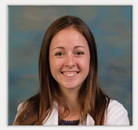
Eco-epidemiology of Anaplasmosis in the peri-domestic environment of southern Quebec



Raphaëlle Audet-Legault
DMV, MSc student

Eastern chipmunks have the potential to be important reservoir hosts for anaplasmosis

INTRODUCTION

- Human granulocytic anaplasmosis (HGA) is a vector-borne disease caused by the bacterium *Anaplasma phagocytophilum* (Ap).
- The zoonotic "human active" variant (Ap-ha) is pathogenic for humans, horses and dogs.
- 2021: Outbreak of HGA reported in the Estrie region (16/25 cases in Bromont).
- Objective : determine which species of wild small mammals can act as competent reservoir hosts for the zoonotic variant Ap-ha.

METHODS

- Eight peri-domestic woodland sites in the city of Bromont (Estrie): four sites close (< 3km) and four sites far (> 3 km) from human cases.
- **June to August 2022 and 2023** : capture of small mammals (live traps) and drag sampling.
- **Samples :** whole-blood and larvae (small mammals), questing nymphs.
- **Diagnosis :** Multiplex real-time PCR and genetic strain identification.

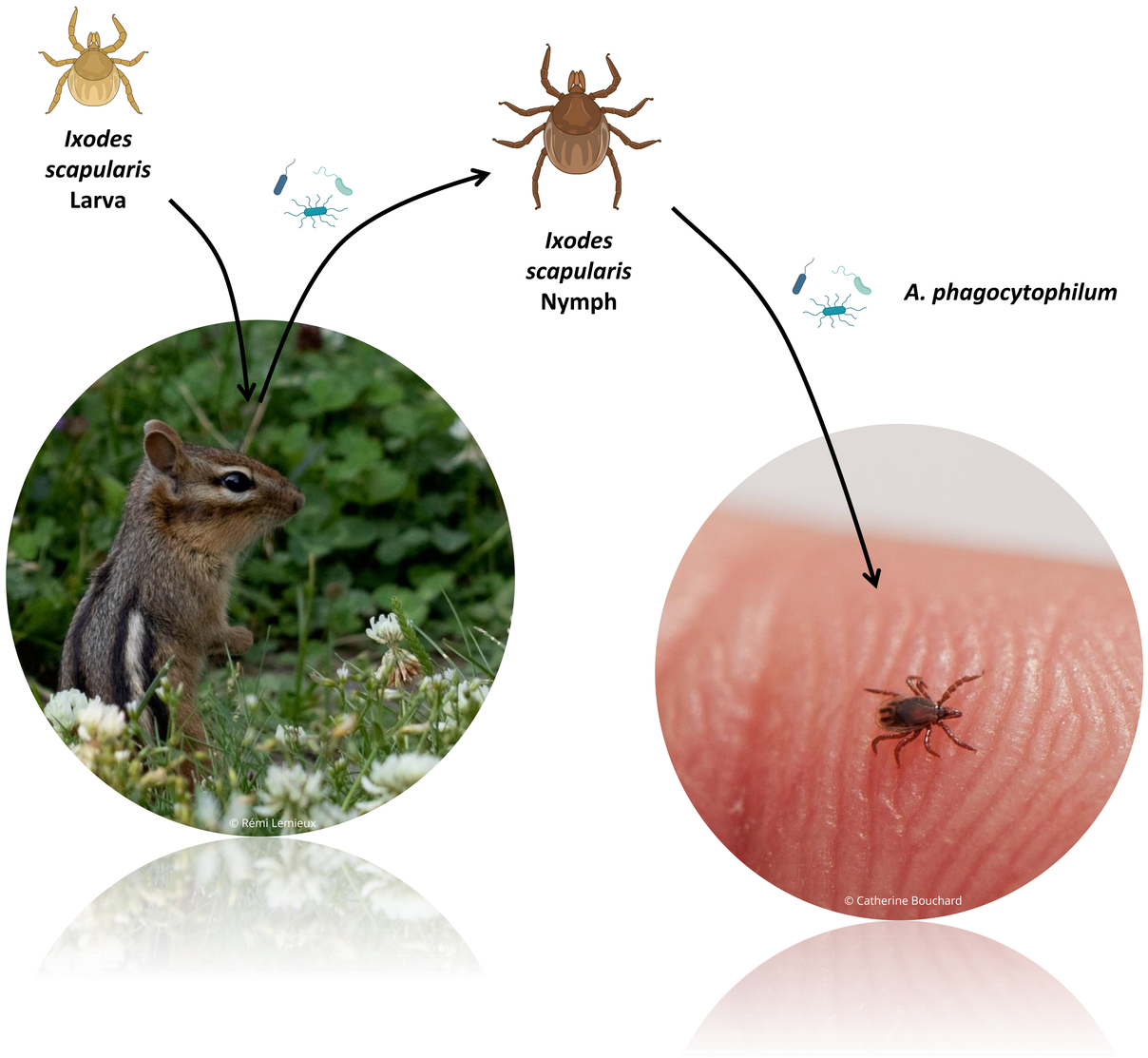
RESULTS (2022)

- **339 small mammals from 9 species.**
- **Blood* :** 18/93 PCR positive rodents (19.4%). Ap-ha strain confirmed in 17 individuals.
- **Larvae* :** 57,1% of eastern chipmunks (4/7), 15,1% of *Peromyscus* mice (11/73) and 11,1% of red squirrels (1/9) transmitted Ap to at least one larva.
- **Prevalence of infection for Ap (positive blood and/or larvae sample)*:** 66.7% in eastern chipmunks (10/15), 15.5% in *Peromyscus* mice (16/103) and 14,3% in red squirrels (3/21).
  *Animals recaptured between trapping periods were excluded.

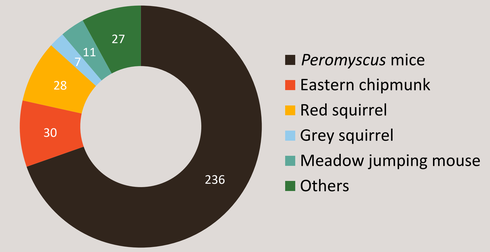
- **Questing nymphs:** 5.3% positive for Ap (22/412).
- Probability of sampling a positive nymph: 4 times higher at sites close to human cases (p=0.0048).

DISCUSSION

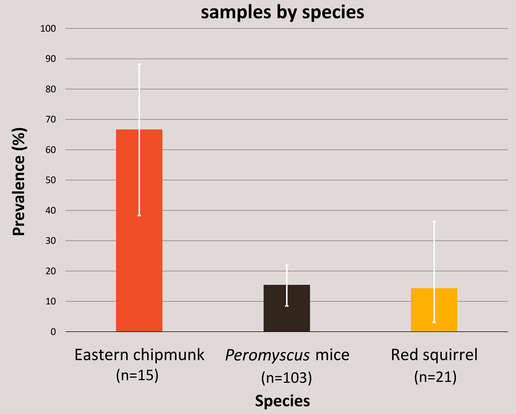
- Other rodent species than *Peromyscus* mice should be considered as potential reservoir hosts for the zoonotic strain of anaplasmosis.
- Results will help better understand HGA emergence factors and guide development of risk management interventions.



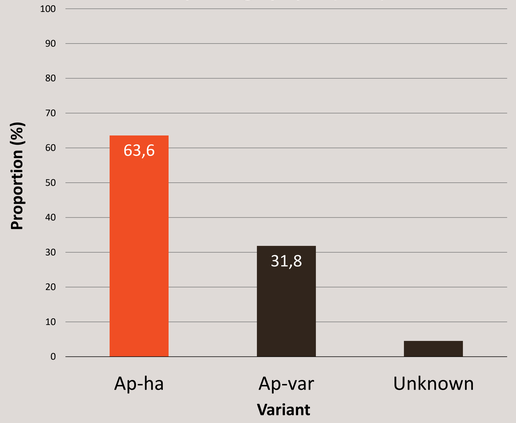
Number of rodents captured by species



Prevalence of Ap (%) in blood and/or larvae samples by species



Proportion of the Ap variants (%) in positive questing nymphs (n=22)



Prevalence of Ap in questing nymphs by site category

Site	No. tested	Ap [%]	Ap-ha	Ap-var	Mean nymph density/100m^2
< 3 km	217	18* [8.3]	11	6	1.37
> 3 km	195	4 [2.1]	3	1	1.01
Total	412	22 [5.3]	14	7	

*For one nymph, the specific strain wasn't identified

R. Audet-Legault[1,2], C. Aenishaenslin[1,2], G. Baron[4], H. Coatsworth[5], M. Desmarchelier[1], A. Dibernardo[5], V. Gabriele-Rivet[2,3], P. Leighton[1,2], J. Pelletier[1,2], JP. Rocheleau[1,2], C. Bouchard[2,3]

[1]Faculté de Médecine Vétérinaire, Université de Montréal, St-Hyacinthe, QC, Canada
[2]Groupe de recherche en épidémiologie des zoonoses et santé publique (GREZOSP), Faculté de médecine vétérinaire, Université de Montréal, St-Hyacinthe, QC, Canada
[3]Public Health Risk Sciences Division, National Microbiology Laboratory, Public Health Agency of Canada, St-Hyacinthe, QC, CAN
[4]Direction de santé publique du CIUSSS de l'Estrie-CHUS, Sherbrooke, QC, Canada
[5]One Health Division, National Microbiology Laboratory, Public Health Agency of Canada, Winnipeg, Manitoba, Canada

SCAN ME
Public Health Agency of Canada / Agence de la santé publique du Canada
Fonds de recherche Santé Québec
CReSP Centre de recherche en santé publique
Université de Montréal
GROUPE DE RECHERCHE EN ÉPIDÉMIOLOGIE DES ZOONOSES ET SANTÉ PUBLIQUE
GREZOSP Université de Montréal