

The evolution of parental care: How strategy relates to female egg hormone allocation in Nicrophorine beetles

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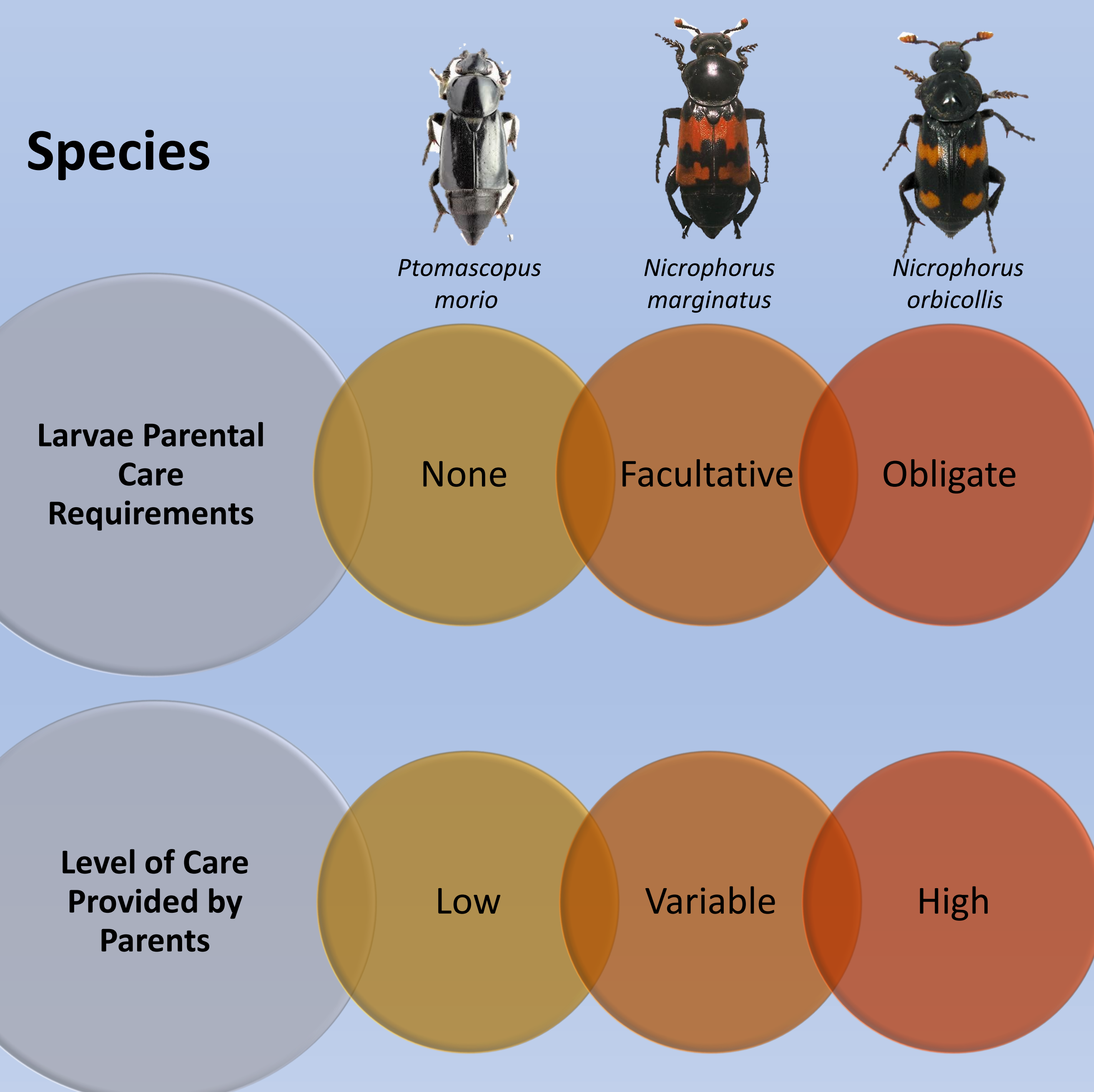
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Background

- Unpredictable environments select for strategies which enhance fitness
- Alterations in maternal steroid hormone provisioning to eggs can alter offspring development rate and behavioral phenotype
- No studies to date have investigated whether maternal hormone provisioning varies with reproductive strategy

Nicrophorine Parental Care



Insects with no parental care compensate by increasing egg hormone allocation, likely as a way to increase offspring fitness.

Methods & Results

- Eggs were collected 24 hrs following start of oviposition and stored at -80 °C in MeOH.
- Egg hormone concentrations were determined via competitive enzymatic immunoassay (EIA) following solid phase extraction (SPE). Conjugated ecdysone was first digested with PLE.

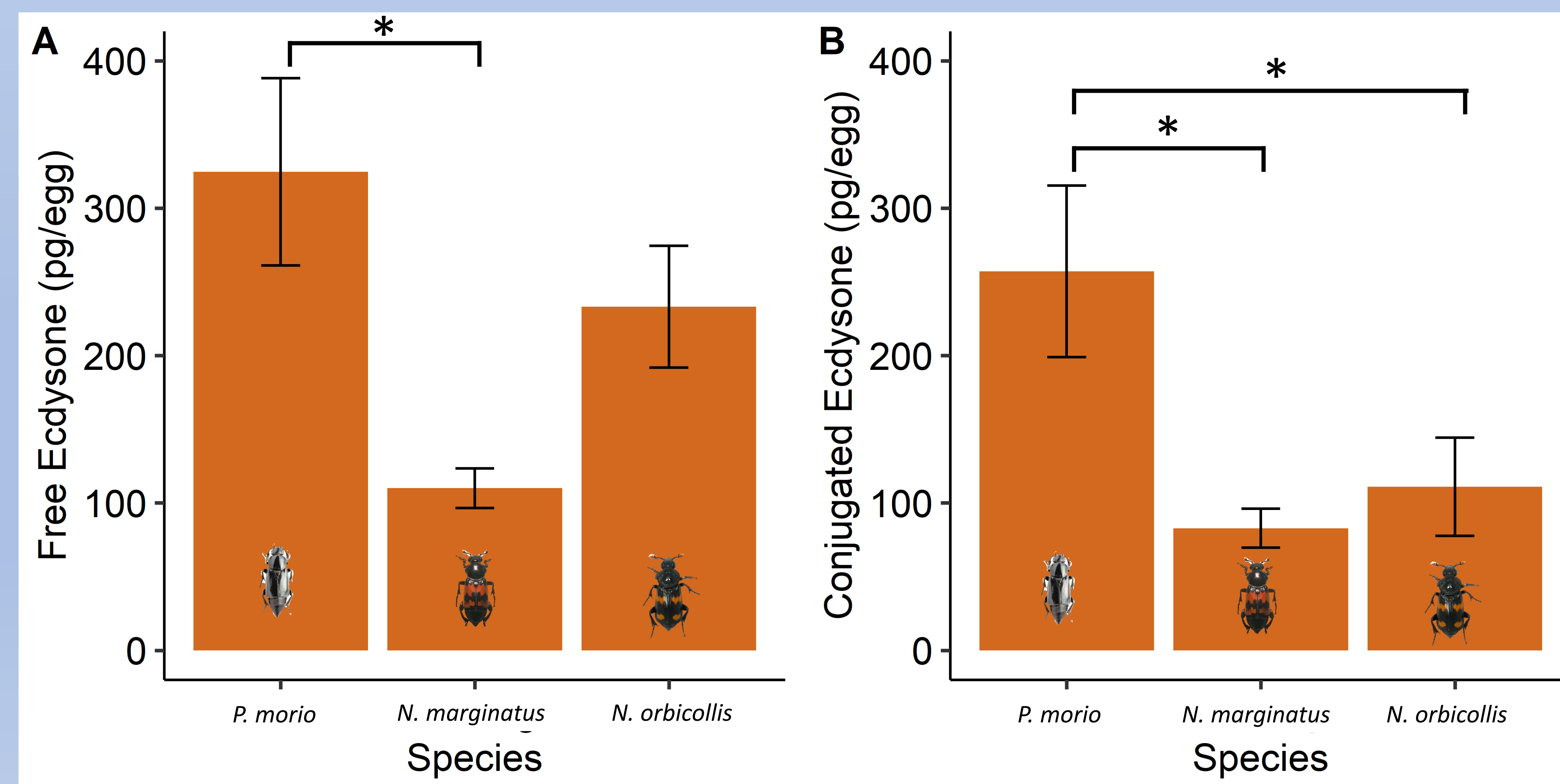


Figure 1: Hormone allocation across Nicrophorine species with differing levels of parental care. 1A) No care species (*P. morio*) allocated significantly more free ecdysone than the facultative species (*N. marginatus*) (ANCOVA: $F_{2,28} = 9.49$, $p < 0.01$; Tukey HSD $p < 0.01$), and 1B) also allocated significantly higher levels of conjugated ecdysone than both species with parental care (ANCOVA: $F_{2,28} = 8.02$, $p < 0.001$; Tukey HSD $p < .05$).

Discussion

- *P. morio*, a species which does not prepare the carcass nor feed developing larvae, allocates higher levels of both conjugated and free ecdysone to eggs compared to species with elaborate parental care
- Both species which provide parental care during larval development exhibit similar levels of hormone allocation
- Carcass preparation and larvae provisioning, regardless of the intensity, appears to constrain hormone allocation

Future Directions

- Investigate whether egg development time varies across species with no care and elaborate parental care
- Determine whether hormone concentrations alter larvae behavior (i.e. begging behavior, aggression)

Acknowledgements

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