

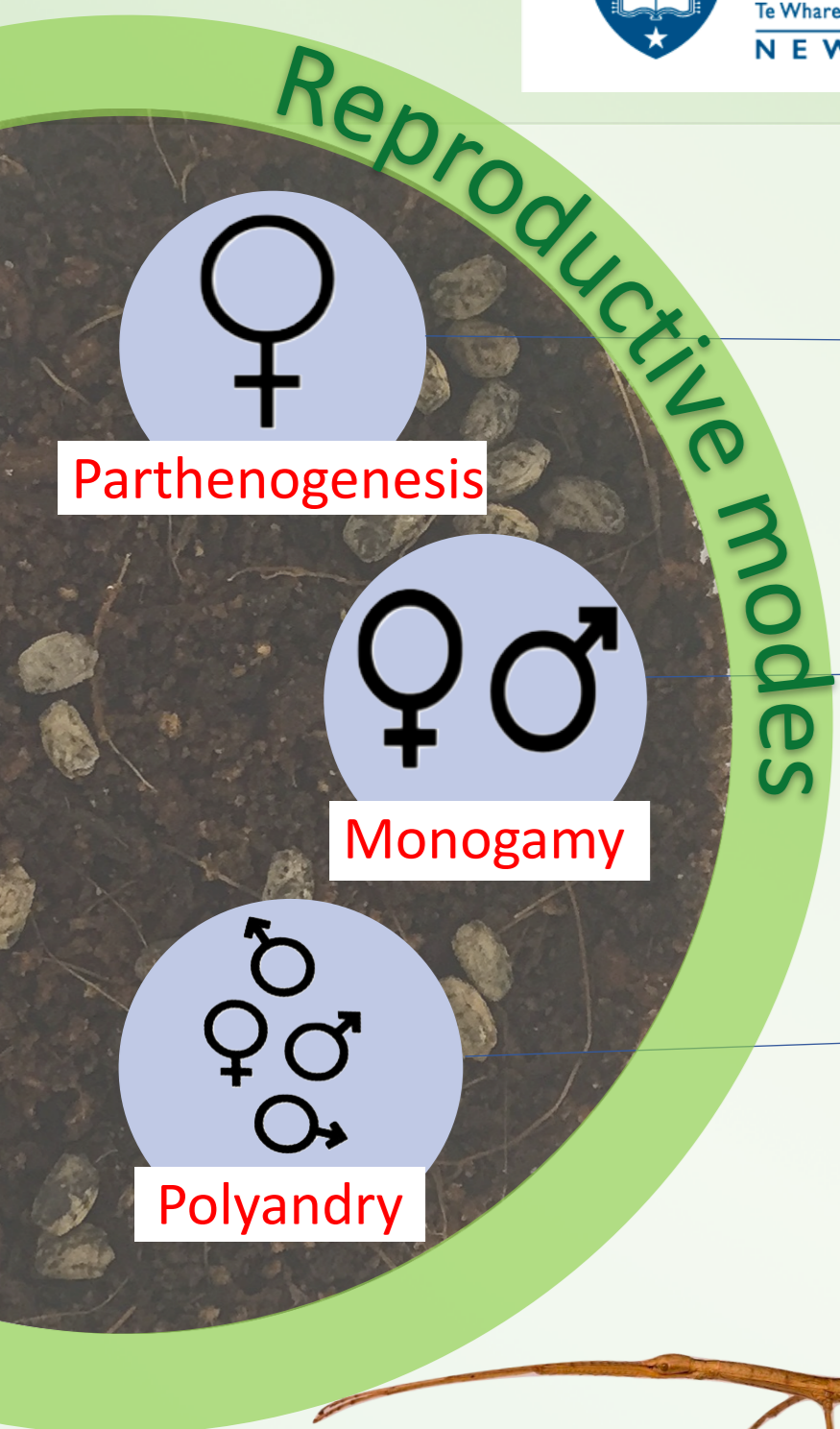
# What are the advantages of mating once, many times or not at all?

## Facultative parthenogenesis in the common New Zealand stick insect

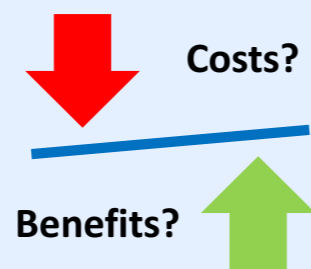


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**QUESTION: 1**  
What are the costs and benefits of different reproductive modes within the same species?



### 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?**

### 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]

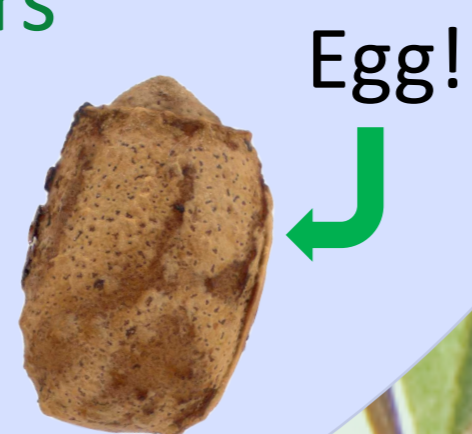
### What did we do?

### METHOD: Mating treatments! 3

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

From mating treatments, we compare:

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



### 4 Preliminary results:

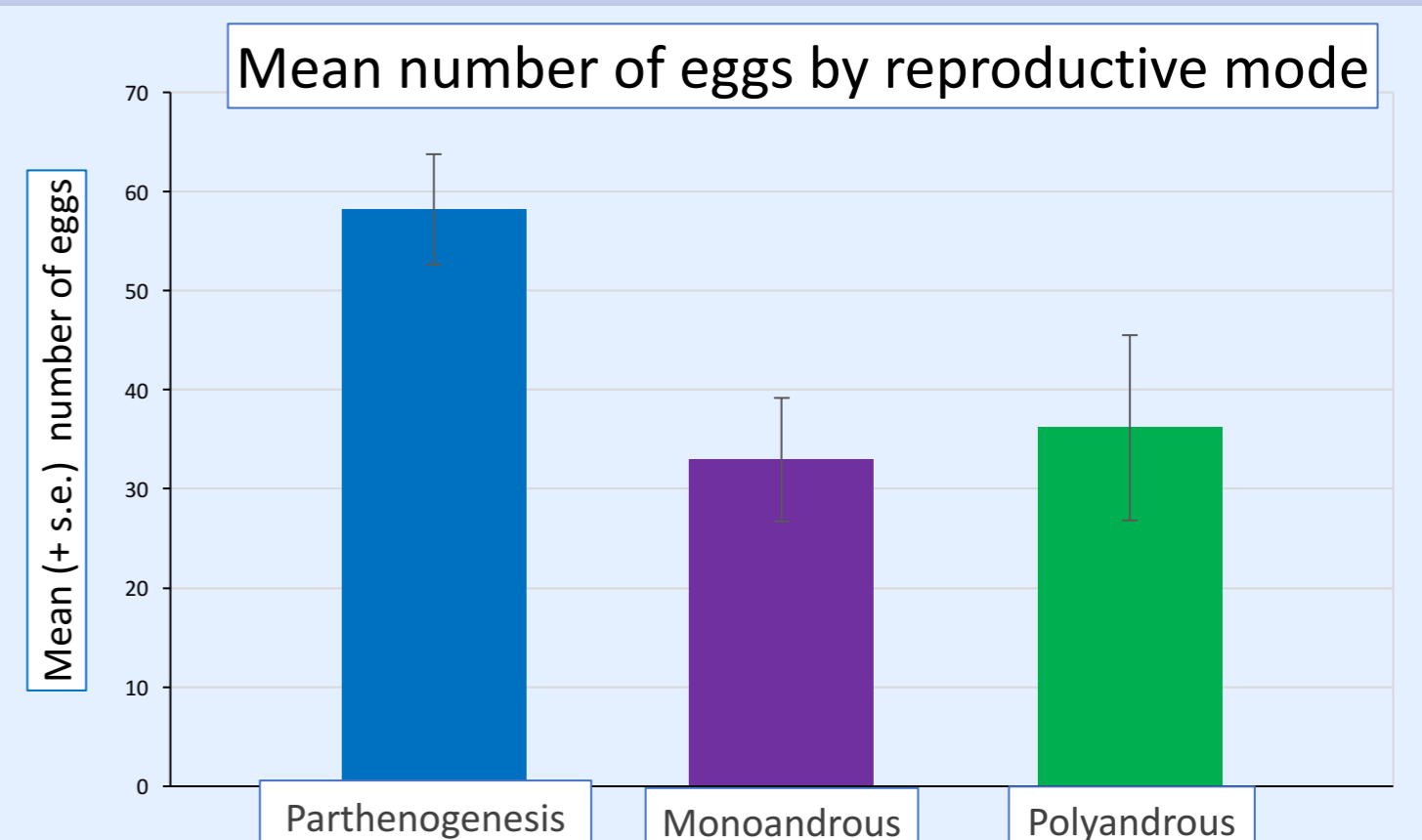


Figure 1. The mean cumulative egg production of females in each treatment group.

### 5

### 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!

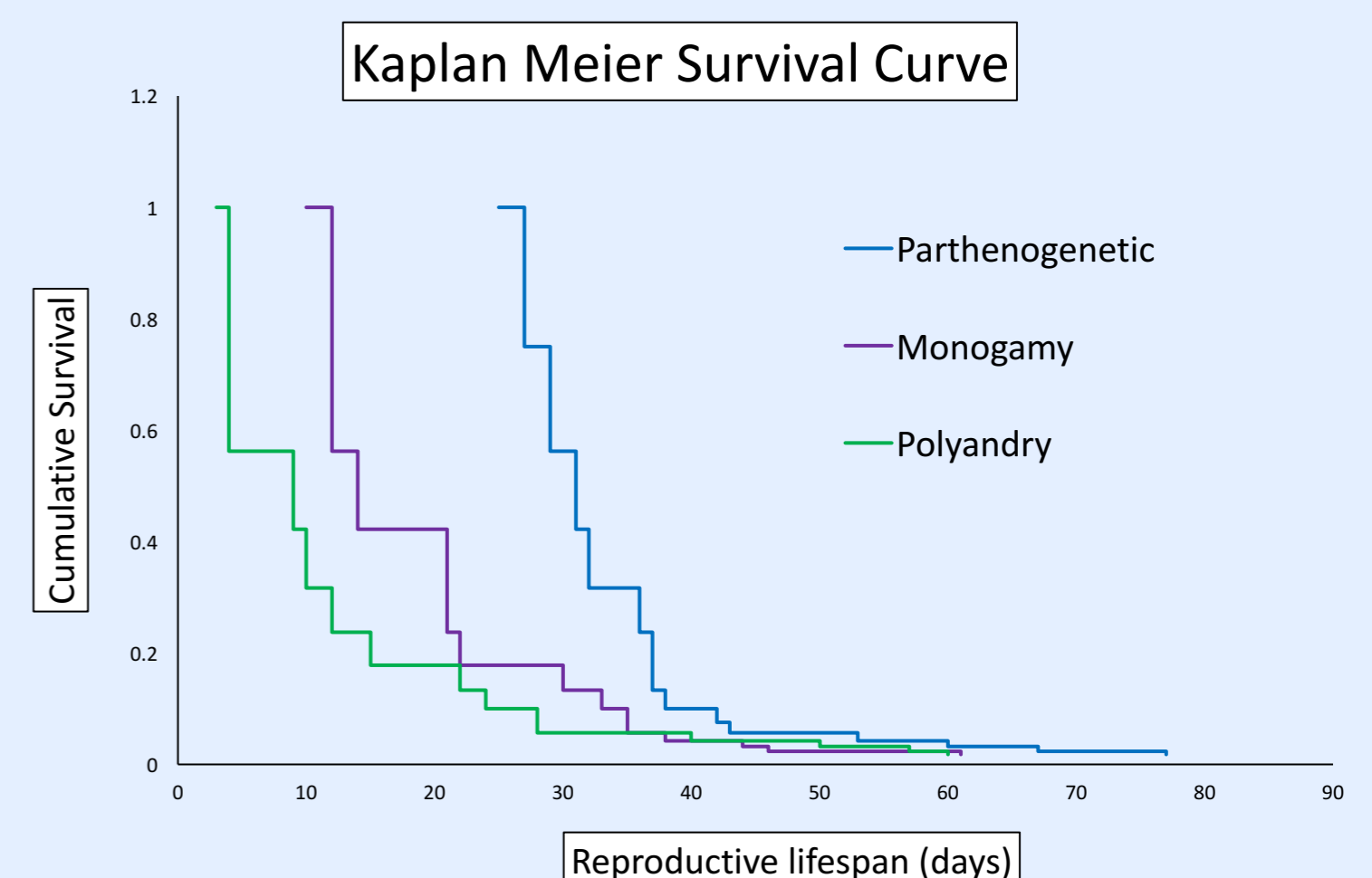


Figure 2. The survival curves for females in each treatment.