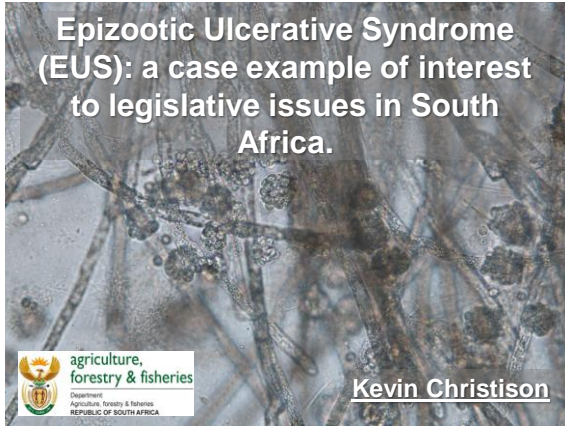



Epizootic Ulcerative Syndrome (EUS): a case example of interest to legislative issues in South Africa.



Kevin Christison



Two case examples of interest to legislative issues in South Africa.

Abalone Tubercle Mycosis – *Haliotricida noduliformans*
 Epizootic Ulcerative Syndrome – *Aphanomyces invadans*

Kevin Christison, Brett Macey, Anna Mouton and Graeme Hatley





Background to Aquaculture legislation

2006 - Policy for the Development of Sustainable **Freshwater Aquaculture** Sector in South Africa - **DOA**



2007 - Policy for the Development of Sustainable **Marine Aquaculture** Sector in South Africa. - **DEAT**



April 2011 - National Aquaculture Strategic Framework - **DAFF**




Background to aquatic animal health legislation

Animal Diseases Act #35 of 1984: To provide for the control of animal diseases and parasites, for measures to promote animal health, and for matters connected therewith.



Marine Living Resources Act #18 of 1998 (Reg. 59 substituted by GN R1428 of 29 December 2000): The Minister may declare any disease, including pest or parasite, that kills or causes illness in fish, marine vegetation, or people to be a notifiable disease.



Strategic Framework for Aquatic Animal Health and Welfare in South Africa - **NASF**




Historical Background

● Abalone farming site

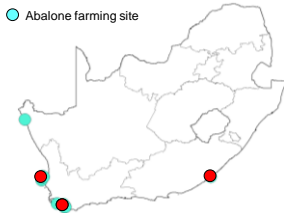










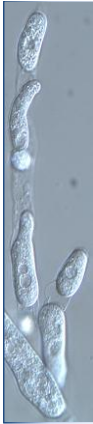
Historical Background

- Infected site confirmed by histology
- Suspect infected site
- Abalone farming site



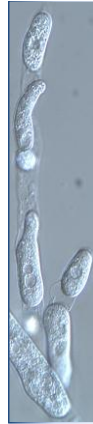
July 2005
 September 2005

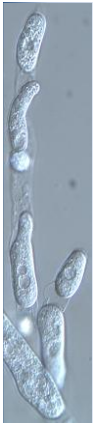
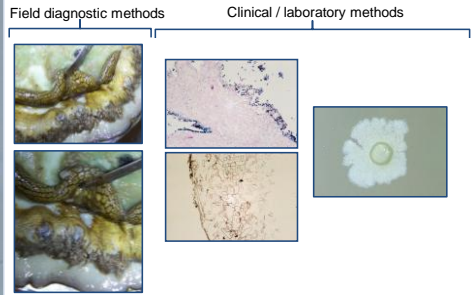


Targeted Surveillance

- 150 baskets were sampled randomly
- Physical inspection for lesions
- Estimation of mortality

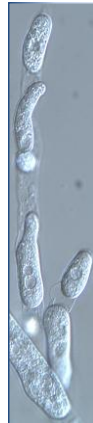
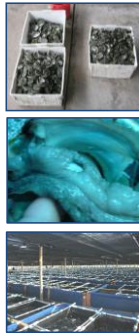
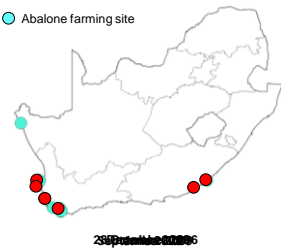


Diagnostic Methods



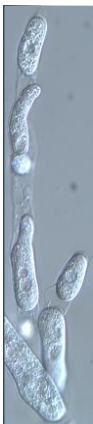
Initial Surveillance Results

- Infected site confirmed by histology
- Suspect infected site
- Abalone farming site

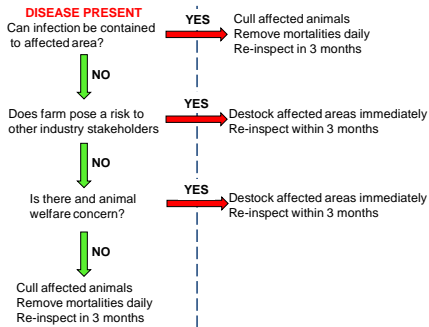


Initial Surveillance Results

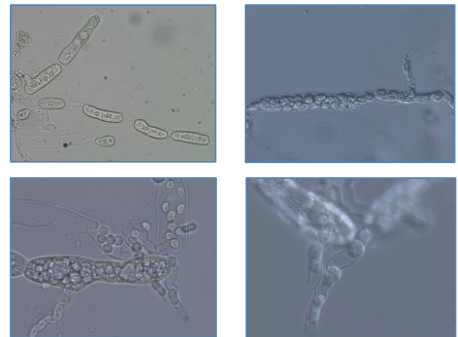
- Clinical signs and histopathology provided strong evidence of a single "fungal" agent.
- Outbreaks possibly linked by stock movements.
- Outbreaks were strongly associated with recirculation systems.
- Outbreaks usually occurred within two weeks of grading / sorting.

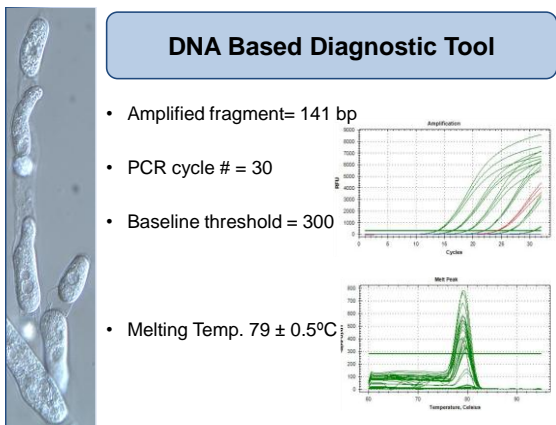
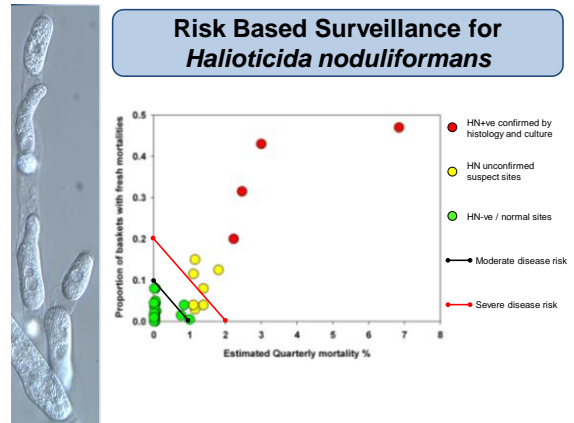
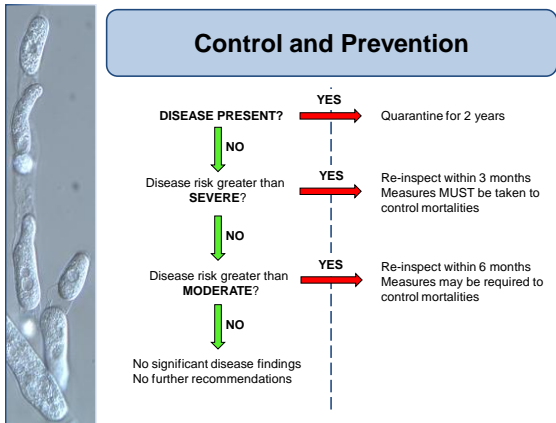
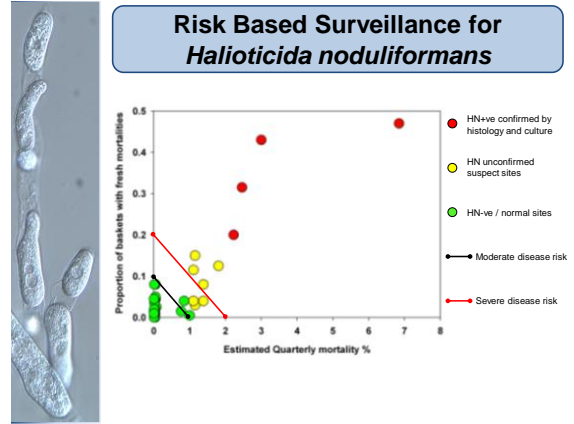
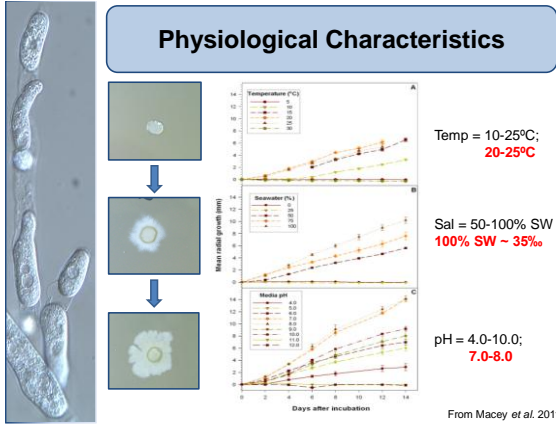


Control and Prevention



Morphological Characterisation





Sample Identification	Method of preservation	*Status at time of collection	Cq-value	Melt curve analysis	Interpretation
SC1.1	EtOH	Affected, live	27.32±0.34	Positive	Positive
SC1.2	EtOH	Affected, live	0	Negative	Negative
SC1.3	EtOH	Affected, live	27.82±0.04	Positive	Positive
SC2.1	EtOH	Affected, live	20.99±0.28	Positive	Positive
SC2.2	EtOH	Affected, live	19.11±0.15	Positive	Positive
SC2.3	EtOH	Affected, live	25.90±0.03	Positive	Positive
WC1.1	EtOH	Affected, live	0	Negative	Negative
WC1.2	EtOH	Affected, live	19.47±0.04	Positive	Positive
WC1.3	EtOH	Affected, live	0	Negative	Negative
WC1.4	EtOH	Affected, live	29.73±0.19	Positive	Positive
WC1.5	EtOH	Affected, live	20.25±0.17	Positive	Positive
WC1.6	EtOH	Affected, live	23.51±0.34	Positive	Positive
EC2.1	EtOH	Affected, live	30.45±0.27	Positive	Positive
EC2.2	EtOH	Affected, live	0	Negative	Negative
EC2.3	EtOH	Affected, live	25.85±0.06	Positive	Positive
EC1.62	EtOH	Affected, live	22.53±0.11	Positive	Positive
EC1.63	EtOH	Affected, live	23.37±0.04	Positive	Positive
EC1.64	EtOH	Affected, live	27.53±0.26	Positive	Positive
EC1.65	EtOH	Affected, live	21.47±0.49	Positive	Positive
EC1.66	EtOH	Affected, live	20.86±0.54	Positive	Positive
EC1.67	EtOH	Affected, live	28.96±0.07	Positive	Positive
WC2.1	Frozen	Affected, moribund	24.37±0.52	Positive	Positive
WC2.2	EtOH	Affected, moribund	21.46±1.01	Positive	Positive
Negative	Frozen	Healthy, live	0	Negative	Negative
NTC	NA	NA	0	Negative	Negative

HN distribution based on archived tissue samples

- Infected site confirmed by Q-PCR
- Suspect infected site
- Abalone farming site

Current HN active sites

- Infected site confirmed by Q-PCR
- Suspect infected site
- Abalone farming site

EUS in South Africa

Initial suspicion of EUS

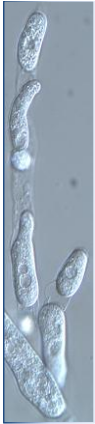
EUS diagnosis by histopathology

Severe inflammatory reaction associated with deeply penetrating hyphae

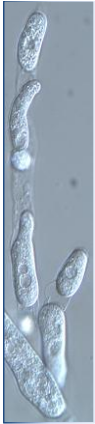
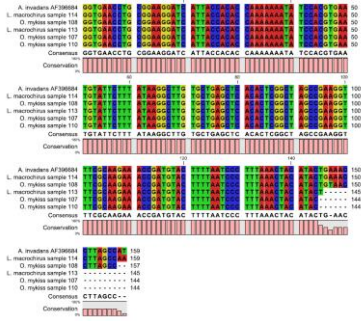
EUS diagnostic confirmation by PCR

Primer set :
 Ainvad-2F
 Ainvad-ITSR1

Protocol according to Vandersea et al 2006
 OIE – Manual of Diagnostic Tests for Aquatic Animals



EUS Sequence Analysis

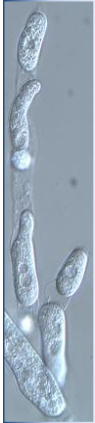


Current EUS status in South Africa

Only confirmed from 1 site in Western Cape in RSA

Isolated from:
Lepomis macrochirus
Micropterus salmoides
Oncorhynchus mykiss

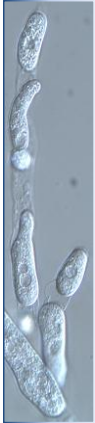
First reported aquatic disease from RSA



Current legislative challenges

- Clearly defined responsibilities
- Competent authority
- Disease control & prevention
- Surveillance
- Certification

Consistency of legislation



Thank you

