

Influence of dietary yeasts on the fecundity of adult spotted-wing drosophila (*Drosophila suzukii*)

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Introduction

The spotted-wing drosophila (*Drosophila suzukii*), native to Asia and widespread throughout North America, South America and Europe, is an invasive insect pest. The tendency of *D. suzukii* to lay eggs in healthy ripe fruits makes it an important insect pest for soft and stone fruits. *D. suzukii* adults are attracted by volatile products emitted during microbial fermentation and *D. suzukii* larvae are affected by the yeast community in their diet (Bellutti et al. 2018).

Aims and Objectives

- Observing the effects on the fecundity of *D. suzukii* females by different epiphytic yeast species and culture media offered.
- Creation of suitable assays for field and laboratory trials.

Materials and Methods

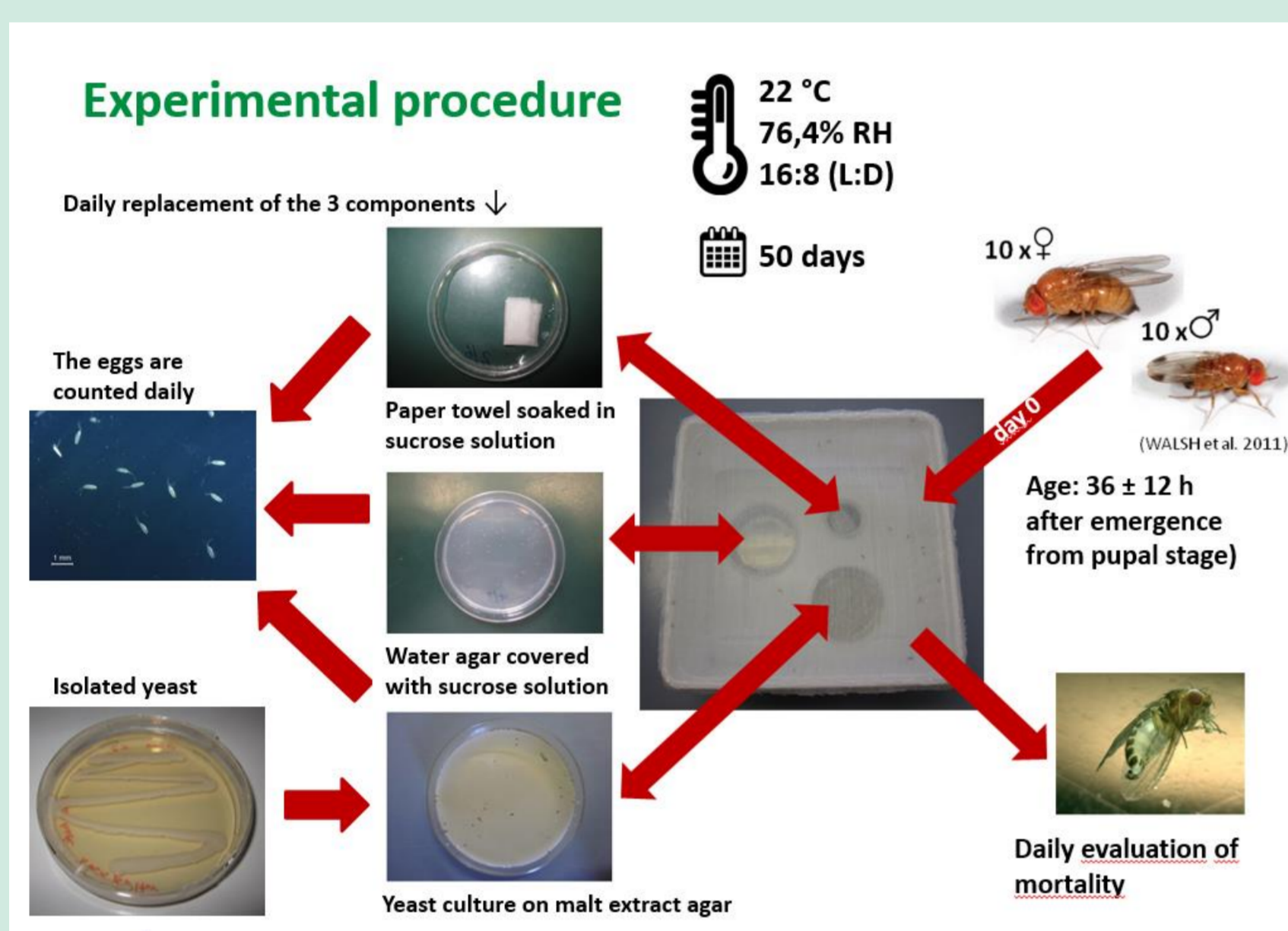


Figure 1. Experimental procedure to observe the influence of different yeast in the diet of *D. suzukii* adults.

- The yeast species used were isolated from the larval feeding grooves of *D. suzukii*-infested fruits in South Tyrol.
- The number of eggs laid, the survivorship, and egg laying behaviors of *D. suzukii* adults were observed simultaneously for each yeast species offered.

Conclusion

- Among the yeast species known to be associated with *D. suzukii*, the ones used in this study turned out to increase the number of eggs laid compared to the yeast-less control (malt extract agar).
- Different culture media showed significant effects on the fecundity. The addition of glucose had no effect on the fecundity
- The beneficial nutritional effect of the yeast species *H. uvarum* on the fecundity of *D. suzukii* was observed on both culture media.

Outlook

- Clarifying knowledge gaps about the species biology and behavior towards yeasts.
- Attractive yeast cultures will be used to develop a suitable pest control method.
- The different metabolites and volatile substances will be determined for each yeast species.
- See poster PO198 "Identification of volatiles released by fruit-associated yeasts for the Biocontrol of *Drosophila suzukii*" and poster PO013 "*Drosophila suzukii* flight activity and females reproductive status in an overwintering site over a four-year period".

Literature

- Bellutti N, Gallmetzer A, Innerebner G, Schmidt S, Zelger R, Koschier EH (2018) Dietary yeast affects preference and performance in *Drosophila suzukii*. J. Pest Sci. DOI 10.1007/s10340-017-0932-2.
- Spitaler U (2016) Influence of dietary yeasts on the fecundity and oviposition of adult spotted-wing drosophila (*Drosophila suzukii*; Diptera: Drosophilidae). Master's thesis, University of Natural Resources and Life Sciences, Vienna
- Walsh DB, Bolda MP, Goodhue RE, Dreves AJ, Lee J, Buck DJ, Walton VM, O'Neal SD, Zalom FG (2011): *Drosophila suzukii* (Diptera: Drosophilidae): Invasive Pest of Ripening Soft Fruit Expanding its Geographic Range and Damage Potential. Journal of Integrated Pest Management 2(1): G1-G7.

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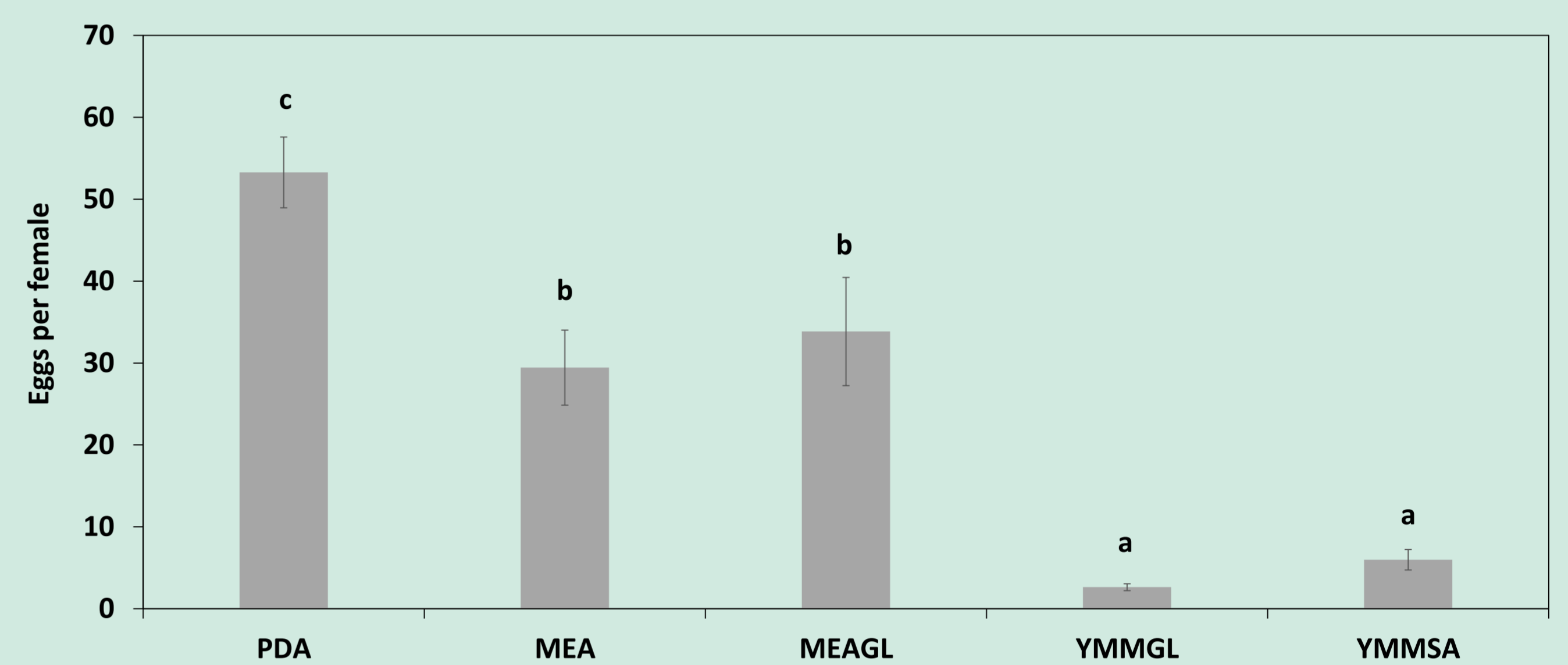


Figure 2. Mean oviposition rate (\pm SE; n = 5) of *D. suzukii* females during the experimental period, i.e. 30 days. PDA (potato dextrose agar), MEA (malt extract agar), GL (with glucose), SA (with sucrose), YMM (yeast minimal medium). Bars with different letters are significantly different at $P \leq 0.05$.

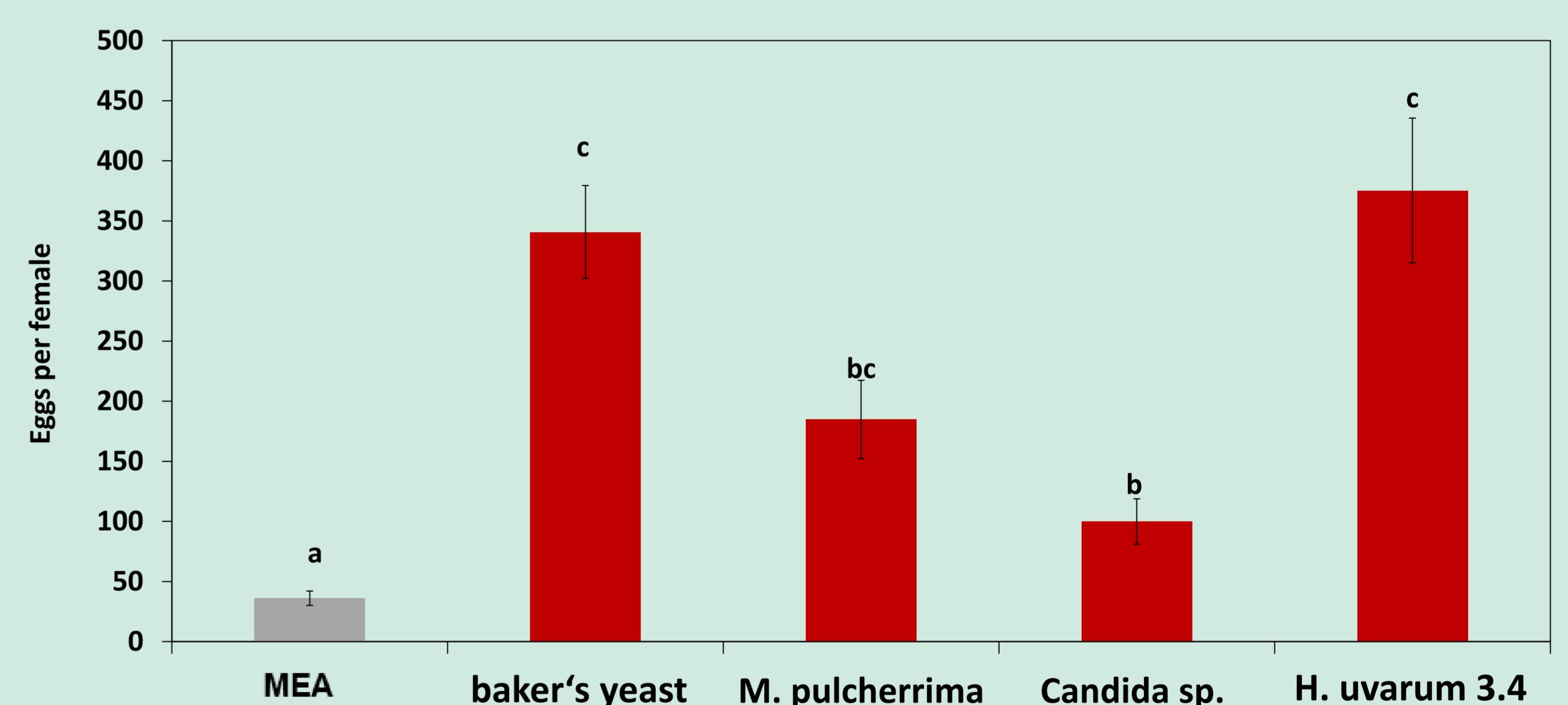


Figure 3. Mean oviposition rate (\pm SE; n = 7) of *D. suzukii* females fed with different yeasts on malt extract agar during the experimental period, i.e. 50 days. As control MEA (malt extract agar without yeast) was used. Bars with different letters are significantly different at $P \leq 0.05$.

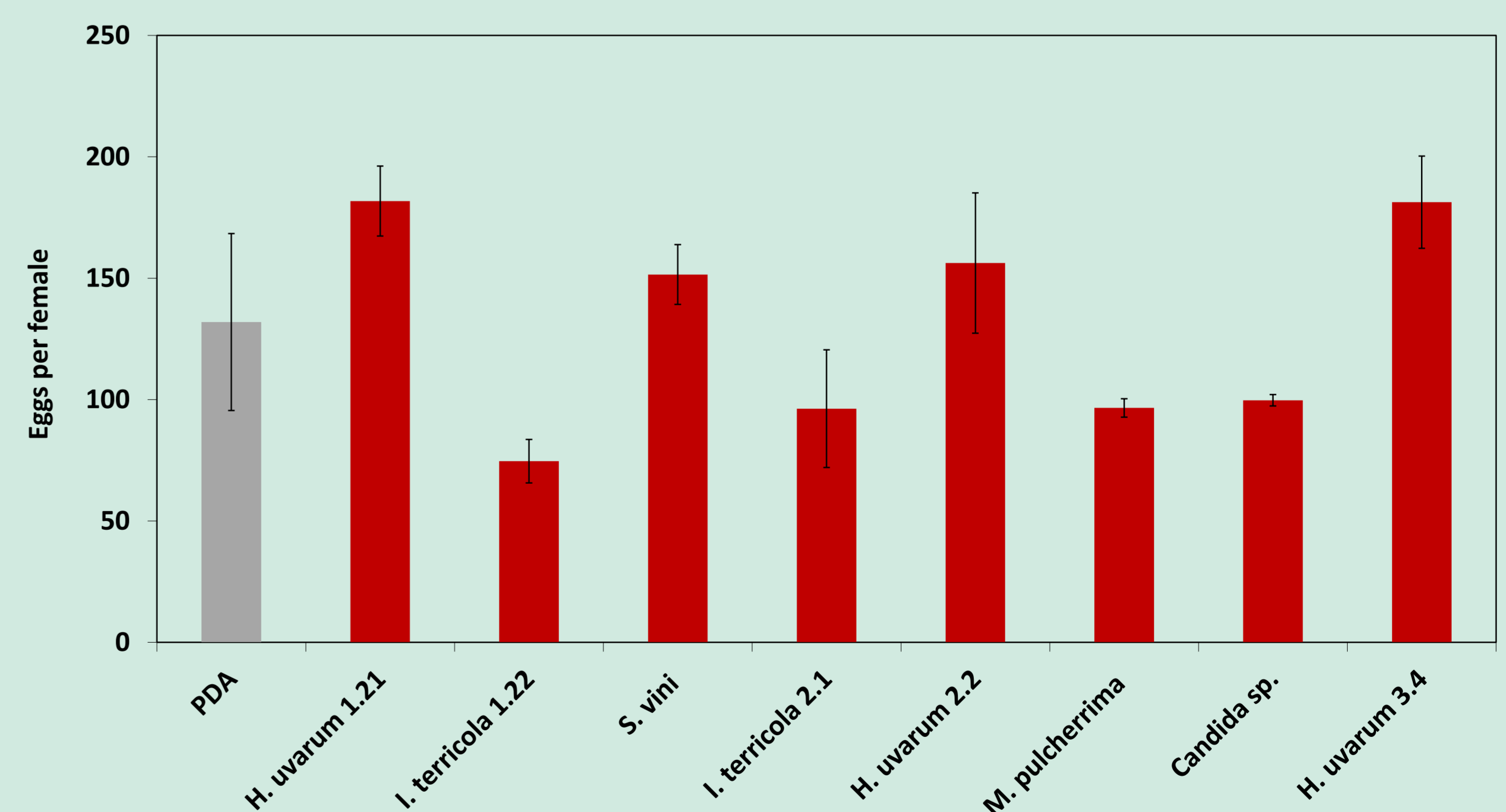


Figure 4. Mean oviposition rate (\pm SE; n = 3) of *D. suzukii* females fed with different yeasts on potato dextrose agar during the experimental period, i.e. 30 days. As control PDA (potato dextrose agar without yeast) was used.