

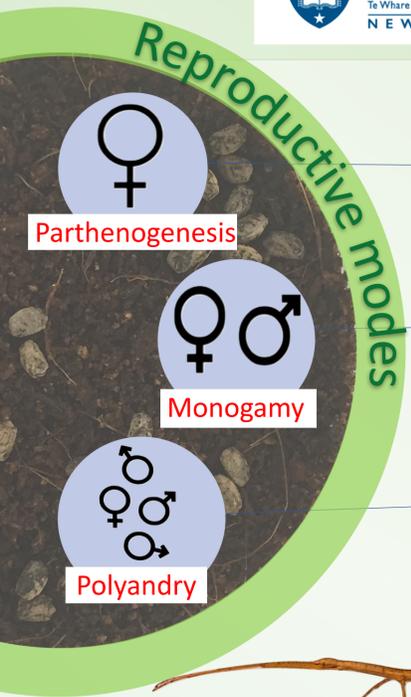
What are the advantages of mating once, many times or not at all?

Facultative parthenogenesis in the common New Zealand stick insect



Morgane Merien, Greg Holwell
School of Biological Sciences, The University of Auckland
morganemerien@gmail.com

School of Biological Sciences



QUESTION: 1
What are the costs and benefits of different reproductive modes within the same species?



BACKGROUND:

The origin of sex represents an evolutionary paradox. According to theory, asexual reproduction should be more common than sexual reproduction, due to the intrinsic two-fold reproductive advantage that occurs from the lack of males. But, sex appears to be more widespread [1-2].

Why? What are the advantages?

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AIM:

Investigate and compare different reproductive modes and their potential adaptive significance (costs + benefits) within one study organism.

WHY?

- Never been done before!
- Provide information on the biology of native stick insect
- Elucidate on the evolution of sex

How?

Our stick insect is special! It is a facultative parthenogen. Females can reproduce either sexually or asexually, presenting us with an ideal study system! [3]

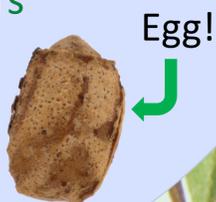
What did we do?

METHOD: Mating treatments! 3

	Treatment 1: Parthenogenetic (n= 20 females)	Females separated into individual enclosures and left alone
	Treatment 2: Monogamy (n= 20 females, 20 males)	Females separated into individual enclosures and mated to one male
	Treatment 3: Polyandry (n= 20 females, 60 males)	Females separated into individual enclosures and mated to three males sequentially

From mating treatments, we compare:

- survivorship of mothers
- number of eggs
- mass of eggs
- egg-laying rate
- hatching success
- offspring fitness



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Conclusion:

- Survivorship differs between reproductive modes. Females that have sex suffer from higher mortality. But, egg number does not differ significantly.

Implication: Understanding the behaviour of native NZ species will inform its conservation and help answer a major theoretical question in evolutionary biology!

4 Preliminary results:

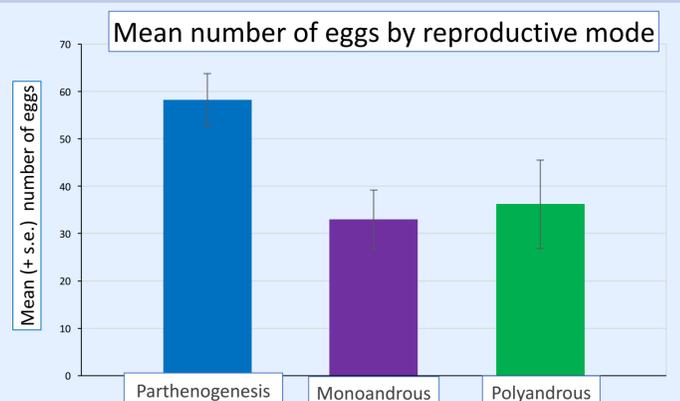


Figure 1. The mean cumulative egg production of females in each treatment group.

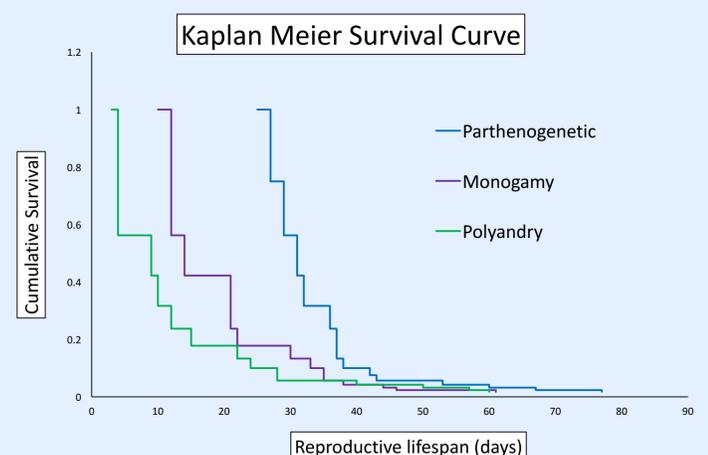


Figure 2. The survival curves for females in each treatment.