浙江省第九届生物多样性保护与可持续发展研讨会

生境片段化通过大型兽类丧失降低鼠类个性的多样性

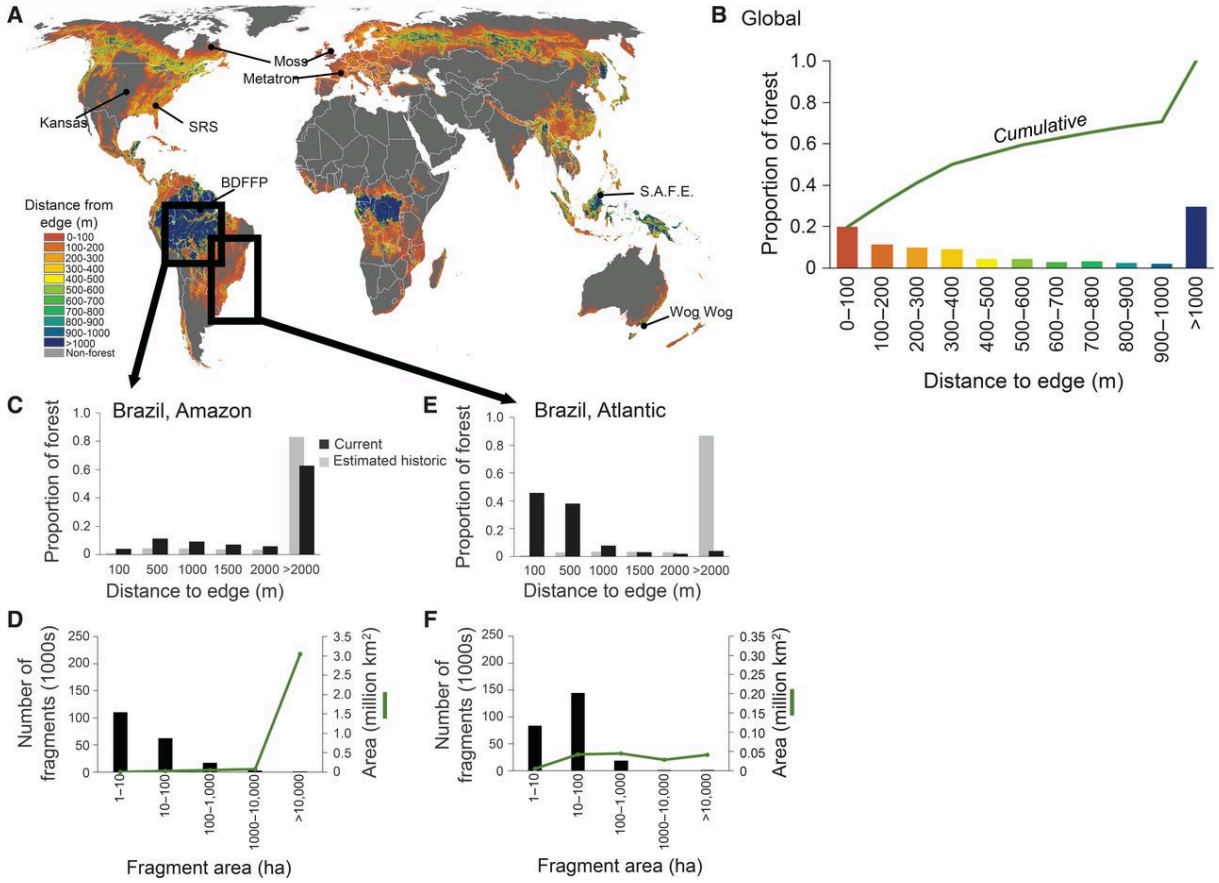
曾頔

浙江农林大学林业与生物技术学院

浙江安吉，2025-10-30

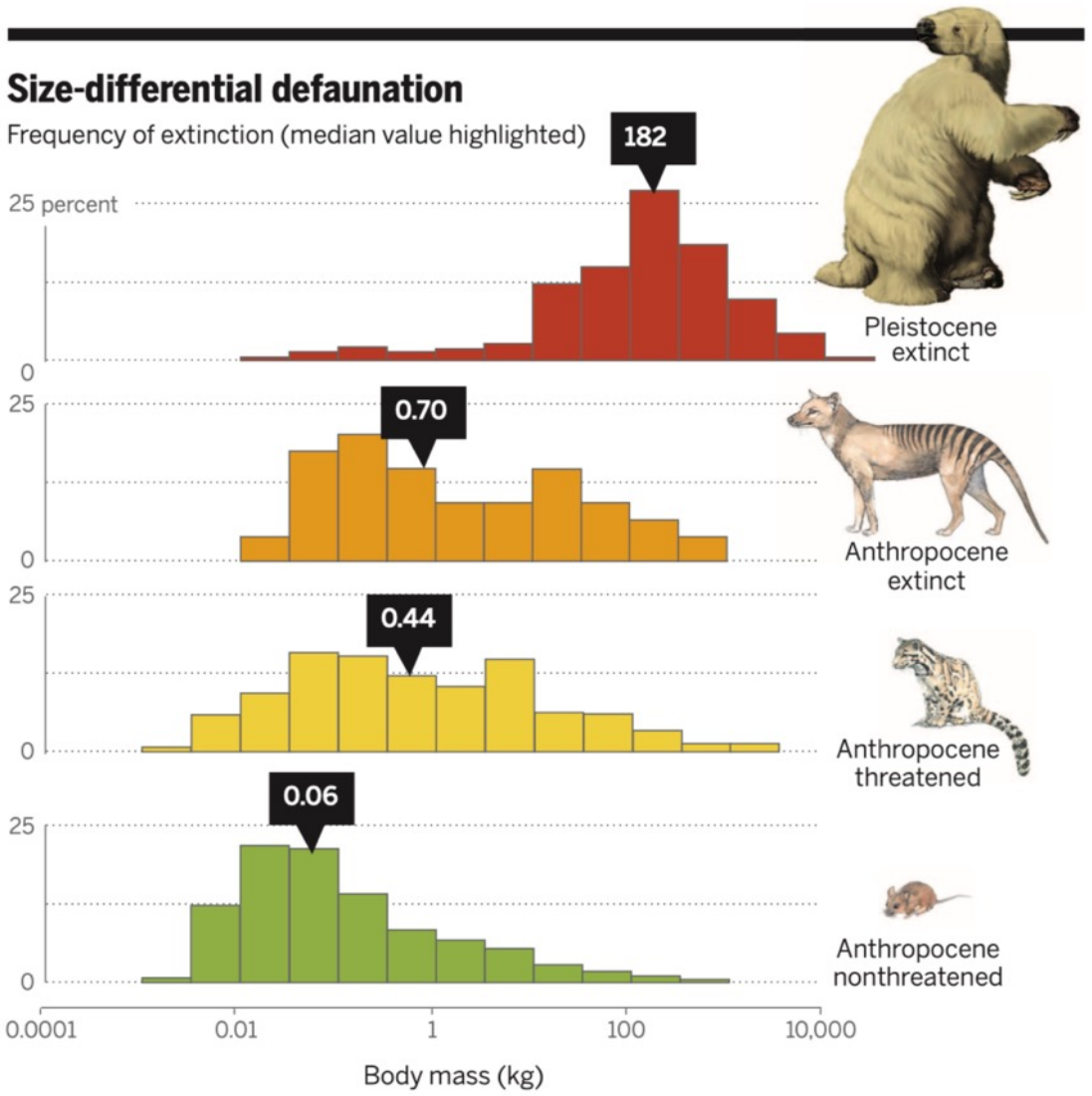
引言

生境片段化



Haddad *et al*. 2015

引言



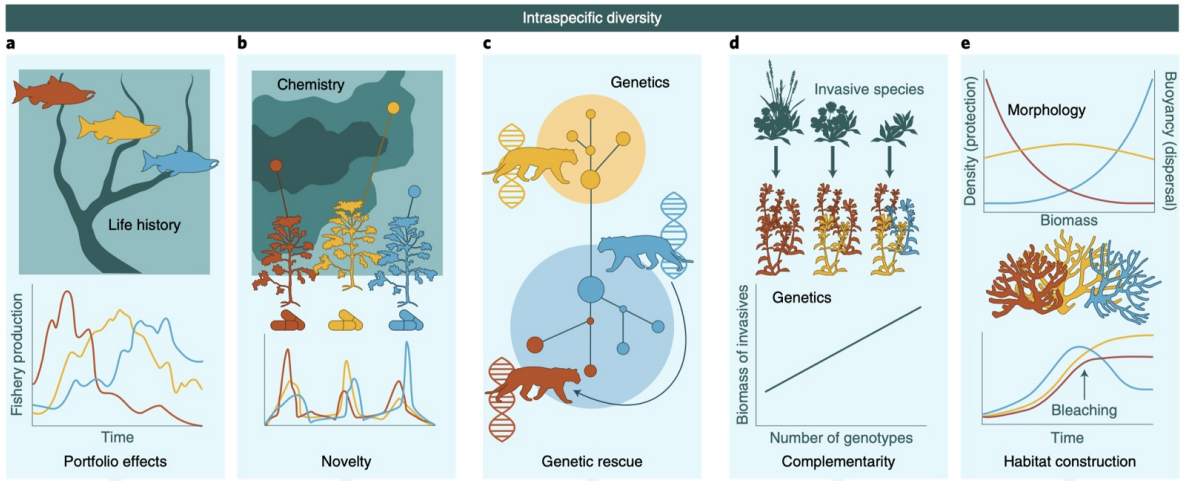
大体型物种丧失

- 物种丧失是生境片段化带来的严重后果之一
- 丧失程度与体型明显相关
- 会改变甚至导致多种生态系统功能丧失

Dirzo *et al*. 2014;

引言

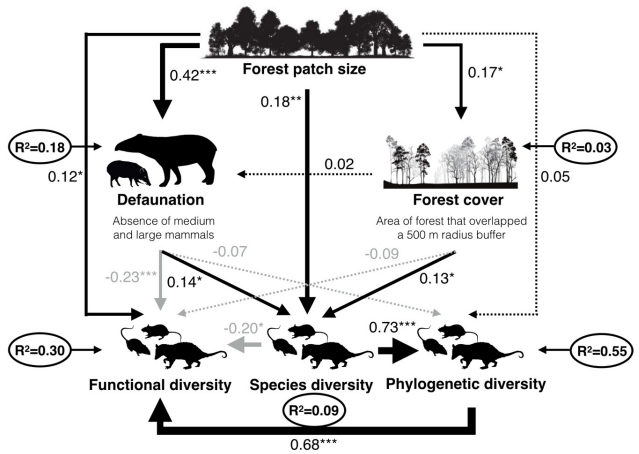
种内多样性



种内多样性同样重要，并且丧失速率要快于种间多样性

种间多样性

种内多样性

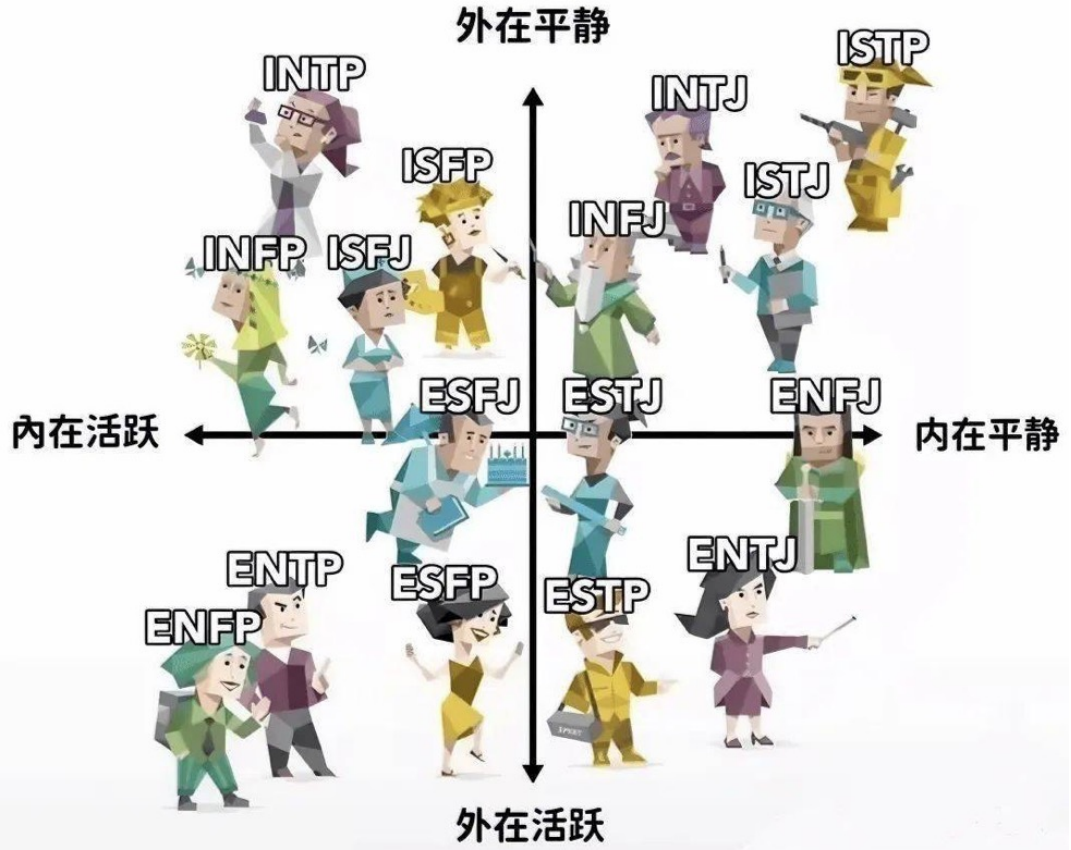


Bovendorp *et al.* 2018, Des Roches *et al.* 2021

引言

动物个性

- 动物行为的种内差异
- 个体间持续的行为差异



McConkey & O'Farrill 2015; Mortelliti & Brehm 2020

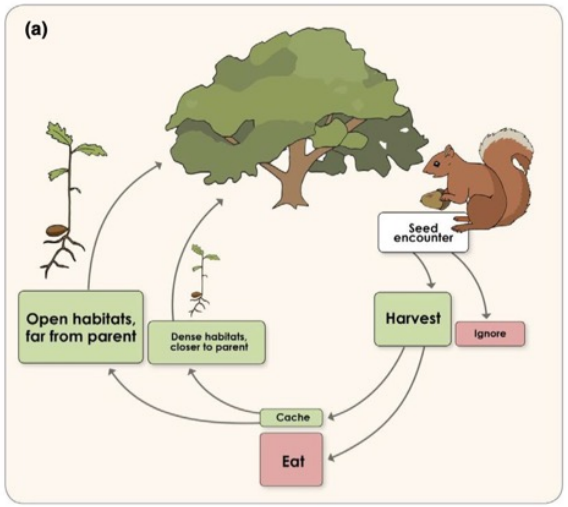
引言

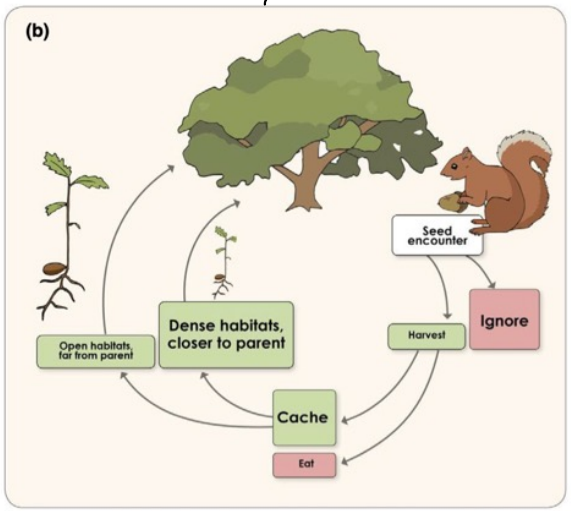
动物个性

- 承担不同的生态功能
- 重要的生态和进化影响
- 行为丧失更为隐蔽

Proactive

Reactive

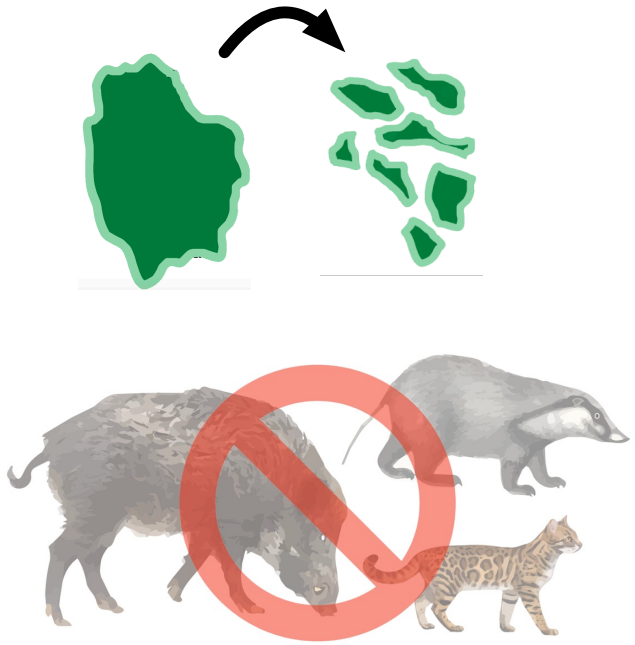




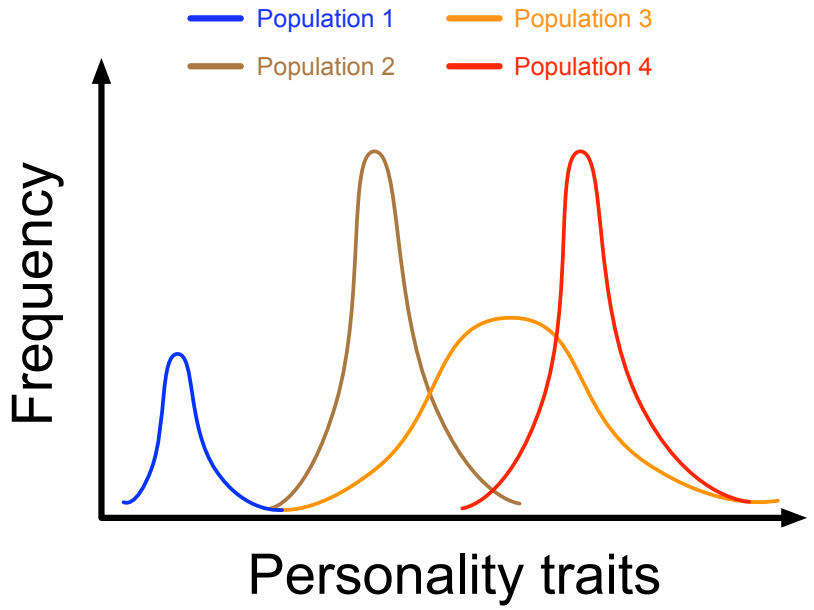
将有助于理解全球变化背景下生物多样的丧失以及动物对环境变化的响应

McConkey & O'Farrill 2015; Zwolak & Sih 2019 Mortelliti & Brehm 2020

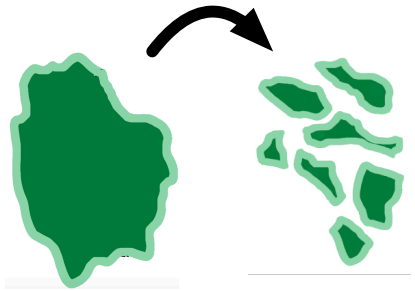
科学问题



个性特征组成


Population 1
Population 3
Population 2
Population 4
Frequency
Personality traits

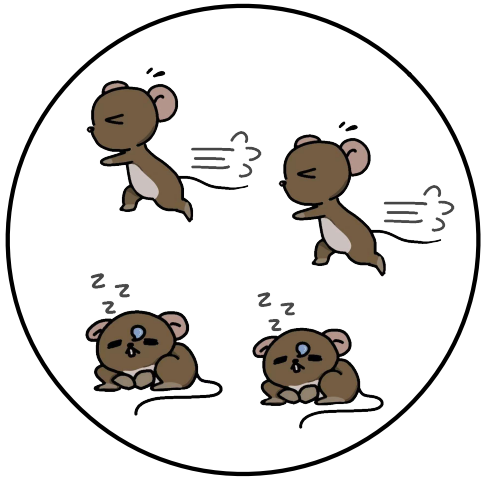
假设和预测



(+)

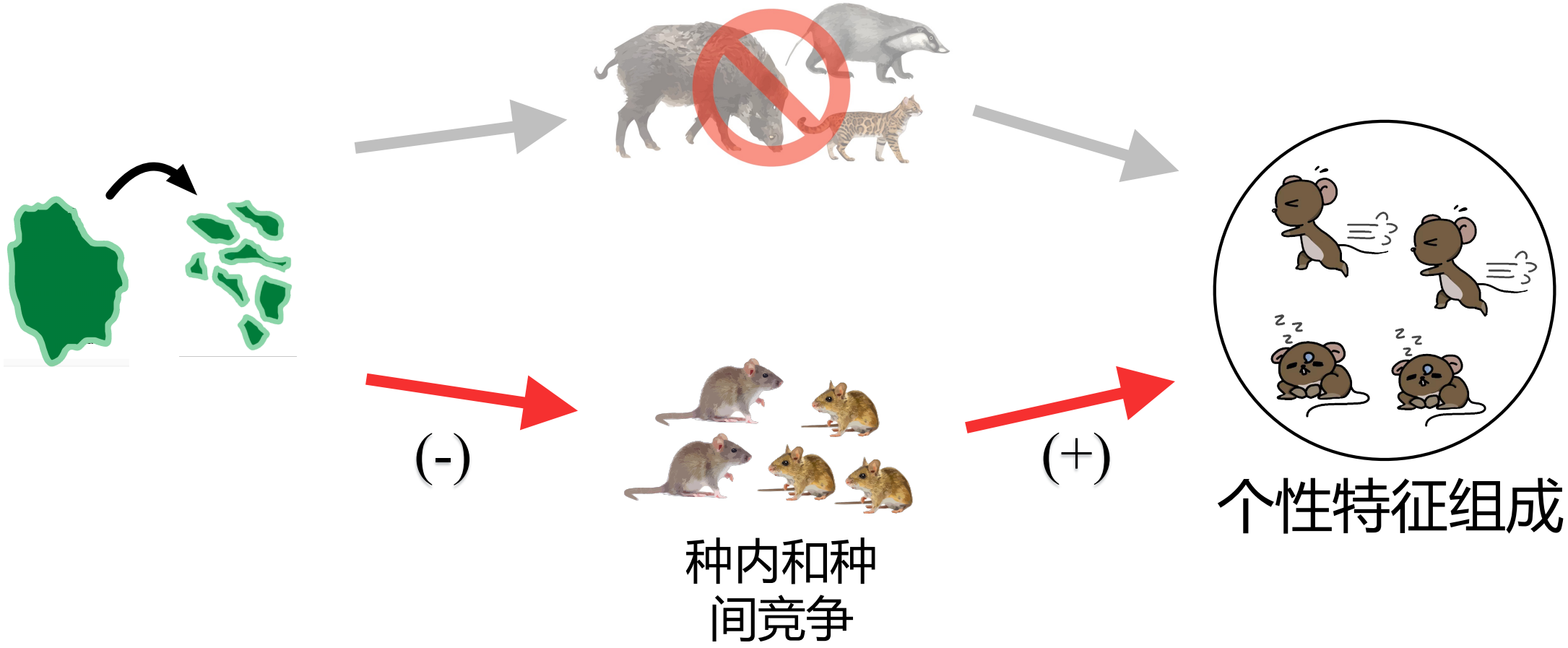
营养和非营养级作用

(-)

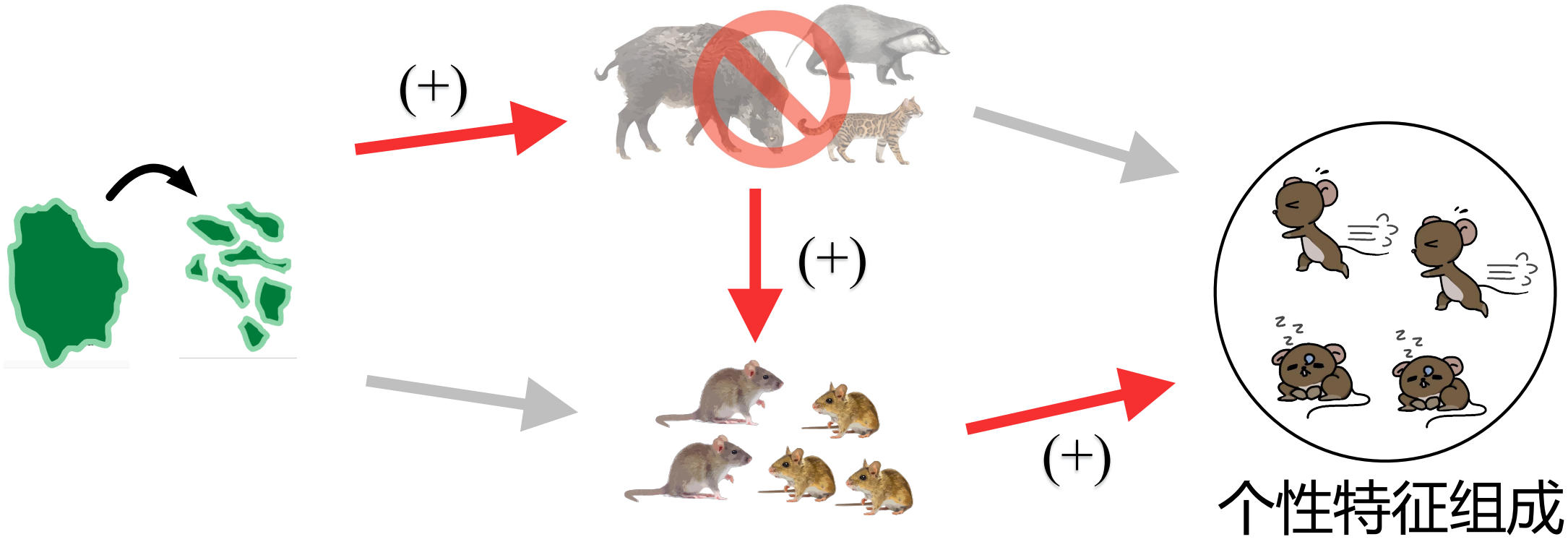


个性特征组成

假设和预测

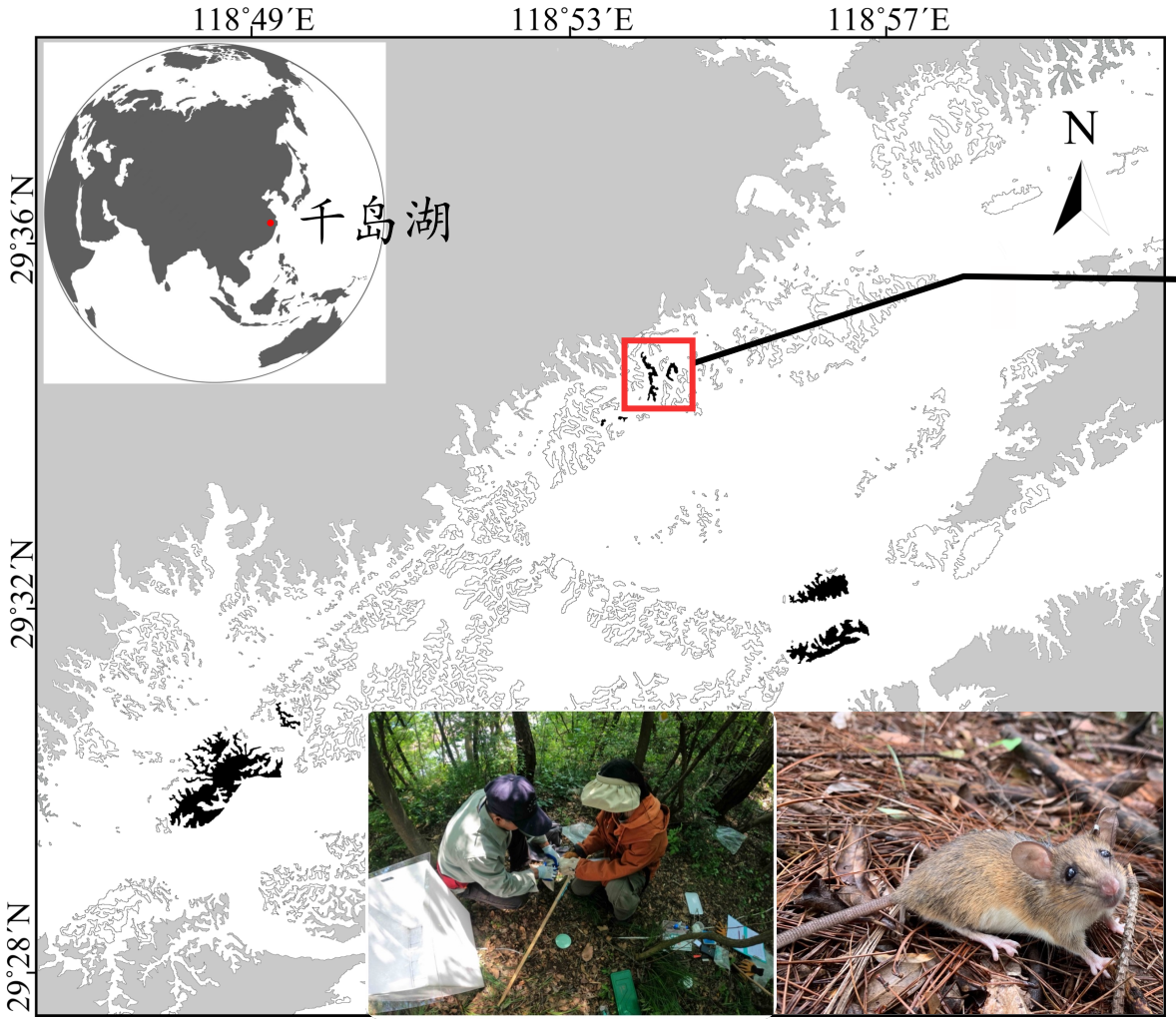


假设和预测



Zeng *et al.* 2019

研究岛屿

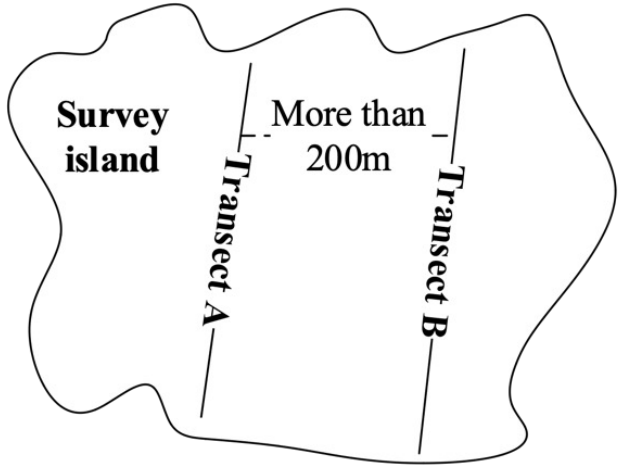


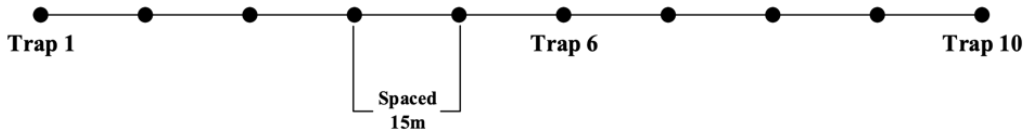
部分研究岛屿的景观鸟瞰图

选择了11个研究岛屿

研究方法

兽类调查

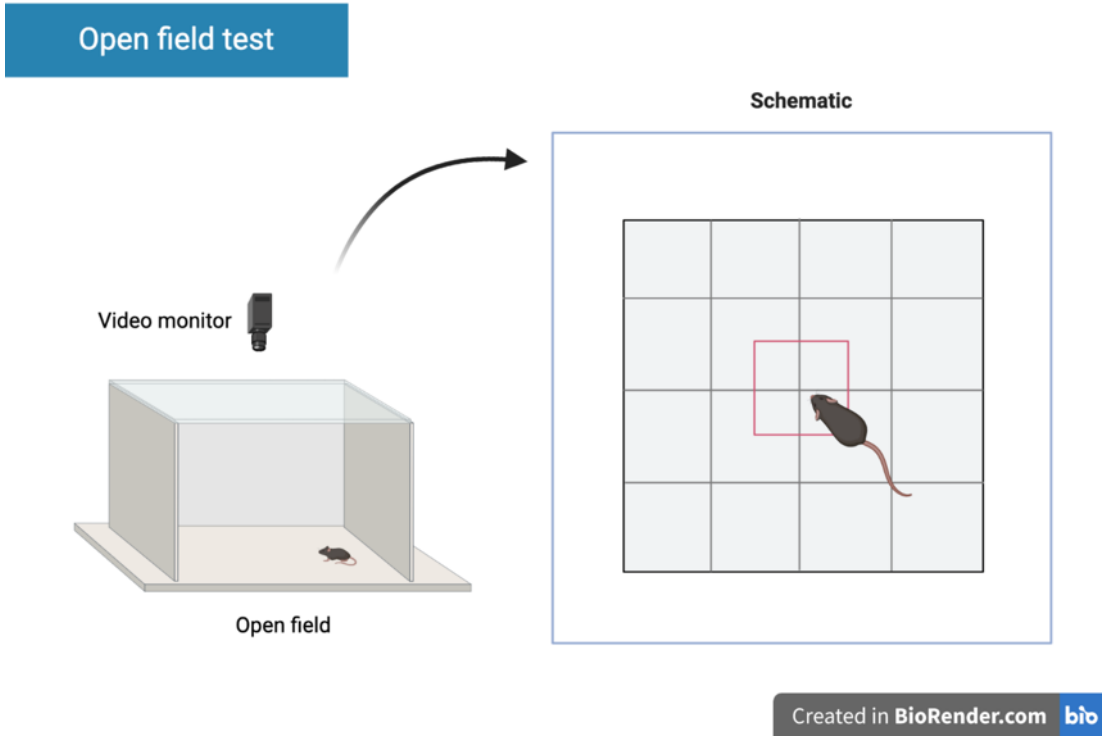




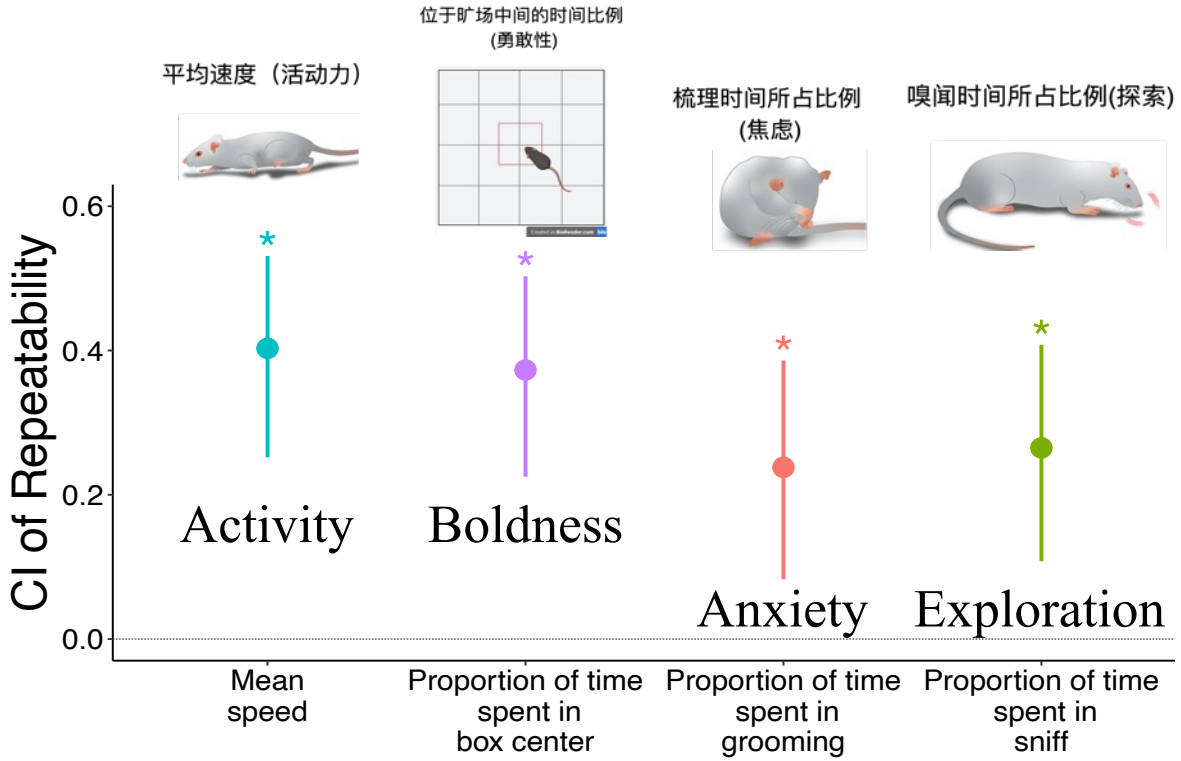
$$D = \frac{\sum_{i=1}^{s} w_i (N_{i,r} - N_{i,f})}{\sum_{i=1}^{s} w_i (N_{i,r} + N_{i,f})}$$

研究方法

行为实验和个性特征



旷场实验



研究方法

个性组成的衡量

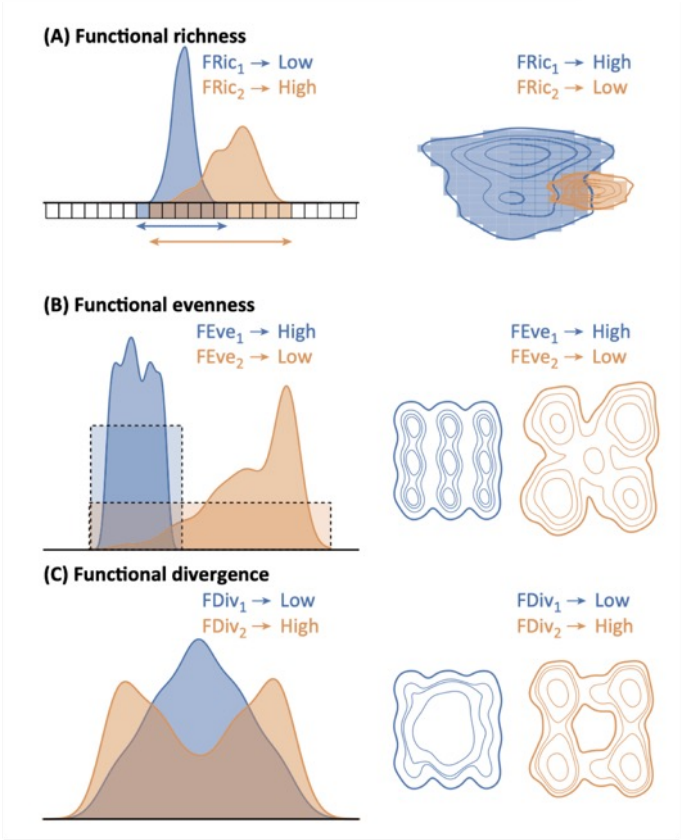
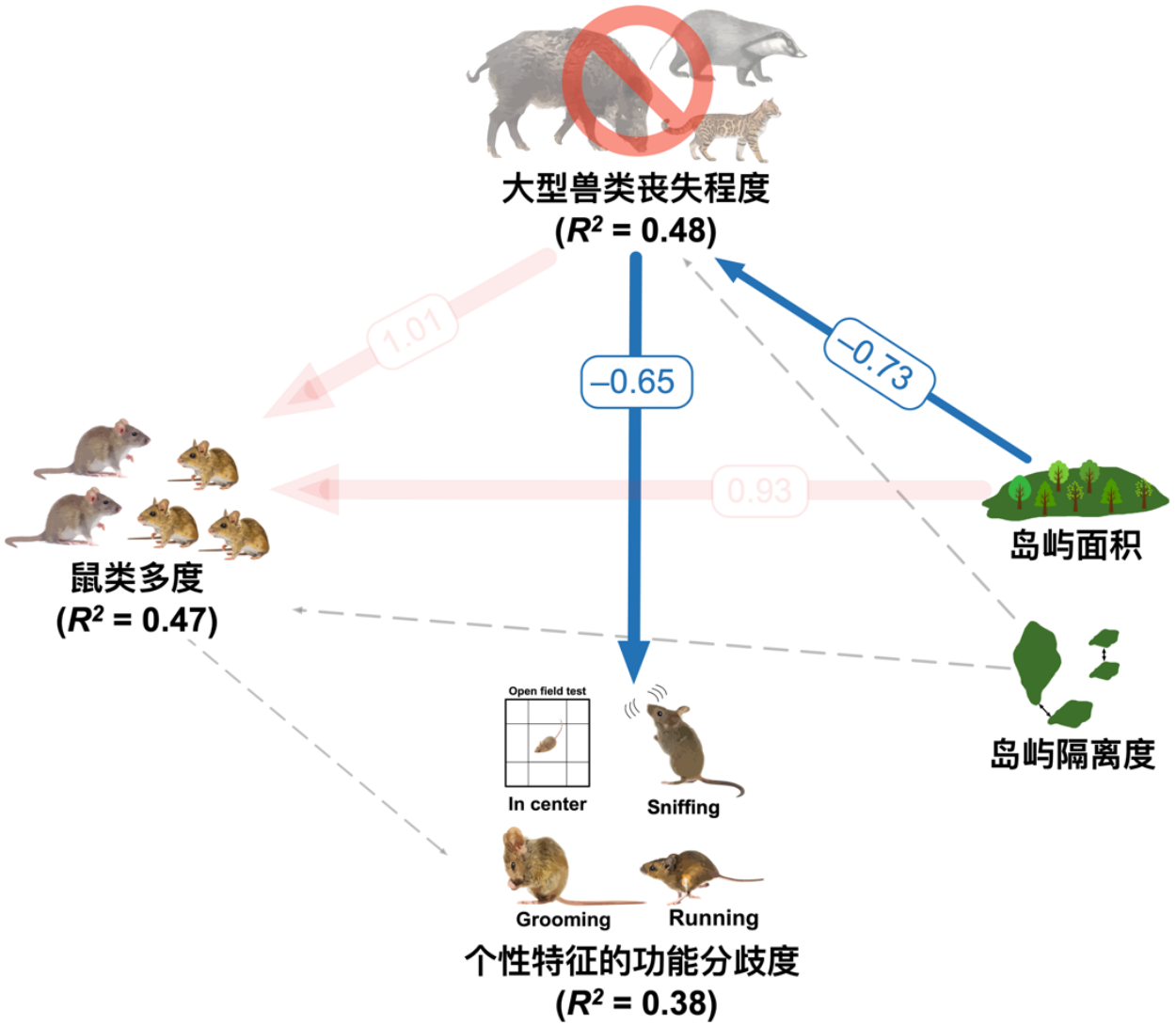


Fig. 2 in Carmona *et al.*, TREE 2016

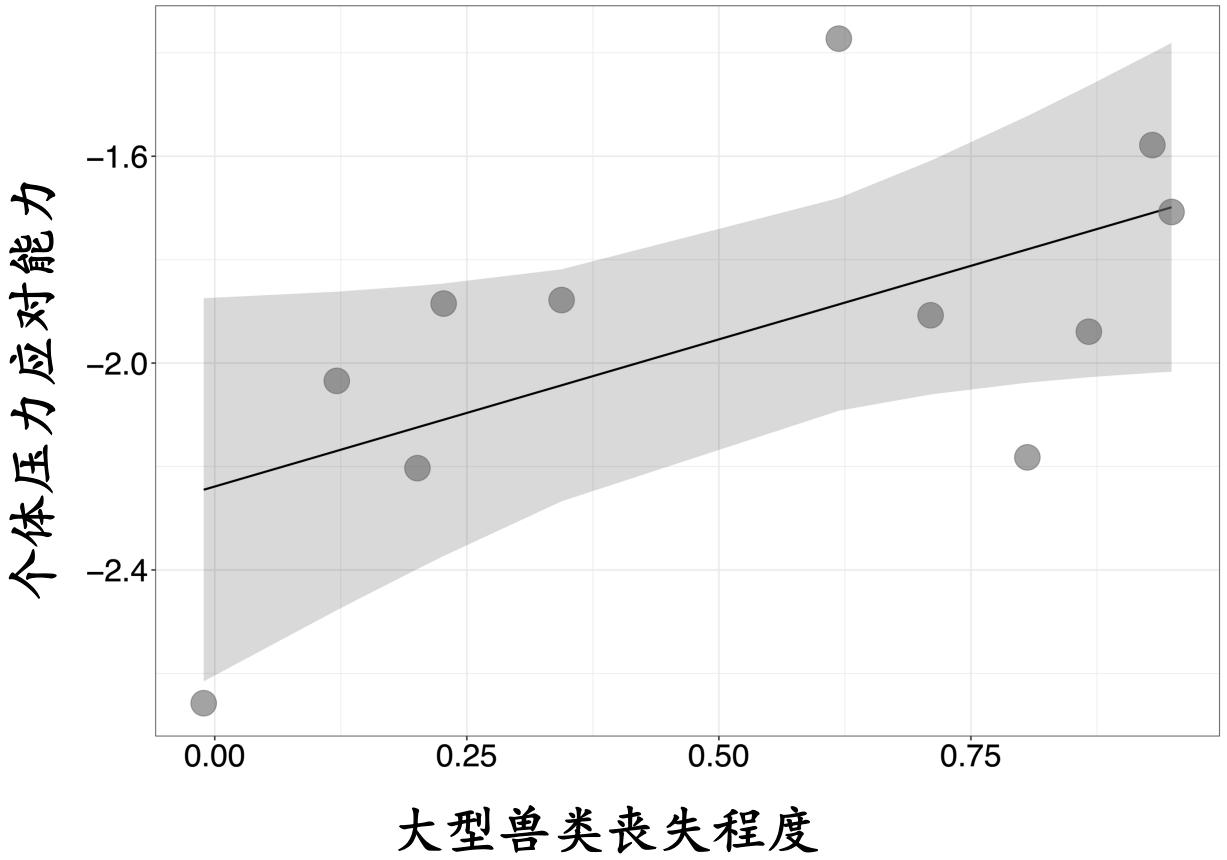
- ❖ 考虑种内性状差异的功能多样性指数（TPD）
- ❖ 主要关注功能分歧度（Functional divergence)
- ❖ 贝叶斯结构方程模型进行假设检验

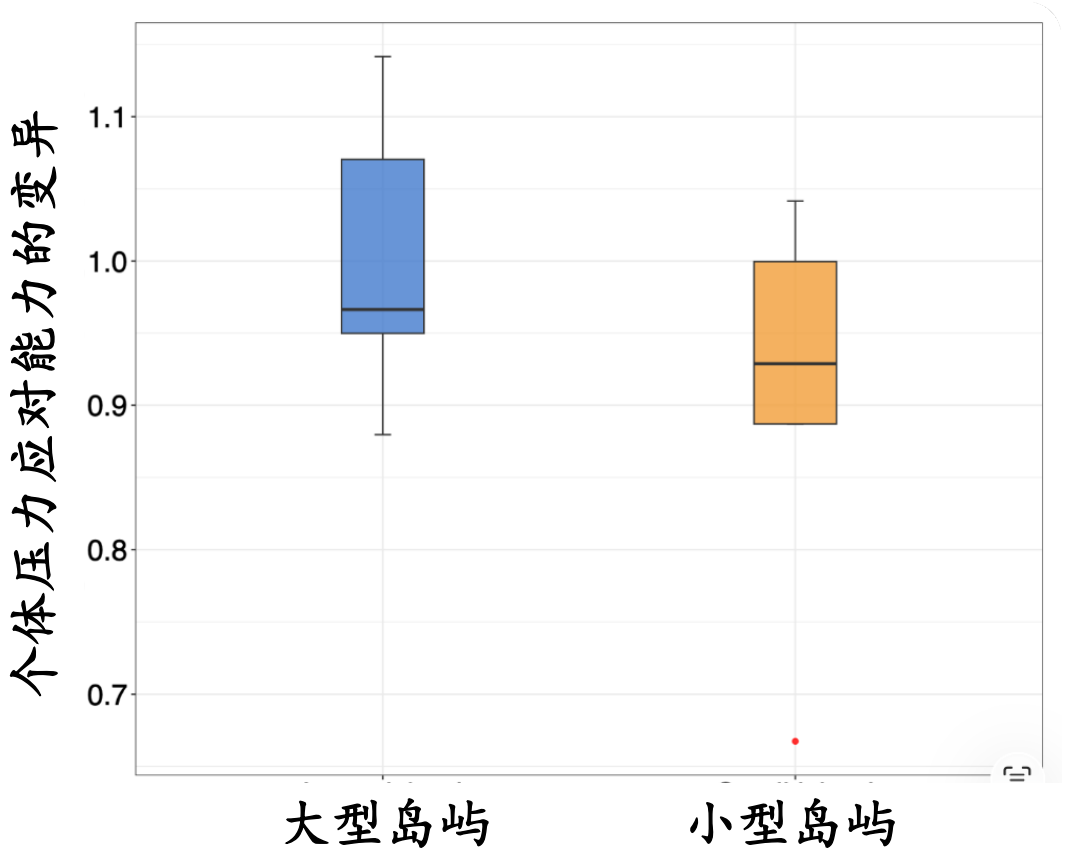
核心结果



- 生境片段化会加剧大型兽类的丧失
- 大型兽类丧失会导致个性多样性的下降

核心结果

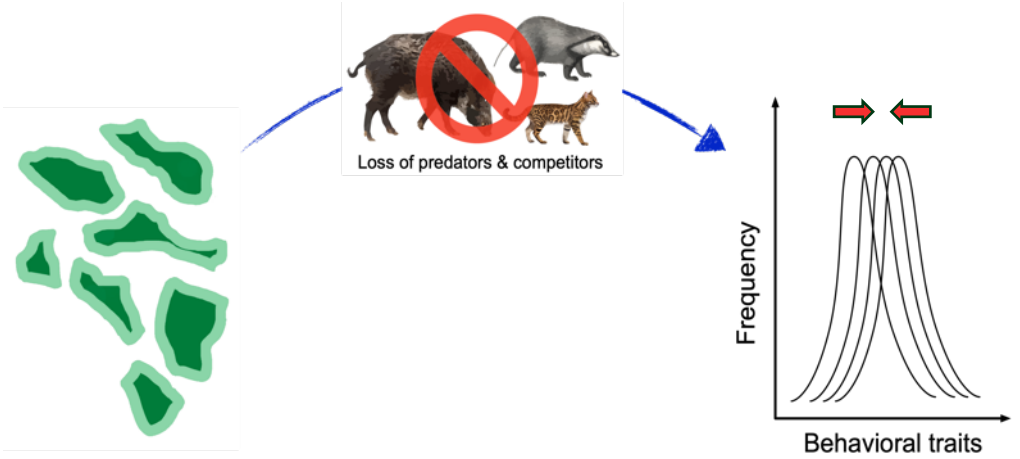


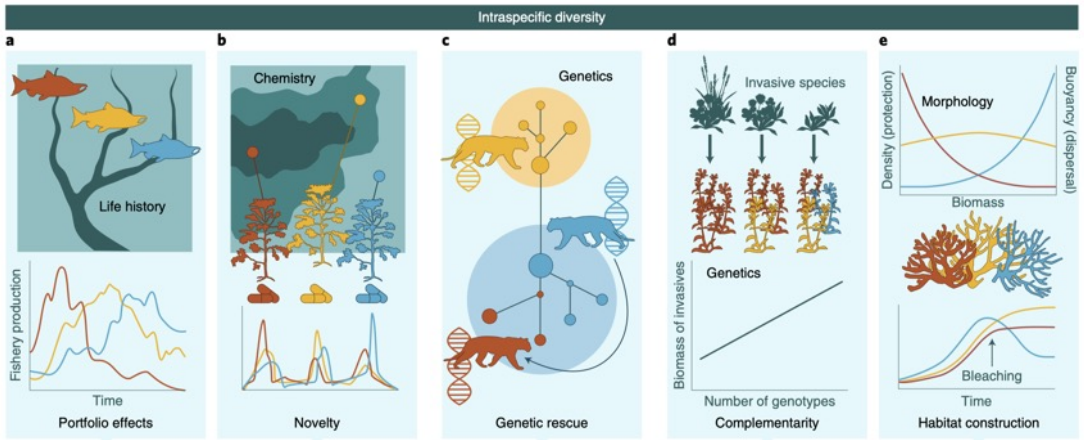


个性多样性的下降是由于鼠类个体压力应对能力普遍增强所致

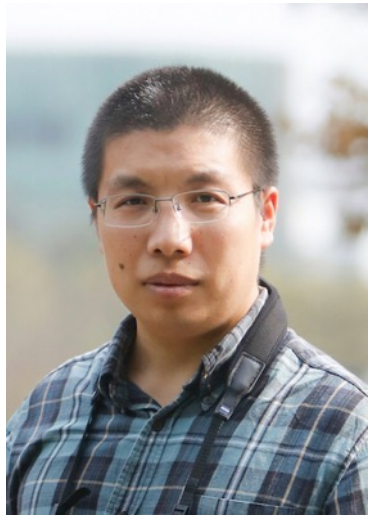
主要结论

- 生境片段化带来的大型兽类丧失是导致鼠类种内行为多样性丧失重要驱动力
- 全球变化背景下，既要关注物种多样性，还要考虑种内多样性





致谢



谢谢聆听！

敬请批评指正！

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Defaunation erodes the diversity of rodent personality traits in fragmented forests

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