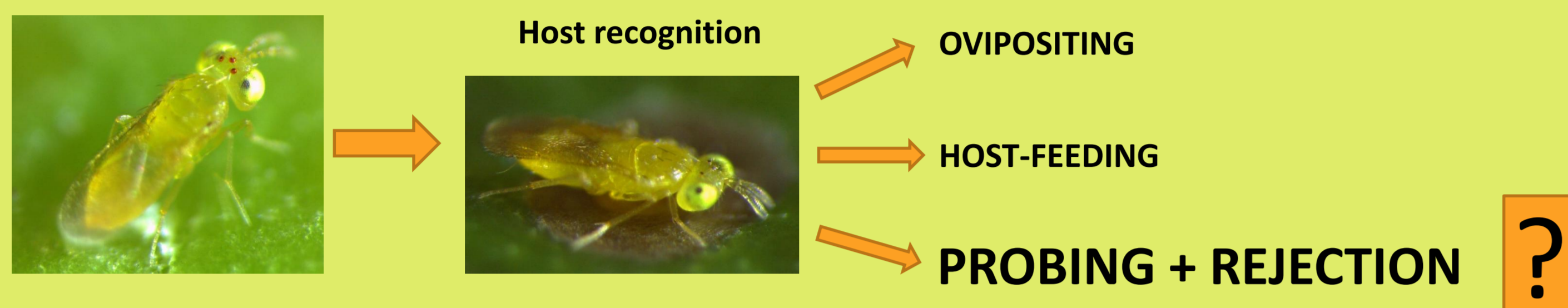


Introduction

- Parasitoid females probe their host with the ovipositor and sometimes they reject the host after probing.
- The frequency of these probes and their effects on the mortality and fitness of the surviving hosts have never been studied.
- Study system:** *Aphytis melinus* DeBach and *A. chrysomphali* (Mercet) (Hymenoptera: Aphelinidae) are the main parasitoids of *Aonidiella aurantii* (Maskell) (Hemiptera: Diaspididae). *A. melinus* has displaced the native parasitoid *A. chrysomphali* in the Mediterranean Basin.



- Objective:**
 - Determine and compare the frequency of probing.
 - Determine the effect of probing on the mortality and fitness of the host.

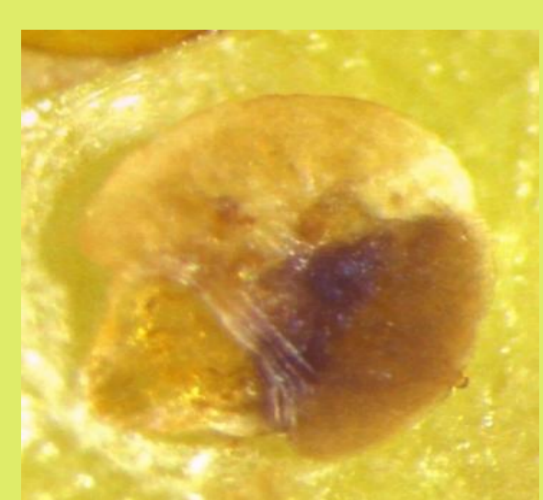
Material and methods

Parasitoid behaviour



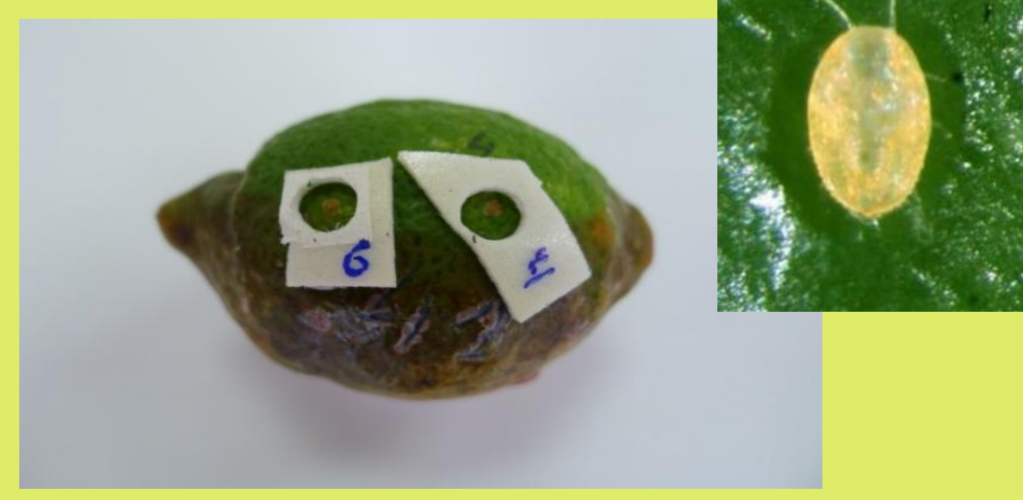
Effect of probing on host

Mortality



Mortality of probed and non-probed hosts (control).

Fecundity



Fecundity of probed and non-probed hosts (control) measured as offspring per surviving female.

RESEARCH HIGHLIGHTS

- Probing is more frequent than host-feeding and it is host instar mediated.
- Mortality caused by probing is higher than that caused by host-feeding.
- For the first time**, we demonstrate that probing by parasitoids reduce the fecundity of the surviving hosts.

Results

Parasitoid behaviour

- Probing was common in both parasitoids. They probed and rejected at least one host per patch (Fig. 1 and Fig. 2).
- Parasitoids probed 3rd instar hosts more frequently than host-fed on them (*A. melinus*: $F_{1,68} = 14.85$; $P < 0.001$; *A. chrysomphali*: $F_{1,46} = 51.43$; $P < 0.001$) (Fig. 2).

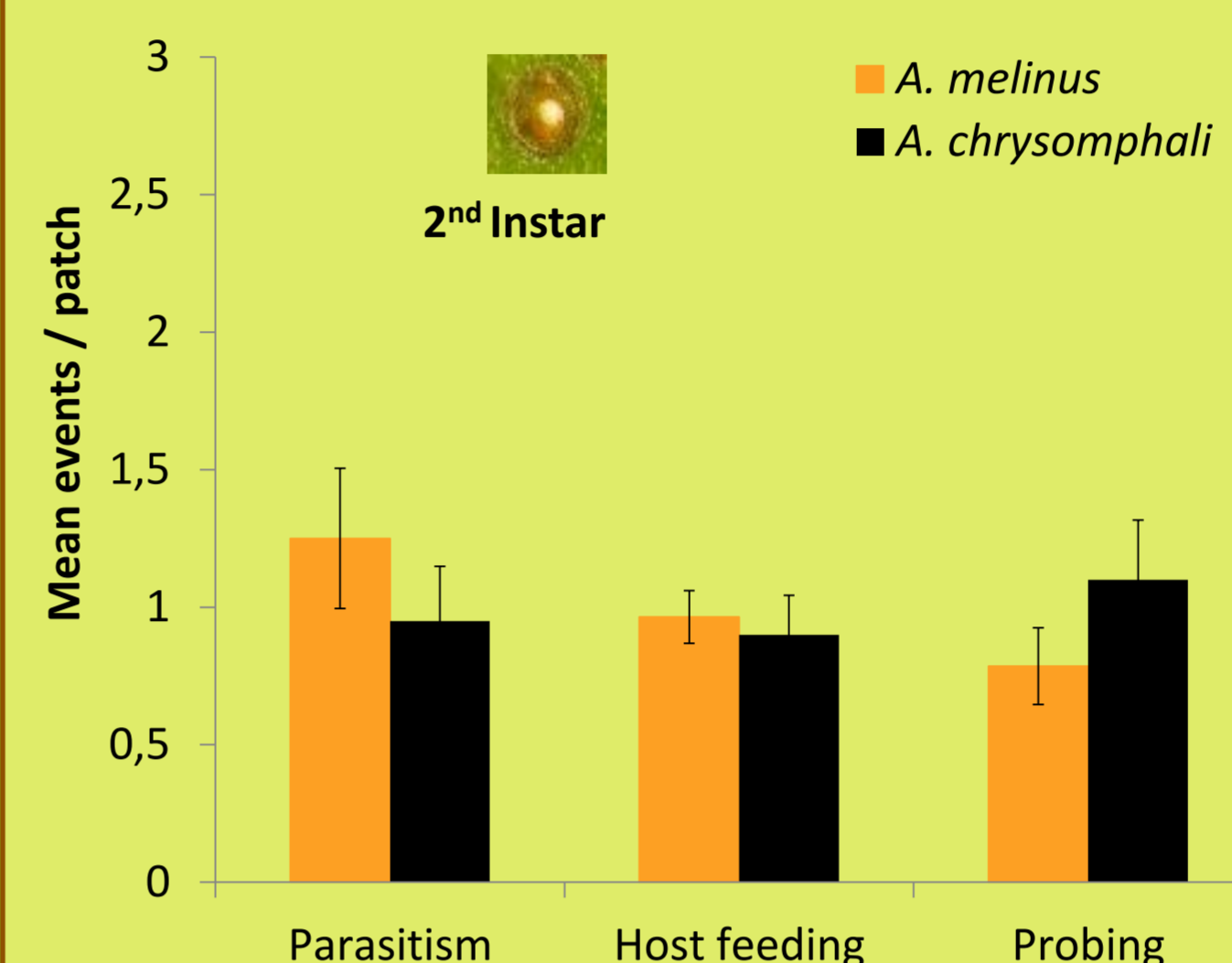


Fig. 1. Behavioral events (mean \pm SE) of the parasitoids *A. melinus* and *A. chrysomphali* in a patch with ten second instars of their host *A. aurantii*.

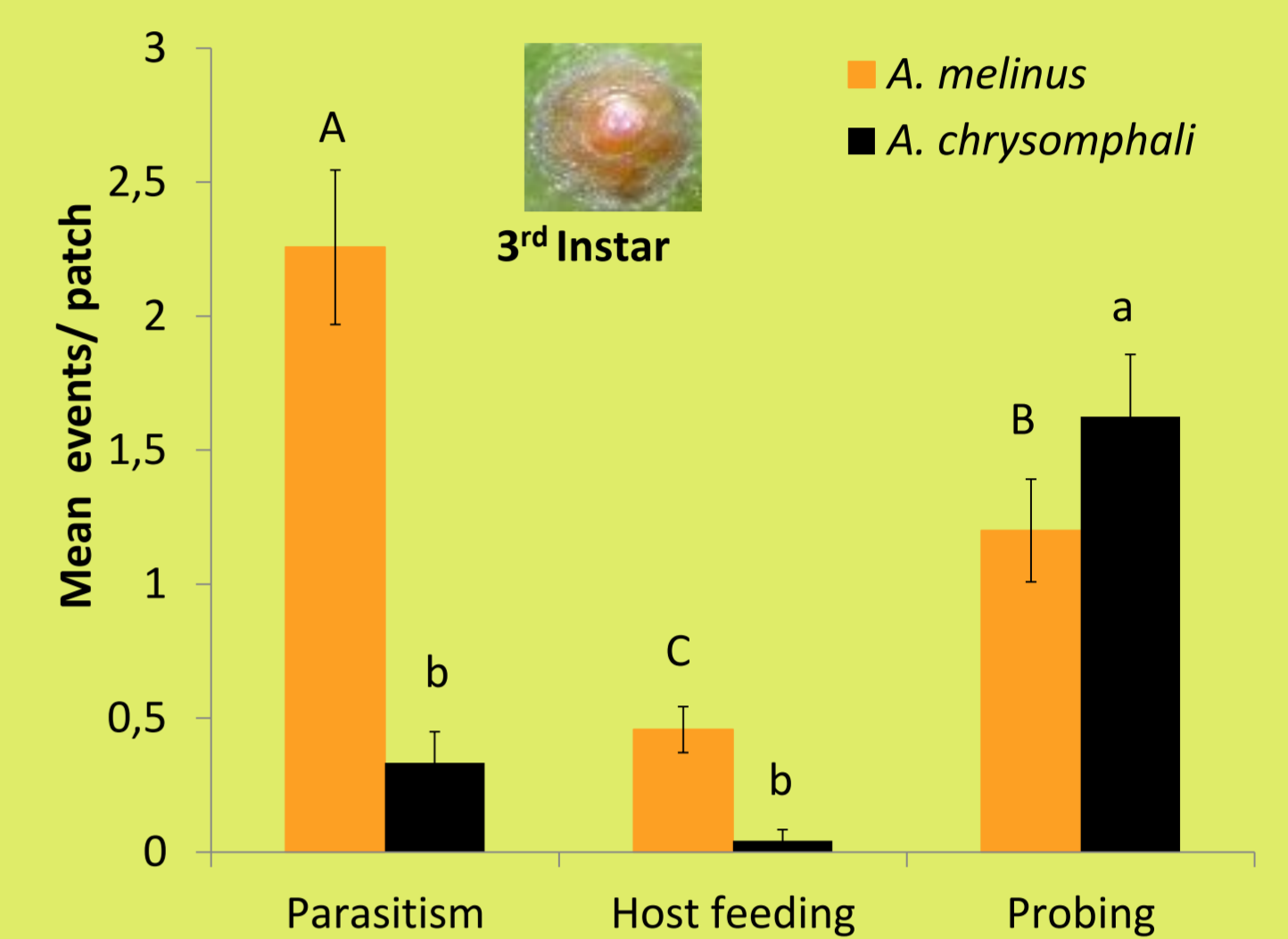


Fig. 2. Behavioral events (mean \pm SE) of the parasitoids *A. melinus* and *A. chrysomphali* in a patch with ten third instars of their host *A. aurantii*. Different upper and lower case letters above columns denote significant differences between the occurrence of the different behaviours of *A. melinus* and *A. chrysomphali*, respectively.

Effect of probing on host

Mortality

- 95% of the 2nd instar hosts probed and rejected by both *Aphytis* species died.
- A. melinus* probes were more lethal (~55%) than that of *A. chrysomphali* (~22%) in the 3rd instar host ($F_{1,41} = 7.34$; $P = 0.0098$).

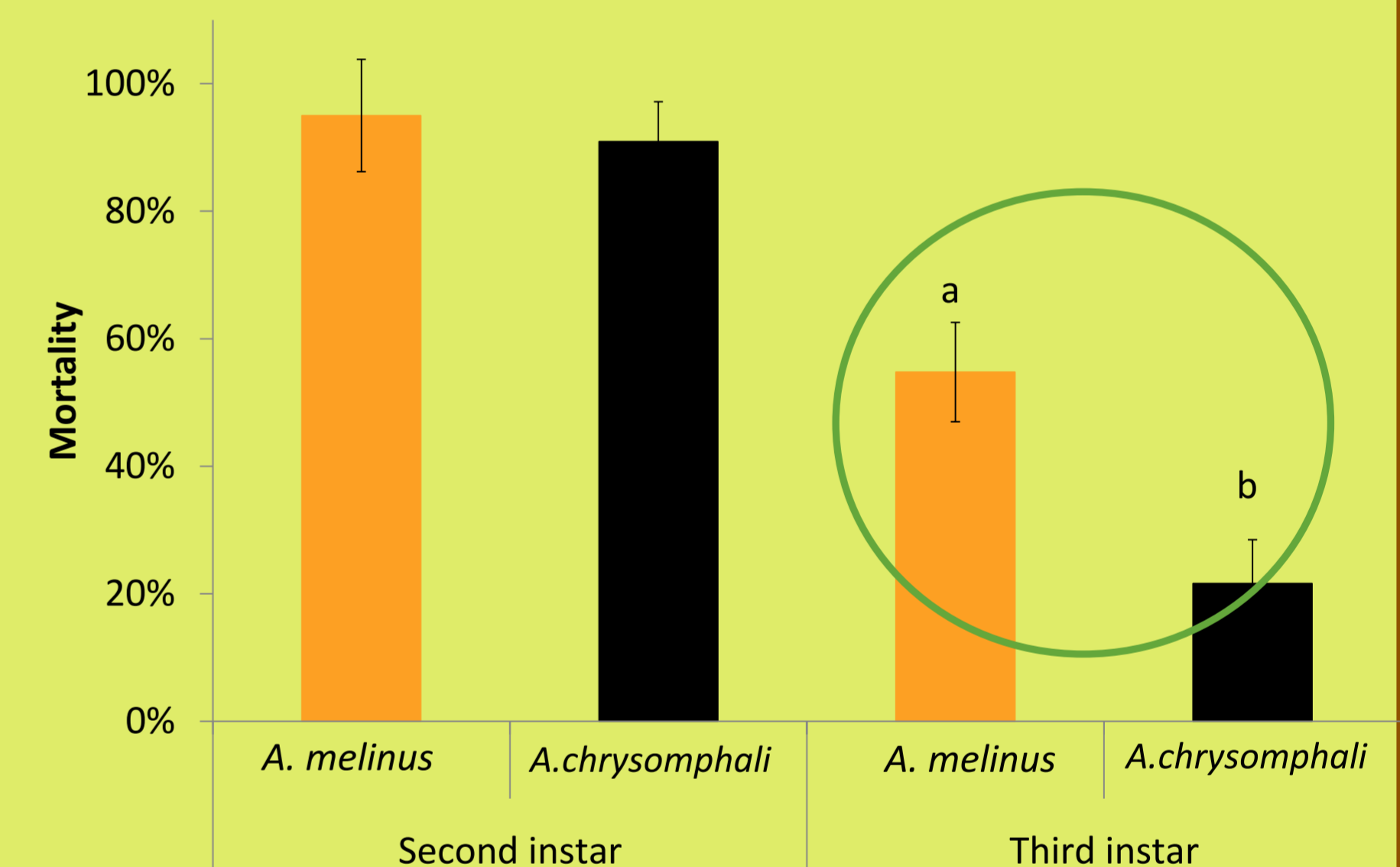


Fig. 3. Mortality of *A. aurantii* caused by probes of *A. melinus* and *A. chrysomphali*. Different letters above columns denote significant differences between parasitoids.

Fecundity

- A. melinus* probes reduced the fecundity of surviving hosts ($F_{2,91} = 5.6$; $P = 0.005$).

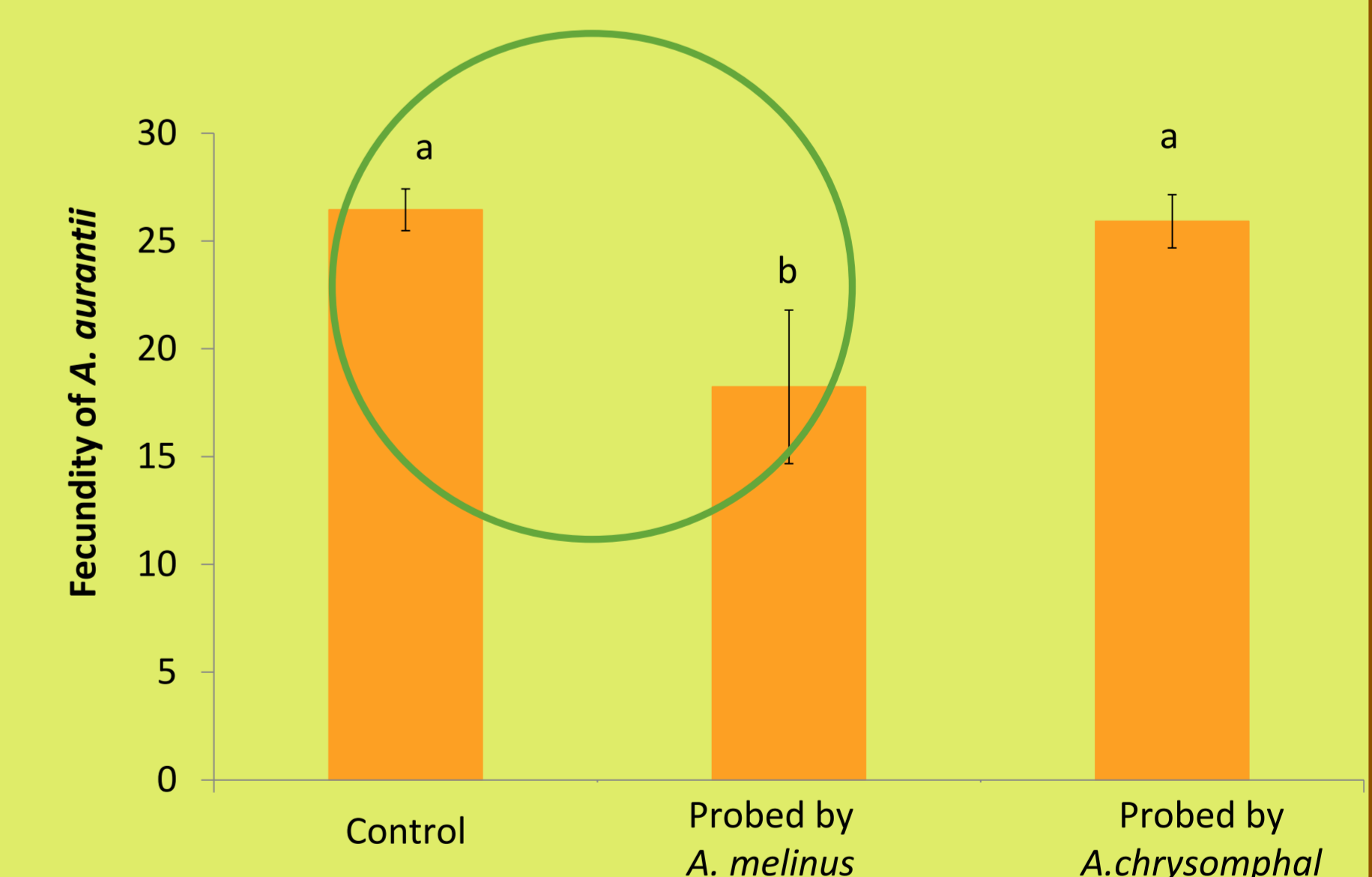


Fig. 4. Effect of probes of *A. melinus* and *A. chrysomphali* on *A. aurantii* fecundity. Mean number of crawlers \pm SE per survival host (probed) and non-probed host (control). Different letters above columns denote significant differences.

CONCLUSION

Our results show that probing should be considered as a biological trait of parasitoids to determine their efficacy as biological control agents and they contribute to understand the higher potential of *A. melinus* as biological control agent of *A. aurantii*.

