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Introduction and objectives

Resistance to desiccation is a critical capability that could increase sterile fly performance released in dry environments. Here we studied the post-copulatory behaviour and physiology of a strain of *Anastrepha ludens* resistant to hydric stress.

Due to a potential trade-off between characters favored by artificial selection for desiccation resistance and some characteristics of the ejaculate, we explored the performance of resistant males in terms of: **i)** number of sperm stored by their mates, **ii)** quantity of proteins in accessory glands and testes, **iii)** size of reproductive organs, **iv)** ability to suppress female receptivity after copulation, and **v)** female longevity after mating.

Methods

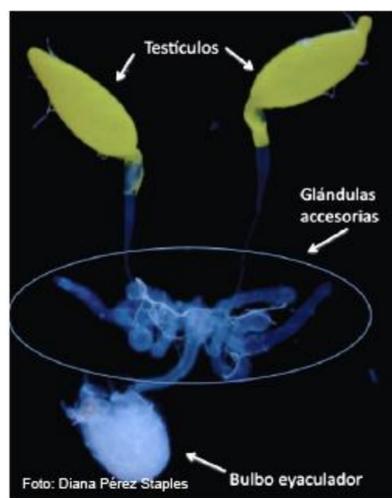
(i) The number of sperm stored in the three spermathecae was quantified in control females mated with control or resistant males.

(ii) Protein was quantified in the accessory glands (AG) and testes of resistant and control males using the Bradford technique.

(iii) The long and short arms of the AG, seminal vesicles, area with sperm in the seminal vesicles, ejaculatory bulb and thorax (as a proxy for male size), were photographed and measured.

(iv) Male ability to inhibit female remating 48 h after mating was evaluated using pairs of wild females mated with resistant or control males.

(v) Control and resistant females mated with control or resistant males were kept singly and survival was recorded three times a day, until death.

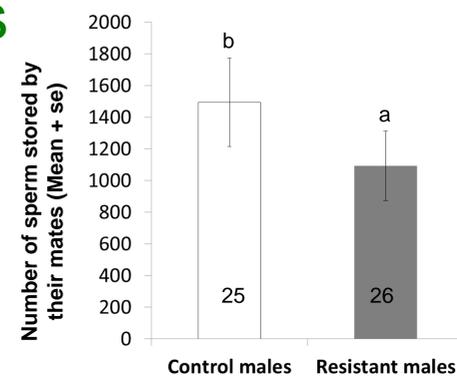


Results

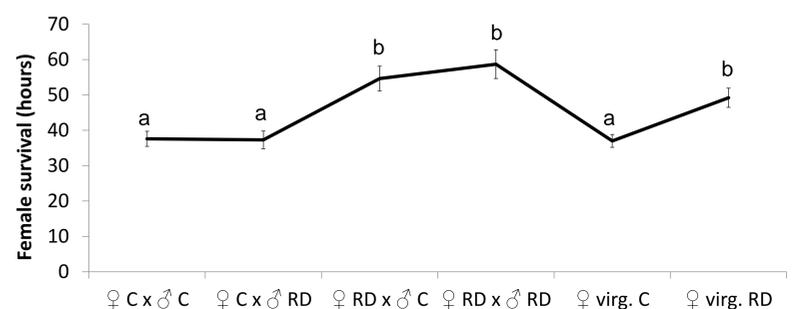
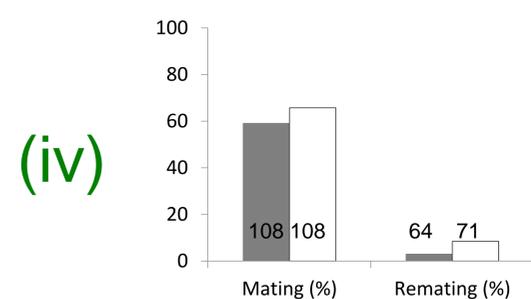
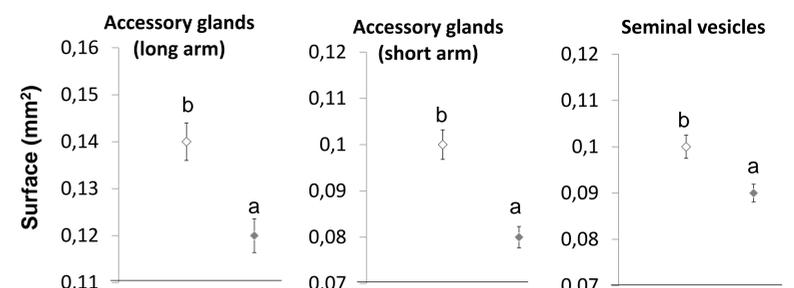
(i)

(iii)

(v)



(ii) There was no significant effect of male strain on the quantity of proteins in accessory glands nor testes



Conclusions

Desiccation resistant males had a similar post-copulatory sexual performance compared with control males, despite the lower numbers of sperm transferred and the smaller accessory glands and seminal vesicles. Desiccation resistant females do not derive nutrients or water from mating. These results are encouraging for the use of this strain in Sterile Insect Technique programs.

