

Seasonality ecology of the arthropods ectoparasites of cave roosting fruit bats

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Why Madagascar fruits bats?

EPIDEMIOLOGY

Harbour pathogens agents

- Protozoaires (eg: Ranaivoson et al, 2019)
- Bacteria (eg: Brook et al, 2015)
- Virus (eg Drexler et al 2008)

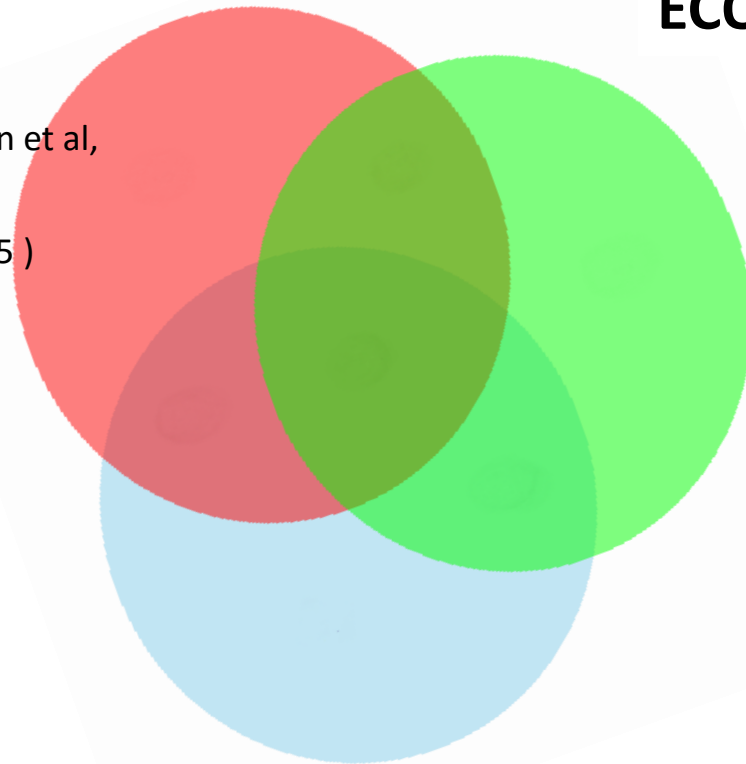
ECOLOGY

Ecosystem balance

- Seed dispersal
- Food web chaine
(eg: Goodman, 2011)

CONSERVATION

- Vulnerable and near threaten (UICN) (eg: Andriafidison, al 2008)
- Hunting by Malagasy people (eg: Jenkins et al, 2007)



Why bats ectoparasites?

- Specific for bats
 - Bat flies (Ramasindrazana et al, 2017)
 - Fleas
 - Mite & ticks
- Play important roles in maintain and transmission of the pathogene in bats population (Brook et al, 2015, Wilkinson et al 2016)
- Limited information available in their ecology and their role in epidemiology .



Aim of the study

Determine the seasonal variation of parasitism index (abundance, prevalence) in two species of fruit bats

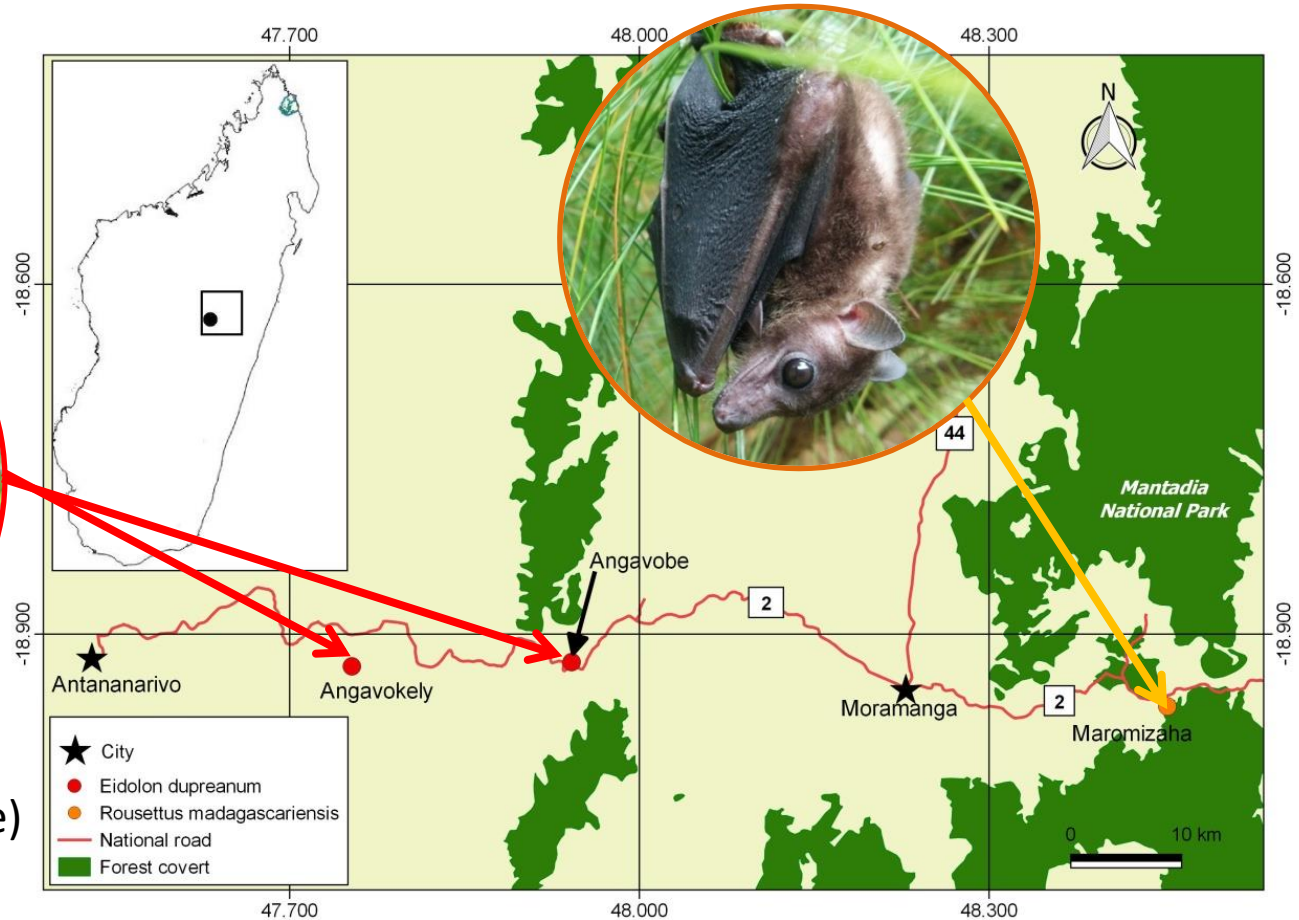
Methods

- Site: Moramanga district

Rousettus madagascariensis
(Maromizaha)



Eidolon dupreanum
(Angavokely, Angavobe)



Methods

Field work and data collection

- Traps: mist nets
- Seasons: dry and wet seasons
- Period: 2013 to 2019;
- Sample collected:
 - Biological samples (hair, blood, feces,...)
 - Body measurements (forearm, weight)
 - Ectoparasites (in ethanol 70%)

Methods

Laboratory and data analysis

- Ectoparasites ID: using morphological criteria (eg: Backer, 1952, Maa, 1964, 1965, Theodore, 1957, 1978)
- Generalized Additive Model (gam) (Hastie & Tibshirani 1990, Wood, 2000)
 - basic spline: cyclic cubic
 - Knots : 4

Results

Species richness and diversity species

BAT FLIES

FLEAS

MITES

TICKS



Cyclopodia dubia



Eucampsypoda madagascariensis



Megastrebla wenzeli



Thaumapsylla sp.



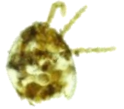
Echidnophaga



Meristapsis sp.



Mite



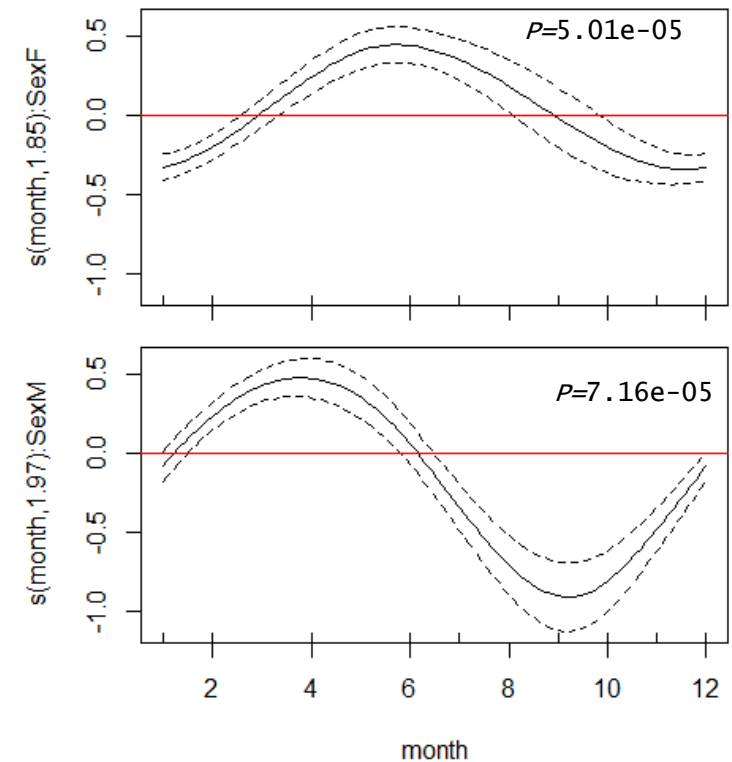
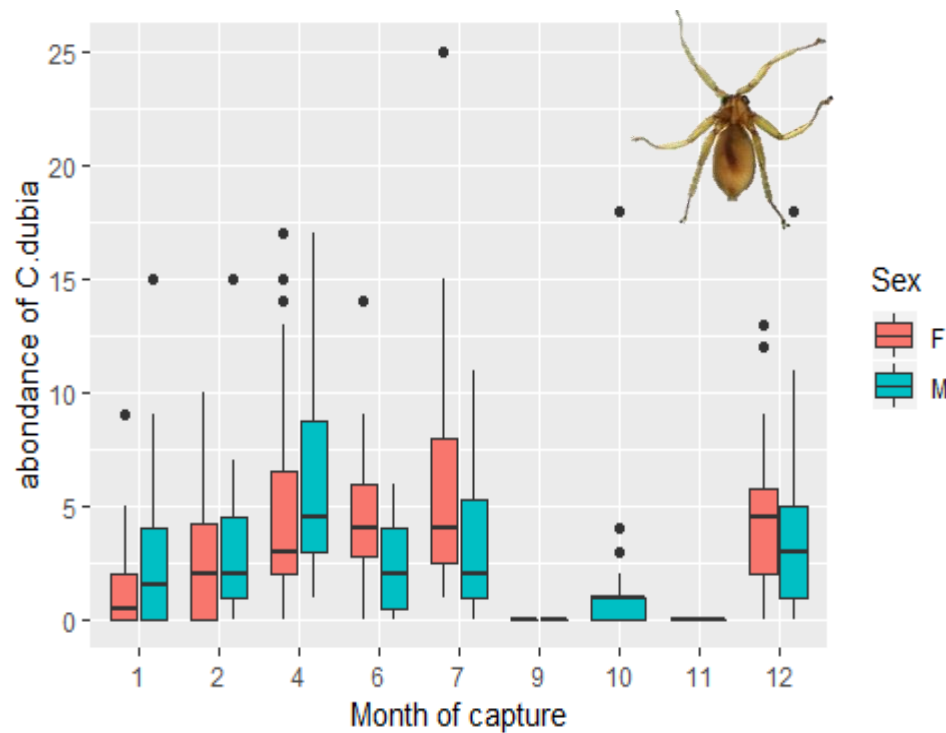
Ticks



Results



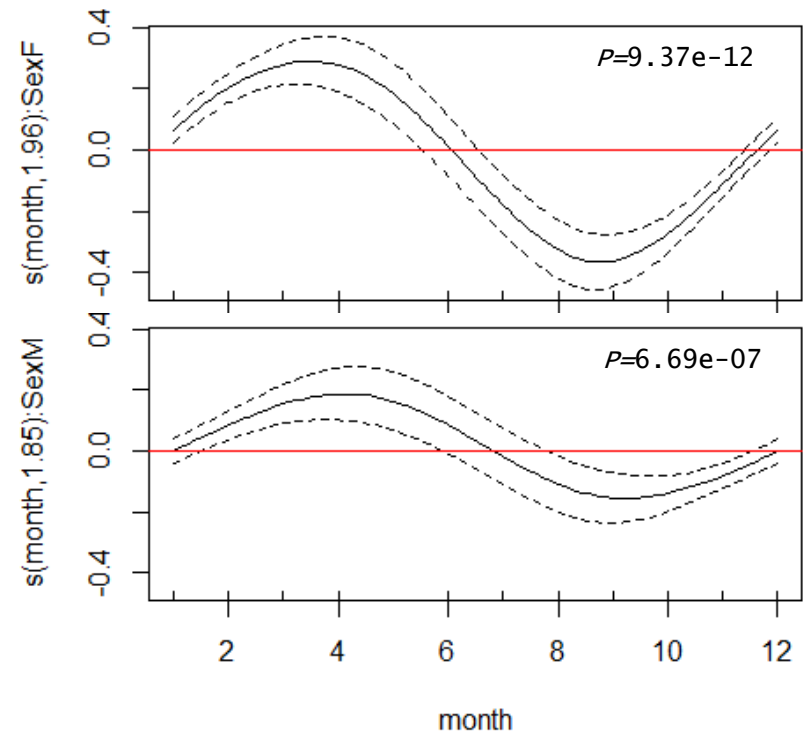
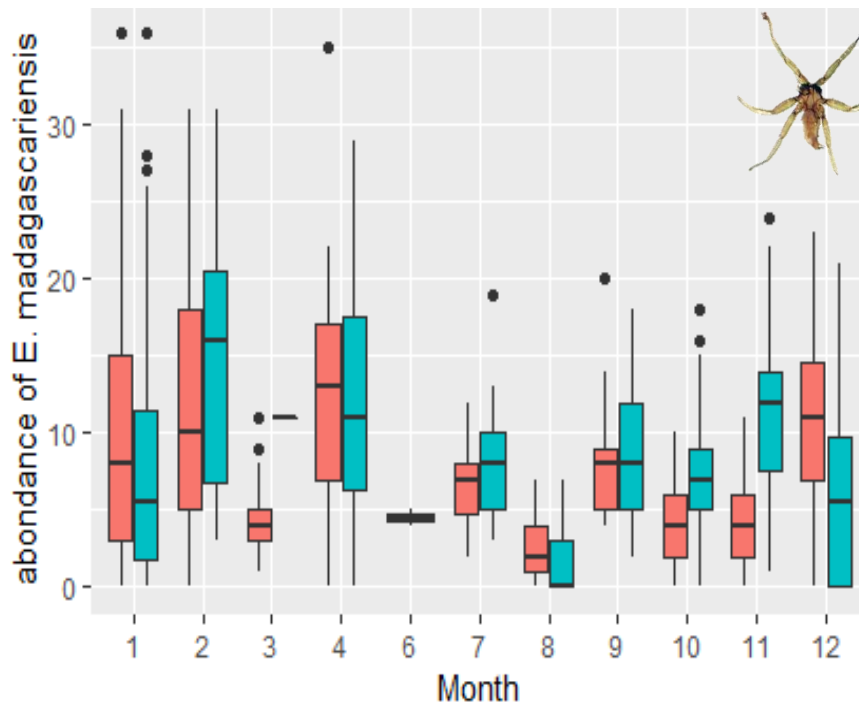
- Seasonal variation of the abundance of *C.dubia* (Nycteribiidae) parasite of *E. dupreanum*



Results



- Seasonal variation of the abundance of *E. madagascariensis* (Nycteribiidae) parasite of *R. madagascariensis*



Discussion & Next step

- This study shows the importance of seasons in the variation of the prevalence of ectoparasites;
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- Seasonal variation in ectoparasites, overlap with bats reproduction;
- The obligatory blood-feeding behavior of ectoparasites may be important in structuring the diversity of associated bat microorganisms of possible medical importance;
- The next step is assessing the diversity of the pathological agents in those bats species and determines the role of seasons on their dynamics (*Bartonella*).

Thank you!