Final report for Mini-project MS0502:

Microalgae culture training for Tonga Fisheries staff

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Approach:

Training will be provided to a member of the Aquaculture staff at Tonga Fisheries for the maintenance and scale-up of micro-algae cultures in support of the aquaculture hatchery activities of Tonga Fisheries. Mr. Siola'a Malimali, the prior head of Aquaculture from Tonga Fisheries is currently undertaking study at AMC in Launceston towards a Master's degree. Upon completion he will return to Tonga and resume his Aquaculture duties. A short course on micro-algae culture was run by the University of Tasmania, School of Aquaculture in Launceston between 27 June and 1 July, 2005. Mr. Malimali attended the course and his report is below:

Report of Mr. Siola'a Malimali (Fisheries, Tonga).

Background

A microalgae growing course was carried out at the University of Tasmania, School of Aquaculture, Launceston. The course was an intensive introduction to laboratory and hatchery-scale algal culture technique. The objective was to provide participants with a comprehensive introduction to the theory and practice of growing microalgae in laboratory and hatchery-scale system. The course was conducted on a lecture-based theory and hand-on practical session providing participants with training in algal culture techniques.

The 5 day course covered several aspects of microalgae culture including:

- Basic microalgae physiology
- Influence of light, temperature and nutrients on algal growth
- Nutritional quality for feeding larval aquatic animals
- Discussion on specific issues and problems with culturing in a hatchery context.

Participants from different institutions and industries working with microalgae were interested to further their knowledge on microalgae culture. The Tongan participant was able to attend the course through the funding from ACIAR Projects.

Daily schedule

Day 1

Lecture

- Algal taxonomy-major algal groups, diversity and taxonomy
- Principles and theory of algal growth

Practical

- Observed aquaculture microalgae
- Inoculate 40ml tube culture & estimate biomass by fluorescence
- Set up and inoculate 70L minibag & estimate bag biomass by fluorescence

Day 2

Lecture

- Algal growth in batch culture
- Growth in semi-continuous and continuous culture
- Hatchery-scale production cultures

Practical

- Observe aquaculture and harmful microalgae
- Estimate biomass of 40ml tube and 70L minibag by fluorescence
- Inoculate f/2 plates and slopes, example of aquaculture algae on solid f/2 media
- Serial dilution of algal culture & incubate plates at 25°c

Day 3

Lecture

- Algal physiology-Photosynthesis, respiration and catabolism, algal growth responses to light, algal nutrients, growth media and response to nutrient limitation
- Algal growth responses to temperature, Summary and overview of physiology

Practical

- Estimate biomass by fluorescence
- Estimate biomass by cell count
- Practice flaming and pour/pipette transfer
- Serial dilution isolation

- Observe and practice micropipette making and manipulation
- Streak 7 stereomicroscope isolation of colonies/cells

Day 4

Lecture

- Hatchery nutrition- Nutrition components and gross composition of microalgae, marine larval nutrition, effect of light, temperature and nutrient stress, live feed & supplementation, artificial and alternative diets.

Practical

- Estimate biomass by fluorescence
- Calculate growth rate in minibags culture
- Examine growth on f/2 plate and slope

Day 5

Lecture

- Harmful algae and phytoplankton monitoring strategies
- Discussion and brainstorming for solution to common algal problems and issues in hatchery context.
- Course finish

Benefits of course attendance

The course is very useful to the Ministry of Fisheries in Tonga as it currently interested developing pearl oyster culture using hatchery propagation. After attending the course, I had some idea about microalgae culture and will be able to use it for the development of pearl oyster industry in Tonga. After attending the course I will be able to grow algae and improve my knowledge and experience from there onward. In addition, learning about harmful microalgae was very interesting.