

Effect of habitat fragmentation on the population structure of two mountain stream-frogs

BACKGROUND

Mantidactylus pauliani and *Boophis williamsi* are CR mountain stream frogs in the Ankaratra Massif due to their severely fragmented distribution. Different factors including human activities and elevation determine the characteristic of each fragment, thus the occurrence of the species.

STATISTICAL QUESTION

Do the stream environmental conditions and riparian forest quality influence the species occurrence?

MECHANISTIC QUESTION

How changes in canopy cover determine the occurrence of the frog?



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STATISTICAL QUESTION: Do the stream environmental conditions and riparian forest quality influence the species occurrence?

- **Response variable:** presence/absence of frogs in site
- **Predictors:** climatic data, water quality, stream structure, riparian vegetation, canopy cover
- **Family, link:** binomial, logit

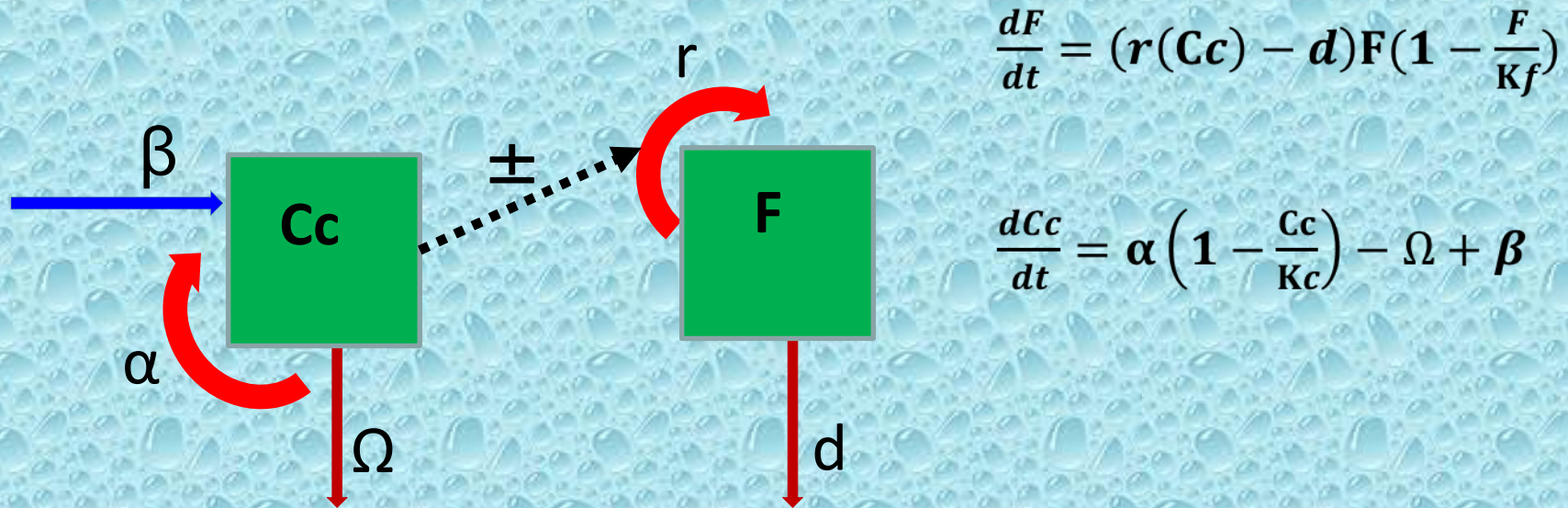
Hypothesis: Frog's occurrence is positively correlated with good habitat

R code: Generalised linear mixed effect model

```
glmer(Species(+/-)~canopy cover+water quality+stream structure+riparian  
vegetation+(1|site),data =data.frame, family="binomial")
```

MECHANISTIC QUESTION

How changes in canopy cover determine the occurrence of frog?



STATES

Cc: canopy cover

F: frog

PROCESSES

Ω : deforestation rate

α : natural regeneration

β : reforestation from extern (eg: human)

r : birth rate of the frog (\pm influenced by the canopy cover)

d : death rate of the frog

NEXT STEPS

- Collect more data at sites where the species were thought to be absent.
- Effect of habitat fragmentation on the genetic structure of each subpopulation

Acknowledgments

Laza, Tendry, Haja, Finaritra

E²M² instructors and mentors



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