HISTOPATHOLOGICAL SURVEY OF LATE STAGE EMBRYONAL MORTALITY IN LEATHERBACK SEA TURTLES IN ST KITTS, W.I.

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Role of sea turtles?

1. Direct impact on **ECOSYSTEM**

2. **INDICATOR** of ecosystem health

brainsandbodies.tumblr.com/post/82357915543/noms-turtle-edition-today-i-found-out-that

Photo courtesy of Nature Seekers 2016
Caribbean Leatherbacks
*(Dermochelys coriacea)*

Photo courtesy of SKSTMN 2016
Where exactly is St. Kitts?
Main Nesting Beaches

- **WIDER Caribbean ~50%**
  - Key’s Beach

- **SKB ~5-10%**
  - North Friars Beach

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**Historical Hatch Success**

- **Keys Beach**
- **North Friars Beach**
SKB 2015: 23 females → 59 nest
What are we studying?

**OBJECTIVE:**
Determine cause of low hatch success in St. Kitts

- Environmental?
- Pollution?
- Temperature?
- Fertility?
- Heavy Metals?
- Sand pH?
- Embryonic development?
- Conductivity?
- POPs?
Methods

- Daily night patrols = monitor and tag nests
- Excavations ~60 days after deposit

Photo courtesy of SKSTMN 2016
Methods

- Record: early, middle, late, pipped & hatched

- Collect samples (priority to dead in nest late stage) for lab analysis
Sample Size

- Total of 23 turtles evaluated
  - 20 late stage embryos
  - 3 dead in nest hatchlings

- Retrieved from 10 nest: 5 Keys & 5 North Friars

- Additional early stage eggs collected for POP and HM testing
Methods

Necropsy

- Classify embryos
- Gross abnormalities?
- Bacteria cultures (+/-)
Methods

Histology

- Analyze all systems
- Abnormal findings?
- Special Stain (+/-)
What did we find?

Proportional Stage of Embryo Mortality

Mean % Death

- Early: 74
- Middle: 12
- Late: 15
Gross PM Findings
What did we find?

Pneumonia present late stage embryos (n=23)

- Broncho = 4
- Interstitial = 19
Histological Findings

Interstitial pneumonia (n=19)

Bronchopneumonia (n=4)

Heterophils within edicular septae (Bar = 100µm)

Granulocytic exudate filling airways (Bar = 100 µm).
Bacteria Cultures

Gross nodule = Broncho = Bacteria

- Pseudomonas spp
- Salmonella spp
- Enterobacter spp
- Bacillus spp
- Citrobacter spp
- Pantoea spp
- Achromobacter spp
- Clostridium spp
Discussion

Pathogenesis of bronchopneumonia?

Is interstitial pneumonia true pathology or embryonal development?

What is the basis for early embryonal death?

- Nest factors (sand temp, pH, grain size, and conductivity)?

- Environmental pollutants like persistent organic pollutants and heavy metals?
Discussion

- Increase sample collections in SKB
- Collect temp, pH, grain size and conductivity data
- POPs and HM testing**
- Collaborate with WIDER Caribbean for comparative studies

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Questions?

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