

# Biological parameters of *Aganaspis daci* (Hymenoptera: Figitidae) on the olive fly, *Bactocera oleae* (Diptera: Tephritidae)

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## Introduction

The olive fruit fly, *Bactocera oleae* (Diptera: Tephritidae), is a major pest of the olive crop in Greece and throughout the Mediterranean Sea. In this study, we explored the possibility of using the endoparasitoid *Aganaspis daci* (Hymenoptera: Figitidae) as a biological control agent against *B. oleae*.



## Material and Methods

*Aganaspis daci* adults were obtained from a laboratory colony maintained on *Ceratitis capitata* as a host species (25 ± 1°C, 60 ± 10% RH, 14L:10D).

Five days old *A. daci* adults (10 ♀♀ and 10 ♂♂) (without previous oviposition experience) were allowed to parasitize 3<sup>rd</sup> instar larvae of *B. oleae* for 1.5 h. Then, *B. oleae* pupae were transferred at four different constant temperatures (15, 20, 25 and 30 ± 1°C) until adult emergence. For each temperature, we run five replicates of 50 *B. oleae* larvae



We recorded: a) survival and developmental duration of immature stages, ii) sex ratio, and iii) body size traits (left hind tibia length, wing width, ovipositor length).

*Aganaspis daci* adults were allowed to parasitize on 400 *B. oleae* larvae, which remained at 25 ± 1°C until adult emergence. One newly emerged *A. daci* male and one female were placed on individual plastic tube provided with water and *ad libitum* sugar and honey, and then transferred at four constant temperatures (15, 20, 25 and 30 ± 1°C). Adult mortality was daily recorded. We run 32-35 replicates for each treatment.



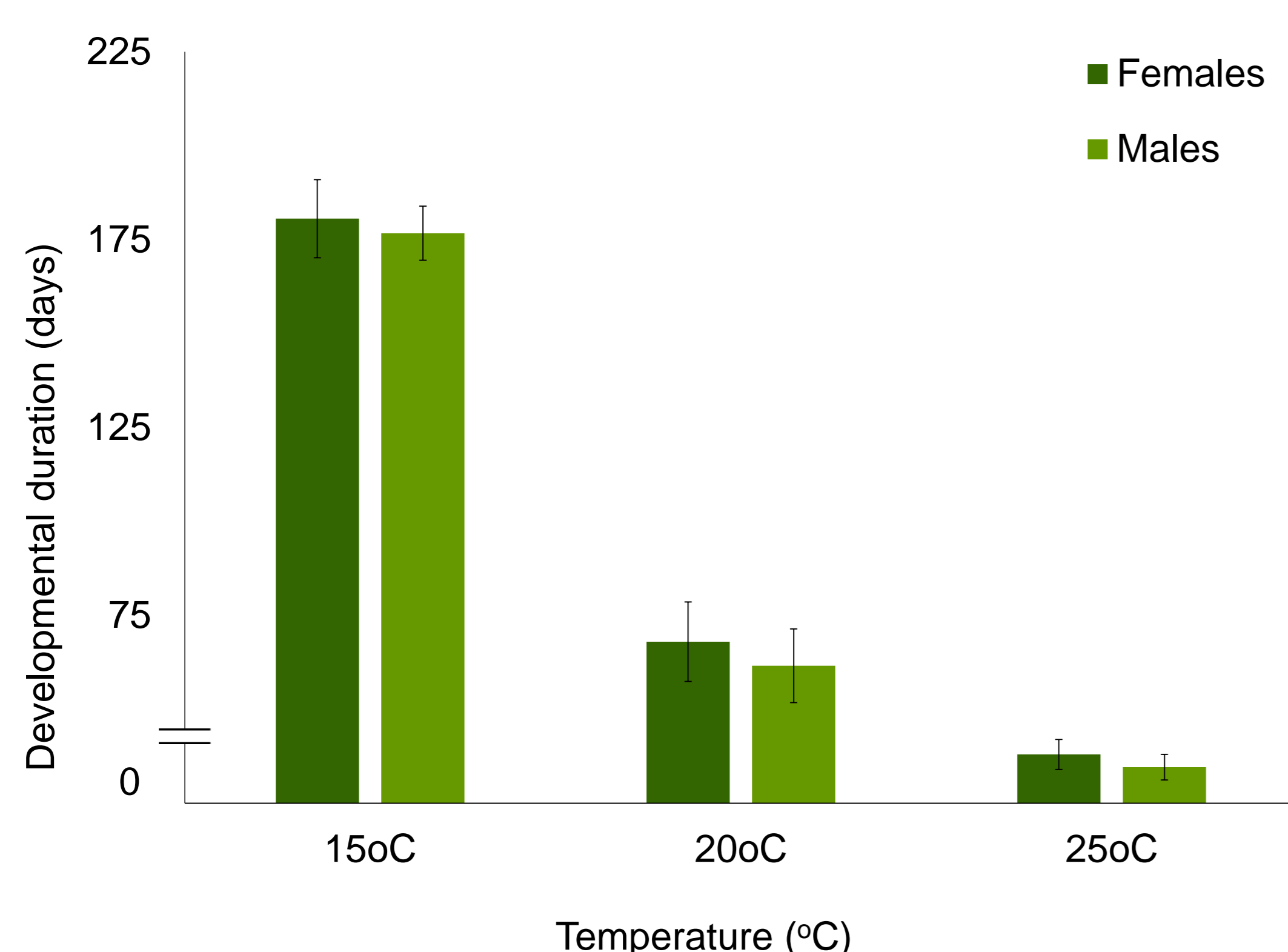
## Results

### 1. Survival and development

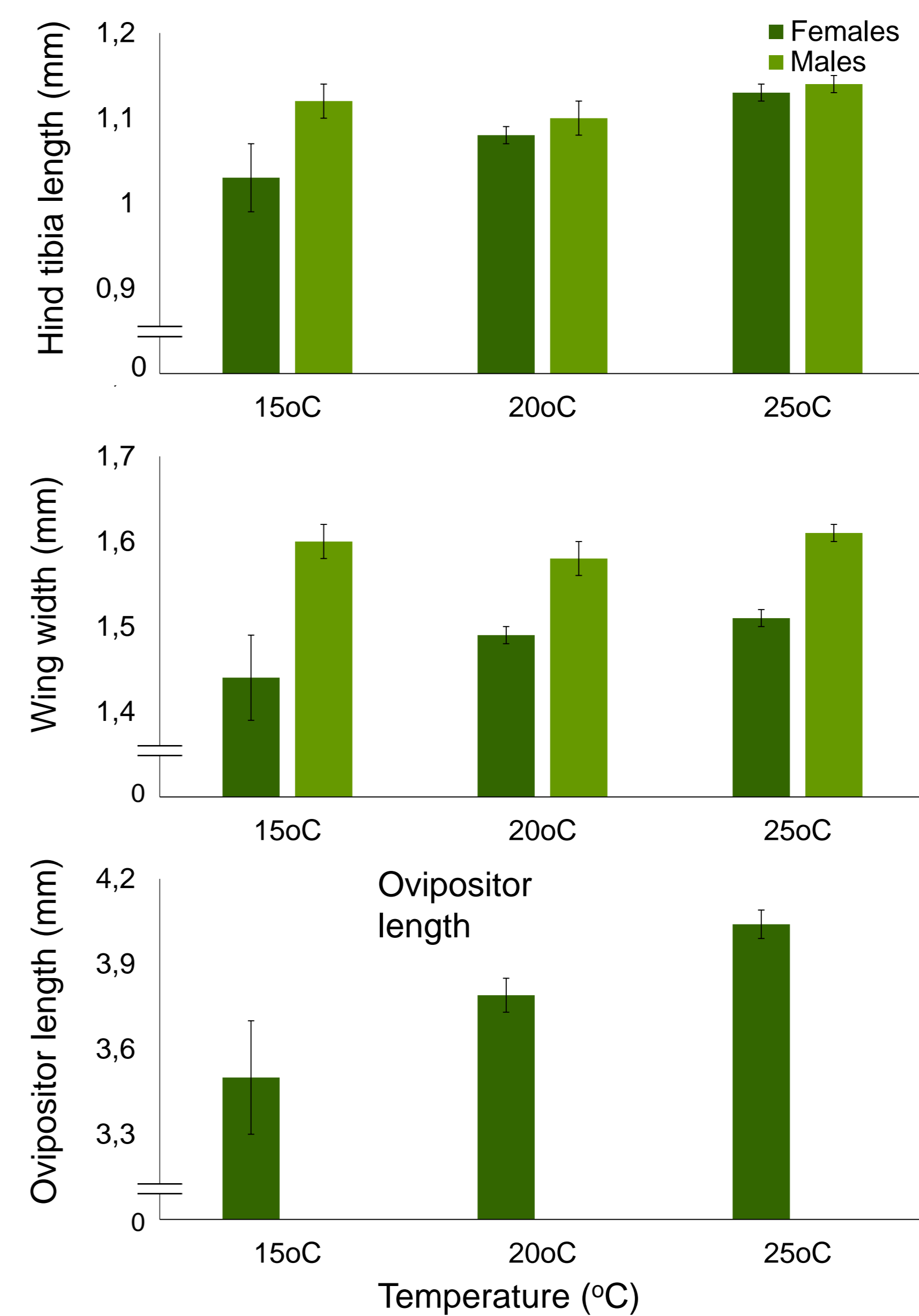
Results showed that immature survival rates were high at 25°C and 20°C (45-60%), as opposed to 15°C (<3%) and 30°C (0%).

Sex ratio of parasitoid progeny was female biased at 25°C. The proportion of females slightly decreased with temperature decrease.

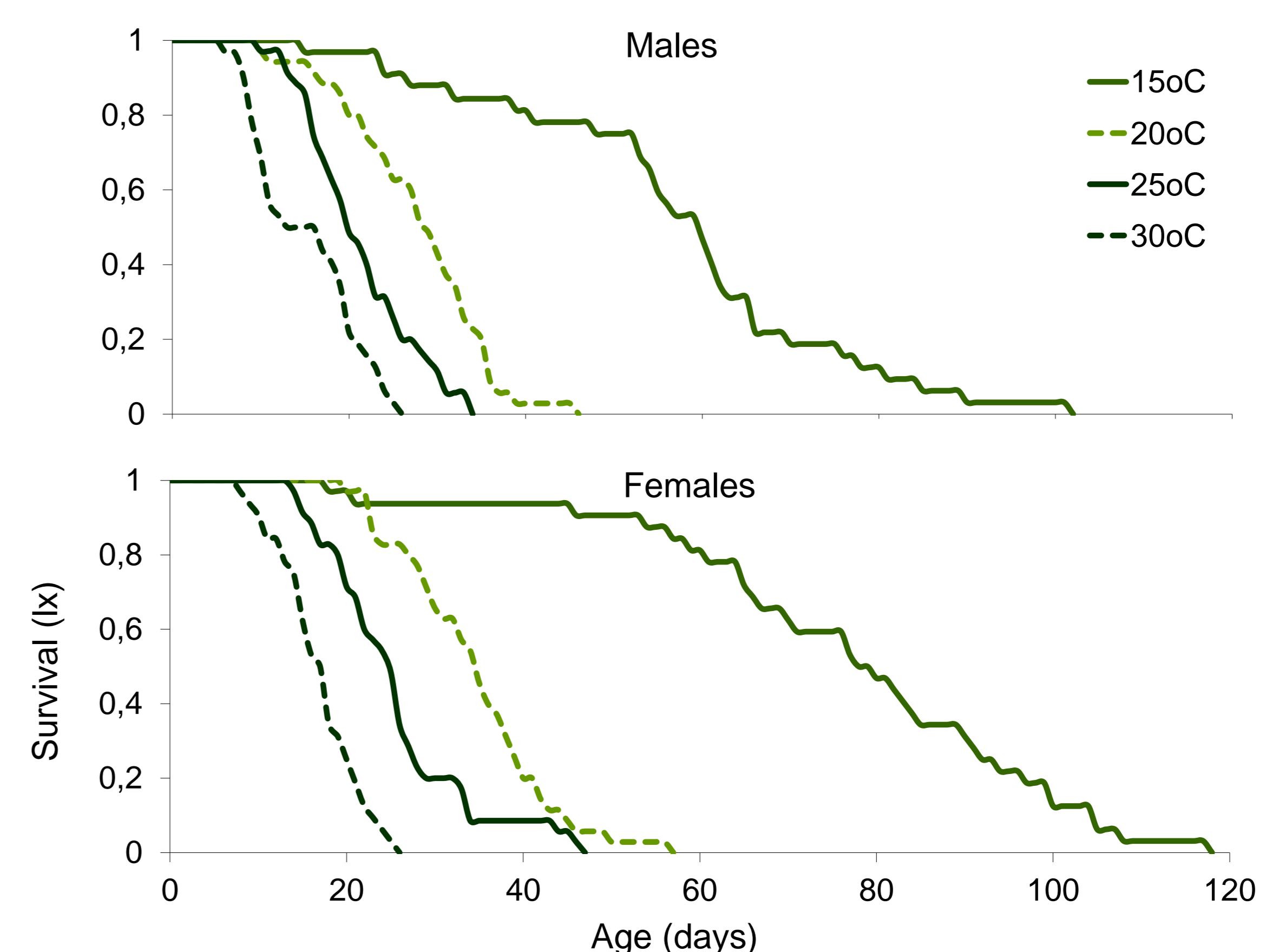
Average, egg to adult developmental duration ranged from 34.6 to 176.7 days for males and from 38.0 to 180.6 days for females reared on *B. oleae* larvae at 15°C, 20°C and 25°C.



### 3. Body size traits



### 4. Adult longevity



## Conclusions

- ✓ Survival rates were high at 20°C and 25°C. No *A. daci* emerged at 30°C.
- ✓ The duration of developmental period was long at 15°C, as opposed to 20°C and 25°C.
- ✓ Sex ratio was not significantly affected by rearing temperature.
- ✓ Hind tibia length and ovipositor length were increased with temperature increase. Males had bigger wings than females.
- ✓ Adult longevity was significantly affected by temperature and sex. Adults live longer at 15°C while females lived longer than males.

## Acknowledgement

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