

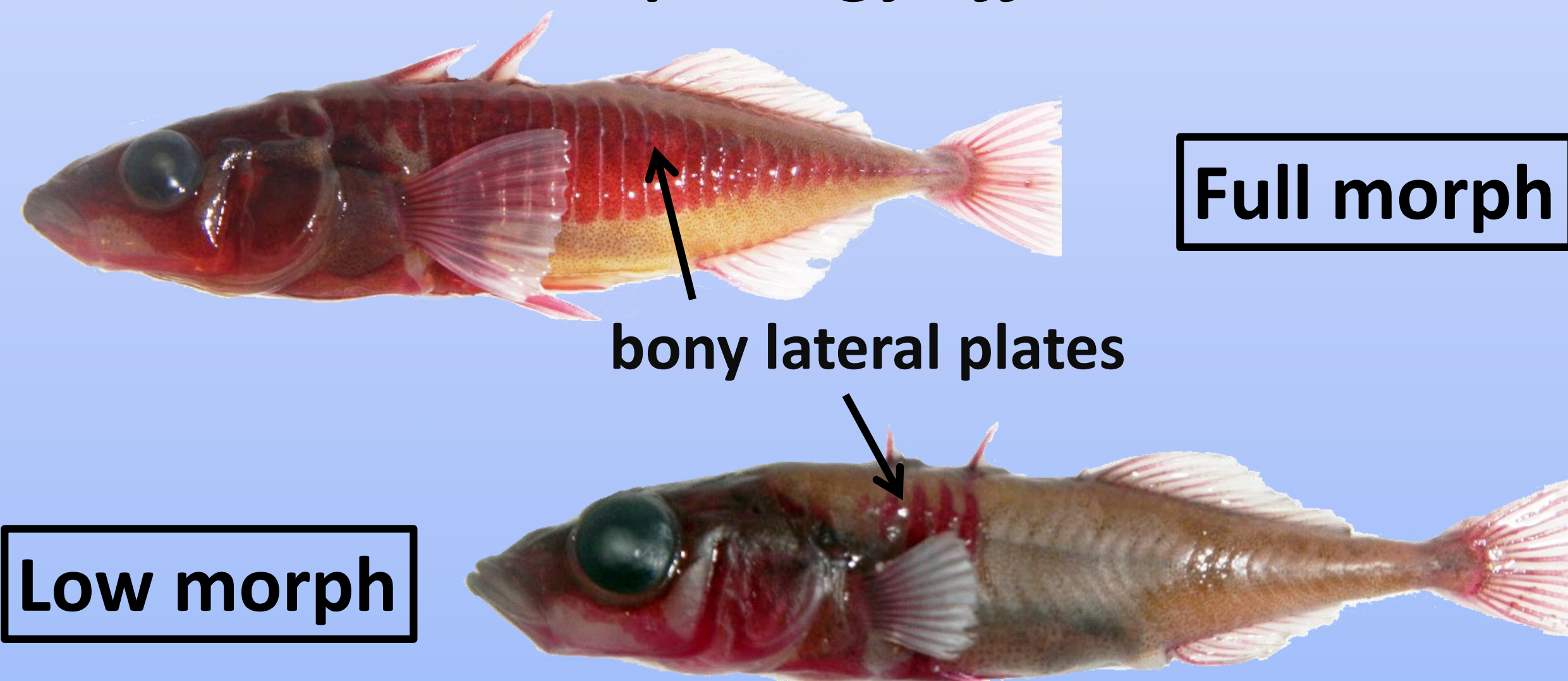
Something's fishy about those nutrients: The effects of stickleback morphology on nutrient recycling

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Fish affect nutrient recycling through their body composition and excretion

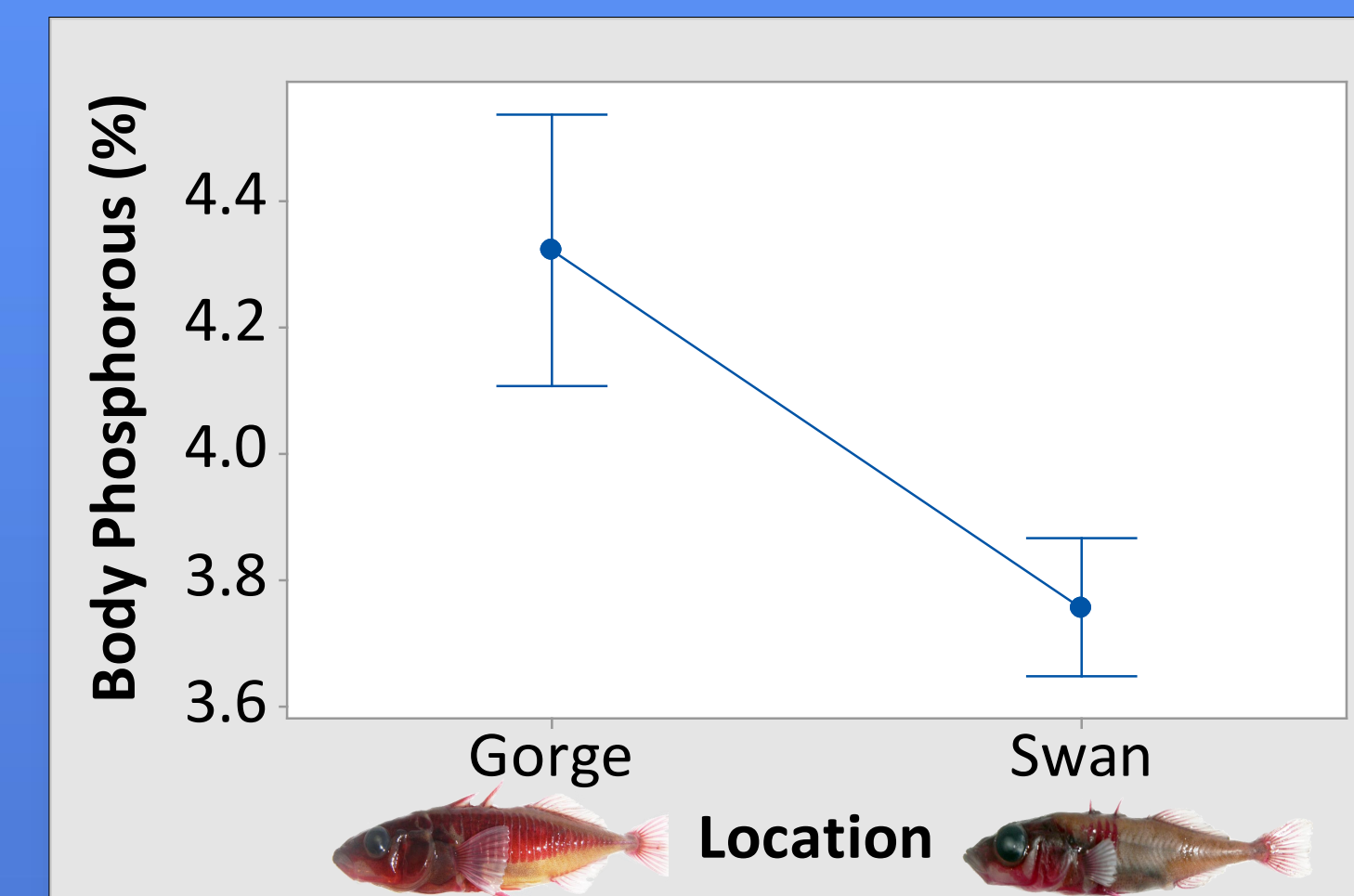
How does morphology affect excretion?



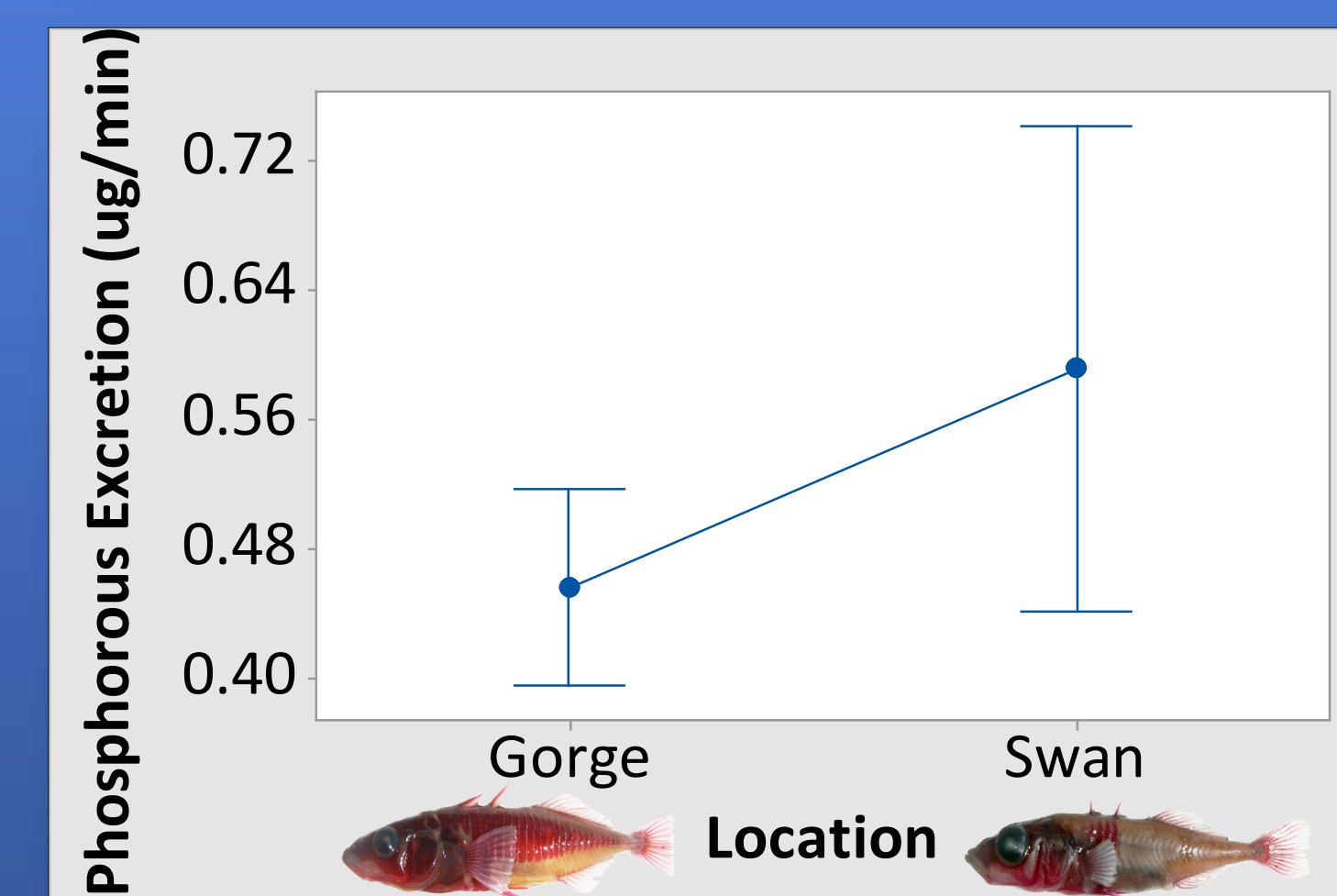
Threespine stickleback are a good model because they vary in bony morphology

Phosphorous varies among morphs

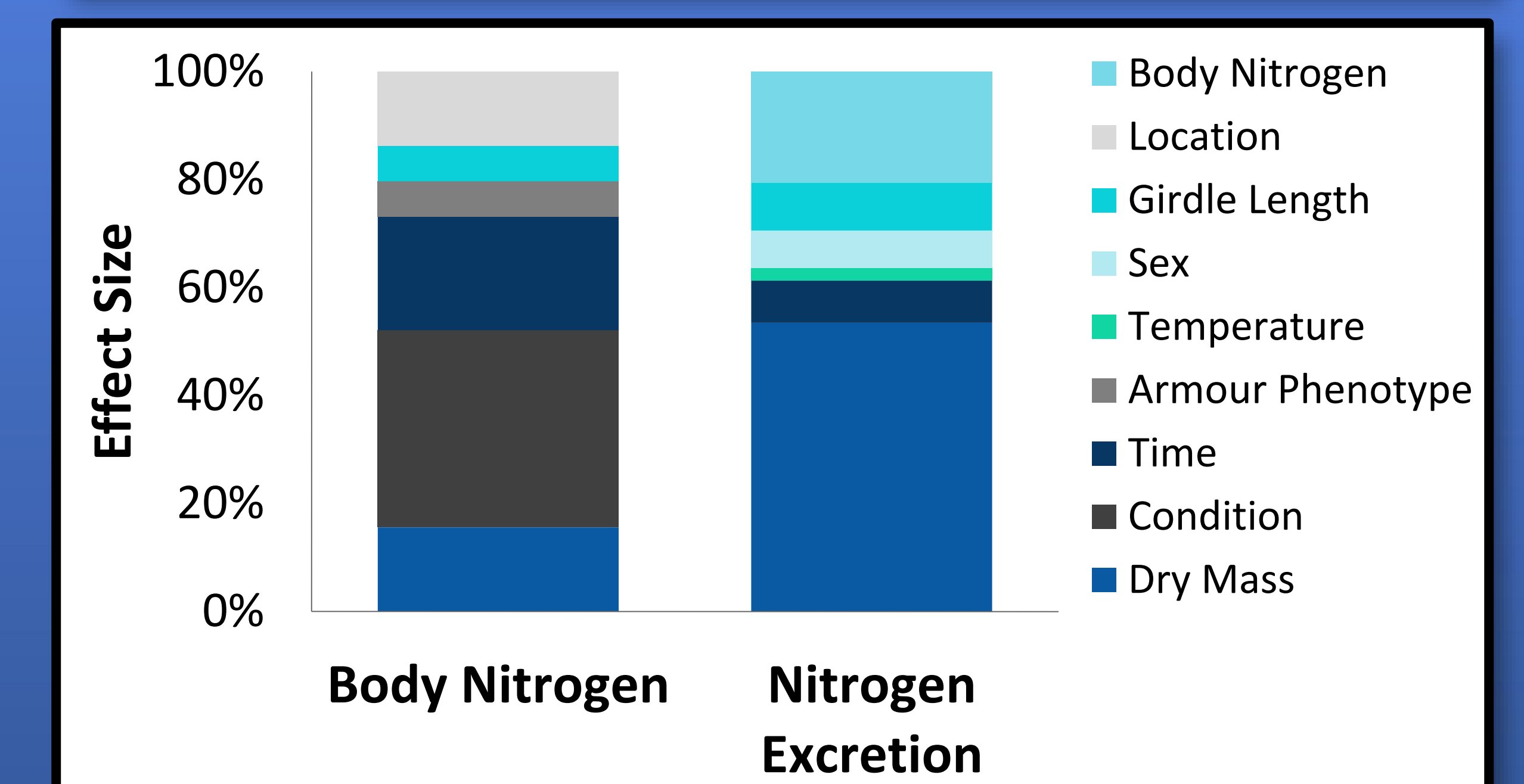
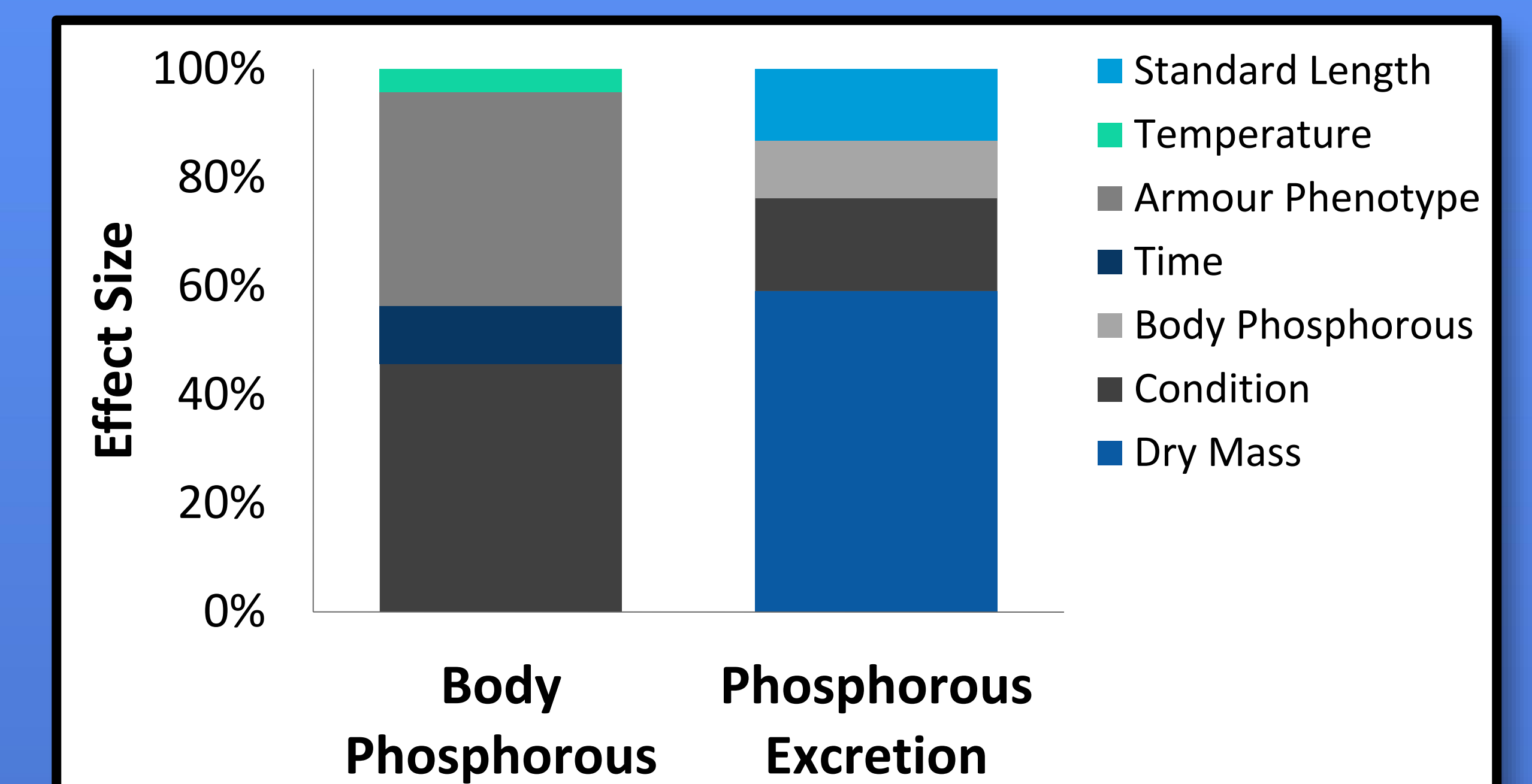
- Full morphs have more phosphorous in their bodies ($P < 0.001$), as predicted



- Full morphs excrete less phosphorous ($P = 0.041$), as predicted



Factors other than morphology are also important



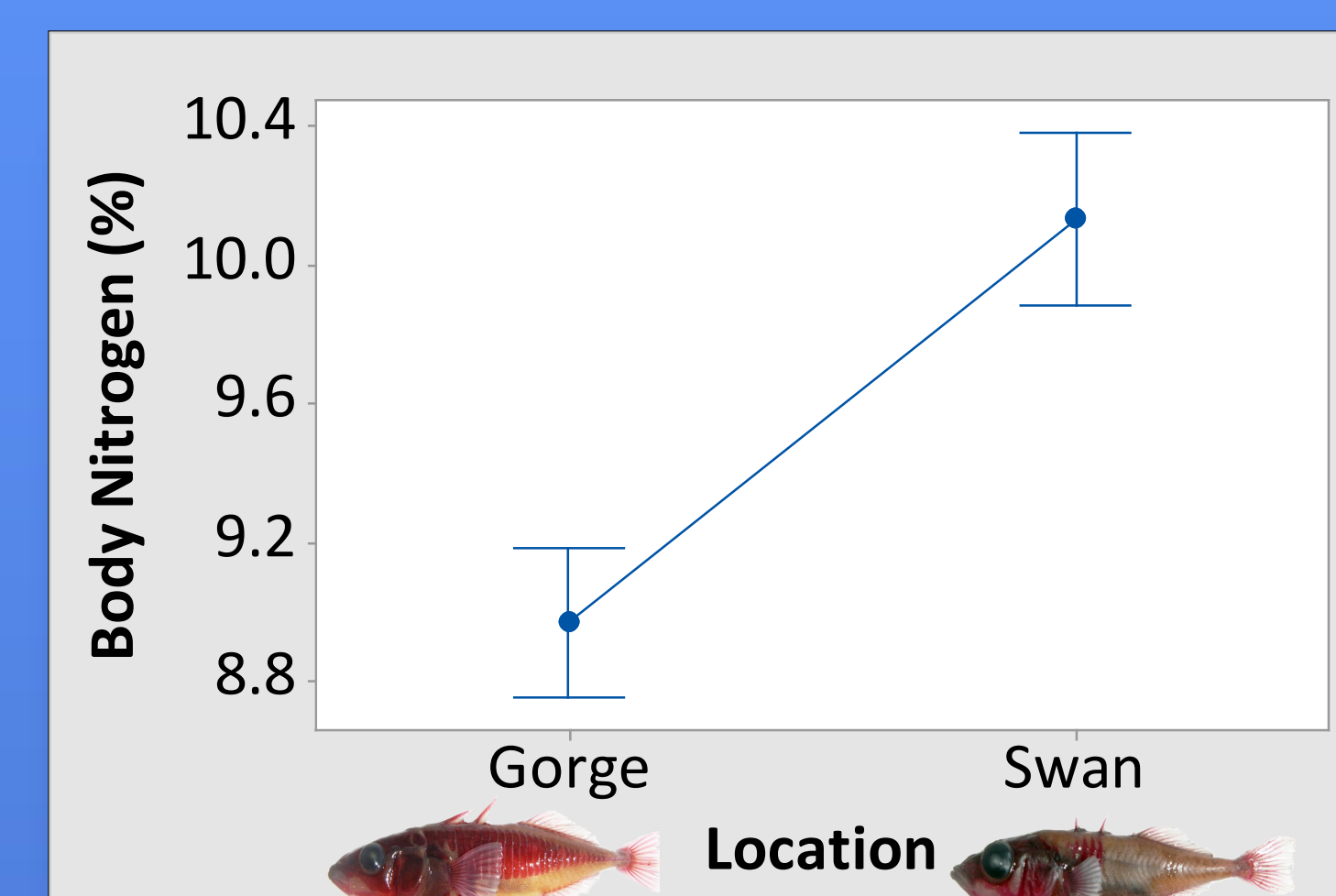
Methods and hypotheses

We sampled elemental body composition, excretion and environmental factors in two different populations using standard methods

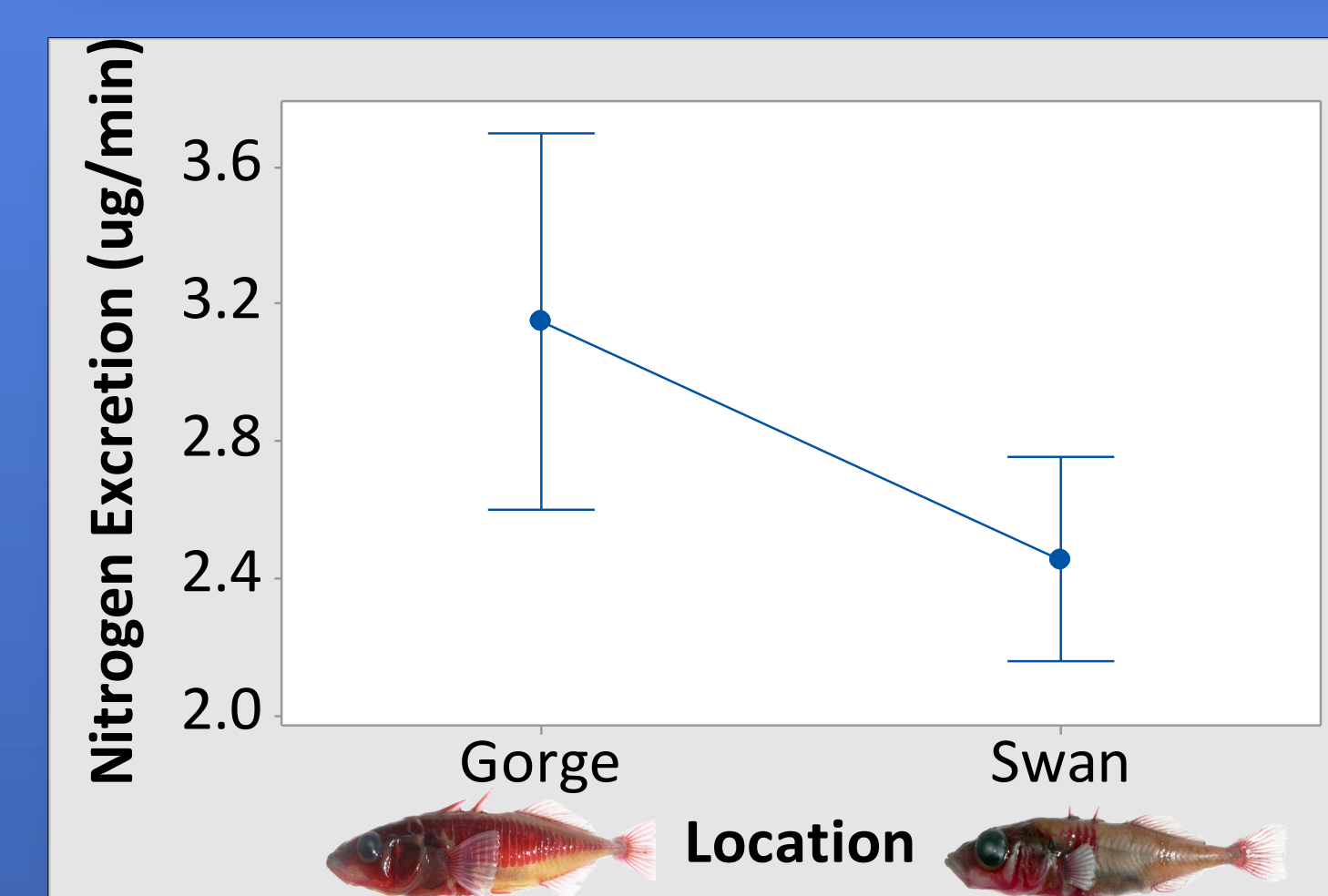
Full morph	Low morph
• Marine (Gorge Waterway)	• Fresh Water (Swan Lake)
• Hypotheses <ul style="list-style-type: none"> • More phosphorous in the body • Less inorganic phosphorous in waste 	• Hypotheses <ul style="list-style-type: none"> • Less phosphorous in the body • More inorganic phosphorous in waste

Nitrogen varies among morphs

- Low morphs have more nitrogen in their bodies ($P < 0.001$)



- Low morphs excrete less nitrogen ($P = 0.045$)



What are the relative effects of different variables on the elemental composition of stickleback and its waste?

Conclusions

- Full morphs have more phosphorous in their bodies and excrete less phosphorous
- Low morphs have more nitrogen in their bodies and excrete less nitrogen
- Body phosphorous and phosphorous excretion were best predicted by differences in armour phenotype and body size
- Predictors of body nitrogen and nitrogen excretion were more numerous and involved more environmental factors

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