Shell Disease in Lobsters from Atlantic Canada

Courtesy - M. Tlusty

Richard J. Cawthorn

AVC Lobster Science Centre

Forms (Types) of Shell Disease

- *Impoundment shell disease*– **Bilaterally symmetrical lesions, setal pores, bacteria (*Vibrio* spp.), overcrowding, water quality, diet**
- *Burnt (rust) spot shell disease* – **Individual lesions, various locations on lobster, fungi and bacteria, offshore canyons, pollution**
- *Epidemic (epizootic) shell disease* – **Dorsal cephalothorax, dermal gland canals, sensory neuron canals, pore canals, bacteria of Flavobacteriaceae species complex, relatively new disease, global warming**

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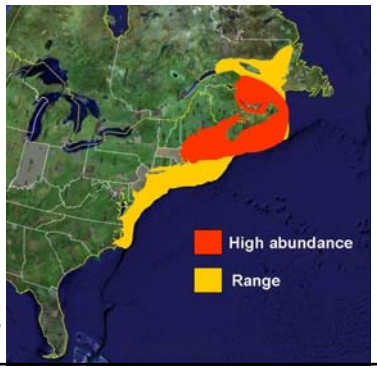
Distribution of American Lobsters



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Epidemic (Epizootic) Shell Disease

Host – Pathogen – Environment

Focus on Host - Lobsters

- **Prevalence depends on season, sex and size of lobsters**
- **Prevalence highest in May and June, lowest in August**
- **Occurs in all size classes of lobster**
- **More common in larger lobsters, especially female**
- **Molt frequency may reduce severity or onset of shell disease**
- **Selection for resistance to disease**
- ***Initial health status important in determining whether or not shell disease develops***

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Epidemic (Epizootic) Shell Disease

Host – Pathogen – Environment

Focus on Pathogens

- **Opportunistic bacteria - Flavobacteriaceae**
- **Other bacteria**
- **Community composition of biofilm on surface of lobsters – varies depending on health status of host and environmental conditions**
- **Secondary organisms (amoebae, diatoms) – contribute to erosion of exoskeleton**
- ***Initial health status important in determining whether or not shell disease develops***

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Epidemic (Epizootic) Shell Disease

Host – Pathogen – Environment

Focus on Environment

- **Anthropogenic inputs – heavy metals, alkylphenols – Interfere with molting?**
- **Little correlation between (organic) pollution and shell disease**
- **Importance of oceanic temperatures – The higher the oceanic temperatures, the higher the prevalence of shell disease.**
- **Ocean health, global warming**
- **Epidemic shell disease is moving from south to north.**
- ***Initial health status important in determining whether or not shell disease develops.***

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Unknowns – Shell Disease

- Role of invasive species
- Impact of bait – lobster *health*, shell quality and strength
- Relationship between cuticle strength and thickness
- Impact of shell disease on quality of shell in postmolt lobsters
- Impact of high water temperatures on shell formation and mineralization
- Impact of pollutants on shell formation and mineralization
- Genetic component to resistance to shell disease?
- Trigger = starting point?

Epidemic (Epizootic) Shell Disease

- Impacts on natural mortality of lobsters – i.e. Rhode Island lobster fishery
- Complex, multifactorial disease
- Lobster host – shell quality, nutritional status
- Pathogens – type, density, pathogenicity
- Environment – oceanic temperatures, current patterns, weather patterns, microbial communities

Initial health status important in determining whether or not shell disease develops. M. Tlusty et al., *New England Aquarium.*

Increasing prevalence of shell disease reflects environmental changes at larger geographical scales.


ATTENTION LOBSTERMEN:

Department of Marine Resources Lobster Health Notice

What to do:

SHELL DISEASE

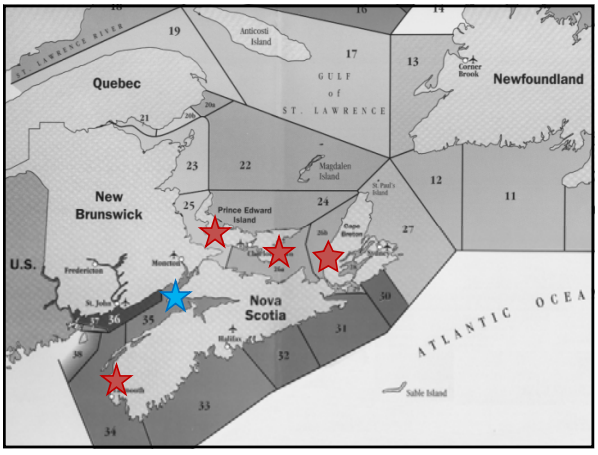
From Maine January 2003

Shell Disease in Lobsters

Awareness Raising and Passive Monitoring in Atlantic Canada

- Inquiry protocol
- Handling protocol
- Sampling protocol

- At AVCLSC – Virginia Jackson, Rick Cawthorn, Rachael Summerfield, Melanie Burton, Lori Edwards
- At AVC Diagnostic Services – Jan Giles
- At AVC – Dr. Jeff Lewis
- At New England Aquarium – Dr. Roxanna Smolowitz
- At University of Louisiana (Lafayette) – Dr. Andrei Chistoserdov



Recent Cases of Shell Disease in Atlantic Canada -2008

- Fisherman's Harbor, NS. – reported by fisher; not seen at AVC (June)
- Cape John, NS – reported by fisher; not seen at AVC (June)
- Inverness, NS – reported by buyer; not seen at AVC (June)
- Alberton, PEI – reported by buyer; not seen at AVC (June)
- SW Nova Scotia – local purchase; processed at AVC (winter)
- SW Nova Scotia – local purchase; processed at AVC (winter)
- New London, PEI – reported by fisher; processed at AVC (June)
- Cape Breton, NS – reported by buyer; processed at AVC June)
- Murray Harbor, PEI – reported by buyer; processed at AVC (June)
- Howard's Cove, PEI – reported by buyer; processed at AVC (Sept)
- Parrsboro, NS – reported by fisher; processed at AVC (July)

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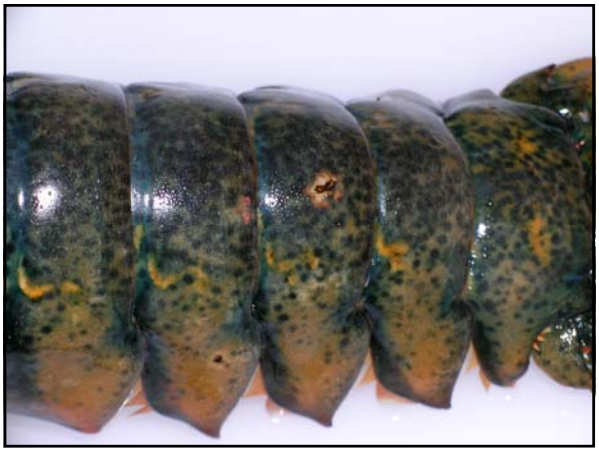


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