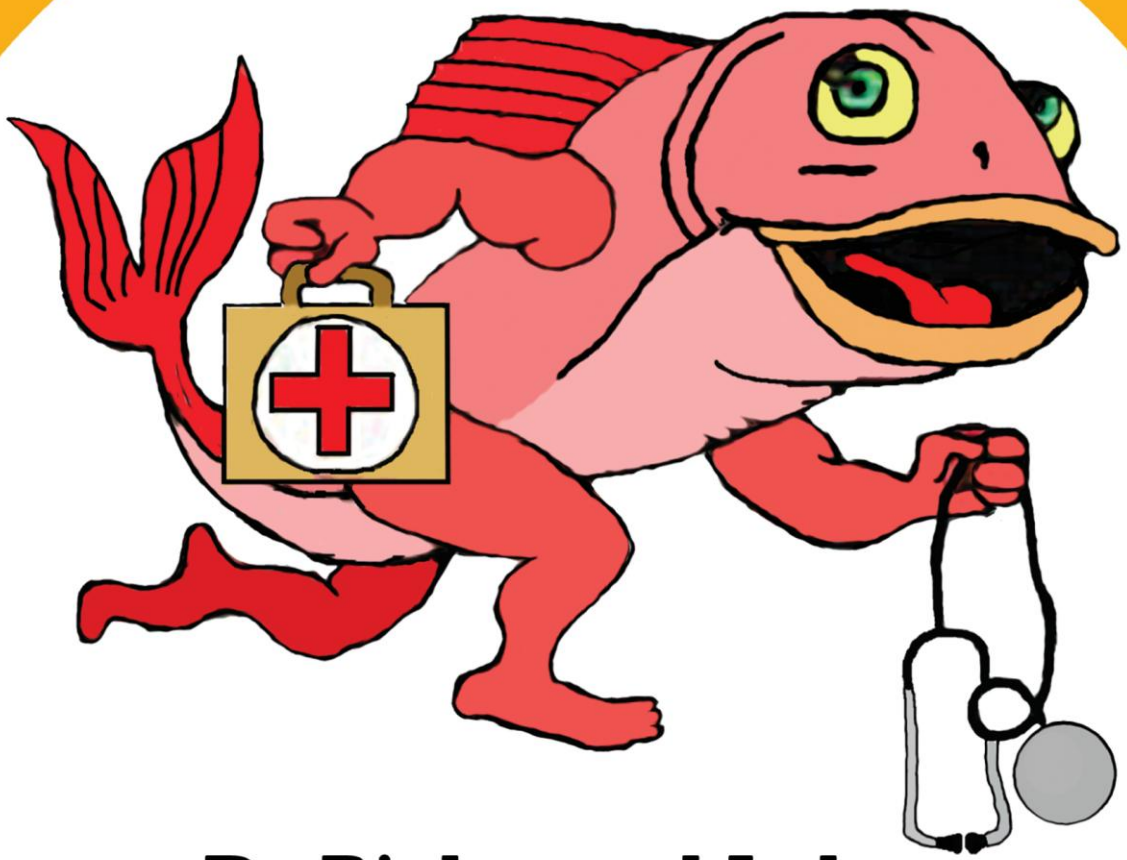
FISH VETTING ESSENTIALS



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Front cover: The Fish Vet's logo. Part fish, part vet.

FOREWORD

This is a revised version of the self-published "Australian Fish Vetting Essentials" (2007) by Drs Richmond Loh & Matt Landos. The purpose of this manual is to collate the knowledge that aquarists, aquaculturalists, public aquaria, local fish shops and veterinarians already have, and to filter out misinformation and then provide this information in a readily digestible form. The information contained in this publication has been in the process of compilation since 2001. This manual is not prescriptive, but rather, it is a collection from our combined knowledge to promote to the industry that veterinarians are best equipped to deal with aquatic animal health.

Worthy of note is that many diseases found in aquatics can be classified as emerging diseases since an "emerging disease" is one that has appeared in a population for the first time, or that may have existed previously but is rapidly increasing in incidence of geographic range.

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ABOUT THE AUTHORS

Dr Richmond Loh

Dr Loh has always been interested in animals, nature and medicine, so naturally he studied to become a veterinarian at Murdoch University. However, his passion for all things fish was strong and so his first job was as a veterinary fish pathologist for the Tasmanian state laboratory, providing diagnostic services for the large aquaculture farms including species such as salmon, trout, ornamental fishes, abalone and oysters. At the same time, he was offering veterinary services to owners of ornamental fishes.

In 2006, he passed the examinations for Aquatic Animal Health for the Australian & New Zealand College of Veterinary Scientists (ANZCVS). In the same year, he was awarded a Master of Philosophy degree for cancer research in Tasmanian devils, publishing the seminal papers on Devil Facial Tumour Disease in Veterinary Pathology. To increase his depth of knowledge in the area of diseases, he studied for and passed the examinations for Pathobiology for the ANZCVS in 2009.

So far, he has given numerous talks at seven National Veterinary Conferences and also to the Pet Industry Australia Association delegates and at the New Zealand Companion Animal Conference. He regularly writes for aquarium and pet publications. These are an initiative to generate interest within the respective professions and industry to apply scientific reasoning for the better health and management of fishes. Through his veterinary career, he has appeared on TV (Creature Features, Stateline, Catalyst, ABC news), been interviewed on radio (Curtin FM), appeared in newspapers (The Sunday Times UK, Herald Sun, The Examiner, Sunday Tasmanian, The Cairns Post, Canning Times), magazines (Australian Aquarium Magazine, Aquarium Keeper Australia, TIME Australia Magazine, Your Pet Magazine, Woman's Day, Pets – Taking Care of Your Family's Best Friend, Animals' Voice) and appears on several local and international websites (ABC Online).

He is the consultant veterinarian to AQWA (the Aquarium of WA), is an adjunct lecturer at Murdoch University, is a founding member of the World Aquatic Veterinary Medical Association (WAVMA), is the secretary for the Aquatic Animal Health Chapter of the ANZCVSc and provides advice on fish health and welfare to several universities and the RSPCA. His clients are diverse and range from individual pet fish owners, to retailers, farmers (ornamental and food cultured fishes) and exporters.

Dr Matt Landos

Dr Landos is the Founding Director of Future Fisheries Veterinary Service, is an honorary lecturer in aquatic animal health and associate researcher at the University of Sydney, Faculty of Veterinary Science and in 2011 he was the president of the Aquatic Animal Health Chapter of the Australian & New Zealand College of Veterinary Scientists.

Dr Landos commenced his consultancy practice in aquatic animals in 2005 after a 5 year stint with the NSW DPI as the Veterinary Officer in Aquatic Animal Health. The client base is located throughout Australia, and it ranges from small native fish hatcheries to 3,000 tonne sea cage operations. He works with all aquatic species including molluscs, crustacea and finfish. He reviews emergency disease preparedness plans and develops health management plans for aquaculture industries. He has had a prominent media profile in recent years associated with investigation of the impacts of environmental pollutants on fisheries in relation to the notorious two-headed Australian bass larvae case from the Noosa River.

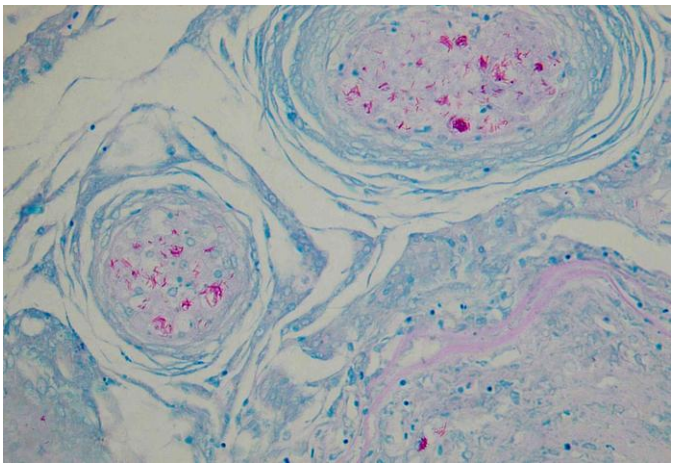
Wasting Disease & Fish Tuberculosis (Mycobacteriosis)

Clinical Signs
Mycobacteria and Nocardia tend to cause systemic infections that may manifest themselves as skin lesions and weight loss despite being well-fed (gaunt appearance to the goldfish pictured below).

The most common bacterial species include: *Mycobacterium marinum*, *Mycobacterium fortuitum* & *Mycobacterium platypoecilus*. Fish suffering from these chronic infections tend to develop granulomatous nodules throughout their internal organs and occasionally on the skin. This leads to a variety of organ-related signs such as: inappetence, wasting, ascites, loss of colour, exophthalmia, loss of scales, spinal cord deformity, loss of balance, listless behaviour, finrot and external ulceration of the body. Skin abscesses that appear to erupt/originate from beneath can occur.

Diagnosis
A tentative diagnosis is made based on clinical signs. Unfortunately, a definitive diagnosis can only be made via necropsy.

On necropsy, there may be widespread granulomatous, grey-yellow nodules in most organs (especially liver, kidney and spleen). Acid-fast bacilli can be visualised using ZN stains on heat-dried smears or on histology.



Risk Factors

- Carrier fish
- Poor tank hygiene
- Overcrowding
- Cannibalism of infected fish

Treatment

Mycobacteria tends to pass from fish to fish by way of cannibalism of infected dead fish. Thus it is a very important aspect of mycobacterial control - that dead fish are promptly removed from tanks so that cannibalism is not allowed to occur. It is also possible that vertical transmission from parent to offspring occurs in live-bearing species of fish. Like many other diseases of fish, it is likely that a carrier state exists and that apparently healthy fish may harbour the disease. Outbreaks of mycobacteriosis may then occur if these carriers are subjected to poor environmental conditions and excessive stress.

If the condition is diagnosed early enough, drugs such as doxycycline and sulphafurazole can be administered systemically (IM) but with limited success. Affected fish should be isolated from other fish and if their condition deteriorates during treatment, they should be euthanased.

As there may be a zoonotic risk associated with these pathogens (below, see granulomatous nodule on the arm of this patient), it is essential to avoid contact with uncovered skin when handling affected stock or contaminated equipment and water.

Some believe that following an outbreak, disinfect all equipment, tanks and other facilities and dispose of all affected fish properly. Some disinfectants recommended include oxidizing agents (chlorine, Virkon), iodophores, alcohol and phenols. However, some consider *Mycobacteria* to be ubiquitous. Therefore, improving aquarium conditions, decreasing stressors and improving nutrition are the measures to be taken.

Prevention

- Avoid overcrowding
- Do not allow organic matter to build up
- Maintain parasite-free fish
- Avoid unnecessary handling

Quarantine new fish for >2-4 weeks.

The Fish Vet

The original handbook, published in 2007, is widely used in veterinary schools, labs, clinics and even zoos. The revised 2011 edition is a comprehensive resource that incorporates elements of fish keeping, clinical medicine and fish pathology.

Important information for fish vets in this revised edition include:

- How to diagnose common fish diseases?
- How to medicate fish?
- How to treat fish diseases using drugs available in your surgery?
- How to interpret water quality results?
- How to anaesthetise fish?
- Notes on surgery and imaging.
- How to identify fish into their broad categories?
- How to breed fish using hormones?

This truly is an essential manual for veterinarians dealing with fishes.