



# Abalone Herpes Like Virus

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# What is an abalone?



- marine snails
- live on macro algae such as kelp
- many species
- very broad distribution

www.google.co.za



Daniel L. Geiger  
<http://vetigastropoda.com/ABMAP/text/index.html>



# Why do we care?



- abalone farming occurs worldwide
- concentrated in Asia
- also wild fishery
- consumption primarily in Asia
- most farming is intensive
- pump ashore systems
- **growth of abalone farming has been accompanied by disease emergence and translocation**




# Risks




- **intensification**
- **new species = new technology + new diseases**
- **wild populations**
- **stock movements**
- **known translocation of withering syndrome through stock movements**



# Abalone viral mortality




- refers to several disease outbreaks
- affecting Asia and Australia
- mortalities in farmed and wild abalone
- viruses implicated
- relationship between outbreaks unclear



# Disease history 01



- first reported from northern China early 1990s
- losses up to 90% spat and 30% older abalone plus wild stock
- outbreak declined by around 1997
- viral particles found on electron microscopy
- not characterised further



## Disease history 02

- major epidemic in southern China in late 1990s
- up to 100% mortality
- spread to Taiwan in 2003
- current status uncertain
- viral particles again found, but not characterised




## Australia

- mortalities first seen in late 2005
- on a farm in Victoria
- spread to affect five farms and wild stock
- up to 90% mortality in farmed abalone
- herpes like virus found on electron microscopy
- molecular diagnostic methods developed
- also work on characterising disease



Victorian Abalone Divers Association  
<http://www.vada.com.au/Virus/Virus.htm>



## Clinical signs

- increased mortalities
- weakness and failure to adhere
- curled foot
- swollen mouth and prolapsed radula
- all non specific

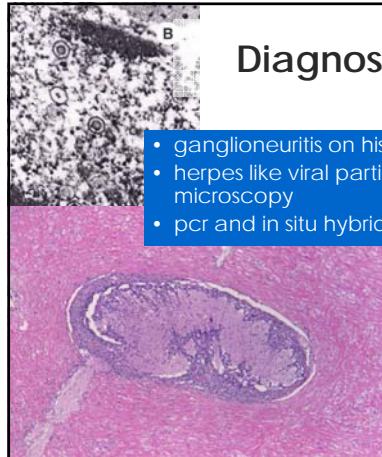

Judith Handlinger  
Animal Health Laboratory, DPIWE, Tasmania




## Diagnostics

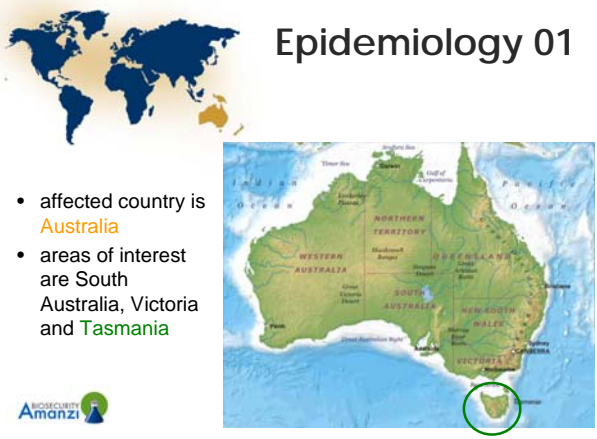

- ganglioneuritis on histopathology
- herpes like viral particles on electron microscopy
- pcr and in situ hybridisation

Crane et al. 2009. Development of molecular diagnostic procedures for the detection and identification of herpes like virus of abalone. FRDC Project No 2007/006.

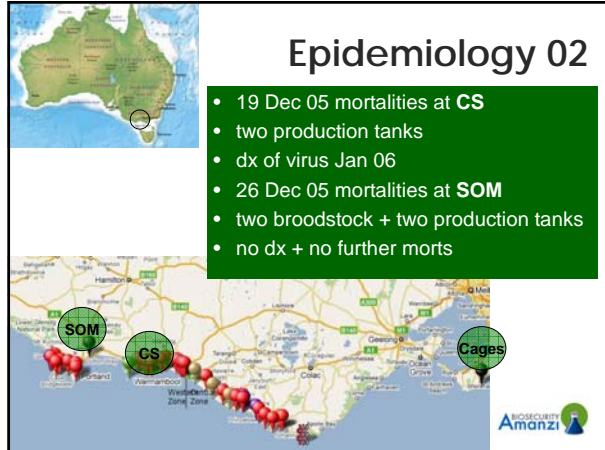

## Epidemiology 01

- affected country is **Australia**
- areas of interest are South Australia, Victoria and Tasmania

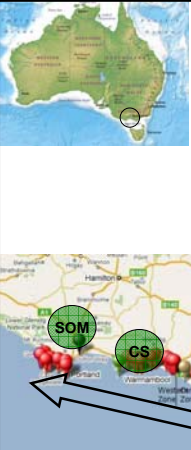



## Epidemiology 02

- 19 Dec 05 mortalities at **CS**
- two production tanks
- dx of virus Jan 06
- 26 Dec 05 mortalities at **SOM**
- two broodstock + two production tanks
- no dx + no further morts

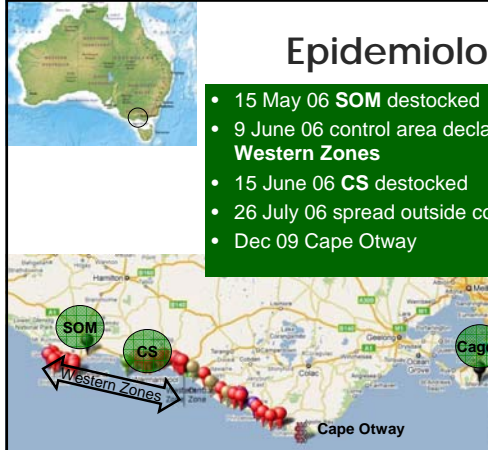



### Epidemiology 03



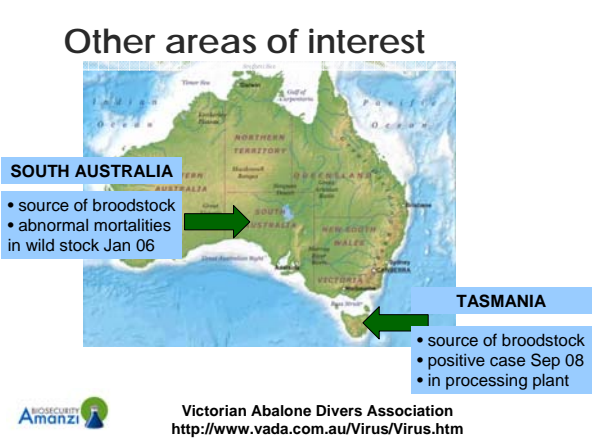
- 17 Mar 06 mortalities resume **SOM**
- 24 Apr 06 mortalities in **Cages**
- 18 May 06 confirmed dx wild stock outside **SOM**
- red markers show progression in wild
- also arrow

### Epidemiology 03



- 15 May 06 **SOM** destocked
- 9 June 06 control area declared **Western Zones**
- 15 June 06 **CS** destocked
- 26 July 06 spread outside control area
- Dec 09 Cape Otway

### Other areas of interest



**SOUTH AUSTRALIA**

- source of broodstock
- abnormal mortalities in wild stock Jan 06

**TASMANIA**

- source of broodstock
- positive case Sep 08
- in processing plant

Victorian Abalone Divers Association  
<http://www.vada.com.au/Virus/Virus.htm>

### Problems in the real world

- closure of two abalone farms + cages
- closure of fishery Victoria AUS60 million
- threat fishery Tasmania AUS100 million
- threats to other farms and fisheries
- **AND IT'S ALL THE GOVERNMENT'S FAULT!!! or so some would say**

### Why?

- because they should have destocked farms immediately...
- BUT:
- disease not confirmed at SOM until 17 Mar 06
- found in wild outside SOM 18 May 06
- was it there before?
- what about the mortalities in South Australia?
- where did this disease come from anyway?

### Most likely scenario

- abalone herpes like virus endemic to Australia
- previously only in wild + unnoticed
- spread to Asia via exports of live animals?
- PCR for Australian virus recognises Taiwanese virus
- material from China not tested
- intervention in outbreak in wild population unlikely to impact on disease progression

## Lessons

- prevention is better than cure (no really!!!)
- biosecurity + surveillance are critical
- contingency plans are important
- but plans are only as good as their implementation
- we need to realise that we are not in control of the natural world



## Sources of information

- Primary Industries Victoria  
[www.dpi.vic.gov.au](http://www.dpi.vic.gov.au)
- Victorian Abalone Divers' Association  
[www.vada.com.au/Virus/Virus.htm](http://www.vada.com.au/Virus/Virus.htm)
- Synopsis of Infectious Diseases and Parasites of Commercially Exploited Shellfish  
[www.pac.dfo-mpo.gc.ca/science/species-especies/shellfish-coquillages/diseases-maladies/index-eng.htm](http://www.pac.dfo-mpo.gc.ca/science/species-especies/shellfish-coquillages/diseases-maladies/index-eng.htm)
- ABMAP abalone mapping project  
<http://vetigastropoda.com/ABMAP/text/index.html>



## Thank you to

- OIE and Government of Namibia
- Judith Handler, Animal Health Laboratory, DPIWE, Tasmania
- Mark Crane, AAHL Fish Diseases Laboratory, CSIRO, Victoria

