

# Exploring Gloger's eco-geographic rule

Why organisms are darker in wetter & warmer environments

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BSc Hons Biological Sciences

Critical theory essay

For Arjun Amar & Petra Sumasgutner

- Eco-geographic and biogeographic rules
  - Biological/biogeographic “rules”: Lomolino et al. 2006; Gaston et al. 2008 (has a def for Gloger's rule too) (also d/d's betw intrasp. traits, intersp. traits, and assemblage patterns (in community properties or community trait avgs))
- Theory vs empiricism of “rules”
- Gloger's rule
- Manifestations of Gloger's rules
  - Intrasp. Gloger's rule manifestations vs intersp./community level manifestations (Lev-Yadun 2015)
- Some intro stuff
- “Herein, I argue that there is sufficient evidence to support Gloger's rule as a useful and true generalisation [...]”

## Origins of the rule

- Gloger's observations
  - Gloger noted bird plumage darkness ~ warmth, humidity (Miksch; Burt & Ichida 2004)
- His contemporaries' thoughts
- Theoretical reasoning behind the rule

## Evidence & examples

- ...
- Gloger vs anti-Gloger patterns (Lev-Yadun 2015)
- Does the pattern exist? Is it observed in the first place?
- Dissect the observations at the intrasp., intersp., and assemblage levels
- Animal vs plant e.g. -> differences in meaning and interpretation

## Mechanisms behind the pattern

- ...
- Burt & Ichida -> dark plumage resistant to bacterial degradation (~ pigments), a common problem in humid climates; methods: measure intrasp.  $\Delta$ colour vs bacterial activity
  - cf Koski & Ashman -> UV role (in plants)
- Persistent colour polymorphism (Tate et al. 2016) within a population of a species -> equivalent fitness of the morphs in heterogeneous habitats; results: darker species forage/hunt better in darker habitats (~

hiding in the ambient background). Since (Ruan says) darker habitats are wetter (ish), this relates to Gloger's rule.

- Connect evidence above to mechanisms described in their respective papers (if applicable)
- & mechanisms from other papers concerning pigment and environment (e.g. Tate et al. 2016)
- Dissect the observations at the intrasp., intersp., and assemblage levels MECHANISTICALLY
- Animal vs plant e.g. -> differences in meaning and interpretation for MECHANISM

## Concluding remarks

- ...

## References