Bartonella dynamic in fruit bats and bat flies

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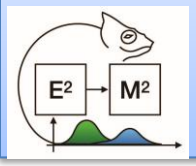
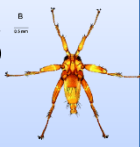




Background:

- *Bartonella* a hemoparasite transmited by vector to the host;
- Little is known about *Bartonella* in Madagascar fruit bats

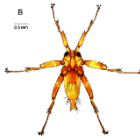
Questions:

Q1-What are the factors associated with the prevalence of *Bartonella ssp* in Madagascar fruit bats?

Q2-How does batflies prevalences affect the dynamics of *Bartonella ssp* in fruit bats through time?

Aknowledgement:
All Instructors & Mentors at E^2M^2,Herilanto Ramaroson & Nantenaina Rindraharilanto

Satistical question:



What are the factors associated with the prevalence of *Bartonella ssp* in Madagascar fruit bats?

Response variable: Presence of *Bartonella* in bats (bat.pos);

Predictor variables: morphometrics(morph), species of the flies (sp.flies), abondance of batflies (n.flies), season, site

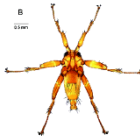
Distribution: Binomial

Link : Logit

Model : Random effect generalized linear mixte model

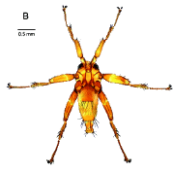
R_code:

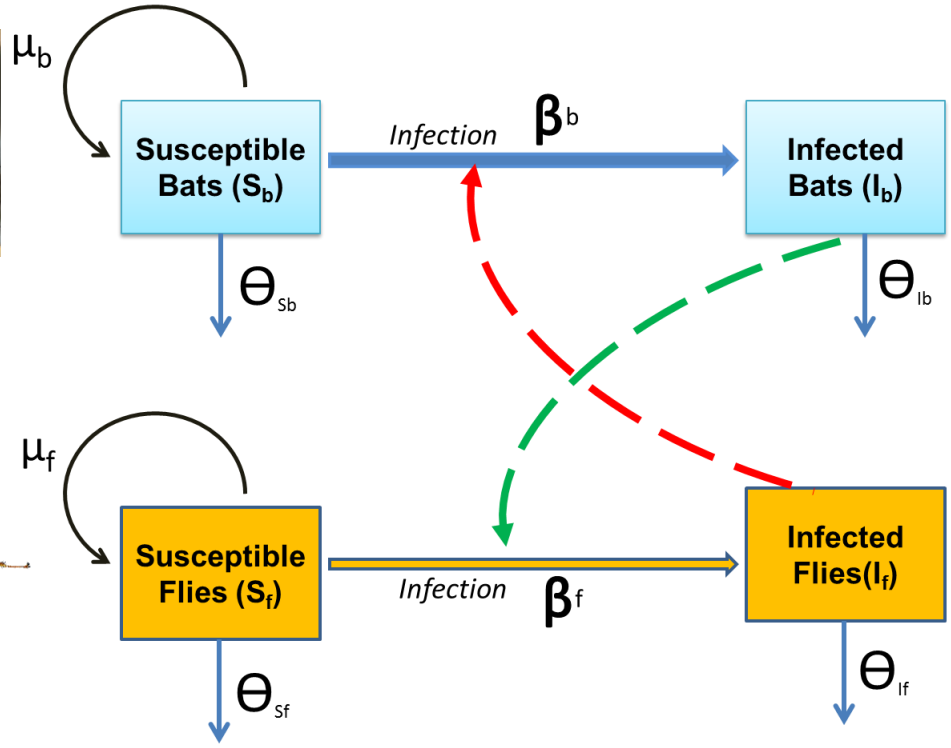
> glmer(formula=bat.pos~morph+n.flies+sp.flies+season+(1 |site), family=« binomial »,data)



Dynamic question:

How does bat flies prevalences affect the dynamic of *Bartonella ssp* in Fruit bats population through time?





States:

- Susceptible bats (S_b)
- Infected bats (I_b)
- Susceptible flies (S_f)
- Infected flies (I_f)

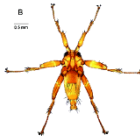
Process:

- Infection

μ_i: birth rate
Θ_i: death rate

β_i : infection rate

Next steps:



- Data collection in the field and in the laboratory;
- Simulate the mechanistic model and the statistical model ;
- Fit the model to the data collected.

« Thank you very much! »