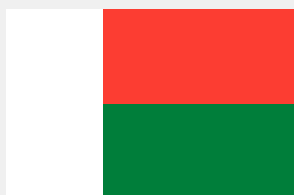


Aquatic Health Information Brief: Madagascar



Summary information

Customs and borders

1. International airports (2):

- a. Ivato International Airport (Antananarivo)
- b. Nosy Be-Fascene

2. Official land border crossing points

Not applicable.

3. Coastal customs ports (5):

The main port, Tomasina, handles 75% of the nation's maritime freight.

Key contacts supporting national aquatic health management

Fisheries and Aquaculture Department	<p>1. Dr Christiane Rakoroarivony: Head, Autorite Sanitaire Halieutique (ASH) [Competent Authority in charge of aquatic animal health], Department of Aquaculture, Ministry of Fisheries and Blue Economy:</p> <p>christiane.rakotoarivony@ash.mg</p> <p>2. Dr Herizo Andriamboavonjy, ASH. Also Focal Point of OIE:</p> <p>santeanimale@ash.mg</p>	Universities and Research Institutes	<p>1. Dr Pierre Michel Ravelavelo, Veterinarian, Department of Veterinary Science, Faculty of Medicine University of Antananarivo:</p> <p>ralaivelopm@yahoo.fr</p> <p>2. Ecole Supérieur, des Sciences Agronomiques.</p> <p>3. Institut des Sciences Marines et Halieutiques (mostly for aquaculture)</p>
Veterinary Services	<p>1. Dr Rakotoharinome Vincent Michel, Director, Direction des Services Veterinaires, Ministry of Agriculture and Livestock:</p> <p>dsv.minae@gmail.com</p> <p>Tel +261340555674</p> <p>2. Dr Ramahefasoa Bettelhein, Ministère de l'Elevage et de la Protection Animale (MADA). At border (Ivato airport):</p> <p>dsv.sif.info@gmail.com</p>	Private sector and other support	<p>1. Marc le Groumellec, Specialist in shrimp health and biosecurity</p> <p>le.groumellec@gmail.com</p> <p>https://www.linkedin.com/in/marc-le-groumellec-b6a2b04/?originalSubdomain=mg</p>

Main fish pathogens and health conditions detected in Madagascar

The commercial shrimp farming sector carry out their own surveillance and keep records of three WOA (World Organisation of Animal Health) notifiable diseases: Taura Syndrome, Yellow Head Disease, White Spot Syndrome – (see history below). They also experience bacterial *Vibrio sp.* Infections, especially *V. harveyii* and bioluminescent vibriosis in the hatchery. Very little information or records of any finfish pathogens or disease outbreaks in carp, tilapia and other cultured finfish, although likely to be some common external and internal parasitic and fungal pathogens, especially in hatchery stages.

Private sector background

There is one large-scale commercial shrimp farming company in the country. An outbreak of white spot disease (WSD), caused by white spot syndrome virus (WSSV), occurred in 2011 – initially on a shrimp farm north of Morondava. This occurrence came eight months after initial detection of the pathogenic virus on a farm near Quelimane, Mozambique. The disease is believed to have come via ballast water from previously infected areas along the Arabian Peninsula. The virus was detected on another two Madagascan shrimp farms. The first was unsuccessfully upgraded; and the second, now largest remaining farm, extensively modified; nursery and grow-out ponds sizes were reduced, filtration upgraded, ozonation and disinfection systems installed, and strict biosecurity was introduced. The high value of the commercial product helped to drive the investment in biosecurity; fencing installed, security guards restricting entry to only essential visitors, disinfection procedures at entry (e.g. change of clothing, foot baths), staff training, no introduction of broodstock, individual batch level separation, rotation and fallowing of grow-out ponds, and predator control mitigation – including for birds. The detail of the protocols remains largely commercially confidential.

The finfish farming sector is still very small-scale, and characterised by low-intensity ponds. French NGO APDRA are involved in developing rice-fish pond-based systems of carps and tilapia. Given the low stocking densities and production there are no reports of major issues with diseases. There is also one commercial sturgeon farm for caviar (www.rovacaviar.com).

Infrastructure and Legislation: FAQs

1. Does the government have a specialised unit for aquatic health?

No. Government veterinarian has recently completed Masters in Aquatic Pathobiology and is now developing the future aquaculture and aquatic health strategies for the country.

2. Are aquatic health diagnostics laboratories accessible and affordable to the majority of aquaculture farmers?

No. During white spot outbreaks in the commercial shrimp aquaculture sector the government used the Pasteur Institute based in the Centre de Biologie Clinique d'Ambatofotsikely (Avaradoha) for a 2 to 3-year period. The laboratory had capacity to screen for shrimp viral pathogens, but was not specialised in aquatic animal health. Contact: lhae@pasteur.mg <https://www.pasteur.mg>. The commercial shrimp farm has in-house, private capacity for bacteriology, parasitology and water quality.

3. Does the government have any bans or limitation on introducing live fish into the country – or moving live fish within the country?

No. At both international airports (Ivato-Antananarivo and Nosy-Be) import/export of live fish/ aquatic animals is allowed, subject to basic checks: a. Document and physical inspection b. Sampling (although there is a lack of equipment, laboratory and surveillance plan). Checks are carried out under the Direction of Veterinary Service not the Competent Authority in charge of fish health; Veterinary Service staff (with animal livestock background) are present in both airports, but the Autorite Sanitaire Haliéutic has no staff present at either airport. Madagascar also exports live aquatic animals: *Anguilla*, *Penaeus monodon*, *Panulirus*, *Scylla serrata* (the last two species from wild stock).

4. Does the government have any specialist legislation on aquatic health?

Decret N 2018/479 Aquatic animal health policy (Ministry of Fisheries and Blue Economy).

Further reading

1. Andrea Simková, Eva Rehulkova, Rasoloariniaina Jean Robertin, Michiel Jorissen, 2019. Transmission of parasites from introduced tilapias: a new threat to endemic Malagasy ichthyofauna. March 2019. *Biological Invasions* 21(3).

https://www.researchgate.net/publication/328326889_Transmission_of_parasites_from_introduced_tilapias_a_new_threat_to_endemic_Malagasy_ichthyofauna

2. FAO, 2016. Report of the Technical Workshop on the Development of a Strategy for Improving Biosecurity (Aquatic Animal Health) in the Subregional Countries of the Mozambique Channel (Madagascar, Mozambique and the United Republic of Tanzania). FAO Fisheries and Aquaculture Report pp 116.

<https://www.fao.org/publications/card/en/c/a8b2b960-ce1f-4aa4-bc41-b28dbe4bf09f/>

3. World Bank, 2014. Reducing disease risk in aquaculture. World Bank Report Nos 8825-GB257-GLB [Significant section on Malagasy shrimp disease case study and recommendations].

https://www.researchgate.net/publication/280858443_Reducing_disease_risk_in_aquaculture_-_WORLD_BANK_REPORT_NUMBER_88257-GLB

4. Responsible Aquaculture Foundation, 2013. Case Study of the Outbreak of White Spot Syndrome Virus at Shrimp Farms in Mozambique and Madagascar: Impacts and Management Recommendations. This report, prepared by the Responsible Aquaculture Foundation and funded by the World Bank, is Case Study #3 of a series entitled, "Lessons Learned in Aquaculture Disease Management". November 15, 2013.

https://www.globalseafood.org/wp-content/uploads/2017/01/raf_wssv-report2.pdf

This brief was produced as part of a series across a selection of sub-Saharan African countries. It was produced by a small team from ThinkAqua and Casammak Aquaculture and reviewed by local experts. Support for the data collection survey was provided by the Food and Agriculture Organization of the United Nations.

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