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THESSALY

The effect of adults' sex ratio on the reproductive output of *Tenebrio molitor*

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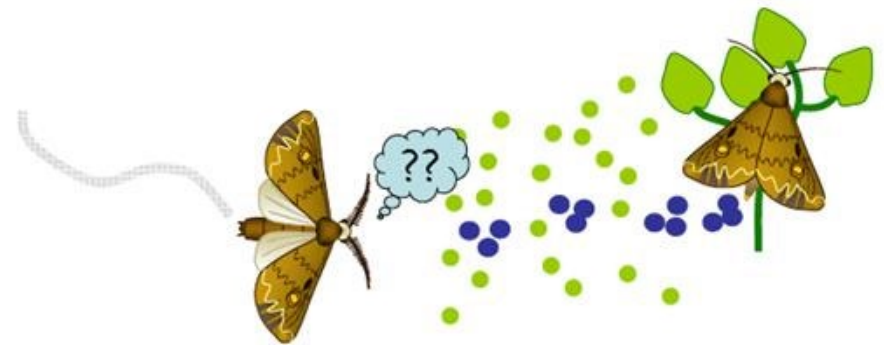
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Manipulating sex ratio of insect populations.



WHY?



What happens with other insect species?



JOURNAL ARTICLE

Effects of Adult Sex Ratio and Stocking Rate on Viable Egg Production of *Anopheles Albimanus* (Diptera: Culicidae)

[Get access >](#)

Donald L. Bailey, Ronald E. Lowe, Joyce E. F. Fowler, Dana A. Focks

Journal of Medical Entomology, Volume 17, Issue 6, 30 December 1980, Pages 563–566,

<https://doi.org/10.1093/jmedent/17.6.563>

Published: 30 December 1980



JOURNAL ARTICLE

Factors Affecting Reproduction of the Tobacco Budworm in the Laboratory

[Get access >](#)

Antonio A. Guerra, Dan A. Wolfenbarger, R. D. Garcia

Journal of Economic Entomology, Volume 65, Issue 5, 1 October 1972, Pages 1341–1343,

<https://doi.org/10.1093/jee/65.5.1341>

Published: 01 October 1972 **Article history** ▼

- ✓ The **supremacy of females** may be beneficial for the optimization of the **egg production**.

What happens with other insect species?



JOURNAL ARTICLE

Plodia interpunctella: Effect of Sex Ratio on Reproductivity

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John H. Brower

Annals of the Entomological Society of America, Volume 68, Issue 5, 15 September 1975,
Pages 847–851, <https://doi.org/10.1093/aesa/68.5.847>

Published: 15 September 1975 **Article history** ▼



[Full Access](#)

Effect of sex ratio at three densities on reproduction in laboratory colonies of *Delia* (= *Hylemya*) *antiqua* Meig

A. S. Robinson

First published: January/December 1980 | <https://doi.org/10.1111/j.1439-0418.1980.tb03504.x> |
Citations: 3

✓ The **male dominance** in a population is **more preferable**.

What happens with *T. molitor*?



JOURNAL ARTICLE

Polyandry in grain beetles, *Tenebrio molitor*, leads to greater reproductive success: material or genetic benefits? FREE

Bradley D. Worden , Patricia G. Parker

Behavioral Ecology, Volume 12, Issue 6, November 2001, Pages 761–767,

<https://doi.org/10.1093/beheco/12.6.761>

Published: 01 November 2001 **Article history** ▼

Females that mated four times to the **same male** laid more eggs and produced more larvae than females that mated only once.

Female biased sex-ratio
→ Females low reproductive effort

Male biased sex-ratio
→ increased the reproductive effort of females

[BMC Evol Biol.](#) 2020; 20: 18.

Published online 2020 Feb 3. doi: [10.1186/s12862-020-1586-x](https://doi.org/10.1186/s12862-020-1586-x)

PMCID: PMC6998128

PMID: [32013878](https://pubmed.ncbi.nlm.nih.gov/32013878/)

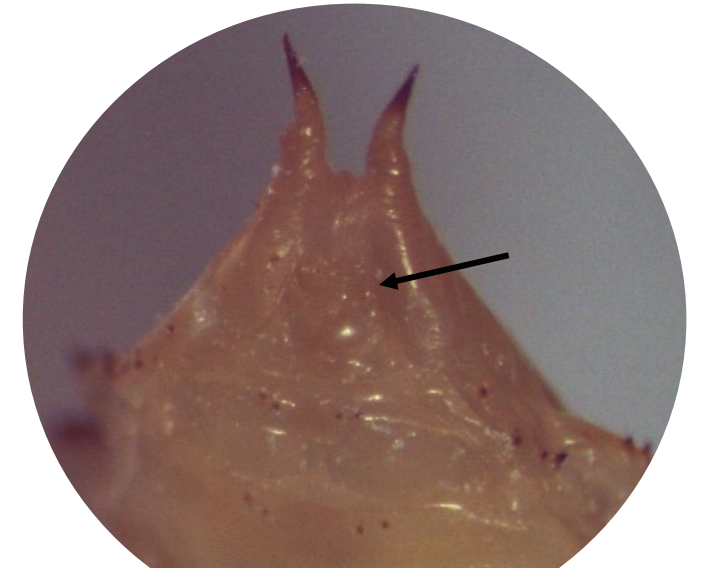
Sex-specific patterns of senescence in artificial insect populations varying in sex-ratio to manipulate reproductive effort

[Charly Jehan](#), [Manon Chogne](#), [Thierry Rigaud](#), and [Yannick Moret](#)

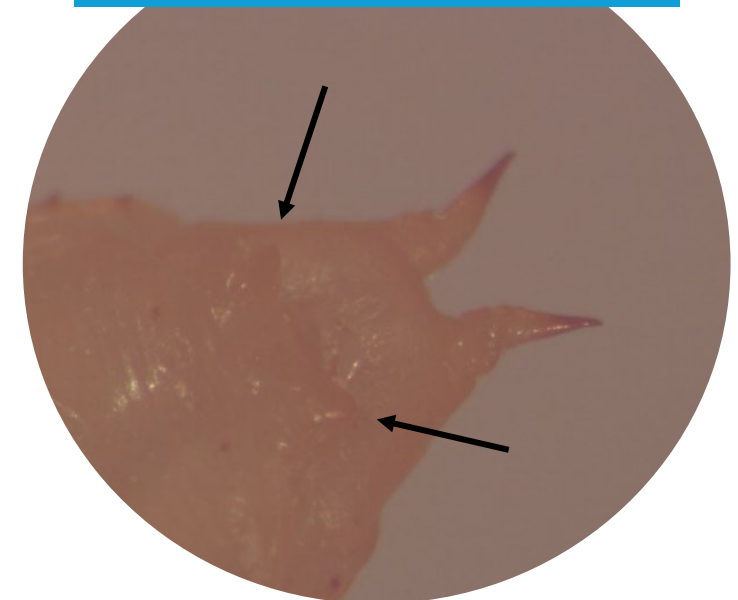
Methodology



Male & Female pupae
seperation



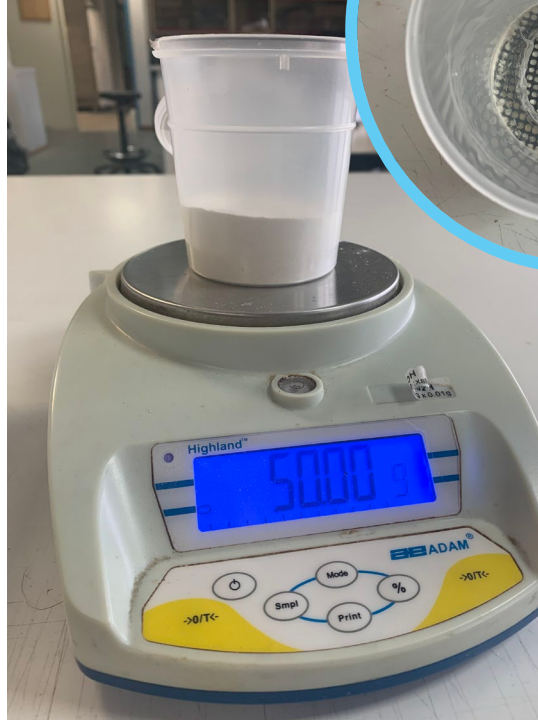
**Pupal abdominal
appendages**



Methodology



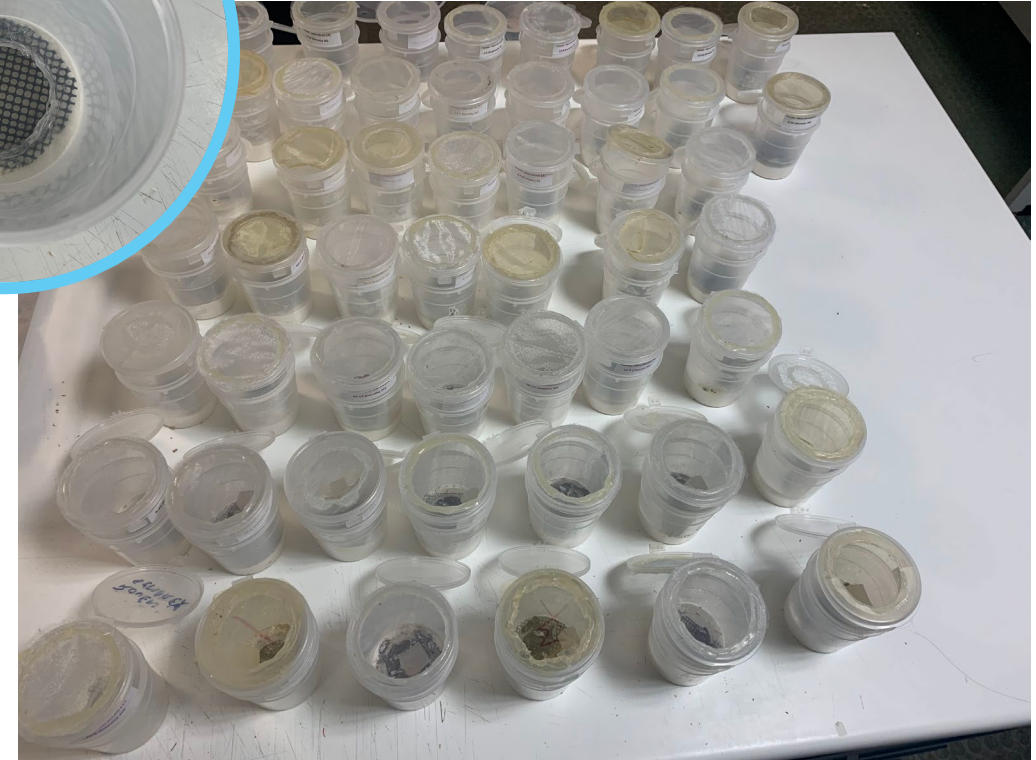
Labelling of female adults



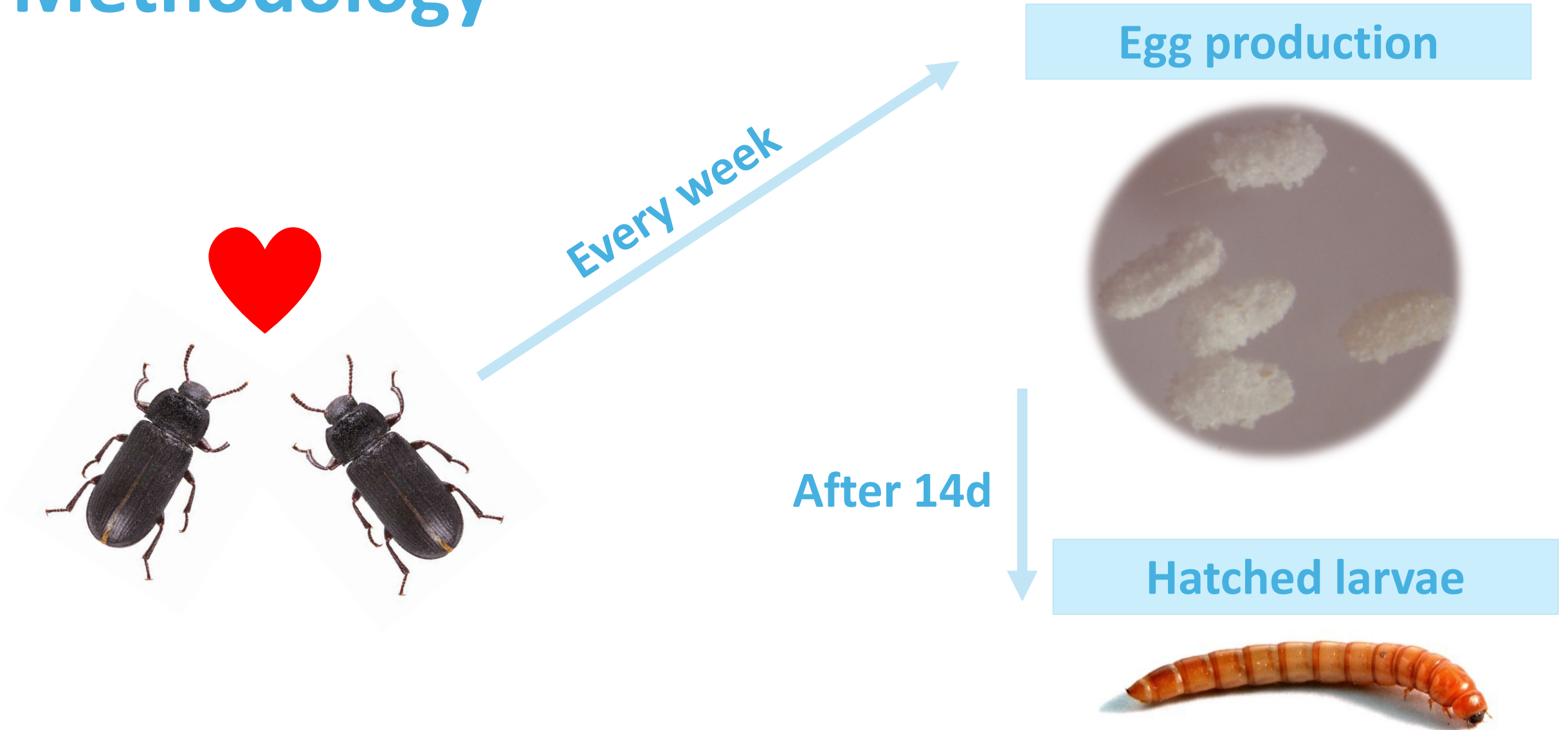
Flour
for oviposition



Sieve to separate adults from eggs



Methodology



Methodology

- ✓ **3 different sex ratios**
(50%, 60%, 80%)
- ✓ **3 different densities**
(10, 20, 30 adults/vial)

Methodology

Density: 10 adults/vial

Density	Sex ratio	Female:Male
C10	50%	5:5
A1	60%	4:6
B1		6:4
A2	80%	2:8
B2		8:2

Density: 20 adults/vial

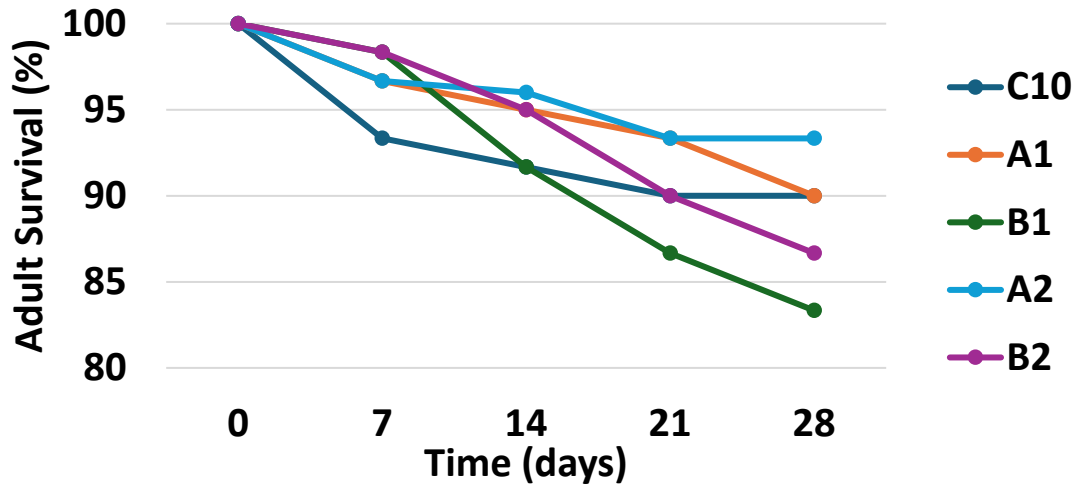
Density	Sex ratio	Female:Male
C20	50%	10:10
D1	60%	8:12
E1		12:8
D2	80%	4:16
E2		16:4

Density: 30 adults/vial

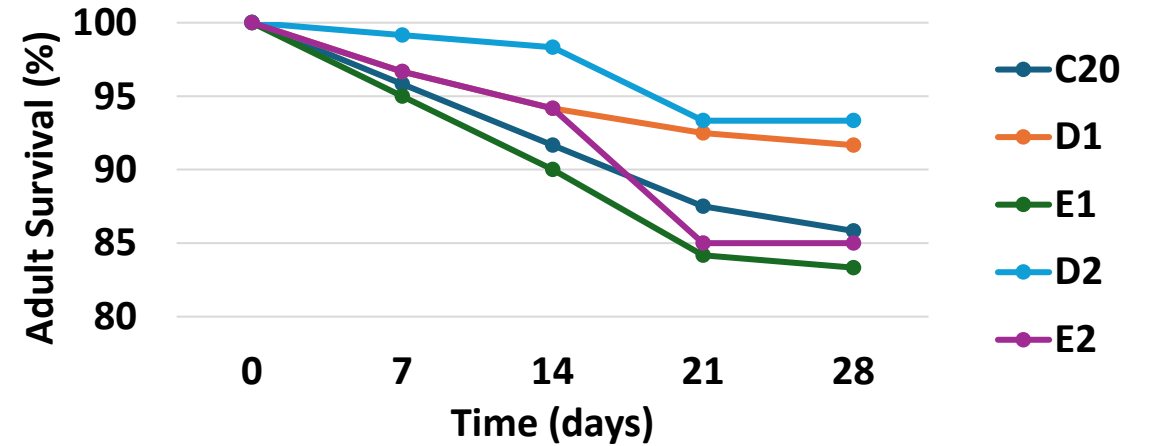
Density	Sex ratio	Female:Male
C30	50%	15:15
F1	60%	12:18
G1		18:12
F2	80%	6:24
G2		24:6

Results

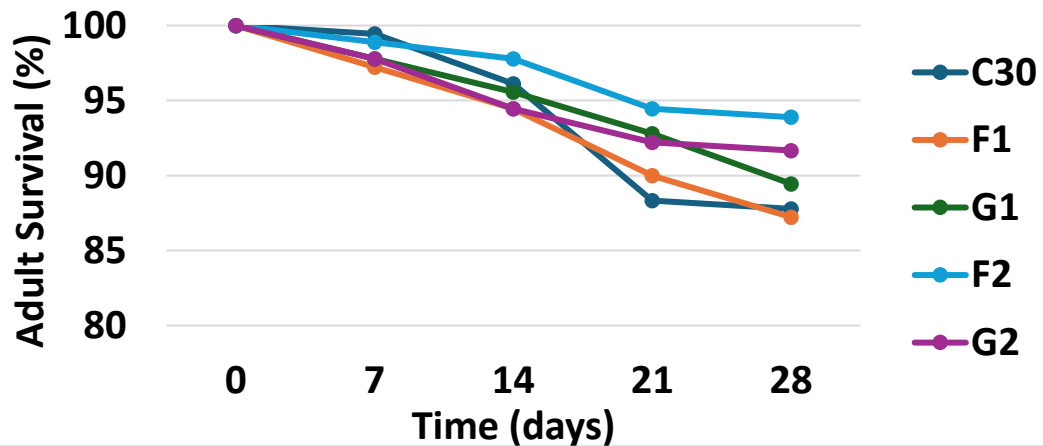
Density: 10 adults/vial



Density: 20 adults/vial

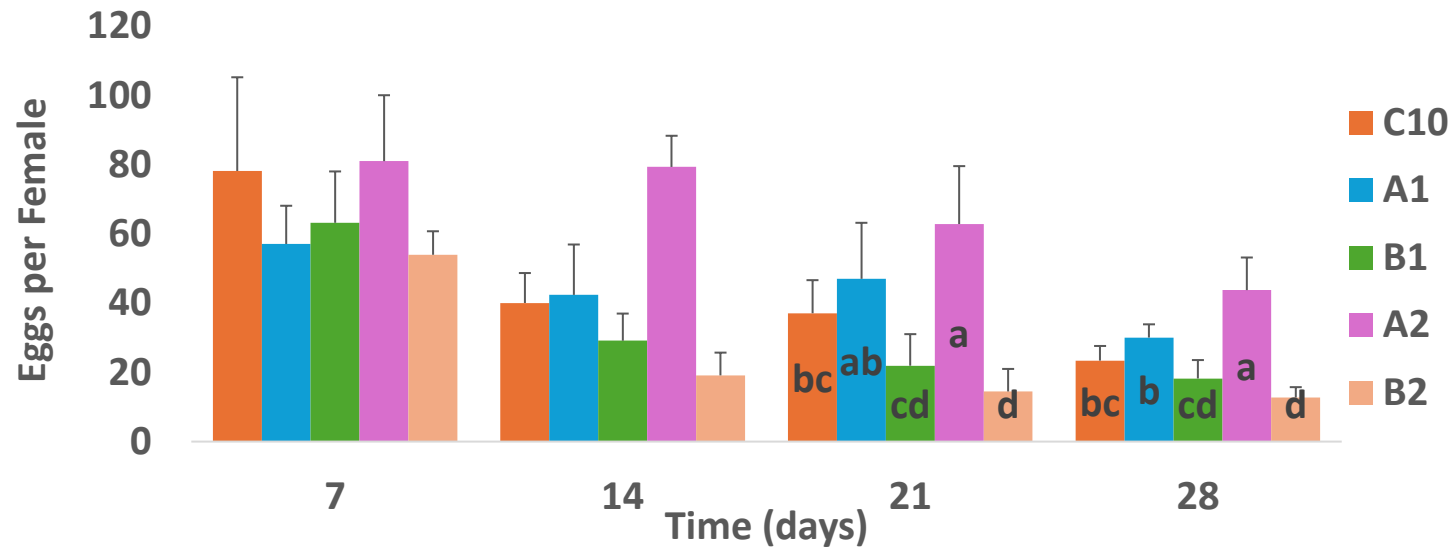


Density: 30 adults/vial

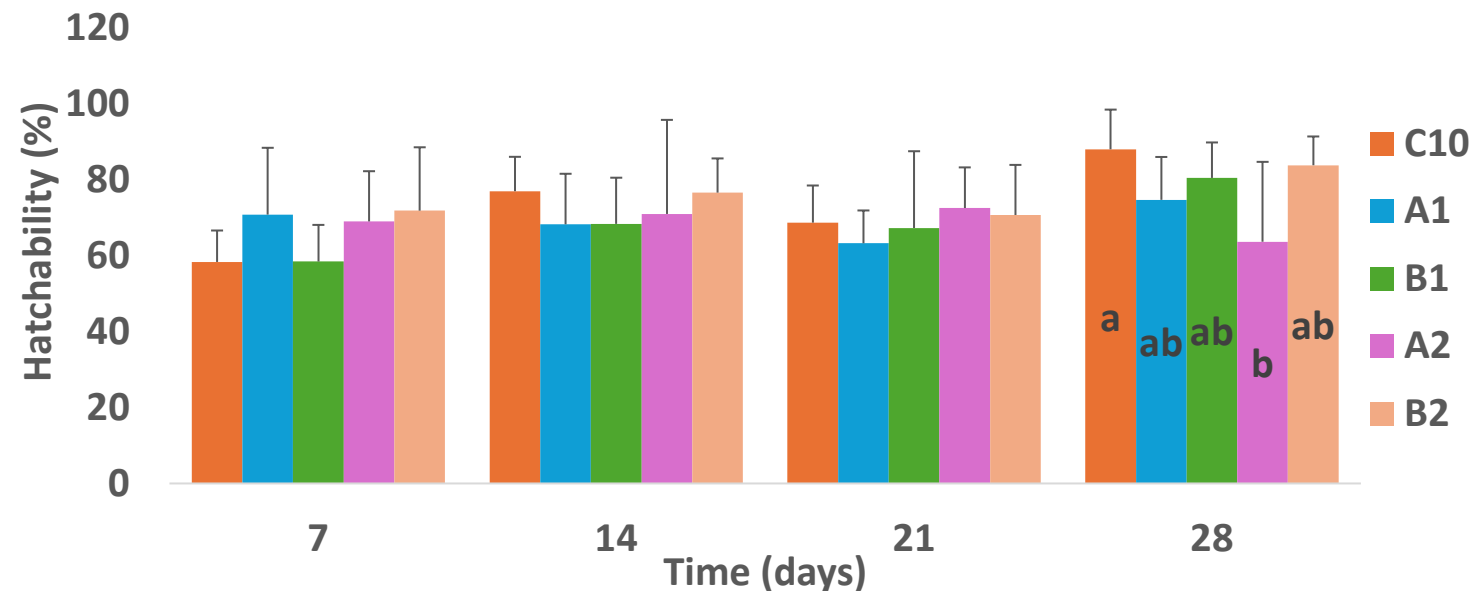


- Overall survival >80-85%
- No statistical differences

Results – Density: 10 adults/vial

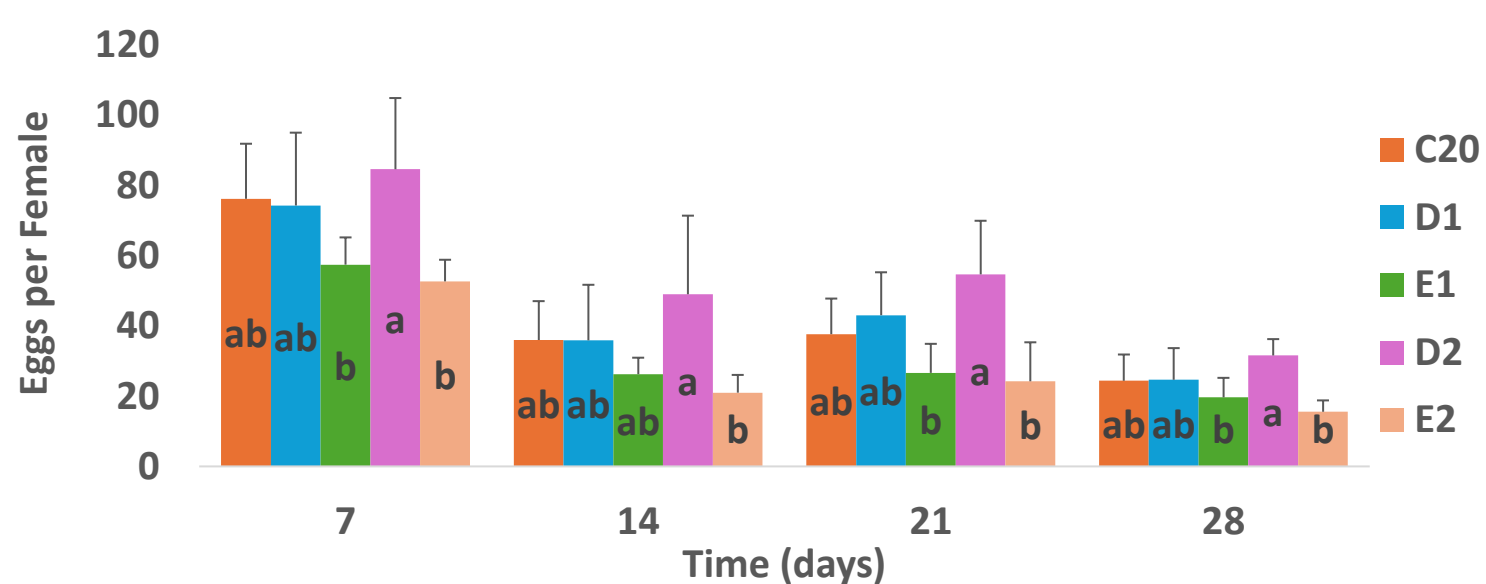


Density	Sex ratio	Female:Male
C10	50/50	5:5
A1	60/40	4:6
B1		6:4
A2	80/20	2:8
B2		8:2

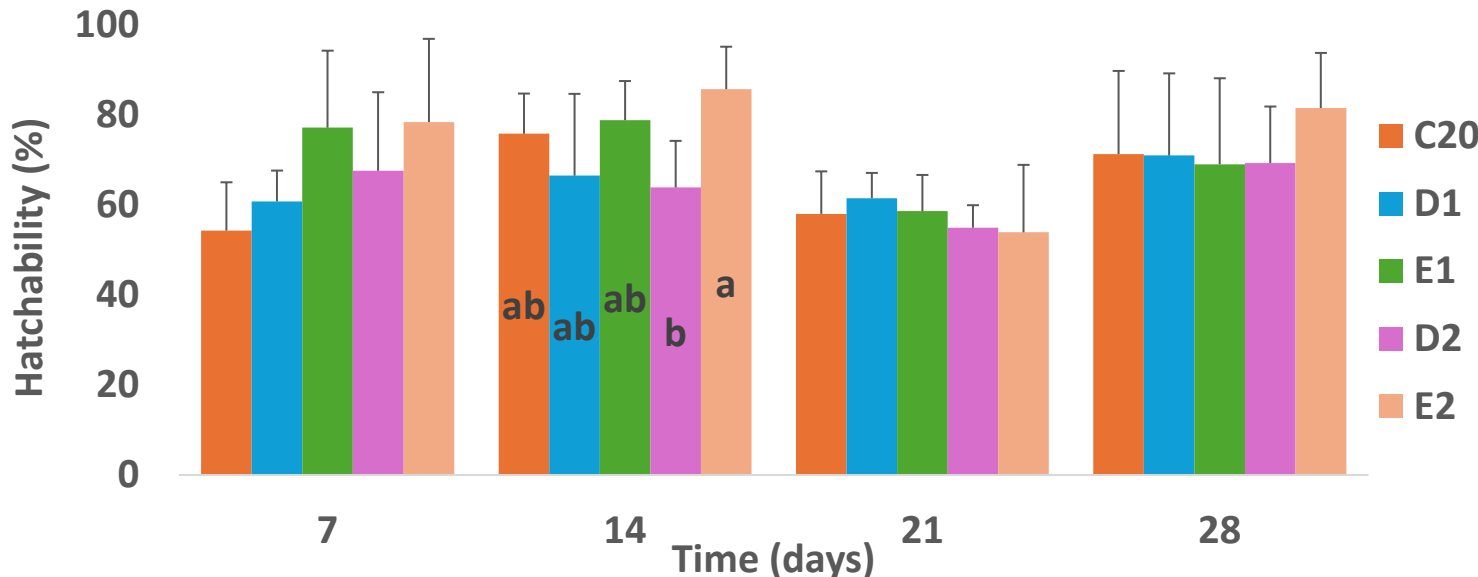


- **2:8 females:males**
more eggs after 21 d
- Differences in hatchability at 28 d

Results – Density: 20 adults/vial

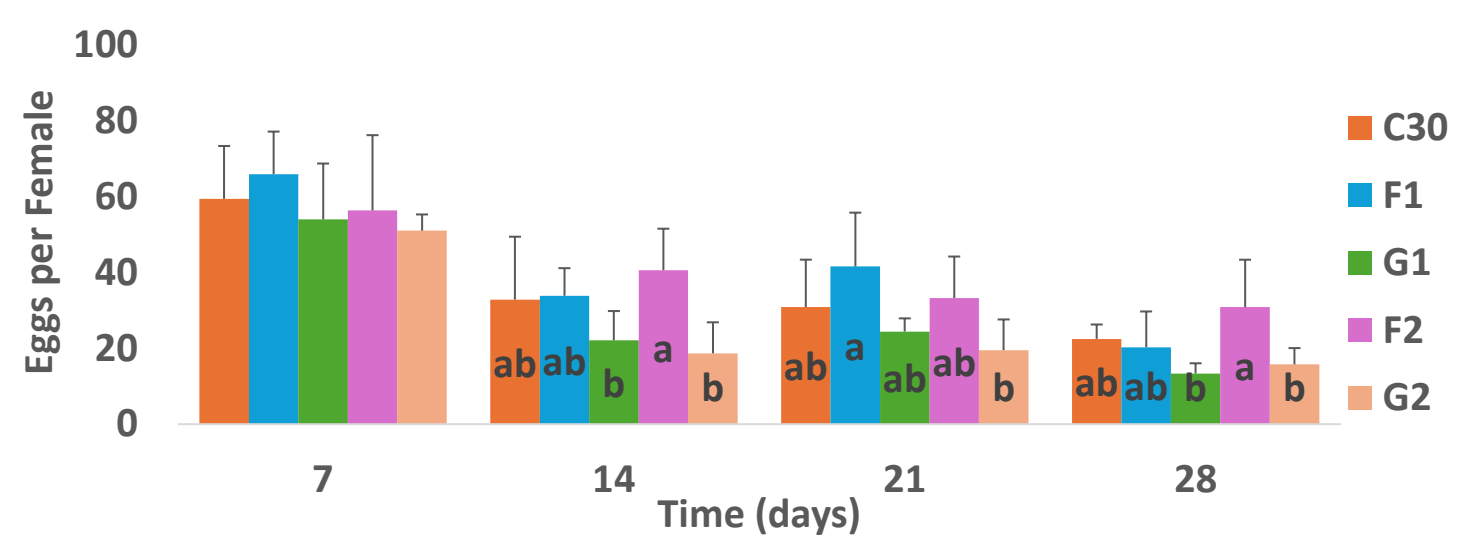


Density	Sex ratio	Female:Male
C20	50/50	10:10
D1	60/40	8:12
E1		12:8
D2	80/20	4:16
E2		16:4

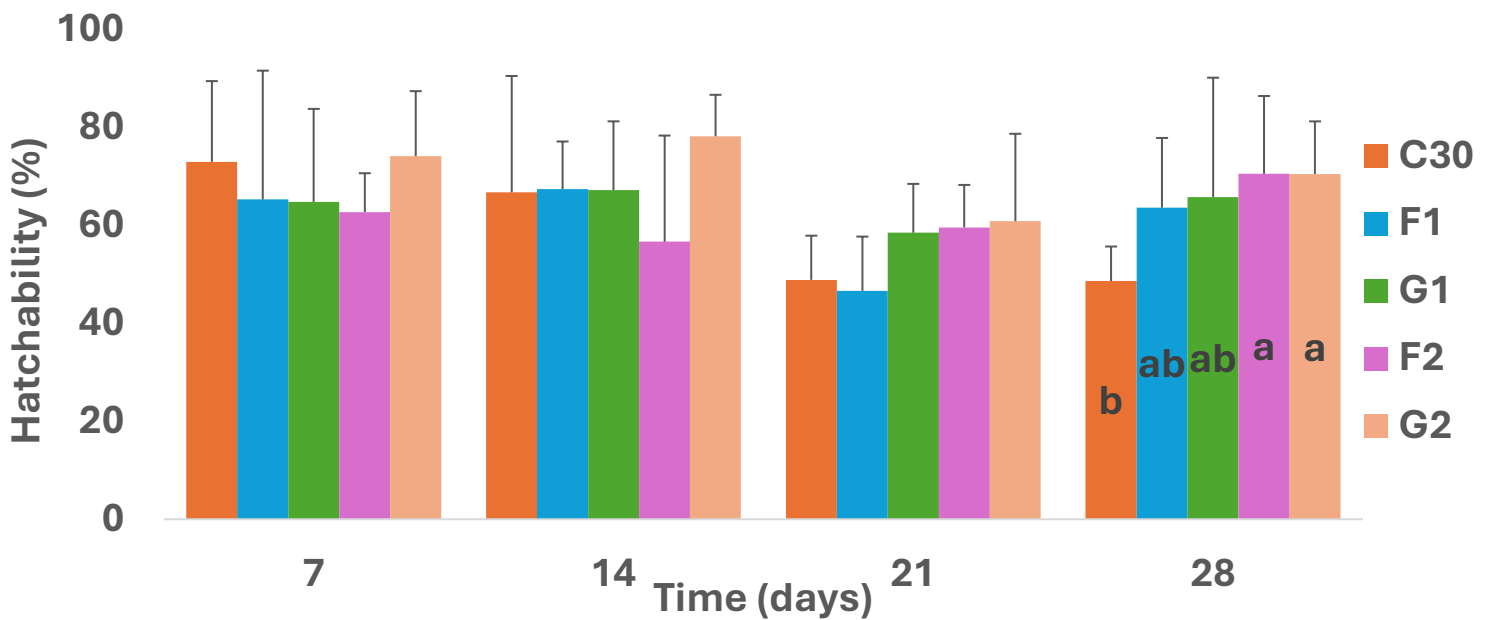


- **4:16 females:males** more eggs
- Differences in hatchability at 14 d

Results – Density: 30 adults/vial



Density	Sex ratio	Female:Male
C30	50/50	15:15
F1	60/40	12:18
G1		18:12
F2	80/20	6:24
G2		24:6



- **6:24 females:males** more eggs (14d & 28 d)
- Differences in hatchability at 28 d

Conclusions & Discussion

- ✓ **Survival was not affected** by different reproductive efforts

- ✓ **Egg oviposition**

Differences were more apparent

For all densities **20% females** oviposited more eggs

- ✓ **Hatchability:**

Differences **at the end** of the bioassay for 10 & 30 adults/vial

Differences **at 14 days** for 20 adults/vial



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Thank You!

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