PARASITES OF CARIBOU
Impacts on the health of caribou and people

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INFORMATION ON PARASITES

http://www.mrnf.gouv.qc.ca/faune/sante-maladies/parasites-caribou.jsp
WARBLE FLY

N.B.
Les larves sortent à travers la peau, au printemps

Oeuf → larve

L’adulte dépose les œufs sur les poils

Les larves tombent sur le sol

après deux mues, deviennent adultes

O. tarandi

MRNF
WARBLE FLY

- *Hypoderma tarandi*
- Impact of adults flies
  - Foraging
  - Herding behaviours
  - Summer movements
- Impact of larvae
  - Skin irritation
  - Loss of meat
  - Value of skin depreciate
NASAL BOT FLY

Les adultes volent autour des naseaux durant l’été et y déposent leurs larves

Après deux mues les larves donnent des mouches

Larves de 3e stade tombent des naseaux au printemps
NASAL BOT FLY

• *Cephenemyia tarandi*

• Impact of adults flies
  – Foraging
  – Herding behaviours
  – Summer movements

• Impact of larvae
  – Nasal irritation
  – Secondary infections
LIVER FLUKE

- OEUFS: 168 μm x 100 μm
- Les Métaboles s'entassent
- sur l'herbe
- Les Cercaires quittent
- l'escargot et
- deviennent Métaboles
- Les Cercaires
- (24 heures de survie)
- Miracidium
- Développement
- 7 à 8 semaines
- ESCARGOT
LIVER FLUKE

- *Fascioloïdes magna*
  - Most infections are subclinical
  - Occasional
    - Lethargy
    - Anorexia
    - Depression
    - Weight loss

- Impacts
  - Primary lesions in the liver (altered functions)
  - Secondary infection

- Growing concern for aberrant host
  - Muskoxen (Nunavik)
MUSCLE CYSTS
MUSCLE CYSTS

• *Cysticercus tarandi* (*Taenia krabbei*)
• Lesions
  – Small cysts in skeletal muscles
• Impacts
  – No significant effects
  – Rarely associated
    • Tissue damage
    • Loss of body condition
LIVER CYSTS
LIVER CYSTS

- *Cysticercus tenuicollis* (*Teania hydatigena*)
- Lesions
  - Small cysts in liver
- Impacts
  - No significant effects
  - Rarely associated
    - Liver damage
HYDATID CYSTS
HYDATID CYSTS

• *Echinococcus granulosis*

• Impacts
  – Rarely impacts lung capacity
  – Occasional
    • Reduced stamina
      – Predisposed to predation

• Humans are infected by carnivores
LUNGWORMS
LUNGWORMS

- *Dictyocaulus viviparus*
- Lungworms
- Impacts
  - Pulmonary damage
  - Reduced resistance exercise
  - Secondary infections
BESNOITIA TARANDI

Definitive host (s)

Environment

Intermediate host

Arthropods Vectors

Figure 239: Life Cycle of Besnoitia
BESNOITIA TARANDI

• Localisation
  – Skin
  – Testicular structures
  – Lungs

• Impacts
  – Reduced stamina
  – Reduce fertility in infected males

• Impacts on the population
  – Depends on
    • Prevalence
    • Density
B. tarandi in male caribou (fall)
B. tarandi in female caribou (fall)

A

Bathurst (n=25) 32%
George River (n=29) 57%
Leaf River (n=85) 38%

B

Mild outliers (●)
IS THERE A COST OF PARASITES TO CARIBOU?

• Evidence suggesting an impact for some individuals
  – Body condition
  – Fecundity
  – Survival
  – Grazing behaviours
AGGREGATED DISTRIBUTION

NUMBER OF PARASITES

NUMBER OF CARIBOU

Affected survival
WHAT ABOUT THE IMPACTS ON CARIBOU POPULATIONS?

- Accumulating evidence suggesting an impact on population trends if it affects:
  1. Survival
  2. Reproduction

- Depends on the number of affected caribou
SHIFT IN THE DISTRIBUTION

NUMBER OF PARASITES

NUMBER OF CARIBOU

Affected survival
WHY VARIATIONS?

1. Differences in pressure of infection
   - Density of insects (vectors)
     - Climate change
   - Density of carnivores
   - Proportion of infected caribou in the population
   - Behaviours
   - Land use patterns
   - Etc…
WHY VARIATIONS?

2. Differences in caribou susceptibility
   - Body condition
     - Quality and abundance of food on the range
     - Other diseases or parasites
   - Immune system
     - Males (?)
   - Parasite genetics
     - No variation with *B. tarandi*
   - Genetic resistance to disease
   - Etc…
FUTURE PERSPECTIVES

• Need for parasite assessment and monitoring
  – Prevalence and intensity

• Establish geographical and temporal trends
  – Correlation with population fluctuations ?
  – Correlation with climate change ?

• Adapt caribou herd management programs if necessary
THANK YOU!
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