

# Farming tropical black-lip rock oysters (*Saccostrea echinata*) in the Northern Territory

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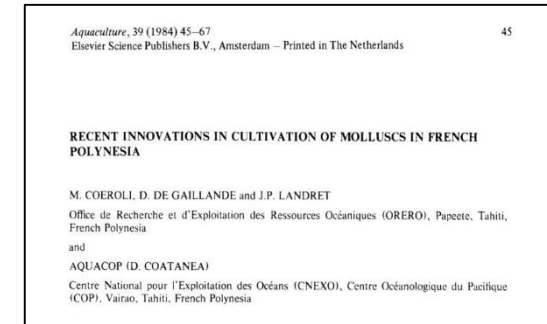
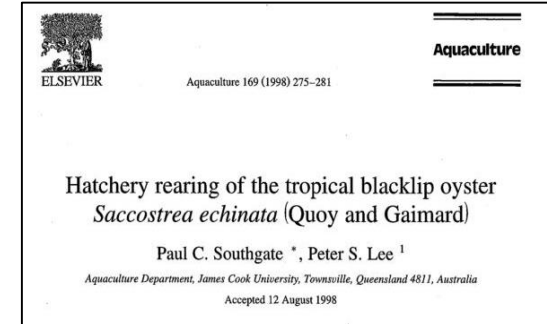
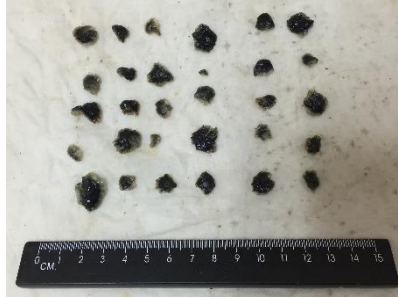
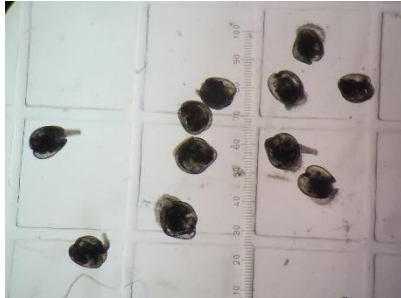
# Why black-lip rock oysters?

- Historically harvested by Aboriginal communities for food and trade
- Local knowledge of the species; where to collect broodstock
- Large oyster species that show promising growth rates
- Found across the Northern Territory
- They taste great!



# Background

- DAC hatchery trials in 2010
- Limited knowledge on this species; only two published papers
- Spat production was inconsistent and not commercial quantities (<30K)
- Settlement percentage were low (0.25%)



# NTG Tropical Rock Oyster Aboriginal Economic Development Program

*Dedicated R&D project started in 2014*

Major objectives:

- » Hatchery production
- » Grow-out production
- » Shellfish quality assurance
- » Business development



# Hatchery R&D aims

To develop and optimise hatchery culture techniques and enable the development of tropical rock oyster farming in the Northern Territory

## Specific aims:

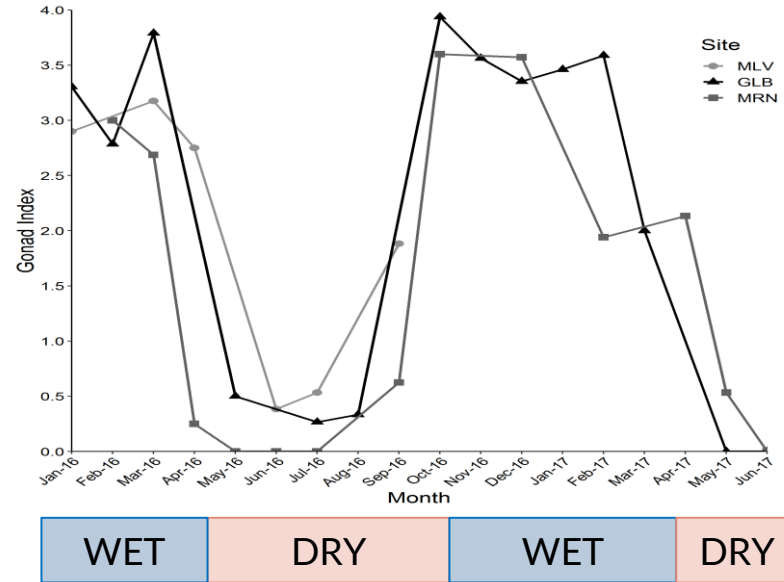
1. Mapping reproductive seasonality
2. Recording and describing specific details of larval development
3. Optimising spawning induction techniques
4. Optimising tank conditions for rearing larvae
  - temperature and salinity
  - microalgae ration and stocking density



# 1. Mapping reproductive seasonality

## Key results:

- Clear wet/ dry seasonality
- Synchronised reproductive patterns
- Environmental cues: temperature and rainfall positively correlate with gonad index
- Very low occurrence of hermaphrodites (2%)
- Sex ratio of 1:1.4 (female: male)



# Aim: Combined effect of temperature and salinity on growth and survival of larvae

## Key results:

- Water temperature and salinity have a significant effect on embryonic development (first 48hrs)
- Larvae are robust; survival was high across all treatments and larval stages
- Salinity preferences change at different larval stages

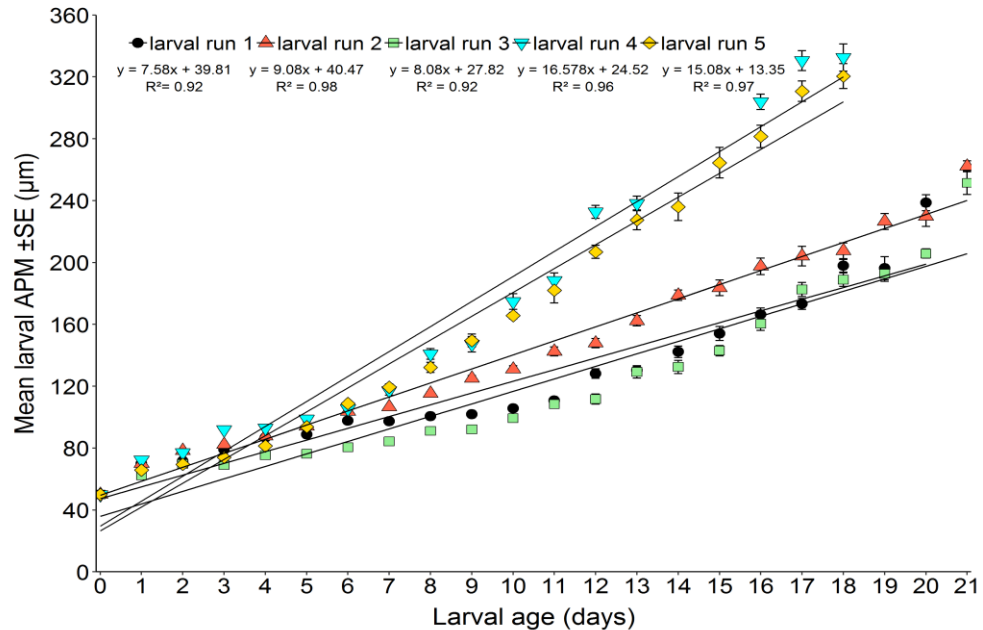
Recommendations				
	Embryo	D-veliger	Umbonate	Eyed
Water Temperature (°C)	28–32	28–32	28–32	28–32
Salinity (ppt)	32	23–26	23–26	28–30

# Aim: Combined effect of temperature and salinity on growth and survival of larvae

## Applied recommendations:

- Percentage of settled larvae increased from 0.49% to 10% (200K spat)
- Settlement occurred 3 days earlier (18 dph)
- Settlement was spontaneous in culture tanks

Outcome is more spat for farmers!





# Goulburn Island oyster grow-out

- 3 sites trialled
  - Wigu
  - Fletchers
  - Mardbalk
- Growth and survival
- Water quality sampling



# Oyster grow-out systems

- Floating baskets, post and rail, intertidal longlines
- Measure growth and survival
- Intertidal longlines most suitable
- Preliminary grow-out trials show ~18 months to market Size 70mm



# Farm development

- Following Hatchery Success
- Fletchers Point Site Selected
  - Oyster Growth
  - Water quality
  - No user Conflicts
  - Access- car and boat



# Farm construction

- September 2018- 200 metres oyster longline
- November 2019- 400 metres new longline





# Future vision

- Oysters are our goldmine!
- Sustainable commercial oyster farms in the NT
- South Goulburn Island Black-lip rock oysters on restaurant plates in Darwin



# Next steps...

- Next phase of R&D program
  - Hatchery
    - Increase larval settlement %
  - Investigate Pest & Diseases
  - Improve grow-out systems
    - increase growth rates
    - Investigate tidal exposure on growth and bio-fouling
  - Quality Assurance Program
    - Heavy Metal Survey
    - Monitoring program



# Partners

Thanks to all partners for their support and participation



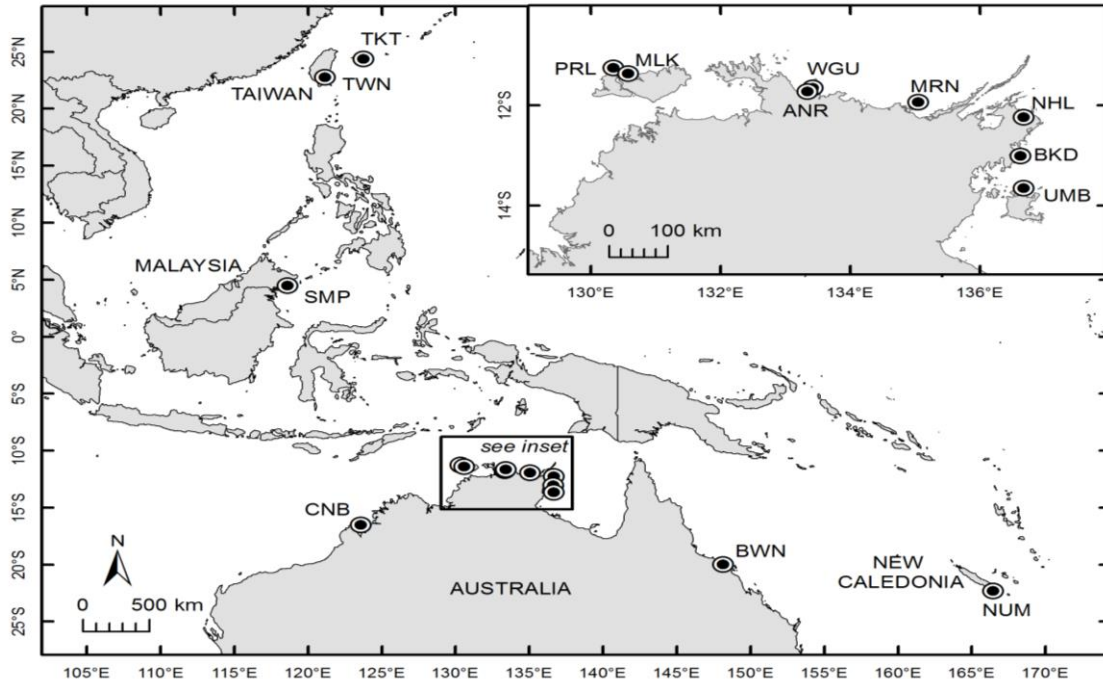
Yagbani Aboriginal  
Corporation



Department of  
Primary Industries



# Black-lip species distribution COI analysis



SMP= Semporna, Malaysia  
TWN= Taiwan  
TKT= Taketomi Island, Japan  
CNB= Cone Bay, WA  
BWN= Bowen, QLD  
NUM= Noumea, New Caledonia

## NT

PRL= Pirlangimpi  
MLK= Milikapiti  
ANR= Anuru Bay  
WGU= Wigu  
MRN= Mooroonga Island  
NHL= Nhulunbuy  
BKD= Bukudal  
UMB= Umbakumba