

The



quatic

eterinarian



Sea turtle CT scan, extrapulmonary air compressing left lung (arrow). See Clinical Case Report on pages 22-25.

Volume 11, Number 1
First Quarter, 2017



WHO ARE WE

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

The objectives of the World Aquatic Veterinary Medical Association are:

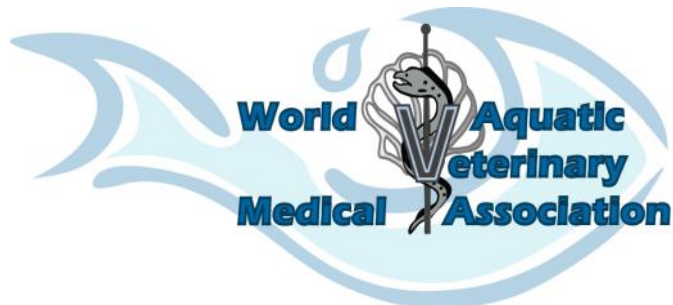
A. To support our members by promoting aquatic veterinary medicine practitioners, and the aquatic animal species and associated industries they serve around the world;

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 and publications, including a credentialing process to recognize day-one competency in aquatic animal medicine.

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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Editor’s Note

This issue of *The Aquatic Veterinarian* was initially scheduled to focus on Aquatic Invertebrates, but that topic will have to wait until more material becomes available. There seems to be a dearth of articles about the aquatic invertebrates lately, so if this is your field of focus, please send me articles and case reports so we can put together an issue on that topic.

However, even though we had focused on aquatic turtles only a few issues ago, there is a plethora of articles available on that topic, including the interesting case report submitted to us by WAVMA member, Dr Monreal-Pawlowsky. This is a great example of material we would encourage all our members to submit about interesting cases they are involved with. It may help another veterinarian in the future to know what steps were taken on previous health issues of a similar kind and how the patient resolved.

In addition to clinical case reports, please submit other articles, review papers, or just items of interest that we can print in our journal. Also, we are always looking for Colleague’s Connection articles to share so that other Aquatic Veterinarians can learn about their colleague’s interesting adventures in our aquatic arts. Please see page 11 for more information about items we would like to have submitted to the journal.

The year 2017 is off to an extremely busy start (at least for me!) and should prove to be another interesting and educational year. I am especially looking forward to the WAVMA Annual General Meeting and Conference in the Fall in Transylvania (Romania!). If that doesn’t get your BLOOD pumping, nothing will. See page 17 for more information about the WAVMA Conference registration.

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



The Editor at the National Aquarium in Baltimore, MD, USA. October 2016.

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



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

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:

Sea turtle CT scan, extrapulmonary air compressing left lung (arrow); from Pneumocoelom related to physiotherapy in a loggerhead sea turtle (Caretta caretta) with fore flipper paralysis
By **Monreal-Pawlowsky, et al.**
See article on pages 22-25.

The Aquatic Veterinarian

The Quarterly Magazine of the World Aquatic Veterinary Medical Association

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Free 1/8 page (business card size) advertisement
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President's Report

The 2017 year started in full force, with great plans and projects for the current and upcoming years for WAVMA members and committees. One of this year's plans is the second stand-alone WAVMA Conference and Annual General Meeting, set to take place in Transylvania, Romania, this autumn; I will refer more to this event in the March e-News newsletter. Also worthy to mention, WAVMA is currently working with The Fish Vet Society (FVS) on a partnership agreement intended to provide mutual benefits and recognition.

Following, I will list and comment on completed and undergoing actions of the WAVMA Executive Board during the first quarter of the year 2017:

Amended Bylaws Poll: During the year 2016, our Past President, Nick Saint-Erne, initiated the process of refining the Bylaws. This process is now completed, the document following to be voted on through a Survey Monkey poll, by the Full WAVMA members. This document is crucial to the future of WAVMA and to its members. Therefore, I strongly encourage WAVMA members to take it into consideration when prompted.

CertAqV Program Updates: To date, we have 52 approved CertAqV awardees and 37 CertAqV applications in progress. The year 2018 is the first year of re-certification of the first CertAqV awardees. Thus, 2018 will mark five years of successful implementation for the CertAqV program. Let us wish many successful years ahead to this great project!

I should also mention here that the CertAqV program is currently undergoing module revisions as part of continual improvement and to reflect knowledge, skills and experience requirements of future applicants.

Pitts Education Awards Program, 2017: A total of 27 applications were submitted for evaluation this year. Notifications to the applicants will be out by May 2017. Also good news with this program is that WAVMA was able to increase its donation this year, due to exceeded expectations of income.

To date, the John L. Pitts Program has provided financial assistance to 65 students and recent graduates over the past 10 years, supporting students and recent graduates across four continents to increase their experience with aquatic veterinary medicine. Let's wish the applicants good luck in fulfilling their educational ambitions with the help of WAVMA!

Multilingual WAVMA Brochure: Very soon, WAVMA will have available for their international members a brand new brochure to promote WAVMA, translated into more languages, such as Portuguese, Spanish, French, German and Romanian/Moldavian, to reflect the multinationality of WAVMA today.

Membership Committee Restart: Recognizing the importance of the committee to members, the Membership Committee was given a fresh start at the beginning of this year following a two year break, with

Chris Walster serving as the committee Chair. As an insight, the committee is tasked with developing packages of benefits to encourage general membership to enroll with various committees, or to undertake new WAVMA projects. It is our hope that these packages will motivate more members to actively contribute to building a brighter future for WAVMA.

New Student Chapters Established: Two new Student Chapters have been established since the beginning of the year, in Africa - University of Pretoria, Onderstepoort (**Faculty Advisor** – Dr. Jan Myburg), and in the United States - Oregon State University (**Faculty Advisor** – Dr. Tim Miller-Morgan). Welcome and good luck!

WebCEPD Program Administration: WAVMA is currently looking for members willing to help with administration of the Webinar program, as well as for webinar presenters/speakers. If interested in getting involved with this great project, please contact me, at: president@wavma.org

Laura Urdes, PhD DVM PgDip CertAqV
WAVMA President
Bucharest, ROMANIA
president@wavma.org



Secretary's Report

Dear WAVMA members,

We have begun the year under the guidance of our president, Dr. Laura Urdes. She has been actively involved in several initiatives aimed at amplifying the influence of WAVMA, especially in the area of alliances with other veterinary organizations. It is also the desire of the 2017 Executive Board to work more closely with the general membership and as a result I wish to encourage members to write to any of the board members on any issue related to WAVMA.

Many of our members have renewed their membership quite early and I thank those of you that have done so. Allow me to also issue a reminder that membership runs from the 1st of January through the 31st December each year and that membership dues can be made online through a secure credit card payment system in your member profile or paid through the post to the Treasurer.

Those who do not pay their 2017 dues by the 1st April 2017 will unfortunately be deactivated from the website. This means that although your original details will still be available to you, you will not be able to access the member's only section of the website or receive any benefits such as the ability to communicate with other aquatic veterinarians around the world through the listserv, the quarterly *The Aquatic Veterinarian* journal (TAV), and webinars which can be used to achieve your CEPD requirements for re-licensure at considerably reduced cost. If you are uncertain of your status, you can simply log into your members profile. If you have forgotten your log-in details, or have any problem concerning the website, then please do not hesitate to email administrators@wavma.org to have the issue rectified.

This year the board intends to refine the process for several member services so as to serve you better and to improve on the various communication tools such as the website. It is expected that more members will in this year take advantage of one of the most significant member services, that of the Aquatic Certification process, which has already been successfully completed by a sizeable group of our colleagues, with many of them serving as mentors. Details can be found at <http://www.wavma.org/CertAqV-Pgm>.

I wish to salute the Students Committee for continuing to keep the perspectives of our student members in focus. We will support their initiatives and encourage the continued formation of student chapters. WAVMA is also committed to the expansion of the John Pitts Award to support an increased number of students in the future.

WAVMA has renewed its affiliation with the World Veterinary Association (WVA) and the World Small Animal Veterinary Association (WSAVA). As secretary, I

will continue to share a wide range of information from these and other international associations with our members. I encourage you to take advantage of the benefits that can be derived from these alliances. Finally, I wish to encourage our general membership to consider attending the WAVMA congress and Annual General Meeting in Romania. More details can be found at <http://conferences.wavma.org/events/2017-tirgu-mures-romania-12-sep-2017>.

Thank you all for the renewed confidence you have placed in us and let's continue to work together to accomplish much in this year.

Devon Dublin, PhD. DMVZ, MSc. CertAqV
WAVMA Secretary
Global Environment Facility - Satoyama Project
6-7-22-451 Conservation International-Japan,
Shinjuku, Tokyo,
160-0022, Japan
Secretary@wavma.org



Treasurer’s Report

The year 2017 is starting strong with 361 renewals of WAVMA memberships. So far this year we have 155 veterinarian members, 15 new graduate veterinarians, 183 veterinary students, 2 vet tech/nurses and 6 affiliate members! Don’t forget that membership runs by calendar year, so your 2017 dues are now payable.

If you have not paid your dues, this will be your last issue of *The Aquatic Veterinarian* (don’t miss out on future issues!), and you will also be locked out of members-only sections of the WAVMA.org website at the end of April. Please go online now and pay your 2017 membership dues if you have not done so already. Here is an easy link to the website:

<https://www.wavma.org/membership-renewal>

In other news, we are on track with the website and programming for our Annual General Meeting and Conference in Romania this September. Registration for the conference is now available on the conference website:

<https://conferences.wavma.org/events/tirgu-mures-romania-12-sep-2017>.

Hope you will renew and then register for our AGM for another entertaining and educational year. Best wishes,

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



New Members (1st Quarter 2017)

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

Full Members

- | | |
|-------------------------|----------------------|
| Anna Bowker | United Arab Emirates |
| Richard Brown | United States |
| Michelle Guarin | United States |
| Jimmy Johnson | United States |
| Tae Sung Jung | Republic of Korea |
| Waweru Kamundia | Kenya |
| David Landers | United States |
| David Marancik | Grenada |
| Tania Monreal-Pawlowsky | Spain |
| Ginger Sturgeon | United States |
| Ratna Kurniasih | Indonesia |
| Amber Roegner | United States |

New Members (1st Quarter 2017) - continued

New Graduate Veterinarians

- | | |
|------------|---------------|
| Lynda Dirk | United States |
|------------|---------------|

Vet Student Members

- | | |
|-----------------------|-----------------------|
| Holly Arnold | United States |
| Lacey Benefiel | Grenada |
| Thea B'ey | United States |
| Jodi Botha | South Africa |
| Christine Casey | United States |
| Sung Hwi Cho | United States |
| Samantha Connolly | Saint Kitts and Nevis |
| Bryden Cox | Australia |
| Kaitlyn Depsky | Grenada |
| Emily Dodd | Saint Kitts and Nevis |
| Paul Frye | Saint Kitts and Nevis |
| Erika Gibson | United States |
| Fernanda Gusmao | United States |
| Laura Haider | Saint Kitts and Nevis |
| Scott Hammer | United States |
| Brian Hargrave | United States |
| Lindsey Hattaway | Grenada |
| Rachel Henriquez | United States |
| Samantha Hough | Grenada |
| Po Jiun Huang | Australia |
| Hannah Jacobs | Grenada |
| Anastasia Lackey | Canada |
| Felicity Lam | Australia |
| Andrea Landgraf | Saint Kitts and Nevis |
| Haylie Lawson | United States |
| Kristina Legland | Saint Kitts and Nevis |
| Stephen Long | United States |
| Hei Yin Lum | Australia |
| Kan Masutani | Grenada |
| Christopher McMonagle | United States |
| Shannon Metzger | Grenada |
| Caitlin Moreland | Grenada |
| Jordan Morris | United States |
| Elizabeth Muller | United States |
| Varushka Naidoo | South Africa |
| Thi Diem Thuan Nguyen | Australia |
| Sarah Orpin | United States |
| Courtney Pace | United States |
| Leidy Peña | Colombia |
| Amanda Perkins | United States |
| Jillian Perron | Grenada |
| Jeanette Peterson | United States |
| Laura Rasche | United States |
| Camille Richie | Grenada |
| Lauren Rooley | Grenada |
| Matei Safta | United Kingdom |
| Foster Scott | Canada |
| Ashika Seshadri | United States |
| Ishita Shah | United States |
| Alexandria Sheppard | Grenada |
| Stephanie Shield | Australia |
| Sarah Tabin | Grenada |
| Christopher Tan | Australia |
| Natalie Torkelson | United States |
| Jennifer Turner | United States |
| Aaminah Vahed | South Africa |
| Joanet van Zyl | South Africa |
| Briana Warner | United States |
| Nathan Wilen | United States |
| Alfred Woodley | South Africa |
| Courtney Wright | United States |

PRIVILEGES & BENEFITS OF WAVMA MEMBERSHIP

Aquatic Veterinary e-Learning

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



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

WAVMA Committees

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

Budget and Finance Committee

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

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

Chair: Sharon Tiberio, Treasurer@wavma.org

Communications Committee

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

Chair: Devon Dublin, DevDub@yahoo.com

Credentialing Committee

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

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

Meetings Committee

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

Chair: Julius Tepper, cypcarpio@aol.com

Membership Committee

This Committee oversees membership issues to optimally serve individual members and the organization. Chris Walster, chris.walster@onlinevets.co.uk

Student Committee

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

Chair: TBD

Certified Aquatic Veterinarians

Giana Bastos-Gomes	Australia
Heather Bjernebo	USA
James Bogan	USA
Todd Cecil	USA
Michael Corcoran	USA
Emily Cornwell	USA
Darren Docherty	UK
Simon Doherty	UK
Devon Dublin	Japan
Mohamed Faisal	USA
Ari Fustukjian	USA
Christopher Good	USA
Orachun Hayakijkosol	Australia
Colin Johnston	New Zealand
Kasper Jorgensen	Denmark
Brian Joseph	Canada
Elizabeth Kaufman	Israel
Jack Kottwitz	USA
Richard Lloyd	UK
Richmond Loh	Australia
Adolf Maas	USA
Matthijs Metselaar	UK
Tim Miller-Morgan	USA
Haitham Mohammed	Egypt
Ross Neethling	UK
Dušan Palić	Germany
Brian Palmeiro	USA
David Pasnik	USA
Ayanna Phillips	Trinidad & Tobago
Jena Questen	USA
Aimee Reed	USA
Stephen Reichley	USA
Komsin Sahatrakul	Singapore
Nick Saint-Erne	USA
Jessie Sanders	USA
David Scarfe	USA
Khalid Shahin	UK
John Shelley	USA
Melissa Singletary	USA
Esteban Soto	USA
Win Surachetpong	Thailand
Gillian Taylor	S. Africa
Julius Tepper	USA
Sharon Tiberio	USA
Laura Urdes	Romania
Greta Van de Sompel	Belgium
Christopher Walster	UK
Scott Weber	USA
Trista Welsh	USA
Peter Werkman	Holland
Howard Wong	Hong Kong

Credentialing Committee

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

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

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

- Register for the Program (application at <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 52 aquatic veterinarians. Congratulations on our newest Certified Aquatic Veterinarian:

Dr. Kerry Illes

There are an additional 38 other WAVMA members currently in the process of being certified. For more information, see the WAVMA website: <http://www.wavma.org/CertAqV-Pgm>.

Tim Miller-Morgan, DVM, CertAqV
2017 Credentialing Committee Chair

**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.

Meetings Committee

The Meetings Committee is pleased to report that our conference “Current Concepts and Practices in Aquaculture and Ornamental Fish,” scheduled for September 12-14th, 2017 in Tîrgu Mureş, Romania, is fast approaching. This conference will provide a framework for discussion and reflection on the role of veterinarians in fostering aquaculture and ornamental fish industries’ sustainable development in the Eastern Europe region.

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

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

We are currently calling upon all those members who are interested in presenting either a live presentation or poster presentation to submit a CV and abstract as soon as possible. We have secured the slate of dignitaries and world-renowned speakers for our keynote presentations. Dr. Hamish Rodger will speak on aquaculture topics and Dr. Julie Cavin will talk about public and private ornamental practice. Information for presenters and attendees can be found at the conference website.

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

In January, 2017 the annual Exotics Symposium was held at the University of Missouri, College of Veterinary Medicine. In attendance and presenting were WAVMA members Dr. Dave Scarfe and Dr. Stephen Reichley. WAVMA was a sponsor at the event and helped to offset the cost of wetlabs.

Looking ahead to the summer, WAVMA will again have our booth at the AVMA Convention from July 21-25, 2017 at the Indiana Convention Center in Indianapolis, Indiana. Several WAVMA members will be presenting. If you’re going, be sure to stop in and say hello.

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



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!

Instructions for Authors and Contributors

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

Colleague's Connection

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

Peer-Reviewed Articles

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

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

Clinical Cases

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

Book Reviews

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

Publication Abstracts

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

News

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

Legislative & Regulatory Issues

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

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

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

Jobs, Internships, Externships or Residencies

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

Advertising

See advertising rates on page 4.

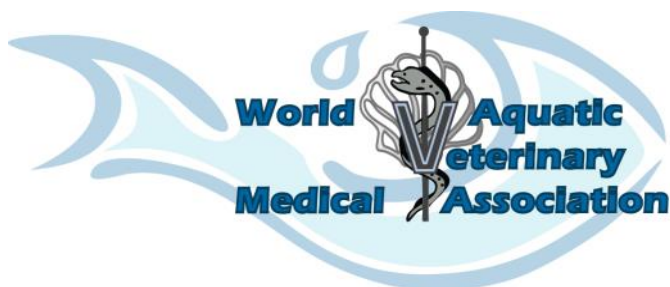
Please send articles, clinical reports, or news items to the editor by the following submission dates:

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

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

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

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



**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.

Fellows Advisory Council

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

Our WAVMA Distinguished Fellows are:

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

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

Executive Board Responsibilities

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

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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>

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

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

SCHOLARSHIP COMMITTEE:

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

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

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

The Program accepts applications from veterinary students currently enrolled, or recent graduates (within the past 24 months), of any nationally recognized veterinary school or college throughout the world that awards a degree allowing the person to practice veterinary medicine. Applicants must submit an application form and resume or curriculum vitae. They must also have someone who can attest to their interest and/or involvement in aquatic veterinary medicine as well as their potential to contribute to the profession send a letter of recommendation on their behalf.

Recipients will be notified by May 2017. After completion of their activity, all awardees must provide a written report for publication in *The Aquatic Veterinarian*, the quarterly publication of the World Aquatic Veterinary Medical Association (WAVMA), and are en-

couraged to give a presentation about their experience to other veterinary students.

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

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

Previous Recipients' Countries

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

Previous Recipients' Universities

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

2016 John Pitts Aquatic Veterinary Education Support Program Report

Tatiana Weisbrod
Cornell University
Class of 2017

I've been hooked on aquatic medicine since interning as a pre-vet at the New England Aquarium with their rescue and rehabilitation department. Marine conservation, research, medicine and specifically sea turtle rehabilitation has been my passion ever since. Thanks to the generosity of WAVMA and the John L. Pitts Aquatic Veterinary Education Awards Program, I was able to spend a month at the Georgia Sea Turtle Center on beautiful Jekyll Island chasing my dream.

I was graciously hosted by an island local who made sure I never missed a good sunrise and taught me all about Jekyll's rich history. The center was established in 2007 in what was formerly the historic Jekyll Island power plant. It features a museum with interactive and educational exhibits and a viewing station of the hospital clinic, providing guests a window into the daily care of turtle patients. Guests are welcome inside the rehabilitation ward to watch recovering sea turtles and diamondback terrapins and listen to daily talks presented by knowledgeable staff members and volunteers.

As a veterinary extern I assimilated quickly into the team working alongside technicians, Americorps volunteers, interns and Dr. Terry Norton, the center's founder and veterinarian. I was instructed in all aspects of turtle care from handling and husbandry to wound management and anesthesia. Each day brought forth a new challenge and I was thrilled to gain practical experience with necropsies, blood draws, tube feedings, shell repair, drug administration and suturing. I also had access to a comprehensive library of current literature and was even able to attend a few of Dr. Norton's sea turtle medicine lectures.

In addition to sea turtles the center also cares for native diamondback terrapins, gopher tortoises and box turtles. Injured wildlife is also treated and I was able to help care for a variety of birds, including bald eagles, owls, hawks, terns, and brown boobies.

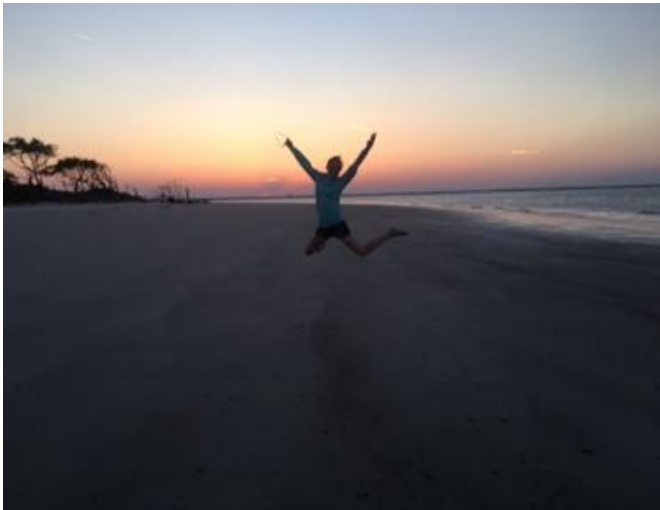
Aside from work at the center, I was also able to spend days with field biologists trekking through marshes tracking alligators and rattlesnakes, tagging turtles and terrapins, and assembling a giant floating net that would provide shelter for hatchling terrapins during their soft release period. I even got to help with a rattlesnake surgery! A particularly momentous occasion for me was the night I went out with the turtle patrol and watched my first sea turtle nest on the beach. We took measurements by the light of headlamps and laughed as a strong wind pelted us with sand while waves crashed behind us.



*A satellite tagged Kemp's Ridley sea turtle
on board the R/V Georgia Bulldog*

Dr. Norton also cares for animals on neighboring St. Catherine's Island and so once a week we would take a boat out to care for inhabitants ranging from lemurs to hornbills. I was also able to spend a day at White Oak, a conservation facility in Florida working with cheetahs. It was my absolute delight to spend a week off the coast of Georgia on board the *R/V Georgia Bulldog* assisting researchers with the South Carolina Department of Natural Resources and the University of Georgia's Marine Extension Service survey, tag and collect biological data on wild sea turtles. Here, I was able to see research and conservation strategies employed in the field, hone my net hauling skills, and become more familiar with local shark, ray, finfish and invertebrate species. The days were hot and salty, the sunsets spectacular, and watching dolphins riding our wake was incredible.

It's hard to imagine packing more experience or learning into one externship. My expectations were high at the start of my month on Jekyll Island and yet I left the island completely blown away. The center is dedicated to exceptional patient care, teaching, research, education, and conservation. They are invested in local outreach and engage members of the public in all aspects of turtle and wildlife care. I am so grateful to have had the opportunity to learn from such a welcoming, devoted and brilliant group of people who inspire visitors and vet students alike to be stewards of animal health.



Driftwood Beach at sunset



Applying a tie-over bandage to an injured Green sea turtle

A diamondback terrapin hatching!



A beautiful female diamondback terrapin patient .



Key-Note Speakers Announced for Conference

We are pleased to announce that Dr Hamish Rodger, Global Managing Director of the Fish Vet Group, will be our keynote speaker for the Aquaculture Section of presentations, along with Dr Julie Cavin, our keynote speaker for the Ornamental Section at our WAVMA Conference this September 12-14 in Târgu Mureș, Transylvania, Romania.



Dr. Hamish Rodger

Hamish Rodger graduated from the University of Glasgow Veterinary School, Scotland in 1984 and has worked as an aquatic animal veterinarian for over 30 years. He has a Masters in Aquatic Veterinary Medicine from the Institute of Aquaculture, University of Stirling, Scotland, where he also completed his PhD in 1997.

He was founder and principal of the veterinary aquatic animal practice Vet-Aqua International, now merged into Fish Vet Group (FVG) of which he is Global Managing Director (www.fishvetgroup.com). FVG is the world's largest aquatic animal veterinary, diagnostic and consultancy company and is part of Benchmark Holdings (www.benchmarkplc.com).

He is a founding Diplomat for the European College of Aquatic Animal Health and current research interests and projects include investigations into the causes and control of gill disease in marine farmed salmon, amoebic gill disease, alternate methods for the control of sea lice and effects of climate change on aquaculture.



Dr. Julie M Cavin

Dr. Julie M Cavin has spent the last seven and a half years at the New England Aquarium in Boston, MA, USA, initially as a Veterinary Fellow and then as Associate Veterinarian. Along with two other full time veterinarians, she is responsible for the health and well-being of a unique collection of animals including Northern fur seals, over 90 penguins of three different species, giant octopuses, and a multitude of fishes (bony and cartilaginous) from around the world. She also supervises multiple veterinary students each year.

Prior to her current position, Dr. Cavin earned a bachelor's degree and a Certificate in Living Marine Resource Ecology at Florida State University and a veterinary degree from North Carolina State University. She then completed a two year internship at the Georgia Aquarium in Atlanta, GA, USA before moving to New England Aquarium.

She has participated and led numerous unique procedures on aquatic animals during the nearly 10 years as a veterinarian and several years prior working with fisheries research and in rescue and rehabilitation clinics. Her research interests include improved anesthetic techniques for elasmobranchs, improving nutrition for aquarium animals of all taxa, and increasing the available baseline hematologic parameters for all aquatic animals.

For registration information, go to:
<https://conferences.wavma.org/events/2017-tirgu-mures-romania-12-sep-2017/registration>

WAVMA Annual General Meeting and Conference

Location: Plaza Hotel in Târgu Mureș (Tg. Mureș), located in the North-central part of the Transylvania region of Romania.

The climate: Tg. Mureș climate is mild, mostly humid. In September, the average temperature is 16° C (60 F) and humidity reaches 74%.

Currency: The currency is Romanian Leu/RON (*pl.* Lei/Roni). One RON/leu is divided into 100 Bani. The exchange rates of the RON conversion are established on a daily basis, by the National Bank of Romania (BNR).

1 EUR = ± 4.55 RON

1 USD = ± 4.26 RON

Dialing code: 004 (national code - Romania); (0)265 (Tg. Mureș area code)

Electricity: 230V-400V/50-60 Hz. Plugs are two round prongs.

Visa requirements: Please, see visa requirements and further travel information on the official website of the Romanian Ministry of Foreign Affairs, at: <https://www.mae.ro/en/node/2084>

To see if a visa is required for you to entry Romania, go to: <https://www.mae.ro/en/node/2040>

Airport transfer to Plaza Hotel

Transfer route from [Avram Iancu International Airport Cluj \(CLJ\)](#) to Plaza Hotel.



Most commonly, transfers from the Cluj airport to nearby cities is by car. Hotels in these cities usually provide transfer to/from the airport. Plaza Hotel will be able to offer transport services to participants, at request. This is a chargeable service and must be booked and acknowledged in advance (7-10 days prior to the arrival). For transfer to/from the venue, please contact directly Laura Urdeș: urdeslaura@gmail.com

Arrival by air: Avram Iancu International Airport Cluj (CLJ) is located in Cluj-Napoca city, at 62.0 miles (99.8 km) away from Târgu Mureș. A number of airlines operate on this airport. Major European capitals are connected directly to Cluj. TAROM and BlueAir are Romanian companies. TAROM - a SkyTeam Alliance member, is the Romanian national airline company. Approximate flight time from most European capitals is 1.50-3 hours.

More information about the flights are available at: <http://airportcluj.ro/>

Places of Interest Around Targu Mures

Apollo Palace (*Palatul Apollo*):

Piata Trandafirilor No. 5.

The Apollo Palace was built between 1820 and 1822 at the initiative of count Teleki Sámue. Today, the building is home to the local Art School.

Old Prefecture Building (*Cladirea Vechii Prefecturi*): Str. Bolyai No. 5.

The former seat of the Prefecture has been in use since 1711. The ground floor served throughout the years as a prison and on the top floor as an assembly hall. Currently, these spaces are used as workshops by the artists of Targu Mures.

Pálffy House: Str. Bolyai No. 12.

Among the first representations of Baroque architecture built in Targu Mures, the Pálffy House, built around 1640, reflects an evolutionary stage that surpasses typical Renaissance architectural elements such as those of the oldest buildings of Targu Mures.

Prefecture Building (*Palatul Prefecturii*):

Str. Primariei No. 2.

The present headquarters of the Mures County Council, together with the Culture Palace, make up a spectacular secessionist ensemble built in Targu Mures at the beginning of the 20th century.

St. Michael Wooden Orthodox Church (*Biserica din Lemn Sf. Arh. Mihai*): Str. Saguna No. 13 A.

The oldest Orthodox Church in Targu Mures harmoniously combines Romanian rural traditions with Baroque influences. The church was built between 1793 and 1794.

Teleki Library (*Biblioteca Teleki*):

Str. Bolyai No. 17.

The Teleki Library, founded at the end of the 18th century by Sámuel Teleki, chancellor of Transylvania, contains a large collection of first editions and important manuscripts documenting Transylvanian history, as well as mathematical and scientific works.

Targu Mures Fortress (*Cetatea medievala*):

In 1492 Prince Stefan Bathory ordered for a castle-fortress to be erected around the Franciscan monastery and church. A few of the original elements have been preserved, among them wall fragments on the Southern and Western sides, the tower on the Southern wing, attached to the furriers' bastion, and ruins of the South-Western tower, included nowadays in the tanners' bastion. The structure of these towers and the fact that they are square-shaped are indicative of a medieval type military architecture.

Questions & Answers from the WAVMA Listserv
(WAVMA_Members-L@wavma.org)

Nephrocalcinosis in Fish

Sent: 28 February 2017

Hello all,

I was wondering if anybody has encountered cases of nephrocalcinosis in fish (or really any species). I'm trying to get a better understanding of the overall condition as well as causative factors, and I would appreciate anyone's clinical experience with this.

Thanks,

Nora Hickey

norahickey@gmail.com

Hi Nora,

This is a common problem in Salmon and you should be able to find plenty of papers on this, I reckon. As the top ones already mention, CO₂ is of influence here.

Matt Metselaar

Hi Nora,

Yes, I've seen it many times myself. As Matt says, it's common in many salmonids and can variously result from high dissolved CO₂, hard water, dietary issues, or even low phosphorus conditions.

Because the development tends to be long-term, mortality tends to be chronically elevated rather than epizootic in nature... but morbidity in a given population can be quite high.

Kidney squash preps can be almost pathognomonically gritty, and histology routinely shows eosinophilic inclusions/residues in renal tubules. Bloodwork (serum chems) however may or may not correlate with the clinical picture.

IMO it's a condition that relatively few fish may die of as a proximate cause, but which can result in elevated stress and subsequent susceptibility to opportunist infections. What else did you want to know?

Dr. Peter Merrill

Director, Professional Services & Regulatory Affairs
Kennebec River Biosciences
[207.841.7261](tel:207.841.7261) cell

Thanks Peter,

That's exactly what I was looking for. From what I was reading, it generally sounded like fish could have fairly severe lesions but not necessarily be experiencing severe disease, and that stress tends to be what puts them over the edge.

I'm working with a facility that had a problem with this, found CO₂ to be high (> 40 ppm), installed CO₂ strippers, didn't necessarily do the strategic testing afterwards (so it's hard to be confident that the CO₂ problem is completely resolved, although I would say levels are definitely improved and consistently < 20 ppm), and recently a fish that has only been on strip-

per-treated water died and necropsy found severe nephrocalcinosis, which we would not have expected to find if CO₂ was causing it and the CO₂ strippers are adequate.

I'm thinking that it's time to go down the nutritional route (although obviously we will also be addressing the water quality measuring so we can be more confident that CO₂ isn't an issue). Have you found specific feeds to cause this problem? Or specific nutritional issues? Is there something specific I should be looking for?

These are captive brood fish, so they are eating the same diet for 3+ years; I've thrown around the idea of just regularly switching up the brand/type of food, not sure what anyone's thoughts would be on this.

Thanks,

Nora Hickey

norahickey@gmail.com

Hi Nora,

I come across mild nephrocalcinosis sporadically doing histopathology in a number of different species. In trout, especially, I also see scattered deposition of calcium in the submucosa of the GI tract every so often and there have been a few instances where deposition is severe and widespread in fish.

Most of the time I consider it an incidental finding, but it's a hard lesion to interpret because I don't really know the underlying pathogenesis or the effect on fish health (hard to be helpful when that's the case).

At least in conversations with producers, monitored CO₂ levels don't always seem to be elevated, so there are obviously some interactions occurring that we're not recognizing. It would be interesting to develop reference ranges for blood chemistry in these fish from affected systems and see if it's associated with elevated levels of any analytes.

Dave Marancik, DVM, PhD

Associate Professor of Aquatic Animal Medicine
Director, Aquatic Animal Medicine Research Laboratory
Department of Pathobiology
School of Veterinary Medicine,
St. George's University
Grenada, West Indies
[473-444-4175](tel:473-444-4175) Ext 3837

Dave is right, it's hard to correlate cause with effect (or vice versa) with this condition. I don't think the interactions between vitamin D, magnesium (both of which are interdependent), hormones, or other nutritional/metabolic variables have been worked out very quantitatively for fish, and there can be big differences not only in possible feed effects (I think absolute and relative calcium levels tend to be pretty variable in fish-meal based diets) in and of themselves but on a 'cultured species' basis too.

On the other hand, I'd also expect to see a higher

than normal level of other skeletal issues (scoliosis/lordosis, jaw or even opercular deformities, etc.) on top of nephrocalcinosis if calcium metabolism was being fundamentally impacted. But in terms of the CO₂ levels that may be over 40 ppm for even a relatively short period of time, I suspect that there are some subtle and longer-term sequelae that can build up to an overall adverse situation.

Although fish, like other vertebrates, probably have a fair amount of renal redundancy of function (and can thus physiologically handle the granulomatous formations that occur), I think there can be other effects on gill, cardiac and other organ functions. There does seem to be a high incidence of otherwise unexplained branchitis and epi- or endocarditis seen by histopathology from time to time in fish that have had that sort of exposure. Maybe those are linked?

Dr. **Peter Merrill**

Director, Professional Services and Regulatory Affairs
Kennebec River Biosciences
[207.841.7261](tel:207.841.7261) cell

Nora,

In Michigan, we come across many salmonid species, wild and hatchery-kept, with nephrocalcinosis. Many years ago, we noticed that occasionally we isolate a bacterium, *Carnobacterium maltaromatica*, from the kidneys of fish exhibiting nephrocalcinosis and also from apparently healthy ones.

In addition to all other theories raised about the etiology of the nephrocalcinosis, I urge further investigations to look at *C. maltaromatica* as one of the potential causes. This Gram positive, lactic acid bacteria alters the pH of its surroundings and that may be a potential explanation for its connection to nephrocalcinosis. *C. maltaromatica* produce a pleasant smell in the lab, so it is fun to work with, unlike other bacteria. More details about this bacterium and how to culture it can be obtained from my colleague, Dr. Thomas Loch.

Mohamed Faisal, DVM, PhD, CertAqV, Dr.H.Causa
SF Snieszko Distinguished Fellow and Professor
WAVMA Distinguished Fellow
Dept of Pathobiology and Diagnostic Investigation
College of Veterinary Medicine &
Department of Fisheries and Wildlife
College of Agriculture and Natural Resources
Michigan State University
East Lansing, Michigan 48824

Nora,

We've been doing some feed investigation and may be seeing some issues with vitamin depletion - especially when stored at extreme temperatures. Calcium depleting to about half by as early as a few months after the production date, but don't quote me on that as I'd have to go back to look at the lecture again.

Any chance of antimicrobial use? I've wondered what role medicated feeds can have on nutrient absorption while the gut microflora restabilizes, as well as

renal toxicity over time. I can give you our nutritionists' contact info, that'd probably be a good place to start.

If you get the blood chemistry thing going, that'll be exciting. I've looked into doing that with little optimism of its value in the case of salmon populations.

Trista Becker

Thanks for your response, Trista,

I have been curious about looking at some blood chemistry samples from these fish--I think it would be especially helpful because the only samples we can take are either from mortalities or non-lethal testing. These are individually valuable fish, so the interest in and money for non-lethal testing may be there to get some blood chemistry testing going. I'll loop you in if we get to that point.

Yes, I've wondered about antibiotic use as well...especially tetracyclines.

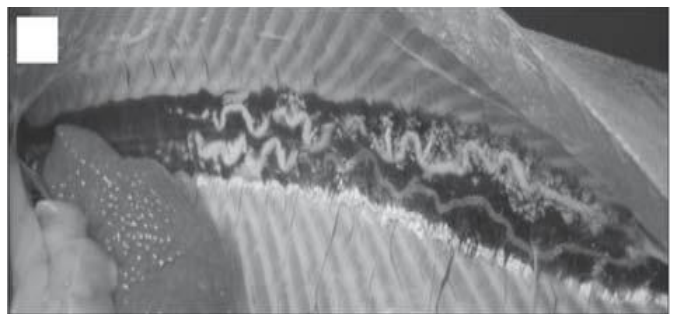
Thanks,

Nora Hickey

I've encountered dozens of cases of nephrocalcinosis in all types of animals, most commonly in reptiles. There are papers on over-supplementation of vitamin D causing this in reptiles and amphibians, as well as pseudogout as a result of chronic inflammation.

If these are valuable individuals, then you may want to consider endoscope guided kidney biopsy to get a better picture of the degree of inflammation, possible infection and inflammatory processes.

Adolf Maas



Kidney of a C. maltaromaticum infected rainbow trout exhibiting nephrocalcinosis of the ureters and renal tubules. (From: C. maltaromaticum Infections in Feral Oncorhynchus spp. in Michigan, by Loch, Kumar, Xu and Faisal. J of Microbiology, 49:5, 2011)

Snake-necked turtle and pig-nosed turtle
in the Australian River exhibit at the
National Aquarium in Baltimore, Maryland, USA.
Photo by Nick Saint-Erne, October 2016.





Pneumocoelom related to physiotherapy in a loggerhead sea turtle (*Caretta caretta*) with fore flipper paralysis

By **Monreal-Pawlowsky, T.** (1,2)(*), **Marco-Cabedo V.** (1), **Sanjosé J.** (1), **Palencia Membrive G.** (1), **Fresno L.** (3), **Martorell J.** (3),

(1) CRAM. Fundació per a la Conservació i Recuperació d'Animals Marins. Passeig de la Platja, 28-30, 08820 El Prat de Llobregat, Barcelona, Spain. Email: t.monreal@izvg.co.uk

(2) International Zoo Veterinary Group, Station House, Parkwood Street, Keighley, West Yorkshire, BD21 4NQ, United Kingdom

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Abstract

A 12-month-old loggerhead sea turtle (*Caretta caretta*) arrived at a rescue centre with bilateral fore flipper paralysis, resulting in its inability to dive. Although the flipper paralysis was reversed completely with a thorough physiotherapy program over an eleven-month period, a pneumocoelom was also detected. Intracoelomic air was detected first through X-rays and then more accurately through a computerized axial tomography (CT) scan. An exploratory coeliotomy under full anesthesia was performed to detect and correct suspected pulmonary tears, but none were detected. Physiotherapy was discontinued because it was suspected to be the cause of the pneumocoelom once other factors were ruled out. The air remitted spontaneously after the intervention but the buoyancy problems remained. Euthanasia was at this time a reasonable consideration due to the inability of this animal to perform its natural behaviours, preventing its survival at sea, but we chose to attempt other therapies first. The attachment of weights to its plastron and especially moving the animal to a bigger tank made this turtle capable of regulating its lung volume and dive, which allowed for its successful release back to the wild after two years in rehabilitation.

Clinical case

A 12-month-old loggerhead sea turtle (*Caretta caretta*), rescued as a hatchling from a nest at risk, was transferred to a rescue centre on the Mediterranean coast. The turtle weighed 286 g and presented with bilateral paralysis of both front flippers and inability to dive. The turtle had been treated with 10 mg/kg enrofloxacin (Baytril; Bayer Health Care, Animal Health Division, Shawnee Mission, KS, USA) intramuscular (IM) once a day for longer periods of time during its first year of life, which might have caused muscle necrosis and affected the joints (Fitzgerald and Newquist 2008).

Initial clinical examination findings, including x-rays, ultrasound of the joints and blood analysis, were unremarkable except for the paralysis of the flippers, for which a cause could not be clearly established. A physiotherapy program was developed, consisting of different movements of the flippers based on 20 times fore and back rotation of both fore flippers, followed by another 20 times of up and down movements, for one month. This was then increased to 25 movements of each category for another month and then to 40 repetitions for six months, adding controlled immersions during this last period. The controlled immersions consisted of holding the turtle from the caudal area of its carapace, and making it dive 60 centimetres underwater, then position the turtle upward and move it back and forth to stimulate front flipper movements for 10 seconds. This was repeated 10 times every session. During the latter period resistance by the turtle was noted, something that didn't happen with less repetitions, which encouraged us to proceed further to 60 repetitions each session, plus the 10 repetitions of controlled immersions for a further three months until the movement of both front flippers was fully recovered.

A strict diet based on hake, sardines, mussels, squid and fresh shrimp, up to five per cent of the body weight of the animal per day, was also provided since its hospitalization. The percentage changed over time, adjusted to its growth and weight rate, ranging from two to four per cent (Figure 1).

Figure 1 - Chart showing sea turtle growth and food from arrival until its release; body weight in grams on left scale and food amount fed in grams on right scale.



No further treatments were administered during the rehabilitation process except for routine antiparasitic treatments with Praziquantel (Zypiran Plus, Laboratorios Calier, S. A. Barcelona, Spain) at 25 mg/kg orally, dosed at three times a day, three hours apart, for three consecutive days. This regime was repeated after two weeks. A copepod infestation was treated with Lufenuron in a bath (Program; Novartis Santé Animale S. A. Huingue, France) at 90 mg per cubic meter of water (mg/m^3) for five consecutive days, repeated after two weeks. The turtle gradually gained in strength and weight and started growing rapidly, and after 11 months the mobility of both front flippers had been regained completely.

After 11 months of rehabilitation, the animal looked bloated and ultrasound and x-rays were performed to diagnose the origin of the suspected gas. Pneumo-coelom was detected (Figure 2) but its exact location was difficult to determine. The air was withdrawn with a syringe and 23G needle inserted in the femoral fossa but the turtle re-inflated again with the first inspiration after the procedure. Pulmonary leakage was then suspected and a computerized axial tomography (CT) scan performed at the Hospital Clínic Veterinari at the Facultat de Veterinària of the Universitat Autònoma de Barcelona. In order to avoid the risk of anaesthesia due to the condition of the turtle, a special box was designed to allow the turtle to be fully awake but immobile during the CT scan. The silhouette of the turtle was cut into a foam mattress and this mattress placed into a plastic box that would fit the CT scan exactly (Figure 3). Intracoelomic air was clearly seen collapsing the left lung (Figure 4) on the CT scan.

Figure 2 - Sea turtle X-ray, Left-Lateral View, air present ventrally to the lung (arrow)



Figure 3 - Sea turtle silhouette cut into foam to immobilize the animal without the need for anesthesia for CT scan.

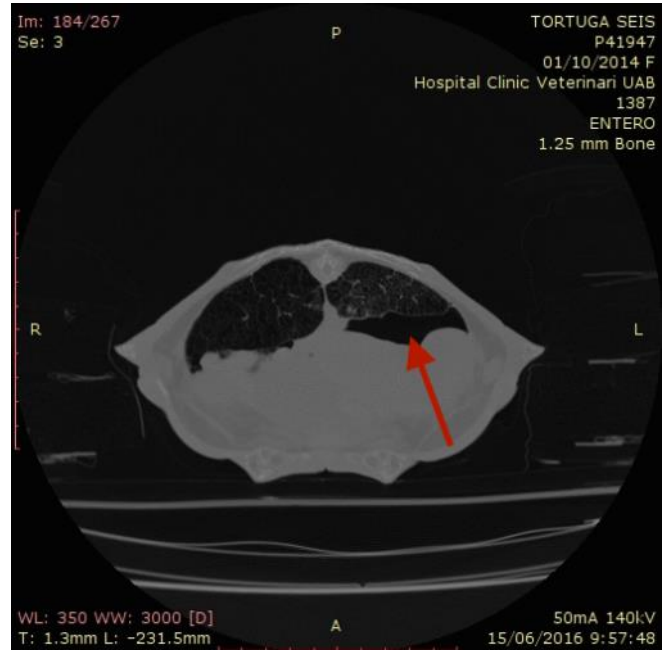


Figure 4 - Sea turtle CT scan, extrapulmonary air compressing left lung (arrow)

A pulmonary tear caused by the physiotherapy was suspected after the first CT scan. Physiotherapy was discontinued and a coelioscopy under full anaesthesia was performed. The aim of the coelioscopy was to locate and close a possible pulmonary tear as described in Fox-Alvarez *et al.* (2014). Anaesthesia was induced with buprenorphine (Buprex; Intervet, Madrid, Spain) at 0.1 mg/kg intravenously (IV) and alfaxalone (Alfaxan, Dechra Veterinary Products SLU, Barcelona, Spain) at 8 mg/kg IV, both in the dorsal cervical sinus and maintained with inhaled isoflurane (Isoflo; Abbott Laboratories, North Chicago, IL USA) via an endotracheal tube. Post-operative antibiotics were given, starting with enrofloxacin (Baytril; Bayer Health Care, Animal Health Division, Shawnee Mission, KS USA) at 5 mg/kg IM every 48 hours, followed by ceftazidime (Fortam; GlaxoSmithKline, S.A., Madrid, Spain) at 22 mg/kg every 72 hours IM due to the rise of the total leucocyte number after the procedure. Meloxicam (Metacam; Boehringer Ingelheim España, S.A., Barcelona, Spain) was given at 0.1 mg/kg IM every 12 hours before the surgery and then one day after surgery.

Bilateral pre-femoral access was performed, using two ternamian cannulas to allow the introduction of a 5 -mm diameter, 30° angle of vision laparoscope. Sterile saline was injected to spray the lungs in order to detect bubbles that would show broken parenchyma that could then be sutured. None were seen and, although the dorsal area of the lungs could not be accessed for inspection, consolidation of the caudal part of the left lung was detected. This area did not fully expand when forced ventilation was performed. Cultures of pulmonary, tracheal and coelomic fluid were done and

proved negative for bacterial or fungal growth. Blood test results showed no sign of infection. The turtle survived the procedure, although full anaesthesia recovery required two further hours of assisted ventilation every five to ten minutes. The air pocket in the turtle was not manually deflated at this point.

One month after the coelioscopy, the turtle deflated completely without manually removing the existing air, a procedure that had not been repeated in this animal after the surgical intervention. A second CT scan was performed, which showed an almost completely expanded left lung (Figure 5).

Figure 5 - Sea turtle CT scan showing symmetrical lungs.



Unexpectedly, the buoyancy problem remained and the turtle was still unable to dive. To assist diving, two Velcro straps were attached to the plastron with coral paste, to which 50 g sandbags were attached as needed to achieve neutral buoyancy (Hochscheid et al. 2003). It was determined that 3% of its body weight should not be exceeded to allow the turtle to break the water surface to breathe. The turtle was then moved to a bigger tank and it started diving immediately, at a shallow level first, but to the bottom of the tank after less than 24 hours. The Velcro straps and the weights were removed after the first successful dive and the turtle continued to dive and eat well.

The turtle was monitored for a further two weeks and released back to the wild, with 3.3 kg bodyweight and a satellite transmitter attached to its carapace. The transmitter was a solar powered satellite tag Desert Star 18 g device (163910 <http://desertstar.com/tt/>) and was attached to the carapace of the turtle with a neoprene-silicone attachment on an acrylic base-coat and treated with an antifoulant to prevent algal growth (Mansfield et al. 2012). One month post-release the turtle had almost reached the coast of the Balearic Islands (Figure 6).

Conclusion

Severe flipper paralysis induced us to consider euthanasia in a juvenile loggerhead sea turtle, but a thorough physiotherapy program was developed and it proved successful after almost a year of daily sessions. Buoyancy problems and extrapulmonary air might have been related to the established physiotherapy program, and despite no extra pulmonary air being shown in the CT scan after the coelioscopy, the turtle needed help in achieving neutral buoyancy and be able to dive.

Figure 6—Sea turtle movement, satellite follow up post-release. Image by Sara Abalo-Morla



Weights and especially a bigger tank, over 1.40 m deep, were necessary for it to start diving appropriately. This shows the need to rethink the design of tanks for buoyancy problems not derived from extra pulmonary air, but from inability to regulate the turtle's own lung volume.

Acknowledgements

The authors would like to thank Marina Agulló, the management and the volunteers of the rescue centre, without them this animal would have never recovered and been able to be released back into the wild.

The Satellite Image of the sea turtle movement was provided by:

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 Campus de Gandia c/Paranimf 1
 46730 Valencia, Spain

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The Reason Turtles First Came Out of Their Shells

By [NICHOLAS ST. FLEUR](#)

FEB. 17, 2017,
 New York Times
 [Excerpt]

Scientists, after studying the cervical bones of a 150-million-year-old turtle fossil, think that most turtles developed the ability to retract their head into the shell as a way to spring their head forward quickly to snatch prey, rather than as a means of protection, as was previously thought.

The earliest known turtle ancestors were unable to retract their necks, but today's modern species can. To understand turtle necks, however, you must first understand the two main types of turtles: cryptodires and pleurodires.

Cryptodires include tortoises as well as most turtles: box turtles, sea turtles and alligator snapping turtles. They retract their necks straight back into their shells by folding the muscles vertically. Pleurodires include species that are mostly found in South America, Australia and Africa, like the matamata and snake-neck turtles. They bend their muscles horizontally to pull their necks to the side and tuck it next to their shoulder.

[Jérémy Anquetin](#), a paleontologist from the Jurassica Museum in Switzerland and the lead author, and his colleagues studied a 150-million-year-old turtle fossil that had some strange characteristics. The turtle, known as *Platycheilus oberndorferi*, was from the Late Jurassic period and lived in what is today Germany and Switzerland. From its shell and skeleton the team could clearly tell that it belonged to the pleurodira group. But the shape of its two cervical bones suggested that it pulled its neck back vertically as cryptodires do, not horizontally. The neck also appeared to be unable to fully fold into the shell.

"Why did it have this neck retraction mechanism? This turtle is very peculiar," Dr. Anquetin said. "Our fossil cannot retract it completely. It brings no value for protection, so we had to find an explanation for that.

The team homed in on the creature's other features for clues. Its appearance was similar to modern bottom-dwelling turtles, suggesting that it was an ambush predator like the matamata turtle or the common snapping turtle. The two modern species are distantly related, but they hunt using similar tactics. They both lurk among the plants that shroud the floors of ponds, swamps and shallow lakes. Once an unsuspecting fish gets close enough, they strike.

The method of retracting their necks straight back allowed them to rapidly shoot out their heads and catch darting prey more easily.

*Rejoignez-nous à la Conférence Scientifique
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 Aquatiques (WAVMA), sur les concepts actuels en
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 12 au 14 septembre 2017, Târgu Mureș,
 Transylvanie, Roumanie.*

Stop throwing coins into wishing wells

[Ashitha Nagesh for Metro.co.uk](http://metro.co.uk)

24 Feb 2017

A turtle affectionately named 'Bank' was left in excruciating pain after she swallowed thousands of coins that had been thrown into her pond. Vets found her floating around the filthy, abandoned pond in agony. The 25-year-old turtle's shell was cracked, swollen and infected, leaving her rescuers worried that she had a tumour.

But medics were shocked to see her CT scans reveal an enormous lump of metal, measuring 20cm by 23cm by 20cm, lodged inside Bank's stomach. They say she had spent years swallowing hundreds of coins that tourists had thrown into the water for good luck in Chonburi province in Thailand. As a result, she had built up a mass in her abdomen of around 2,000THB in coins – approximately £45.

(Picture: Viral Press)



'Unfortunately the turtle was raised in a public enclosure where people like to throw in coins,' Nantari-ka Chansue, an associate professor at Chulalongkorn University, said.

'We hope to operate on her after her overall health condition improves in a few weeks. We named her "Bank".'

'Please do not throw coins into ponds with animals in. It is a serious sin, and very dangerous for the marine life.'

Prof Nantarika, who also works at the Veterinary Medical Aquatic Animal Research Centre, explained that the coins had caused the extreme swelling in Bank's stomach.

This was pressing against her shell, which then cracked from the pressure and became infected. Bank was also suffering from a severe lung inflammation, which was preventing her from breathing, diving and eating properly. Vets say she could have died if they hadn't found her when they did.

(Picture: Viral News)



'The weight of the coins was making her move very slowly,' she added. 'The pain was slowly torturing the poor creature.'

If rescuers hadn't found her when they did, vets say Bank would have died.

In around two weeks Bank will undergo an operation to have the coins removed – and the cash will be kept as a warning to visitors.

Since hearing about Bank's plight, members of the public have been donating money to help cover her medical expenses.

Read more: <http://metro.co.uk/2017/02/24/you-should-stop-throwing-coins-into-wishing-wells-immediately-6469453/#ixzz4aZIBSJ3w>

<http://metro.co.uk/2017/02/24/you-should-stop-throwing-coins-into-wishing-wells-immediately-6469453/>



Surgeons remove 915 coins swallowed by Thai sea turtle

JERRY HARMER, Associated Press: March 6, 2017



In this photo released by Chulalongkorn University's veterinary faculty, veterinarians prepare to operate on the female green turtle nicknamed "Bank" at the veterinary faculty in Bangkok, Thailand, March 6, 2017. (Chulalongkorn University's veterinary faculty via AP)

BANGKOK (AP) — Tossing coins in a fountain for luck is a popular superstition, but a similar belief brought misery to a sea turtle in Thailand from whom doctors have removed 915 coins. Veterinarians operated on "Bank," removing the coins from the endangered animal. Her indigestible diet was a result of many tourists seeking good fortune tossing coins into her pool over many years in the eastern town of Sri Racha. Many Thais believe that throwing coins on turtles will bring longevity.



Coins removed from the female green turtle nicknamed "Bank."
 (AP Photo/Sakchai Lalit)

Typically,

a green sea turtle has a lifespan of around 80 years, said Roongroje Thanawongnuwech, dean of Chulalongkorn University's veterinary faculty. It is listed as an endangered species by the International Union for Conservation of Nature.

The loose change eventually formed a heavy ball in her stomach weighing 5 kilograms (11 pounds). The weight cracked the turtle's ventral shell, causing a life-threatening infection. Five surgeons from Chulalongkorn University's veterinary faculty patiently removed the coins over four hours while "Bank" was under general anesthesia. The stash was too big to take out through the 10-cm (4-inch) incision they had made, so it had to be removed a few coins at a time. Many of them had corroded or partially dissolved.

"The result is satisfactory. Now it's up to Bank how much she can recover," said Pasakorn Briksawan, one of the surgical team. While recovering in Chulalongkorn University's animal hospital, the turtle will be on a liquid diet for the next two weeks.

Bank was brought in to veterinarians by the navy, which found her ailing in her seaside hometown. It was only after a detailed 3D scan that veterinarians pinpointed the weighty and unexpected problem. As well as the coins they also found 2 fish hooks, which were also removed. The surgery team leader said that when she discovered the cause of the turtle's agony she was furious.

"I felt angry that humans, whether or not they meant to do it or if they did it without thinking, had caused harm to this turtle," said Nantarika Chansue, head of Chulalongkorn University's veterinary medical aquatic animal research center.

Thai media began publicizing the turtle's tale last month after she was found, and in response, some 15,000 baht (\$428) in donations was raised from the public to pay for her surgery.

Source:

<http://wfi.com/2017/03/06/surgeons-remove-915-coins-swallowed-by-thai-sea-turtle/>

Veterinarians in Bangkok put the turtle in water four days after her surgery to see how well she could move. The turtle was gently lowered into a large plastic tank and very quickly began swimming.

"It's fantastic! She is responding very well," said Dr. Nantarika Chansue, who led the team from Chulalongkorn University's Veterinary Faculty. "Now she is very happy and looks like normal turtle."

"The wound healing seems to be okay and there is no secondary infection because we are using sterile seawater," said Nantarika, "but we have checked her blood and her nickel concentration is very high so we have to work on that."

Source: <http://detne.ws/2msOuQ2>

AQUATIC VETERINARY ABSTRACTS: TURTLES

Compiled by David Scarfe

PREVALENCE OF *CITROBACTER SPP.* FROM PET TURTLES AND THEIR ENVIRONMENT

By S. Hossain, S. Wimalasena, M. De Zoysa, and G. Heo

Journal of Exotic Pet Medicine 26(2017), pp7–12

Abstract

Pet turtles are considered a source of bacterial infection to humans when handled in captivity. Turtles purchased from 9 pet shops and 8 online markets in Korea were examined to determine whether the turtles and their environment were contaminated with *Citrobacter spp.* bacteria. Biochemical tests and morphology revealed that *Citrobacter spp.* were isolated from 7 fecal and 76 environmental samples. Among the 7 fecal isolates, 5 bacteria were identified as *Citrobacter freundii* through 16SrRNA gene sequencing. The isolation rate of *Citrobacter spp.* from soil and water samples increased over time. Each of the isolate's antibiotic resistance was characterized with a disk diffusion test. The strains showed susceptibility against amikacin, ceftriaxone, ciprofloxacin, imipenem, sulfamethoxazole/trimethoprim, and tetracycline, but were resistant to ceftiofur, cephalotin, and chloramphenicol. These results indicate that pet turtles are a potential source of *Citrobacter* infection in humans in Korea.

Key words: *Citrobacter spp.*; pet turtles; antibiotic resistance

TABLE 2. Isolation rates of *Citrobacter spp.* from the fecal samples in turtles

Species	No. of Tested	No. Positive	Isolation Rate ^a (%)
Chinese stripe-necked turtle (<i>Ocadia sinensis</i>)	10	2	20
Yellow belly slider (<i>Trachemys scripta scripta</i>)	8	2	25
River cooter (<i>Pseudemys concinna concinna</i>)	6	1	16.7
Northern Chinese softshell turtle (<i>Pelodiscus maackii</i>)	4	0	0
Western painted turtle (<i>Chrysemys picta bellii</i>)	3	2	66.7
Common musk turtle (<i>Sternotherus odoratus</i>)	3	0	0
Total	34	7	20.6

^aIsolation rate: the ratio of positive samples to total samples.

Natural Nomads, Leatherback Turtles Opt To Stay In Place Along The Mozambique Coast

by Blaine Friedlander, Cornell University

December 2, 2016

Endangered leatherback sea turtles are known for their open-ocean migratory nature and nomadic foraging habits -- traveling thousands of miles. But a Cornell naturalist and his colleagues have discovered an area along the Mozambique coast that the turtles have made their permanent home, according to a study published in Nature's *Scientific Reports*, Nov. 25, 2016.

"They seem to be staying there year-round. We've found these turtles -- a supposed nomadic migrant -- congregating in coastal waters," said Steve Morreale, senior research associate in the Department of Natural Resources. "We've identified an area where leatherback turtles are clustered together."

Leatherbacks, the world's largest reptiles, do not have hard shells like other turtles. Instead, they have a softer, leather-like shell. The turtles can weigh up to 1,500 pounds and are eating machines, as one can nosh daily on hundreds of pounds of its favorite meal -- jellyfish. Leatherback sea turtles and jellyfish are found throughout the world's oceans, but the authors of this study think that these leatherbacks are likely enjoying a bountiful jellyfish supply in the Mozambique Channel.

Morreale and his colleagues tracked electronically tagged turtles using satellite telemetry. As expected, some leatherbacks journeyed up to 6,000 miles into the Indian and Atlantic oceans. But, nearly half were tracked into the Mozambique Channel, which runs between Mozambique and Madagascar, off the southern African coast. They further confirmed the turtles' homebody behavior by taking skin samples and examining the animals' stable isotope signatures, which provide a long-term chemical analysis of where the animal feeds, at which level of the food web they eat and whether they feed in the open ocean or along the coastal waters.

Scientists had seen this coastal feeding behavior before, but believed that leatherbacks sought only seasonal refuge along continental shores and coastal waters. The vast oceanic distances that migrating leatherback turtles travel complicate conservation efforts, explained Morreale, but grasping this new behavior "makes it a little easier to protect, regulate and to enforce protection -- especially if it is in one country like Mozambique -- than if they were spread throughout the world's oceans."

Journal Reference:

Coastal leatherback turtles reveal conservation hotspot: *Scientific Reports*, 2016; 6: 37851

Nathan J. Robinson, Stephen J. Morreale, Ronel Nel, Frank V. Paladino.

DOI: [10.1038/srep37851](https://doi.org/10.1038/srep37851)

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Evaluation of the analgesic effects of oral and subcutaneous tramadol administration in red-eared slider turtles.

Baker BB, KK Sladky, SM Johnson (2011).
J. Am. Vet. Med. Assoc., 238(2): 220-227.

Abstract

Objective—To determine the dose- and time-dependent changes in analgesia and respiration caused by tramadol administration in red-eared slider turtles (*Trachemys scripta*).

Design—Crossover study.

Animals—30 adult male and female red-eared slider turtles.

Procedures—11 turtles received tramadol at various doses (1, 5, 10, or 25 mg/kg [0.45, 2.27, 4.54, or 11.36 mg/lb], PO; 10 or 25 mg/kg, SC) or a control treatment administered similarly. Degree of analgesia was assessed through measurement of hind limb thermal withdrawal latencies (TWDLs) at 0, 3, 6, 12, 24, 48, 72, and 96 hours after tramadol administration. Nineteen other freely swimming turtles received tramadol PO (5, 10, or 25 mg/kg), and ventilation (V_E), breath frequency, tidal volume (V_T), and expiratory breath duration were measured.

Results—The highest tramadol doses (10 and 25 mg/kg, PO) yielded greater mean TWDLs 6 to 96 hours after administration than the control treatment did, whereas tramadol administered at 5 mg/kg, PO, yielded greater mean TWDLs at 12 and 24 hours. The lowest tramadol dose (1 mg/kg, PO) failed to result in analgesia. Tramadol administered SC resulted in lower TWDLs, slower onset, and shorter duration of action, compared with PO administration. Tramadol at 10 and 25 mg/kg, PO, reduced the V_E at 12 hours by 51% and 67%, respectively, and at 24 through 72 hours by 55% to 62% and 61 % to 70%, respectively. However, tramadol at 5 mg/kg, PO, had no effect on the V_E .

Conclusions and Clinical Relevance—Tramadol administered PO at 5 to 10 mg/kg provided thermal analgesia with less respiratory depression than that reported for morphine in red-eared slider turtles.

Begleiten Sie uns auf der Internationale Wissenschaftliche Konferenz und der Generalversammlung der World Aquatic Veterinary Medical Association (WAVMA) über aktuelle Konzepte in der Aquakultur und Zierfischpraxis, 12-14. September 2017, Târgu Mureş, Transsylvanien, Rumänien.

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Know Your Turtle Anatomy



[iIGz1AZw5d8/s800/Red-eared-slider-turtle-organs-ear-JPG](https://i.gziAZw5d8/s800/Red-eared-slider-turtle-organs-ear-JPG)

<https://s-media-cache-ak0.pinimg.com/originals/fd/f8/4d/fdf84d4d1a54290f97b60aea9ba84363.jpg>

Shell Nomenclature

Carapace (upper shell):

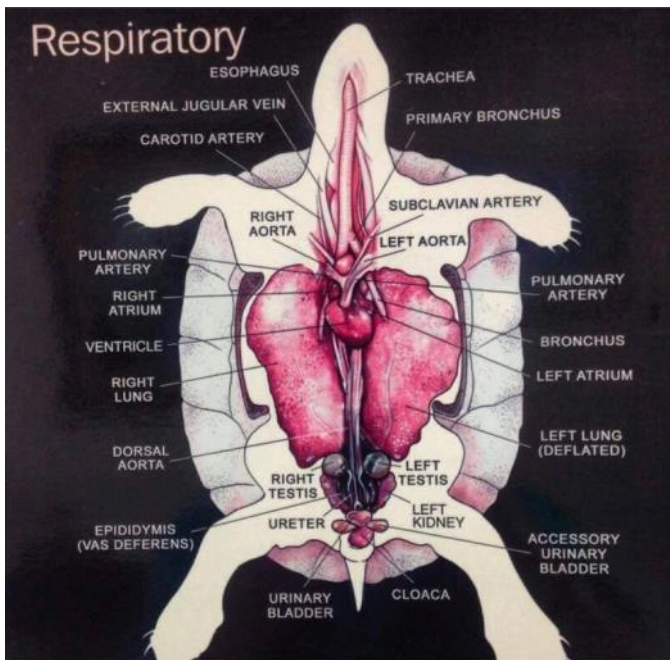
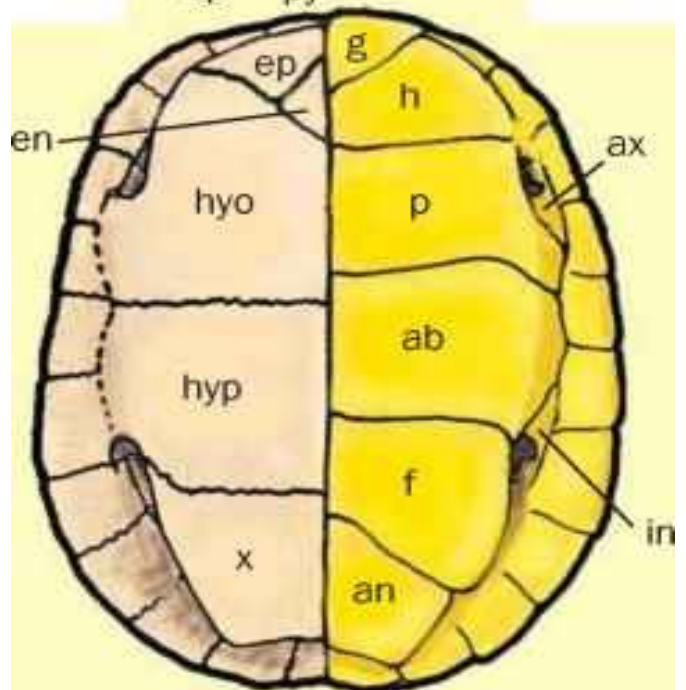
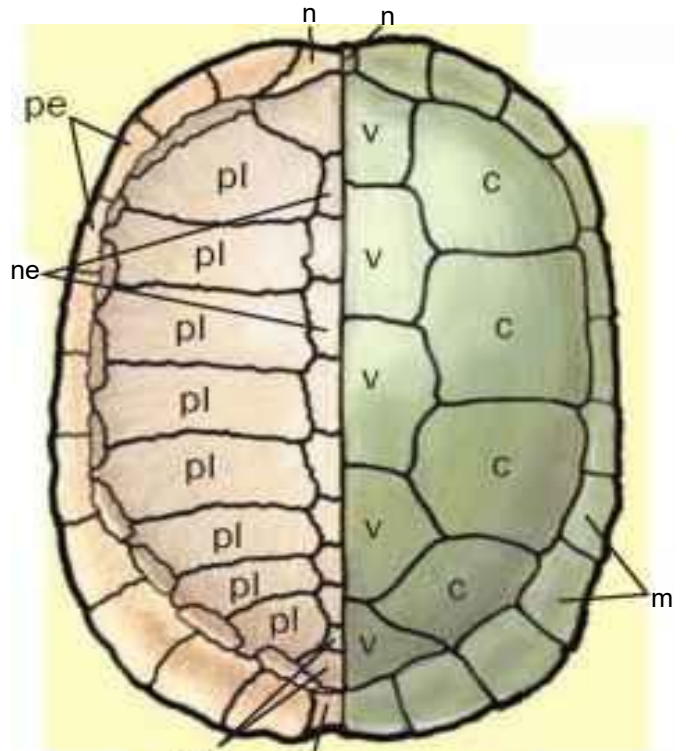
Bones— n=nuchal; pe=peripheral; ne=neural; pl=pleural; sp=suprapygal; py=pygal

Scutes— n=nuchal; v=vertebral; c=costal; m=marginal;

Plastron (lower shell):

Bones— ep=epiplastron; en=entoplastron; hyp=hyoplastron; x=xiphiplastron

Scutes— g=gular; h=humeral; p=pectoral; a=abdominal; f=femoral; an=anal; ax=axial; in=inguinal.



Aquatic Turtle Diets

Dietary preferences in aquatic turtles range from completely herbivorous to totally carnivorous; however, many turtles are omnivores and consume a mixture of plant and animal matter. In some species there is a dietary shift from the carnivorous diet of hatchlings to the mostly herbivorous adults.

Although modern turtles lack teeth, there are many modifications of the maxillary, premaxillary, and dentary bones for feeding. A pronounced beak made of keratin may be used to hold and tear food. The palate of herbivorous turtles contains a series of ridges that assist in the maceration of plant matter. Macrocephaly, characterized by an enlarged head (as in many female map turtles), often develops in mollusk-feeding species. The broad crushing surfaces and powerful musculature allow them to exploit an abundant food item that may be unavailable to turtles that cannot extract this meal from the mollusk's protective shell.

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- Gourmet Aquatic Turtle Food is a great choice to offer your turtles as a treat or main diet.
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Providing a Turtle Bone™ (Cuttlebone) will help maintain proper calcium levels and help maintain the turtle's beak.

ANIMAL/PRODUCT SELECTION/CARE

ANIMAL	HABITAT	TEMPERATURE	HEATING	HUMIDITY	LIGHTING	SUBSTRATE	DIET TYPE	SUPPLEMENTAL FOODS	TIPS
Banded Dragon	Aquatic	24-81°F (20-27°C)	Heater	30%+	UVB	Gravel	Herbivorous	Banded Dragon Pellets, Can O' Fish, Fruit Meds	Provides UVB 20% Chlorophyll
Least Tortoise	Aquatic	72-87°F (22-31°C)	Heater	30-50%	UVB	Gravel	Carnivorous	Least Tortoise Food, Can O' Fish	Use 3 in 1 ReptiSticks™ for natural intake
Sea Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Redbelly Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Aquatic Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Red-eared Slider	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Spiny-tailed Caiman	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Noddy	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Painted Turtle	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Mudpuppy	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Snapping Turtle	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity
Common Frog	Terrestrial	74-87°F (23-31°C)	Heater	30%+	UVB	Gravel	Carn O' Fish	Can O' Fish	Use ReptiSticks™ to maintain humidity

Source: http://zoomed.com/cm/resources-stuff/Care%20Sheet/fb_AquaticTurtles.html



< 1 Year Old	> 1 Year Old
<p>50% Protein Diet 50% Veggie Diet Pellets Guppies Crickets Earthworms Green Leaf Lettuce Dandelion leaves Turnip greens (leaves only)</p>	<p>25% Protein Diet 75% Veggie Diet Pellets Guppies Green Leaf Lettuce Water Fern Dandelion leaves Turnip greens (leaves only) Water Lily</p>
<p>Moderate Use</p>	

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RES Should Have Calcium & Vitamin D3

DO NOT OVERFEED YOUR TURTLE (They will always beg)

Only feed Pellets every other day, avoid too much protein

Sea turtles face rising threat

[Julie Garcia](#), Corpus Christi Caller-Times

Published Feb. 13, 2017

After months of mild weather, temperatures dropped fast and hard on the weekend of Jan. 7, 2017, cold-stunning hundreds of sea turtles in Texas waters. But as scientists treated the animals, they discovered another problem. About 94 cold-stunned sea turtles were found at the Upper Laguna Madre and Corpus Christi, according to Donna J. Shaver, chief division of Sea Turtle Science and Recovery at the Padre Island National Seashore.

Scientists found that half of the turtles were afflicted with fibropapillomatosis, or FP, a herpes virus specific to sea turtles. FP was not seen by researchers in Texas until 2009 when nine were studied in South Padre Island.

"We are shocked at the increase in numbers and size and aggression of the tumors, especially on their eyes and shells," said Dr. Tim Tristan, a veterinarian and director of the Texas Sealife Center. "There is something changing in the environment to make it more prevalent."

Only two months in, and 2017 is shaping up to be the busiest year on record for Coastal Bend sea turtle advocates and veterinarians who perform surgeries on FP-afflicted turtles. At \$200 per turtle, these nonprofit and unfunded facilities rely on donations or their own pocketbooks to pay for tumor-removal surgeries and rehabilitation.

"We have to keep them isolated," Tony Amos, director of the [Animal Rehabilitation Keep](#). "We are probably the only people, us and the [Texas Sealife Center](#), who handle sea turtles with FP on the Gulf Coast. We do it willingly and knowingly. We're not heroes."

The ARK rehabilitates marine turtles and coastal birds from the area of Mustang Island to St. Joseph Island, but they also receive animals from all along Texas shores. Two large concrete tanks are used for the 39 turtles awaiting FP removal surgery. These tanks have their own circulation system to prevent spreading the disease to unaffected turtles, Amos said.

It's believed that FP is spread by marine leeches (*family Ozobranchidae*) which feed on sea turtles. The disease causes tumors on the soft tissue, head and eyes of the turtles, and are also prevalent on the underside of their shells.

Tristan, the Sealife Center director, said the disease is more prevalent in green sea turtles but can affect any species, including Kemp's ridley, which are common at the national seashore. Theories about the cause range from climate change, pollutants and contaminants in the ocean and immuno-suppressed sea turtles.

Plans to perform surgery on the 45 sea turtles with FP began immediately after January's cold-stun event, Tristan said. Dr. Tristan uses a CO₂ surgical laser to

remove fibropapillomatosis tumors from green sea turtles under anesthesia at the Texas Sealife Center.

"Many of the turtles were underweight, so they had to be healthy enough to have surgery," he said. "We can perform surgery on 1-3 turtles a day depending on how many masses each turtle has."

Last year, a \$50,000 laser was donated by the Border Animal Hospital in Weslaco to the center to perform tumor removal surgeries, he said. The laser reduced rehabilitation time from months to weeks, Tristan said. In the first surgery of the year, he removed a 14-pound tumor from one turtle that appeared to be about 10 years old.

"We don't know what has happened in the last five years to make the disease increase so much," Tristan said. "They used to only come in during cold stun events; now we see them all the time. It's very common for them to have large and multiple tumors all over their body."

Though uncommon in Texas until recent years, FP has affected sea turtles in Florida, Hawaii and parts of South America for at least 20 years. Researchers at the University of Florida have been studying FP and its possible causes for decades, said Catherine Eastman, sea turtle program coordinator for the [Whitney Laboratory for Marine Bioscience](#).

"Some theories point toward pollution as something that is driving persistence of the tumors," Eastman said. "We see large cauliflower tumors hanging off their eyelids, the seam of their shells, soft tissue and the top part of the shell."

A hospital opened about a year ago at the Whitney lab to perform surgeries, rehabilitate and then return them to the wild, she said. Currently, there are six turtles with FP at the lab.

"While they're with us, we have researchers studying the tumors to try to understand the genes that are driving tumor production," Eastman said. "We're not experimenting on the turtles, but the waste product of the surgeries: tumors. We are hoping to start looking into blood and other research aspects."

Whether the tumors return is the question. Both Tristan and Eastman said it's hard to know if the tumors aggressively return after surgery because the turtle is returned to the ocean. There have been rare recurrences of tumor regrowth, Eastman said.

"Once the animal is healed and there's no tumor regrowth, we'll release them," Eastman said. "

Source:

<http://www.caller.com/story/news/local/kemps-ridley/2017/02/13/sea-turtles-face-rising-threat/97573152/>

CITES Protections for Four Freshwater Turtle Species

November 21, 2016: Effective today, the common snapping turtle, the Florida softshell turtle, the smooth softshell turtle and the spiny softshell turtle are listed in Appendix III of the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Once a species is listed under CITES, any international trade in the species, either as live specimens or parts or products, must be accompanied by a valid CITES permit or certificate. Permits ensure trade is conducted at sustainable levels and provide a means to balance use and conservation of protected species.

Export of CITES Appendix III species requires a permit issued by the Service's Division of Management Authority (DMA). DMA will issue a permit only if the applicant obtained the specimen legally and live specimens are packed and shipped in accordance with International Air Transport Association (IATA) Live Animals Regulations. Any shipment containing wildlife must be declared to a Service Wildlife Inspector upon import, export, or re-export, and must comply with all applicable regulations.

Florida softshell turtle.



Photo by Andrea Westmoreland/ CC BY-SA 2.0

For more information on CITES protections and for guidance on how to apply for the appropriate permits to import, export and re-export CITES listed freshwater turtles, please visit our [webpage](#). If, after reading this information, you are unclear about the permitting process, please feel free to contact us at managementauthority@fws.gov.

Sea Turtles monitored with mini solar trackers in Australia

SkyNews, 2/22/17

A group of young turtles with satellite tags have been released into the wild off the coast of Queensland so scientists can study their early 'lost years'. The miniature, solar-powered trackers were fitted to nine flatback turtles as part of a world-first marine conservation project.

The juveniles were collected as hatchlings in February 2016, but spent the past 12 months at Sea Life Sunshine Coast. On Tuesday, the 15-centimetre-long reptiles were released 10 nautical miles from the Bundaberg coast, not far from where they were born.

Sea Life Sunshine Coast general curator Aaron Sprowl said the project would help researchers capture 'the lost years' of a flatback turtle's life.

'It goes out to sea and more or less it disappears for five to 10 years of its life,' he told AAP.

'The goal for the satellite tagging is to try and get an idea of where they go and what they do.'

Mr Sprowl said it was also hoped the project would help conservation efforts to stop the vulnerable species from becoming endangered.

'We don't find this turtle anywhere else in the world except for Australian waters,' he said.

The tracking initiative is expected to last for about three months or until the tags break free from the turtles as they grow. However, Mr Sprowl said more hatchlings had been collected this year ahead of their planned release in 2018.

People interested in tracking the turtles can visit Sea Life Sunshine Coast's social media pages.

<https://www.underwaterworld.com.au/>



Plight of Chinese turtles shows lax protection in nation's nature reserves

By Kathleen McLaughlin, 3/7/17, sciencemag.com

Beijing—China's nature reserves are woefully inadequate at protecting biodiversity, a 12-year study of turtle poaching in dozens of conservation areas has found. The research results, published 6 March in *Current Biology*, focus on turtles but draw larger conclusions about the state of wildlife conservation in China. The authors note that China has 2700 nature reserves covering 1.46 million square kilometers, or about 15% of the country's total territory, a higher percentage than many other countries. And though China ranks first in flora and fauna richness in the Northern Hemisphere, 43% of those species are threatened.

"We discovered that poaching occurred in all of the 56 reserves surveyed, resulting in dramatically reduced turtle populations," the authors wrote. "In a majority of the reserves, the reserve staff themselves were generally involved in poaching."

"Although nature reserves were created to protect plants and animals, they have become part of the problem due to weak enforcement of rules," the authors wrote.

The scientists relied on field studies, surveys of exotic animal markets, and interviews to document the declining turtle population trends in protected areas across three provinces.

"Hunting is strictly forbidden in all nature reserves in China," they wrote. "From field surveys, however, we found over 1400 poaching devices (i.e. cage traps, hooks, pitfall traps) and encountered 69 hunters in 11 nature reserves. This unexpected finding reflected the managers' inaction. Although historical records identified 15 species present in these areas, we just found nine species in the field."

The study asserts that this lack of protection for turtles almost certainly extends to all species in China's wildlife conservation areas.

"This situation is not unique to turtles, as we saw signs of poaching for all species valuable for food and trade. Currently in China, endangered species are facing a serious threat of extirpation due to poaching, and we identify nature reserves as contributing to the problem due to poor management practices and lack of effective supervision," they wrote. "In order to improve the conservation of China's rich biodiversity, it is imperative for China's nature reserve system to make meaningful changes to its policies and procedures."

The authors recommend that China's natural reserves cease all commercial activities and focus on species and habitat conservation. Recognizing the problem, China's central government is rolling out plans for a series of national parks around the country that will focus on protecting critically endangered species. A massive national park in northeastern China will preserve habitat for Siberian tigers and leopards, and other parks will focus on endangered antelopes,

pandas, elephants, and other large animals.

The national park plan will take control of protected areas away from local and provincial officials, who face funding shortfalls and often engage in profit-making schemes—like turtle poaching—that harm habitat and wildlife, environmental groups contend. The central government will provide the funding and direct the management of the national parks.

15 endangered turtles found smuggled into Taiwan in shoes

By [Matthew Lubin](#), Taiwan News, Staff Writer 3/13/17
TAIPEI (Taiwan News) –

The Forestry Bureau said on March 13 that the Customs Administration confiscated 15 endangered turtles on flight FX5142 from Malaysia being smuggled inside sports shoes in parcels. All of the turtles were alive when discovered by customs when the parcels were checked, and the Forestry Bureau has sent turtles to a wildlife center in northern Taiwan. The wildlife center works with academic institutions and the Taipei Zoo to ensure proper care of its animals. The wildlife center has options for the endangered turtles, including returning them to their native habitats. No specific plan has been made at this time.

The Forestry Bureau plans to prosecute the smugglers. Relevant laws indicate offenders are subject to six months to five years in prison and a fine of NT\$300,000 (US\$9,700) to NT\$1.5 million.

Among the turtles confiscated were one angonoka tortoise (*Astrochelys yniphora*) and 14 painted terrapins, or saw-jawed turtle (*Batagur borneoensis*). The angonoka tortoise is native to Madagascar and is one of the rarest land tortoises in the world with an estimated wild population of just 600. The painted terrapin is native to rainforests of Brunei, Indonesia, Malaysia and Thailand and is a Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II critically endangered species, according to the International Union for Conservation of Nature (IUCN).

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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>.

Mystery eye disease is latest blow for Australia's sick turtles

By Alice Klein, [Daily news](#)
21 February 2017



Many green turtles in Australia are getting eye infections. (Christine Hof/WWF)

Turtles on Australia's Great Barrier Reef can't seem to catch a break. After an outbreak of herpes and a mass stranding, many have now developed a puzzling eye disease. Researchers are investigating whether metal run-off from mining and agriculture is affecting the turtles' immune systems and making them more susceptible to illness.

The first sign of trouble was in 2010, when two-thirds of the green turtles surveyed in Brisk Bay in the central Great Barrier Reef had developed fibropapillomatosis. The condition, which is triggered by a turtle-specific herpes virus that has since affected other areas, too, caused tumours to grow on their eyes, shells, flippers, tails and internal organs.

Then in 2012, more than 100 green turtles became stranded at the nearby Upstart Bay. Most washed up dead, but those that were still alive experienced seizures, uncontrolled head movements and other neurological symptoms.

Now, many of Upstart Bay's turtles have developed unexplained eye infections. The lesions are not fatal, but they cloud the animals' vision, making it harder for them to find food and avoid predators. A survey conducted last year found that a quarter of green turtles in the area had eye infections. The results were released by WWF-Australia this week. Preliminary work by Mark Flint at the University of Florida in Tampa suggests the infections are bacterial.

Cobalt culprit?

To try to get to the root of the problem, Alex Villa at the University of Queensland in Coopers Plains, Australia, and his colleagues have been analysing blood samples from Upstart Bay turtles.

One of their most striking findings is that turtles there have between four and 25 times as much cobalt in their blood as is normal. Levels of antimony,

molybdenum and manganese are also elevated, but not to the same extent.

In small amounts, cobalt is an essential metal for animal and human health, but at high levels it can damage vital organs such as the brain and heart. Cobalt occurs naturally in soil and rock, and is washed into waterways by rain. But this process can be accelerated by farming and mining, says Jon Brodie at James Cook University in Townsville, Australia. He is examining whether livestock grazing and mining in the area are leaking excess cobalt into the bay.

Immune problems

It is still too early to know whether the high cobalt levels and spate of health issues are linked, says Flint. However, he says the metal may be placing pressure on the turtles' immune systems and making them more vulnerable to bacterial and viral infections. This idea is backed up by the finding that turtles with high cobalt levels tend to have higher levels of immune cells in their blood.

Duan March at Southern Cross University in Coolangubatta, Queensland, agrees. "It looks like those animals, or that environment, is stressed, and the ocular disease is most likely due to a secondary bacterial infection," he says.

The 2012 mass stranding may also be connected to cobalt contamination, says Villa. "Many metals are directly neurotoxic."

However, more evidence is needed, he says. "It would be tempting to point to the nearest mine and say 'that's the problem', but the links between human activity and contaminant accumulation in wildlife are difficult to unravel," Villa says. "At this stage, there's still no smoking gun."

Source:

<https://www.newscientist.com/article/2121783-mystery-eye-disease-is-latest-blow-for-australias-sick-turtles/>

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.



**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 Annual General Meeting & Conference
September 13th, 2017
Plaza Hotel, Piata Trandafirilor 46-47,
Tirgu Mures 540053.



**4th International
Symposium on
Ranaviruses**
June 7-10, 2017
Budapest, Hungary



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

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

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

**International Association for Aquatic Animal
Medicine 48th Annual Meeting & Conference**
May 20 - 24, 2017
Cancun, Mexico

On behalf of the International Association for Aquatic Animal Medicine (IAAAM), and the 2017 host, Dolphinaris, Cancun, Mexico, we invite you to join us at our 48th Annual Meeting & Conference. The 2017 event will be held May 20 - 24 at the Marriott CasaMagna in Cancun, Mexico. Several of the evening events including the Icebreaker and Auction will be at our host, Dolphinaris. More information about the conference is at www.iaaam.org.
American Association of Fish Veterinarians



4th Annual Conference,
September 24 & 25, 2017
Dallas, Texas.

This year we will be holding our conference in conjunction with the American Association of Zoo Veterinarians, the Association of Exotic Mammal Veterinarians and the Association of Reptilian and Amphibian Veterinarians Annual Conference – September 23-29.

This event will bring together the best exotic pet, zoo and wildlife veterinarians from all over the world to contribute to the scientific, continuing education, networking and hands-on learning that make our careers enriching and fulfilling.

We look forward to seeing you in September!
[For more information click here.](#)



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

Unusual Pet and Avian Veterinarians' Conference
August 11-14, 2017.
Queensland, Australia

The Unusual Pet and Avian Veterinarians' Conference will be held in conjunction with the FASAVA conference, to be held at the Gold Coast in Queensland, August 11-14, 2017.

[Click here for more information](#)

Federation of Asian Small Animal Veterinary Associations



FASAVA CONGRESS
11 | 14 AUGUST 2017
Gold Coast Australia

WORLD VETERINARY DENTAL CONGRESS
11 | 14 AUGUST 2017
Gold Coast Australia

UPAV EXOTICS CONGRESS
11 | 12 AUGUST 2017
Gold Coast Australia

VNCA ADVANCED VETERINARY NURSING CONGRESS
12 | 13 AUGUST 2017
Gold Coast Australia

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8th International EAFP Conference on Diseases of Fish and Shellfish
4-8 September 2017
Belfast, Northern Ireland, UK

A brief description:

<https://eafp.org/belfast-2017-second-announcement/>

Contact person & website link: <http://eafp2017.com/>



World Small Animal Veterinary Association

September 25-28, 2017

Copenhagen, Denmark

<http://www.wsava2017.com/>

Aquaculture Europe 2017

October 17-20, 2017

Dubrovnik, Croatia

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

Kind regards,
Alistair Lane - Executive Director,
European Aquaculture Society

Junte-se a nós na Conferência Científica Internacional e na Assembleia Geral Anual da World Aquatic Veterinary Medical Association (WAVMA), com o tema "Conceitos Actuais em Aquacultura e Clínica de Peixes Ornamentais", 12-14 de Setembro de 2017, Târgu Mureş, Transilvânia, Roménia.

World Veterinary Congress to be an Annual Event

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

42nd Annual Eastern Fish Health Workshop

April 3-7, 2017

Michigan State University, East Lansing, MI, USA

We are proud to announce the 42nd Annual Eastern Fish Health Workshop at the Kellogg Hotel & Conference Center in East Lansing, MI. Registration begins at our annual reception on Monday, April 3 from 5:00 to 7:00 pm, and is followed by an evening of interesting, bewildering, and bemusing case reports. There will be three full-day sessions (April 4-6), followed by a full-day continuing education course on Friday, April 7. We encourage contributions for oral presentation of case reports and research investigations that are pertinent to animal health within marine and freshwater environments. There are no poster sessions.

For the first time, the EFHW will be held in Michigan, a state which fittingly boasts the longest freshwater coastline of any political subunit in the world and where a person is always within 6 miles of a stream, lake, river, or natural waterbody. The Michigan State University Aquatic Animal Health Laboratory (MSU-AAHL) has been a longstanding supporter of the EFHW and is proud to host the annual meeting in Spartan Country. We have plans to offer tours of MSU's campus that will include the veterinary diagnostic and other related laboratories, as well as optional organized excursion(s) that showcase some of Michigan's delights. The banquet and Best Student Presentation award will be on Thursday night, when there is never a shortage of dancing - not to be missed.

Call for General Session Titles and Abstracts:

To guarantee a place on the program, please return a tentative title for your abstract and presentation via email (TheEFHW@gmail.com) as soon as possible. If you are presenting a diagnostic case, please indicate your tentative title that you would like included in our special session titled: "The Aquatic Detective."

A \$200 registration fee (U.S. dollars) includes a reception on Monday evening with heavy hors d'oeuvres, workshop proceedings, refreshments at breaks, buffet breakfasts and luncheons on each of the three full days of the workshop (Tuesday, Wednesday, Thursday), and dinner at the Banquet on Thursday night. That's a steal for \$ 200!!! Make checks payable to the "Eastern Fish Health Workshop" and return payment with your registration form postmarked by 21 February 2017. The late registration fee of \$35 (U.S. dollars) is charged if postmarked after this date (for a total registration fee of \$235, if late). The EFHW does not accept credit cards and there are no daily or discounted registrations. Please ensure that you mail your registration form and check to Dr. Roy Yanong.

Individual lodging accommodations start at \$108/night and must be made with the Kellogg Hotel & Conference Center in East Lansing, Michigan. You

can make reservations online or by phone. Please call the hotel at 1-800-875-5090 and use either the code 1704FISHHE or Block Name Eastern Fish Health Conference.

You may also go online to www.kelloggcenter.com, click Reservations in the link at the top, and fill in the dates, rooms, and number of people. Select "Click Here for Special Rates" and enter the Group Code: 1704FISHHE. In order to secure reservations, please make reservations with the Kellogg Hotel before March 3, 2017.

The Kellogg Hotel is located on the Michigan State University campus in the heart of East Lansing. Lansing's Capital Region International Airport is only eight miles away. The hotel offers a shuttle to the Lansing Capital Region International Airport, but it must be reserved ahead of time.

FHS CE Sessions Planned for Upcoming Fish Health Meetings

The QA/QC committee of the FHS is pleased to announce two upcoming continuing education sessions on Quality Management System Training at the Fish Health Section Meeting (April 7, 2017) and again at the Western Fish Disease Workshop (June 20, 2017).

These sessions will be taught by Dr. Kelly Burkhart, microbiologist and quality management trainer with the National Animal Health Laboratory Network (NAHLN). Topics to be covered include: document writing and control, record keeping, training, equipment, corrective action, root cause analysis and internal audits. The training will be RACE-approved for veterinarians requiring continuing education hours.

This training should be valuable for all aquatic animal health laboratories, and especially those who are participating in the QA/QC recognition program of the FHS. Quality Management Training like this will likely be a requirement of the upcoming Tier 2 process, but this training would be of benefit to those just starting Tier 1, or those labs just contemplating entering the process in the future.

And for those of you sending in those samples to the lab? Field pathologists, inspectors and technicians should not feel left out! This workshop will give you training on the documentation required for the samples that you send, and insight in to the care that should be taken in processing them to give you confidence in the results.

For more information on the June session, contact Marcia House at mhouse@nwifc.org.

2017 Shrimp Pathology Short Course

"Disease Diagnosis and Control in Marine Shrimp Culture"

July 17-22, 2017

University of Arizona, Tucson, AZ (USA)

The Aquaculture Pathology Laboratory will again offer an intensive one-week course combining lectures with hands-on laboratory sessions, demonstrating the methods used for detection and diagnosis of the diseases farmed shrimp.

The following topics will be covered:

- Short-course introduction, purpose, scope and schedule.
- Major shrimp diseases listed by World Animal Health Organization (OIE)
- The baculovirus diseases: white spot syndrome virus (WSSV), monodon-type baculovirus (MBV), baculovirus penaei (BP)
- The parvovirus diseases: infectious hypodermal and hematopoietic necrosis virus (IHHNV), hepatopancreatic virus (HPV)
- RNA viruses infecting penaeid shrimp: Taura syndrome virus (TSV), yellow head virus (YHV), infectious myonecrosis (IMNV), *Penaeus* nodavirus (PvNV), white tail disease (WTD)
- Bacterial diseases: acute hepatopancreatic necrosis disease (AHPND; caused by a unique strain of *Vibrio parahaemolyticus*), necrotizing hepatopancreatitis (NHP-B), *Vibrio harveyi*.
- Microsporidian diseases: *Enterocytozoon hepatopenaei* (EHP), cotton shrimp disease
- Methods of disease prevention and/or treatment.
- Development of biosecurity and quarantine protocols

Topics to be covered in the labs include:

- Sample preparations for histology and PCR.
- PCR/RT-PCR for diagnosis of WSSV, AHPND, EHP, TSV
- qPCR/qRT-PCR for diagnosis of WSSV, AHPND, TSV
- Laboratory bioassay: AHPND
- Review of histopathology of viral and bacterial diseases.

Registration is limited to 30. Cost: \$2,000 (USD) if the deposit is received on or before June 1, 2017; \$2,500 (USD) if the deposit is received on or after June 2, 2017.

For more information about the course or to register, go to <https://acbs.cals.arizona.edu/aqua>, or contact:

Dr. Arun K. Dhar or Ms. Deborah Huie
Aquaculture Pathology Laboratory
School of Animal and Comparative Biomedical Sciences

University of Arizona
1117 E. Lowell Street, Room 102
Tucson, Arizona 85721 USA
Phone: 520-621-4438; Fax : 520-626-5602
Email: adhar@email.arizona.edu;
dhuie@email.arizona.edu

The 3rd Fisheries and Aquaculture Conference (FAC 2017)

May 18 to 20, 2017

Hangzhou, China

The FAC: International Conference on Fisheries and Aquaculture aims to bring together leading academic scientists, professors, researchers, students and research scholars to exchange and share their experiences and research results about all aspects of Fisheries and Aquaculture. It also provides the premier interdisciplinary forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns, practical challenges encountered and the solutions adopted in the field of Fisheries and Aquaculture. We cordially invite you to submit papers or abstracts to our conference through the Registration system.

Hangzhou is one of the important tourism cities in China, famous for its natural beauty and historical and cultural heritages. Hangzhou is the capital of Zhejiang province. It is the political, economic and cultural center of the province as well. In addition to this conference, we cordially invite you to join a Tech Tour to experience this beautiful city.

We call for special session chair now. If you are interested in this, please contact us.

Benefits to be the special session chair:

A free platform for academic exchanges;
Free dinners and coffee break during conference period;

Free registration and accommodation (2 nights during the conference period);

PS: All attendees invited by the Special Session Chair can enjoy the maximum discount.

Duties to be the special session chair:

Determine the session topic within the conference field;

Please contact FAC Organizing Committee:

http://www.engii.org/conference/FAC/?utm_campaign=fac&utm_source=e_cp&utm_medium=conf_2015ws12_fac1_20170105_pan_100958

5th Euro Global Summit on Aquaculture & Fisheries

March 30-April 1, 2017
Madrid, Spain

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

World Aquaculture 2017

June 27-30, 2017
Cape Town, South Africa

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

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

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

Asian-Pacific Aquaculture 2017

July 25-27, 2017
Kuala Lumpur, Malaysia

Asian-Pacific Aquaculture 2017 is the place to learn about the latest in aquaculture, see the newest technology in the trade show with exhibits from around the world and enjoy the many tourist sites in Malaysia. APA 2017 will have a large exhibition featuring international companies showcasing the latest in products, services and all aquaculture related information. Click here for [more details](#).

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

**IAVBC Aquaculture Biosecurity Special Session
World Aquaculture Conference**

June 26-30 and July 1-2, 2017
Cape Town, South Africa

Click <http://tinyurl.com/h3lc576> for more information on the 2017 World Aquaculture Conference.

For additional information about the IAVBC or this Special Session, see:

www.fisch.vetmed.uni-muenchen.de/biosecurity

or contact IAVBC@vetmed.lmu.de

Please register for the 2-day workshop (July 1-2) at: http://www.fisch.vetmed.uni-muenchen.de/biosecurity/iaavbc_workshop_2017/index.html

Veterinarians attending this Special Session will receive a veterinary CE certificate of participation.

Our mailing address is:

IAVBC Secretariat
Department of Fish Diseases & Fisheries Biology
Faculty of Veterinary Medicine
Ludwig-Maximilians University
Kaulbachstr. 37
80539 München, Germany

2017 Aquaculture Biosecurity Special Session & Workshop Organizers, Coordinators, Supporters & Contributors



Veterinary Specialist (Fish Pathology)

British Columbia Ministry of Agriculture, Plant and Animal Health Branch, Animal Health Centre
Abbotsford, BC, Canada

Annual Salary: \$77,873.69 - \$97,265.08

Review of applicants will start ~March 15, 2017.

We seek a fish pathologist who is a highly effective communicator and collaborator, and able to provide comprehensive reports and work successfully with industry, stakeholders and Ministry executives. Requires analytical, innovative and results oriented, to work with other fish pathologists to initiate special investigations when required and represent the Ministry on inter-jurisdictional working groups and committees. As an expert, the individual requires to have the ability to provide effective diagnostic services, and the vision to address future industry and ecosystem needs.

If you are a skilled veterinary pathologist seeking a new challenge and a position where you can make a difference, we look forward to your application. This is an excellent opportunity for a veterinary pathologist interested in fish to see a large and diverse case load and to work with a group of highly skilled and experienced veterinarians and scientists in an AAVLD (American Association of Veterinary Laboratory Diagnosticians) accredited laboratory.

The Plant and Animal Health Branch supports the sustainability of animal and plant agriculture, while serving to protect the well-being of the people of the province of British Columbia through surveillance, regulatory compliance, risk assessment, and the development of strategies to address identified risks. The Animal Health Centre is the AAVLD accredited provincial veterinary diagnostic laboratory that provides world class diagnostic services to protect the health of all animals in B.C. in support of disease prevention, control and eradication. The Centre protects human health with the timely and accurate diagnosis of zoonotic diseases that transmit from animals to humans, in both the public health and the food safety sectors.

For more information concerning this position and to apply, please visit:

<https://search.employment.gov.bc.ca/cgi-bin/a/highlightjob.cgi?jobid=38055>.

Assistant Professor (Aquaculture) in the School of Veterinary Medicine

The Hong Kong University is currently accelerating its recruitment of highly motivated and qualified staff that will contribute to the development of the School of Veterinary Medicine.

The innovative Bachelor of Veterinary Medicine curriculum includes a number of courses on Aquaculture. The appointee is expected to contribute to the further development and implementation of the professional veterinary curriculum (Bachelor's and Master's levels) in the area of Aquaculture; foster excellence in veterinary education and research; teach and manage undergraduate and postgraduate courses; develop new research directions and maintain robust research programmes; and carry out administrative work and other duties to facilitate the development of the School.

A Doctor of Veterinary Medicine degree or an equivalent veterinary degree, preferably registrable in Hong Kong, with evidence of further postgraduate education in the form of Diplomate status in a recognized specialty board and/or an advanced degree. A PhD in a relevant discipline (veterinary medicine, animal science, biology) or equivalent is highly preferred. Applicants must have demonstrable evidence of research success including the ability to obtain research funding, and strong interpersonal skills with the ability to work collaboratively as a member of an academic team. Preference will be given to candidates with background in the field of Aquatic Veterinary Medicine.

Remuneration package will be driven by market competitiveness and individual performance. Excellent fringe benefits include gratuity, leave, medical and dental schemes, and relocation assistance (where applicable). Initial appointment will be made on a fixed-term contract.

Further information on the post and the University is available at <http://www.cityu.edu.hk>, or from the Human Resources Office, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong, Hong Kong [Email : hro-job@cityu.edu.hk Fax : (852) 2788 1154 or (852) 3442 0311].

Please submit an online application at <http://jobs.cityu.edu.hk>, and include a current curriculum vitae, a cover letter, and research and/or teaching statement(s).

The School of Veterinary Medicine (SVM) was launched in spring 2014 in collaboration with the Cornell University College of Veterinary Medicine. City University of Hong Kong is an equal opportunity employer and we are committed to the principle of diversity. Personal data provided by applicants will be used for recruitment and other employment-related purposes.

Únase a nosotros en la Conferencia Científica Internacional y en la Asamblea General Anual de la World Aquatic Veterinary Medical Association (WAVMA), sobre Conceptos Actuales en Acuicultura y Clínica de Peces Ornamentales, 12-14 de Septiembre de 2017, Târgu Mureş, Transilvania, Rumania.



AQUATIC

Action

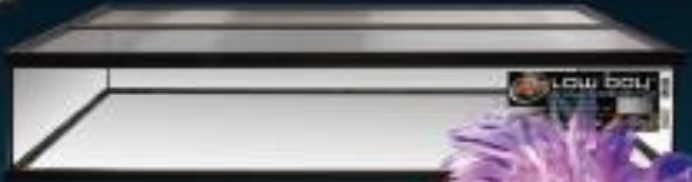
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