

FINAL REPORT

Project 2019-03

AWARD RECIPIENT: Dr. Maximiliano Canepa, The Company One

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DATE: 31/12/2019

ACTIVITY UNDERTAKEN

Participation in a fish histopathology workshop at the University of Tasmania to gain knowledge and skills on health assessment of tropical groupers throughout histology.

OUTCOMES ACHIEVED TO DATE

One of the planned outcomes was to acquire knowledge and skills to identify both normal and pathological states in fish organs which has been achieved by participating in a fish histopathology workshop. As a result of my participation in this workshop, The Company One (TCO) would be able to undertake collaborative research with a colleague of the affiliated companies in Taiwan and Hong Kong who has also attended the workshop. This would help to make the shipment of giant grouper (GG) fingerlings a more profitable enterprise and improve fish welfare during transportation.

Additionally, those skills will be utilised to improve fish husbandry procedures of fingerlings held at TCO and thus, to provide domestic growers with improved guidelines and advice on the aquaculture of GG.

To sum up, my participation in the fish histopathology workshop will benefit not only TCO, but also the GG industry in Australia.

Acknowledgments

I would like to thank:

The Company One for supporting my participation in the fish histopathology workshop.

The Fisheries Research & Development Corporation's "Aquatic Animal Health & Biosecurity Training Scheme" for supporting and funding this activity.

Background

Over recent years, TCO, has focused its fingerling production on giant grouper (GG), *Epinephelus lanceolatus*. Fingerlings (~500k) are shipped domestically and internationally to grow out facilities, which has shown to be a challenge. Shipments of fingerlings occur by plane

where high densities, minimum water and dissolved oxygen and CO₂ levels challenge fish survival.

By utilising histological techniques, TCO could obtain critical information on the state of organs prior to shipment and allow us to identify changes that relate to transportation. Moreover, the majority of the exported fingerlings are shipped to affiliated companies in Hong Kong, "Aquaculture Technologies Asia" (ATA) and Taiwan, "Epic" where grow-out facilities are operated. In collaboration with these facilities, research can be undertaken to improve shipment conditions and fish husbandry.

Need

Improving the overall wellbeing and survival of fingerlings shipped overseas and within Australia is essential best practice for TCO. Using histological techniques to understand how high densities, minimum water and dissolved oxygen and CO₂ levels influence GG health, would allow TCO to develop and apply best practice, reduce stress and occasional mortalities on arrival and improve the position of the company in the SE Asia competitive market.

Furthermore, the aquaculture of GG is expanding in Australia with domestic growers investing in this species. Therefore, being able to identify health related issues to husbandry procedures is needed to provide farmers with improved guidelines and advice for the aquaculture of this species

Objectives

The objective of this training was to gain knowledge on interpretation of fish histopathology. This objective was achieved and TCO has therefore attained additional tools to further improve the husbandry and shipment of tropical groupers.

Methods

A fish histopathology workshop was held at the University of Tasmania between the 27th and the 29th of November 2019 and covered the histopathology of all fish organs. As a result of my participation in this workshop, I have gained skills in fish histopathology and the assessment of fish health through histology.

The workshop consisted of sessions, each one focused on a particular organ and its histopathological changes due to diverse pathologies. Participants were divided into small groups (4 participants each) ensuring individual experience. Histological sections were observed by microscopy aiming to identify abnormalities in organs. Sessions, led by an experienced histopathologist, were arranged as follows:

Dr Brian Jones

- Liver, nervous tissue, sensory organs, pathology cases

Dr Judy Handler

- Haematopoietic organs, excretory kidney, spleen, haematology, reproductive organs & early life stages

Professor Barbara Nowak

- Introduction to histopathology, resources available

Dr Mark Adams

- Gills, Amoebic Gill Disease

Dr Graeme Knowles,

- Skin, digestive tract, muscle

Results/Discussion

The workshop provided me with the skills to (1) identify pathological changes in fish organs; and, (2) to interpret those changes in the context of aquaculture. It also provided TCO additional skills to keep improving the GG shipment conditions and farming. Besides, being an emerging species for aquaculture in Australia, developing expertise in all aspects of giant grouper farming is crucial to providing advice and guidelines to farmers.

Benefits and Adoption

As an emerging species for aquaculture in Australia, gaining expertise in the farming and live shipment of GG is essential for its future. Also, the development of guidelines on the aquaculture of GG would be beneficial to fish growers. The skills and knowledge gained through the fish histopathology workshop will help to develop those guidelines and the industry to establish and grow.

Further Development

To further exploit the outcomes of the award, it would be advantageous to undertake collaborative research projects to improve further the farming of giant grouper. For example, a research project with a nutritional component, which is believed to be the next bottleneck for this industry to grow, will utilise the skills gained through this award.

Appendices



Fish histopathology workshop session. On the left side of the photo, Alex Lin from the affiliated company in Hong Kong "Aquaculture Technologies Asia" and Taiwan "Epic" and on

the right side Maximiliano Canepa from The Company One, Cairns, QLD. Photo provided by Alex Lin.