**Hepatozoon infections in African squirrels: is a sex-bias present and does it matter?**

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**Background**

- Males and females often differ in their life history strategies and energy allocations to survival, growth, and reproduction.
- Sex-differences in energy allocation may influence parasite susceptibility, resulting in sex-biased parasitism.
- Cape ground squirrels (*Xerus inauris*) exhibit sex-biased parasitism.¹
- Ectoparasitism is higher in male squirrels, likely because more energy is invested into testosterone production than immune function.²
- Female squirrels likely invest more energy into immune function than reproductive fitness.¹
- Females also autogroom and allogroom more than males, contributing to the male-biased ectoparasitism.¹
- These squirrels are host to an intracellular *Hepatozoon* blood parasite, transmitted by ingesting infected ticks and fleas.
- It is unknown if *Hepatozoon* infections are sex-biased or if they impact the health of infected squirrels.

**Objectives**

**O1:** Determine if *Hepatozoon* infections are sex-biased in Cape ground squirrels.

**O2:** Determine if *Hepatozoon* infections impact the fitness of infected squirrels.

**Hypotheses and Predictions**

**H1:** Males invest more energy into testosterone production at the expense of immune function.

- **P1:** Male-biased *Hepatozoon* infections
- **P2:** Infected males will have higher testosterone

**H2:** Grooming hypothesis – Females generally groom more than males, resulting in differences in exposure to *Hepatozoons* between males and females.

- **P3:** Female-biased *Hepatozoon* infections, as females consume more infected ticks and fleas

**H3:** *Hepatozoons* affect the fitness of the squirrels

- **P4:** *Hepatozoons* immunocompromise the squirrels, as they persist within their immune cells
- **P5:** Infected squirrels will have lower survival, body condition and reproductive success

**Expected Results**

![Expected Results](image)

**Figure 1.** Expected prevalence (# of infected squirrels/total squirrels sampled in male (blue) & female (pink) squirrels for hypothesis 1 (H1) & hypothesis 2 (H2).**

**Methods**

**Sex-Bias Determination**

- Hormone data (2012 and 2013)

**Measures of Fitness:**

- Antimicrobial assays from 2013
- Regression of residuals of mass on spine length
- Neutrophil: lymphocyte ratios and hematocrit
- Survival data, site persistence, and # of offspring

**Conclusion**

- Host physiology & behavior may influence sex biases in *Hepatozoon* infections in *X. inauris*
- Understanding *Hepatozoon*-host dynamics could have implications in the veterinary industry and in conservation efforts, as *Hepatozoons* infect many endangered species of animals.³

**References**

