Correlated Response to Selection for Increased Body Weight on Fecundity in *Hermetia illucens*

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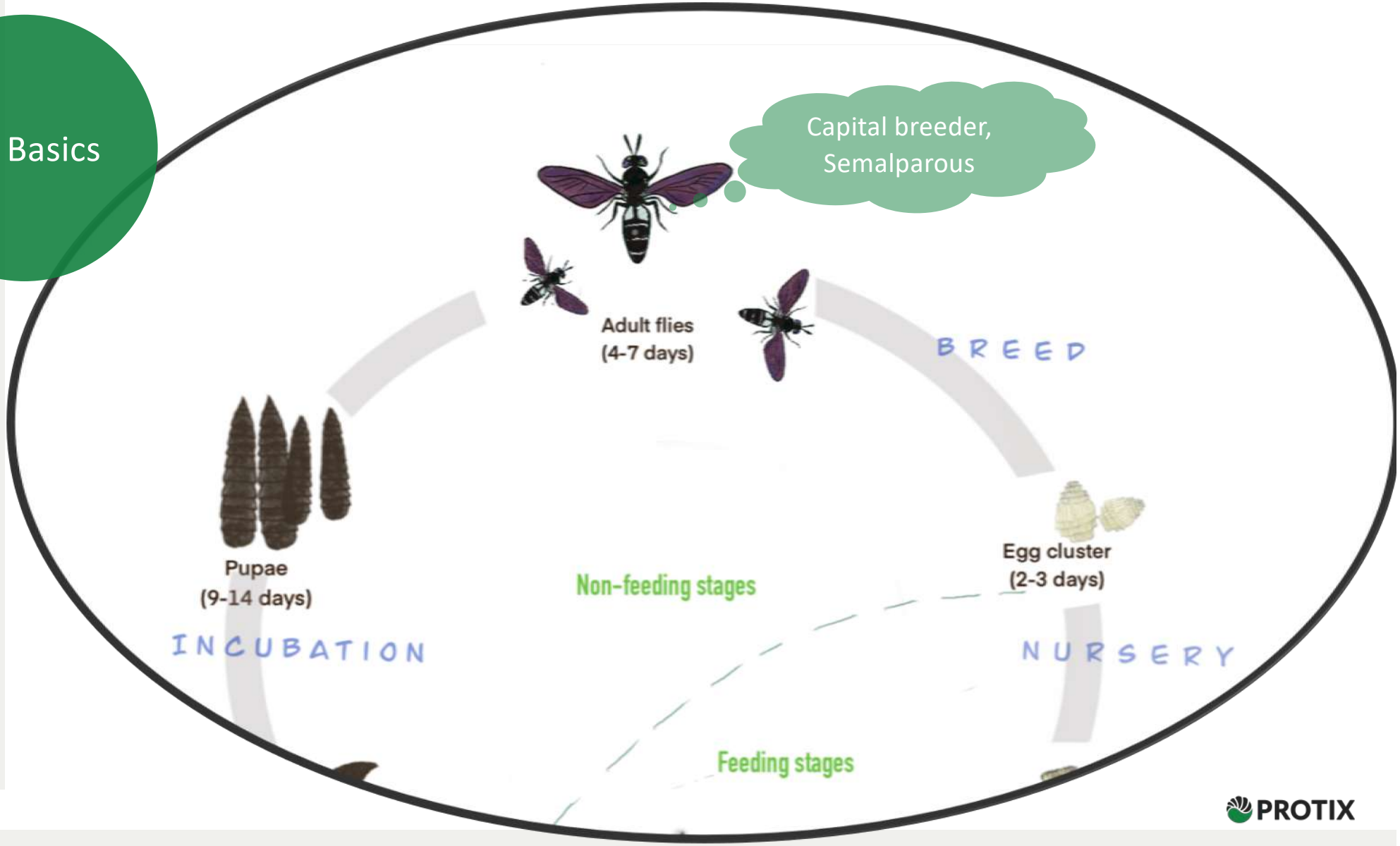
BSF Basics



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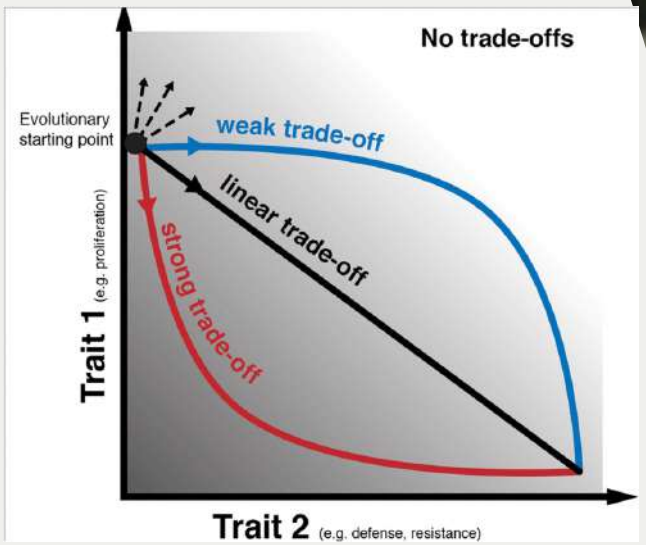
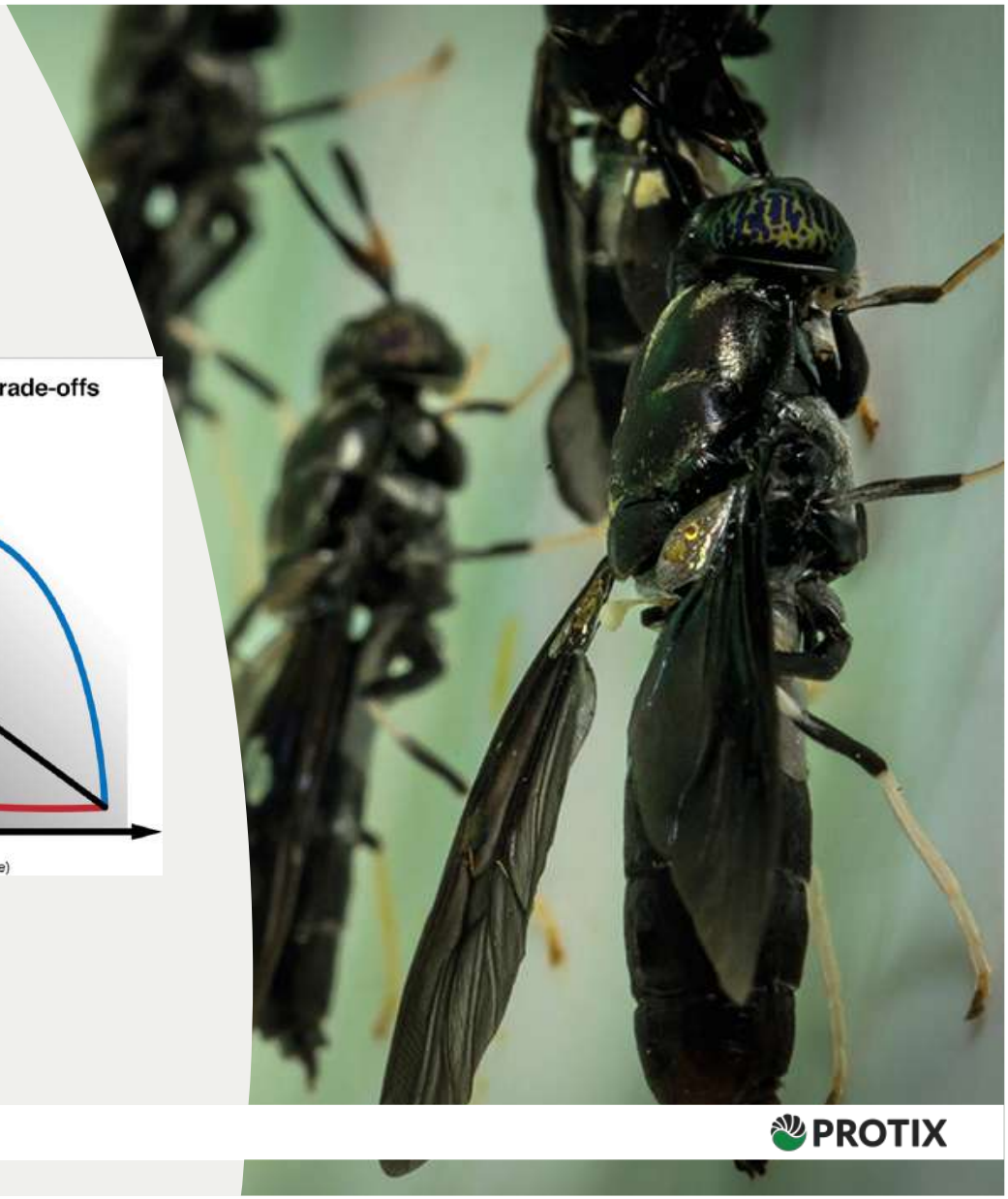
Relevance of studying fecundity





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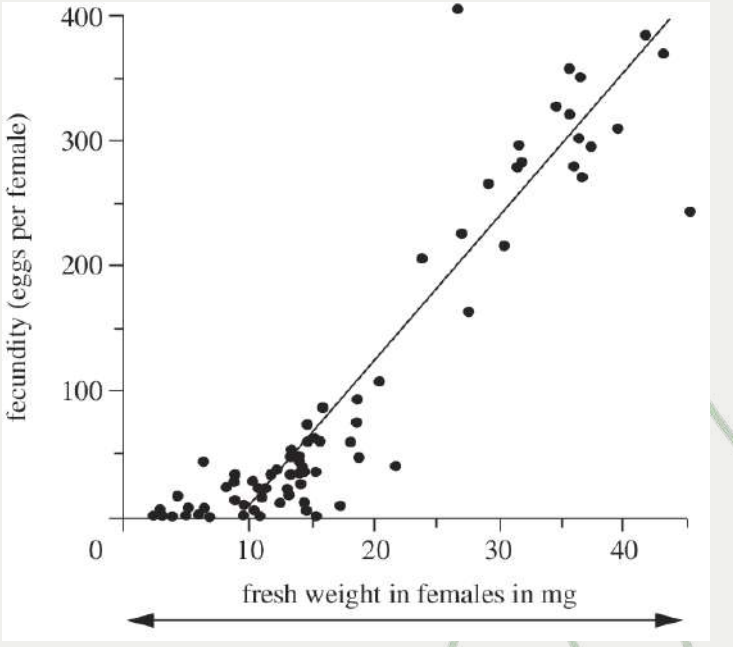
Relationship between body weight and fecundity



Singer & Parmesan (2010)

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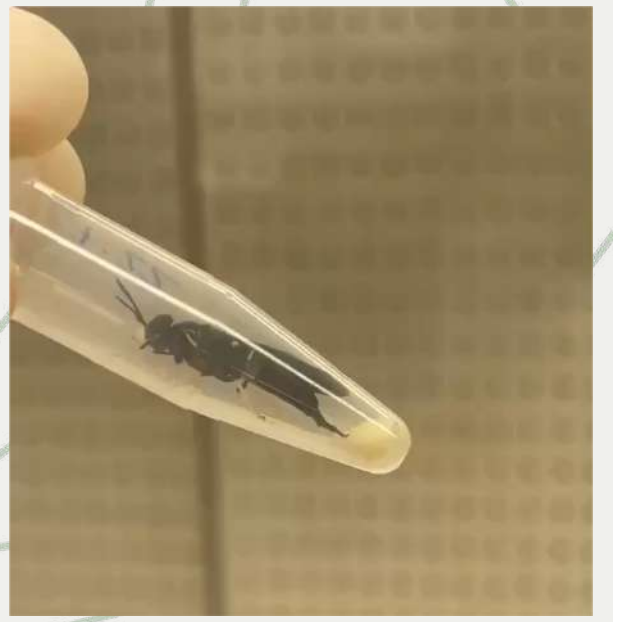
How to get individual egg clutches

Breeding cycle

High temperature 30-32°C



Egg clutch weight

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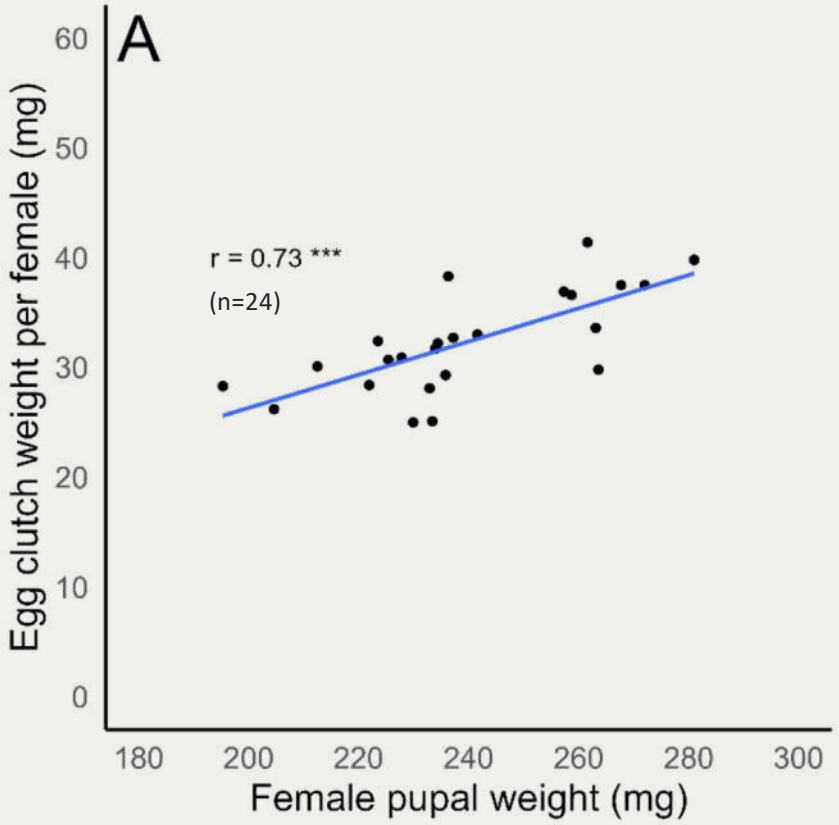
Maternal body weight is positively corelated with egg yield



r=Spearman's correlation rho, (*P<0.05; **P<0.01; ***P<0.001)

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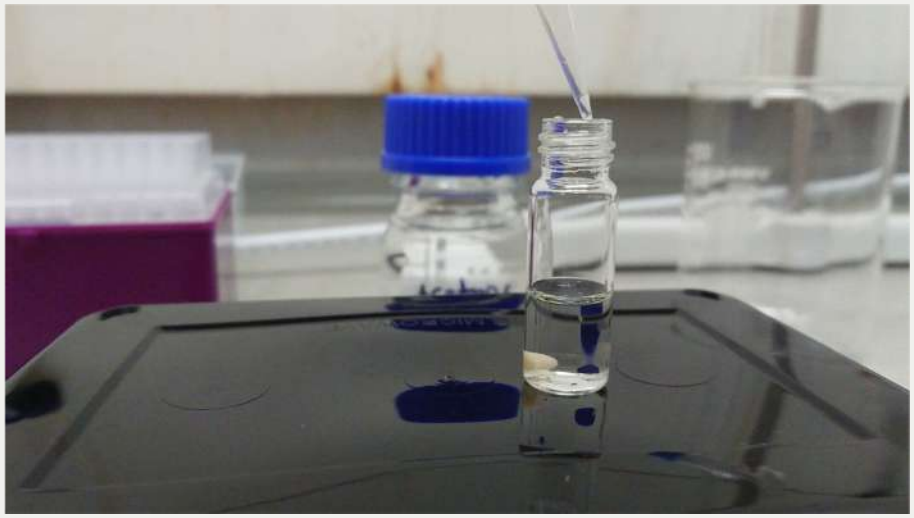
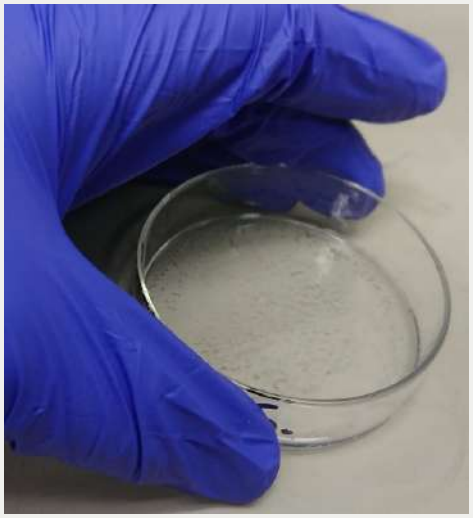
Acetone, an effective way to count eggs





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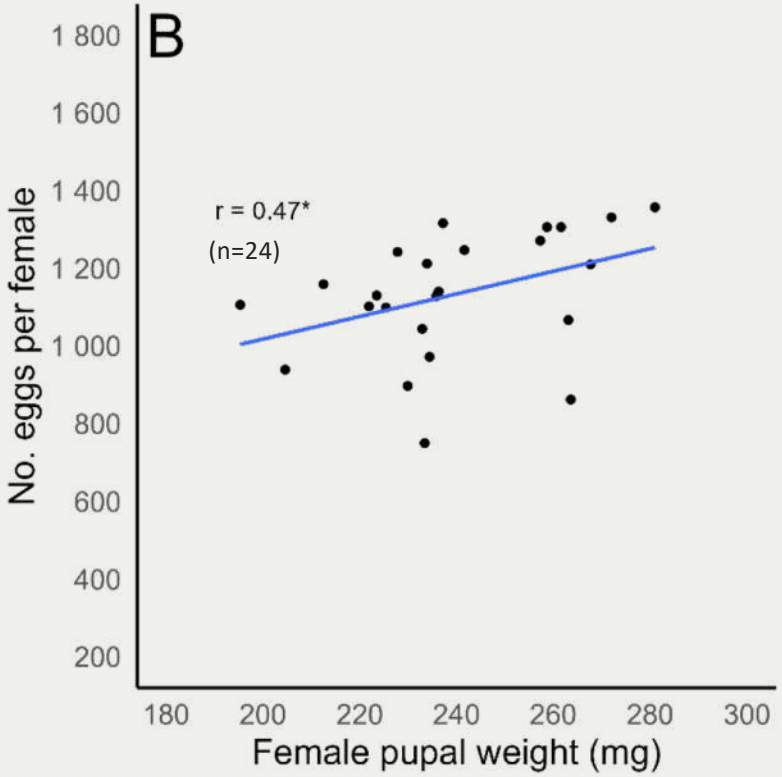
Maternal body weight is positively corelated with fecundity



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But there’s more

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Tradeoff on offspring fitness?

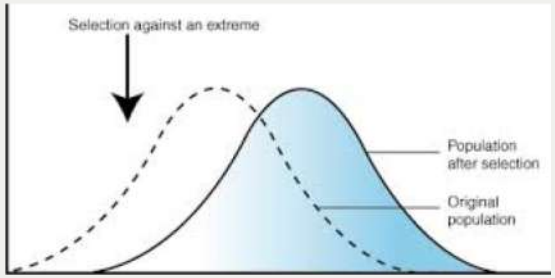
More smaller eggs OR

Few bigger eggs

Differ with genetic strains

Differ with location

Differ with selected generation



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Genetics lab

Compare with BW S32

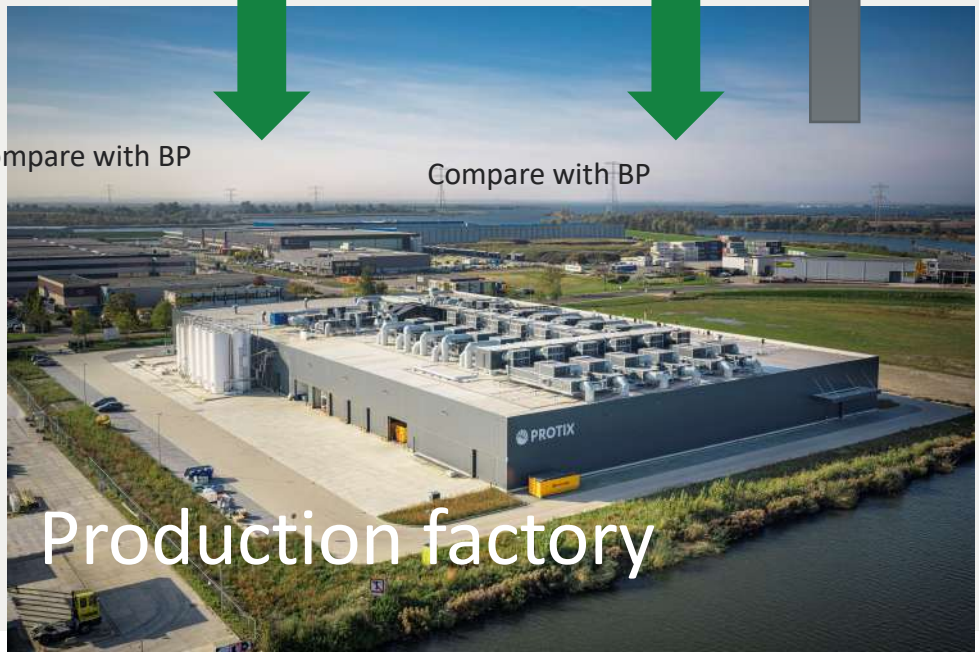
Dissemination
Bodyweight line S14

Dissemination
Bodyweight line S21

Dissemination
Base Population line

Compare with BP

Compare with BP



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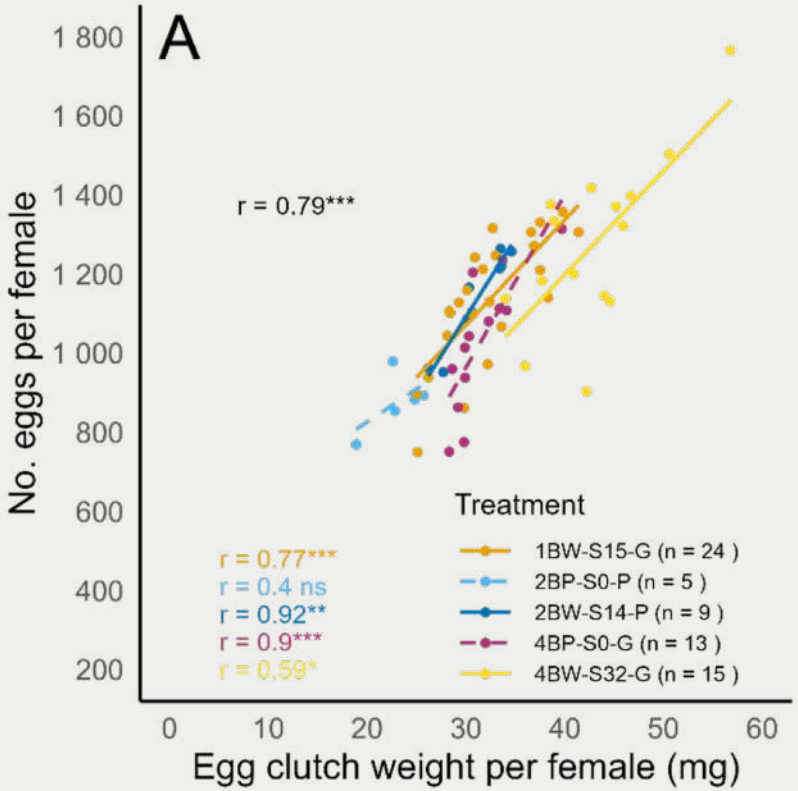
Egg clutch weight is a good proxy for fecundity but…



r=Spearman's correlation rho, (*P<0.05;**P<0.01; ***P<0.001; ns: not significant).
Treatment indicates test ID, genetic line, generation selected for body weight and location of rearing history. n represents sample size per treatment.

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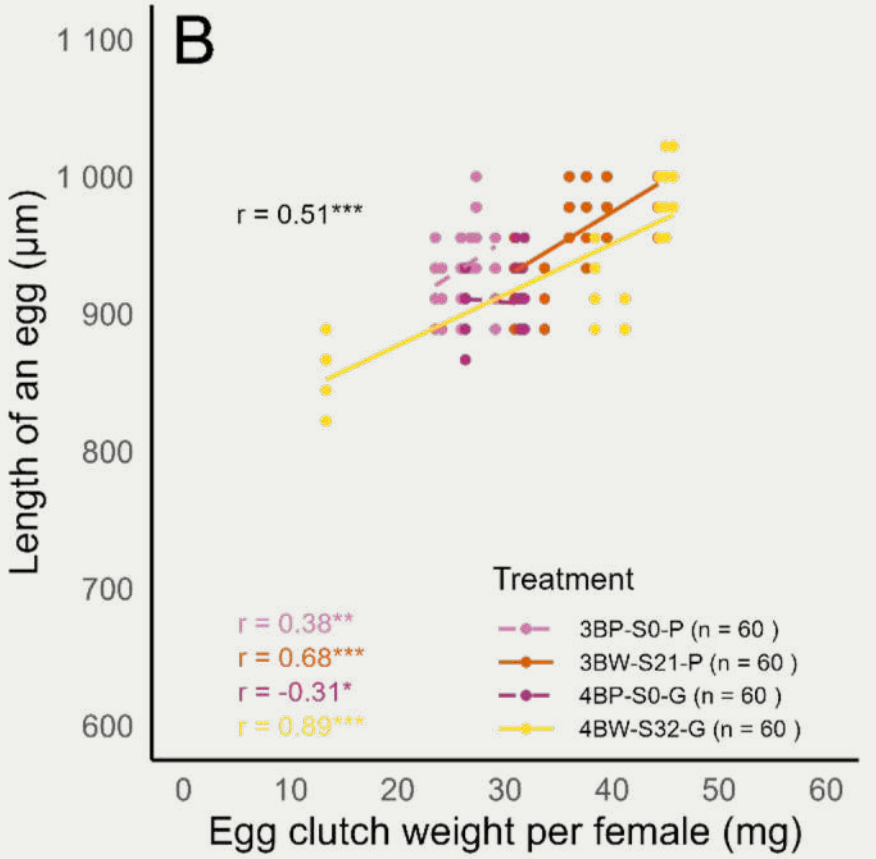
Bigger egg clutches also have longer(bigger) eggs

Black soldier fly eggs measured under a calibrated binocular



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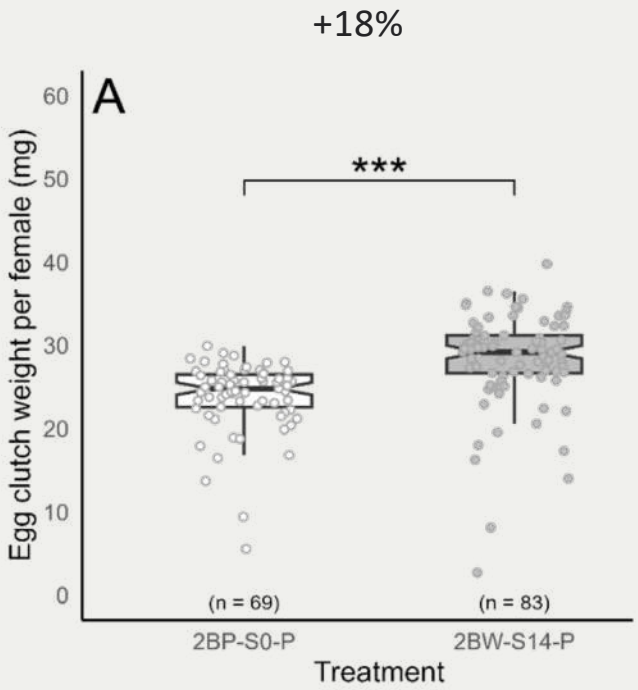
BW strain yielded heavier egg clutches



Statistical tests based on Wilcoxon rank sum test (*P<0.05;**P<0.01; ***P<0.001; ns: not significant).
Treatment indicates test ID, genetic line, generation selected for bodyweight and location of rearing history. n represents sample size per treatment.

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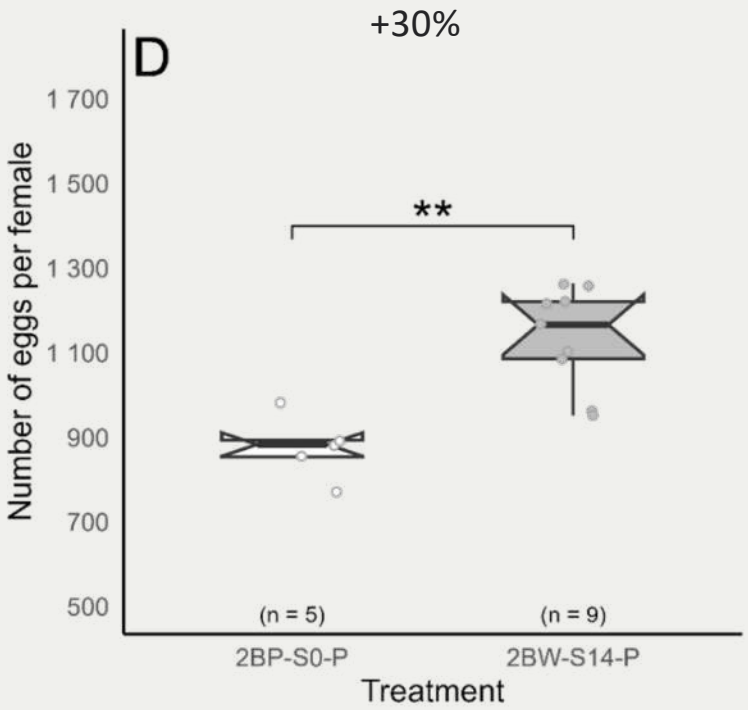
BW strain had more eggs



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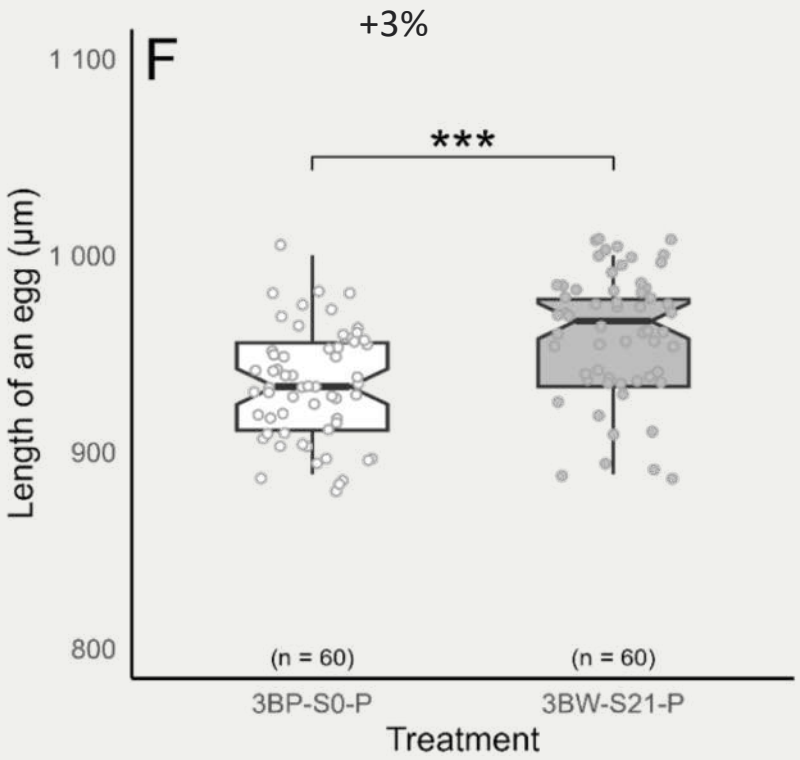
BW eggs were longer



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Treatment indicates test ID, genetic line, generation selected for bodyweight and location of rearing history. n represents sample size per treatment.

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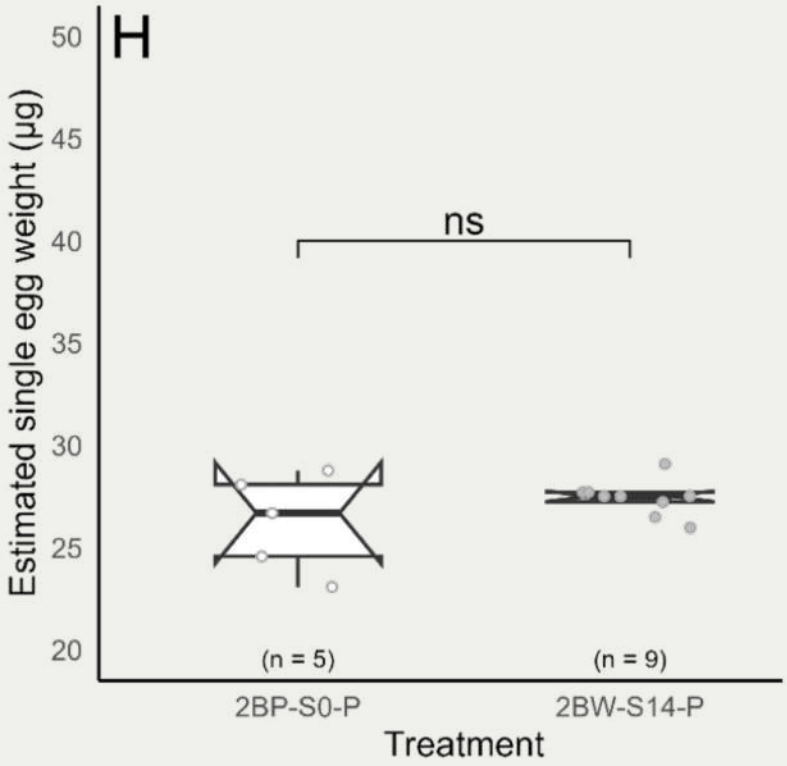
No difference in estimated single egg weight



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Major findings

- Maternal BW positively corelated with fecundity. Concurrent with other capital breeding insects
- Careful with generalizing fecundity based on egg clutch weight.
- No trade-off in clutch size and egg size.
- BW selection can bring dual benefits : Larval yield + egg yield

Future directions:

- Impact of BW Selection on fertility is unknown.
- We only show phenotypic relationship, no inferences can be made on genetic correlation

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