinical Procedures
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13 Transporting Samples for Laboratory Analysis
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18 Protozoan Parasites
19 Metazoan Parasites
20 Zoonotic Diseases from Fish
21 Non-infectious Diseases
22 Fish Facility Husbandry and Biosecurity
23 Administering Medications to Ornamental Fish
24 Ornamental Fish Welfare
25 Welfare of Fish in Public Aquariums
26 Quarantine Protocol
Recommended Reading
Glossary
Index

The chapter authors are all WAVMA members and Certified Aquatic Veterinarians, and include:
Azureen Erdman, DVM, CertAqV
Sharmie Johnson, DVM, CertAqV
Wildlife World Zoo & Aquarium
Robert Martinez, DVM, CertAqV
Aquatic Veterinary Consulting, PLLC.



Lily Parkinson, DVM, DACZM, DACVECC, CertAqV. Brookfield Zoo
Nicholas Saint-Erne, DVM, CertAqV
WAVMA Distinguished Fellow
Chris Walster, BVMS, MVPH, CertAqV
WAVMA Distinguished Fellow

The book can be read through to gain a complete overview of the care and welfare of ornamental aquarium and pond fish, or it can be used to easily look up specific information about a topic of interest. With extensive photographs, plus references allowing readers to study areas of interest in more detail, this book makes an invaluable teaching and reference handbook. It is a vital source of information for veterinarians, scientists using fish in their labs, students, ornamental fish breeders, retail pet store workers, and aquarium keepers looking for trusted advice about how to properly care for their ornamental freshwater fish.

Available through the CABI website:

https://www.cabidigitallibrary.org/doi/book/10.1079/9781789246032.0000

AQUATIC VETERINARY CE & PD

MEETINGS OF INTEREST TO AQUATIC VETERINARIANS

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

WAVMA Resources for CertAqV and CertAqVN/T
www.wavma.org/WebCEPD
Resource: one hour Webinars on various topics
Cost: Available for free to WAVMA Members.
KSE Credit: Stated for each webinar. To gain the CEPD certificate you need to complete a short quiz.
Evidence: Submission of Certificate with KSE record.

www.wavma.org/video-library
Resource: Video recordings deemed of good quality but not part of WebCEPD
Cost: Free to WAVMA members
KSE Credit: Variable,
Comments: One of WAVMA's primary aims is to promote aquatic veterinary medicine. There are other resources WAVMA provides such as The Aquatic veterinarian, member listservs, e-news and blog.

Aquadocs
www.aquadocspodcast.com
Resource: Various discussion topics
Cost: Free
KSE Credit: Dependent on time and topic
Evidence: None. Discuss with mentor
Comments: Lots of information on various topics.



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Fish Health, Parasites and Biodiversity Conservation
Mérida, Mexico – 20 January to January 24, 2025

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- Protozoal Parasites of Fish - 10 Lessons
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- Nematode (round worm) Infestations in Fish - 2 Lessons
- Other Disease conditions - 14 Lessons
- Formulary of Fish Medications - 7 Lessons
- Biosecurity - 2 Lessons
- Welfare and Euthanasia - 4 Lessons
- Anaesthesia and Surgery - 5 Lessons
- Euthanasia - 1 Lesson
- Laboratory Testing - 2 Lessons
- Case Studies - 5 lessons
- VIP Access for FVMC Facebook group for direct questions with Dr Loh

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AQUATIC VETERINARY CE & PD

The Fish Vet Masterclass online course

Testimonials

Harriet Woodhall

BVM&S CertAVP(ZM) MRCVS Advanced Practitioner in Zoological Medicine

I completed this course to go towards creditation for the WAVMA aquatic certification. It was extremely comprehensive, had a range of formats and everything was clearly explained in a logical way. I'm very happy it was recommended to me, it has given me an excellent foundation in fish medicine with practical applications to practice. Thank you!

Dr Karlee Hirakis

Certified Aquatic Veterinarian (BVSc CertAqV)

I thoroughly enjoyed the fish vetting masterclass. The lessons are just the right length, packed full of important information in an easy to understand manner. I particularly love how Dr Loh makes applying the scientific information to real life easy.

Dr Greta Van de Sompel

Certified Aquatic Veterinarian (DMV, CertAqV)

Very happy I follow this course! I'm a certified aquatic vet and always interested to learn about fish health. This course is a pearl for anyone who is interested in the health of fish!

Dr Sandri Jonker

Veterinarian (DVM)

Your course was absolutely awesome. It was like doing a paper at Uni, but the advise more practical and applicable. Excellent value for money. I think it's even helped me as a regular clinical vet.

For more info and testimonials visit: **https://fishvetmasterclass.com**

Betta splendens photograph by Aquazone Indonesia



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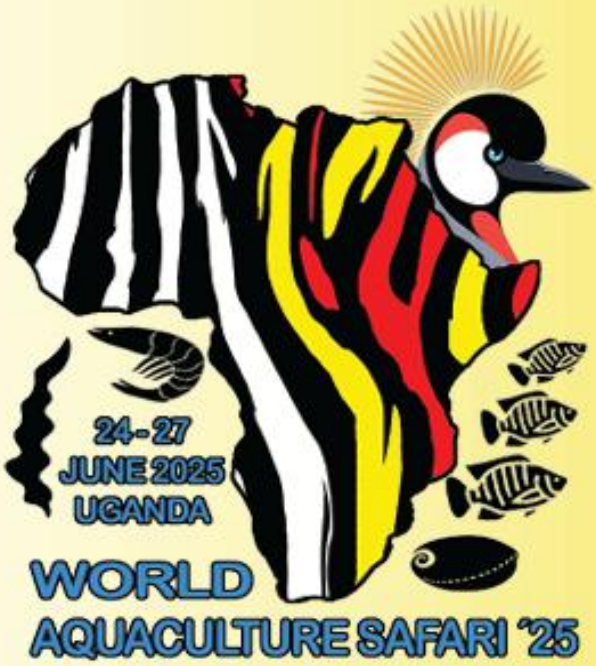
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American Association of Fish Veterinarians

The conference is being held at the Long Island Aquarium:
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The American Association of Fish Veterinarians (AAFV; fishvets.org)
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