The effect of hunger and species identity of sex on mating probability between two parapatric ambush bug species

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Introduction

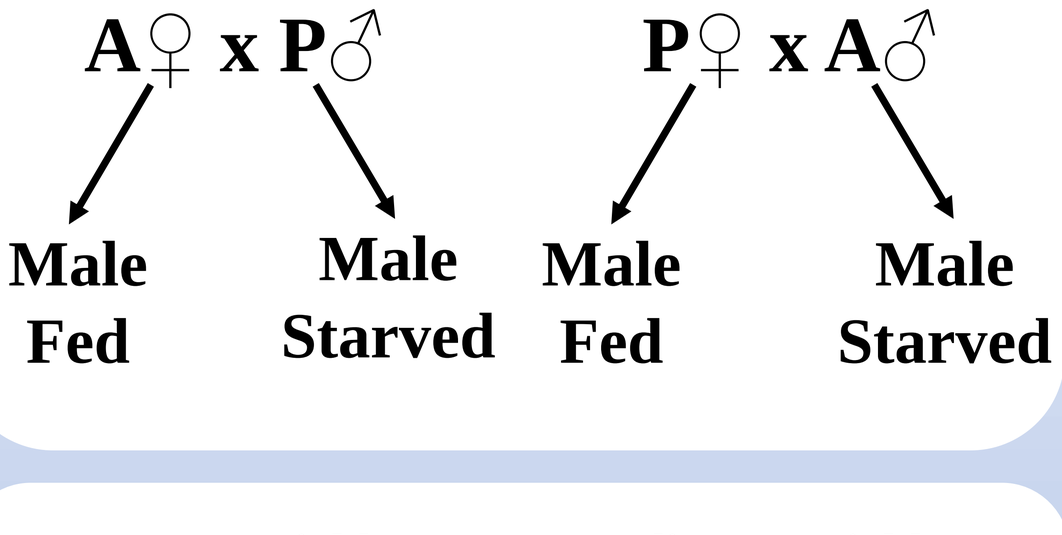
What prevents species collapse in parapatric species?

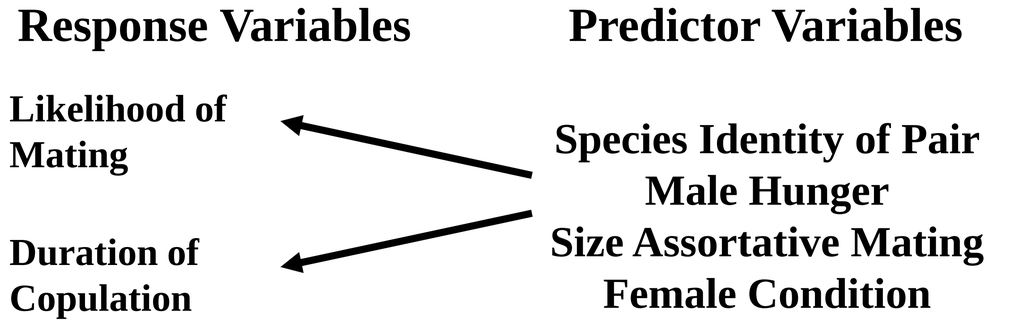
- General isolation mechanisms absent: no species-assortative mating, no reduced heterospecific fecundity, no F1 hybrid inviability
- Condition (non-mating fitness) can affect female mating preference and male signal
- Heterospecific interactions consist of individuals at the limits of their respective ranges and are expected to be in poor condition due to maladaptation

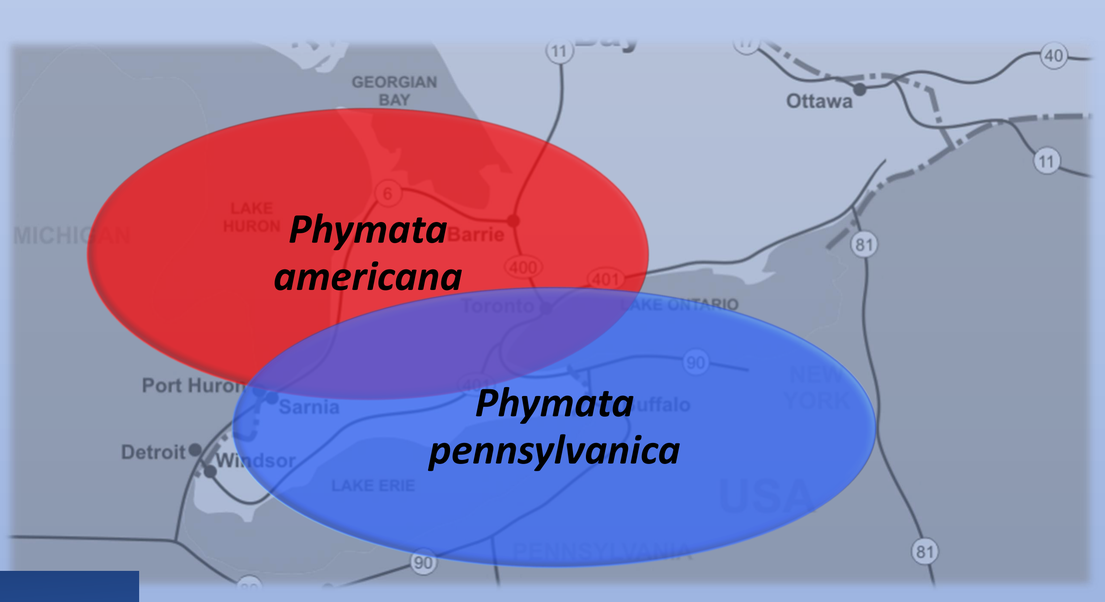
Prediction 1: Males in poor condition will have a lower probability of mating than males in high condition

Prediction 2: Duration of copulation will be affected by male condition (high condition males may have longer durations due to increased sperm transfer, or shorter durations due to greater mechanical efficiency of sperm transfer)

Methods: Heterospecific Mating Assay







Results and Discussion

Likelihood of Mating

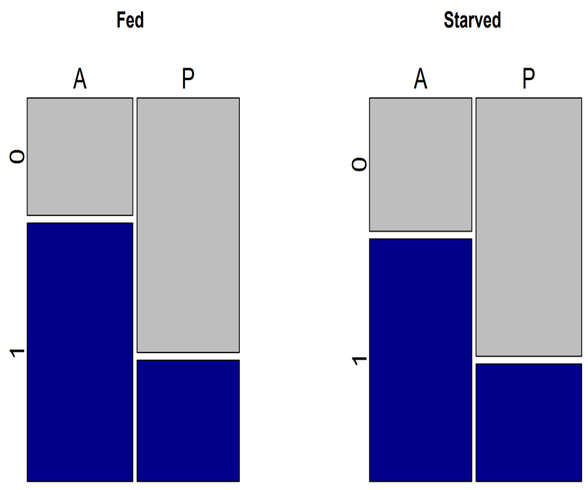


Fig. 1a Proportional mating success of heterospecific pairs grouped by species identity and male hunger (blue=mated, grey=did not mate). (*n*=126).

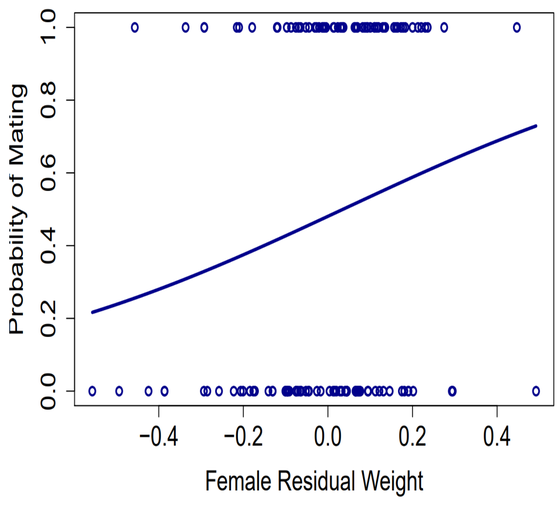


Fig. 1b Probability of mating as a function of female condition. (*n*=126, *P*=0.0623).

- Hunger treatment on males did not affect probability of mating
- *P. americana* females were more than twice as likely to mate heterospecifically than *P. pennsylvanica* females
- Female condition increased probability of mating, marginally non-significant

Implications: potential for asymmetric hybridization

Prediction 1: Not supported

Duration of Mating

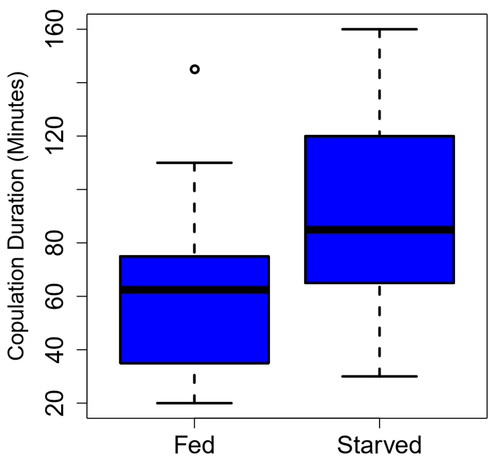


Fig. 2a Average duration of copulation corresponding to manipulation of male hunger. (*F*=1.8257, d.f.=58, *P*=0.0122).

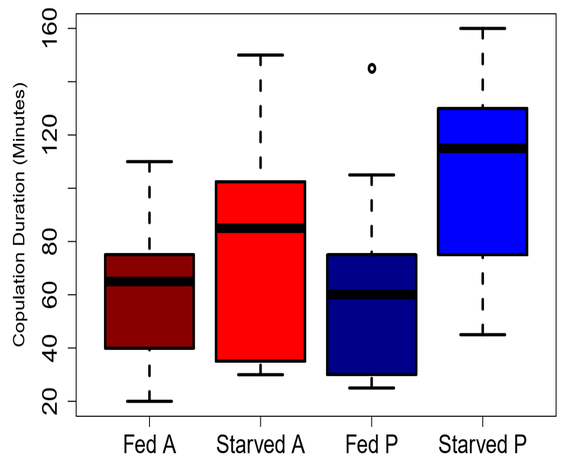


Fig. 2b Copulation duration as a function of both male hunger and species identity. (*F*=1.8257, d.f.=58, *P*=0.1516).

- Starved males have longer copulation durations than fed males
- Hunger had a more pronounced effect on males of *P. pennsylvanica*, approximately doubling copulation duration

Possible interpretations:
i) Species differences in male sperm transfer ability
ii) Species differences in male (condition-dependent) re-mating strategies
iii) Species differences in female postcopulatory biases

Prediction 2: Supported