

Starvation resistance and nutritional status of *Anastrepha fraterculus* (Wiedemann) males is affected by the presence of symbiotic bacteria in their digestive tract

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Background

- Fruit flies have symbiotic bacteria in their digestive tract and the result of their interaction can be conditioned by the quality of the diet.
- In previous studies with the South American fruit fly, *A. fraterculus*, we found that the addition of antibiotics into the diet removes symbiotic bacteria from digestive tract with a negative impact on male mating success.
- Here, we evaluate the effect of antibiotic treatment in different adult diets on the starvation resistance and the nutritional status of *A. fraterculus*.

Materials and Methods

Wild (W) and laboratory (L) reared males were provided with one of two different diets: sugar (S) or sugar + protein (Full), which in turn could have or not antibiotics (AB).

To evaluate the starvation resistance, diets were removed from the cages after 10 days and only water was provided. The number of dead males was recorded daily.

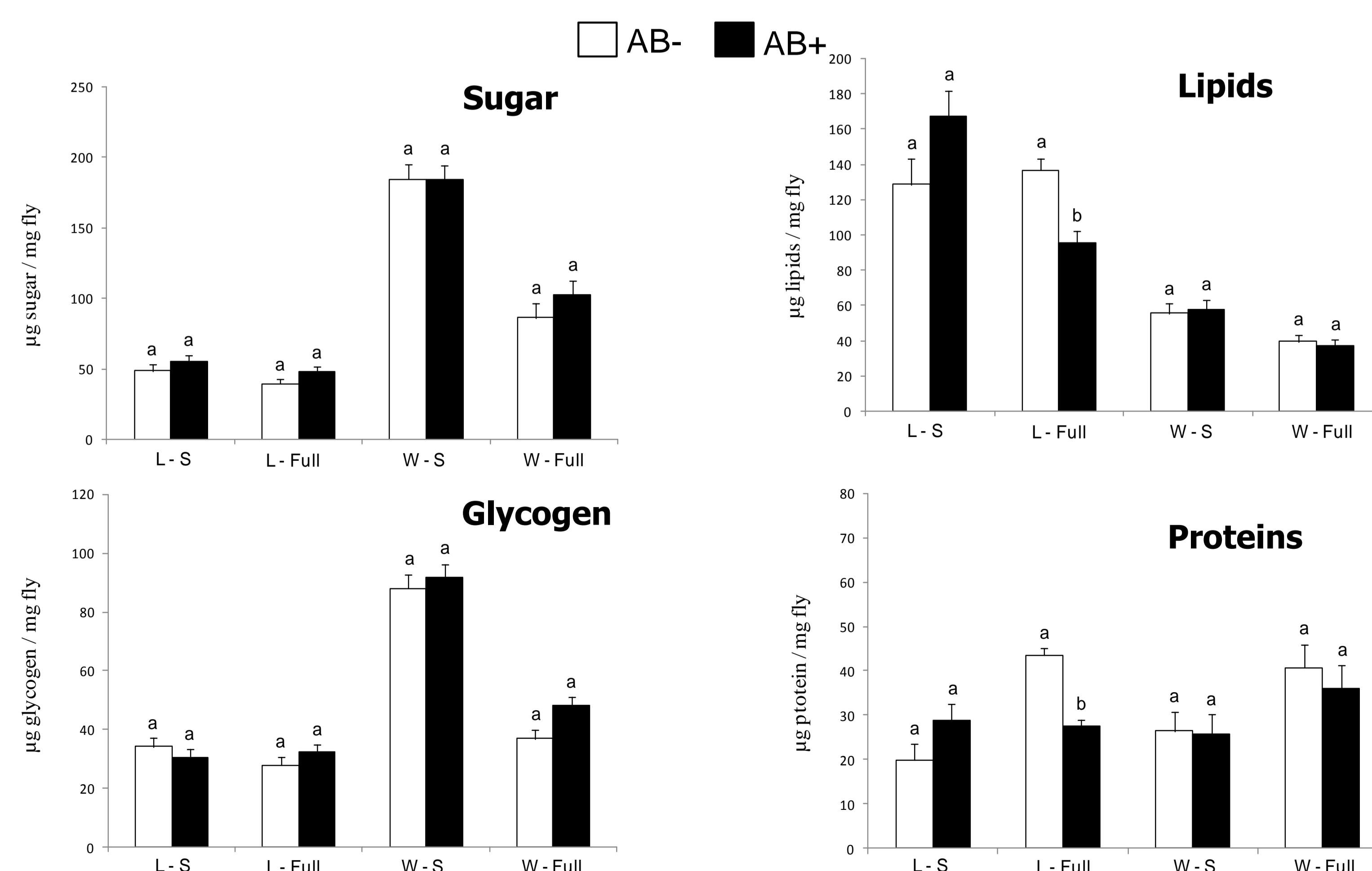
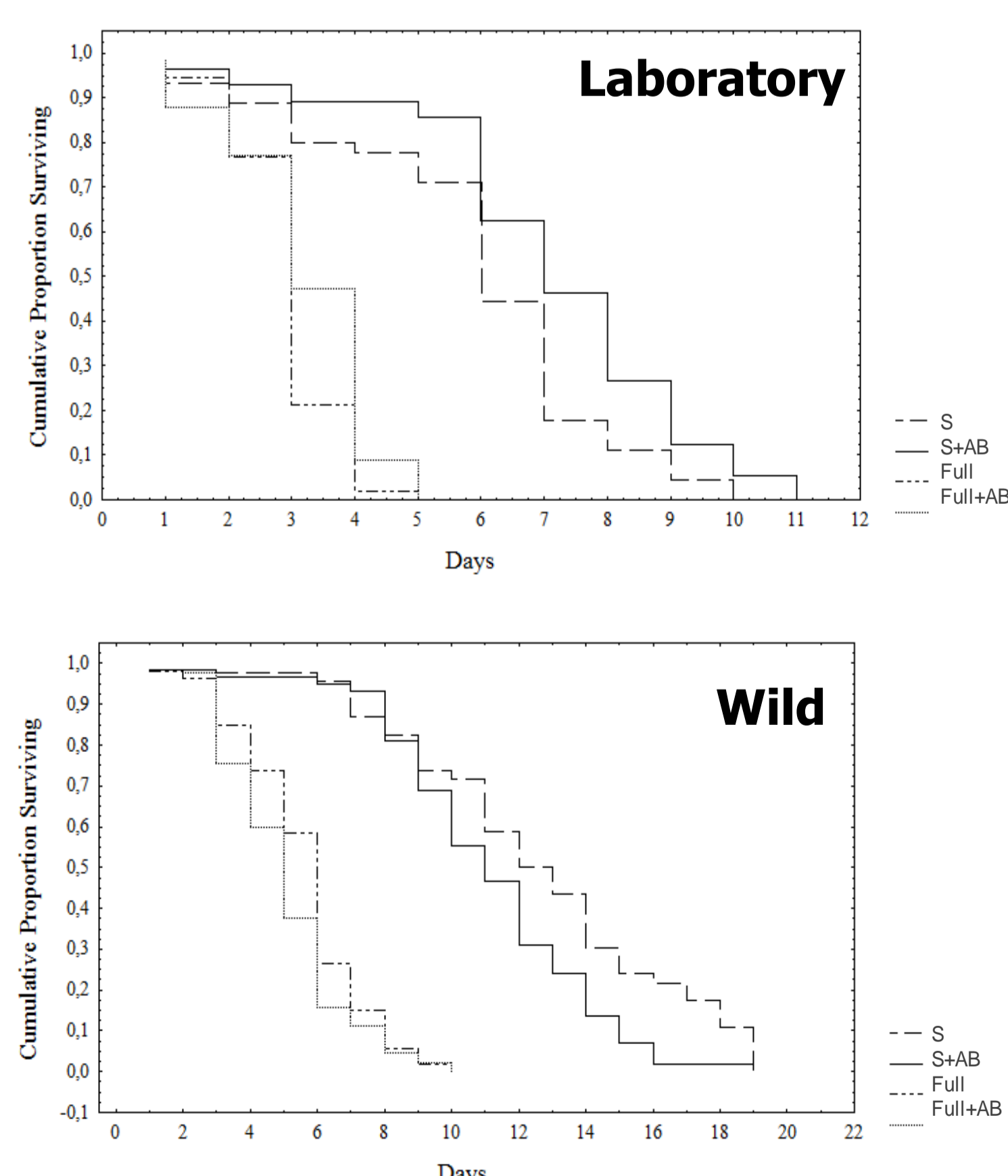
To evaluate males' nutritional reserves, diets were replaced every 48 h until 14 days from adult emergence. Completed that time, males were preserved at -20°C. Protein content was determined by Bradford's method and lipid and carbohydrates (sugar and glycogen) content were determined by Van Handel's method.

Before experiments we confirmed that the presence of antibiotics had no impact on diet consumption.

Results

Starvation resistance was not affected by antibiotic treatment in Full fed males. In S fed males, antibiotics affected survival, positively in laboratory males and negatively in wild males (Kaplan-Meier survival analysis).

Antibiotic treatment did not affect carbohydrates content in both males origin; but the absence of antibiotic into the diet increased lipid and protein content in Full fed laboratory males (Mixed effects model analysis).



Conclusions

Our results have practical implications for the Sterile Insect Technique by suggesting that gut bacteria play a role in *A. fraterculus* nutrition and therefore can contribute to the biological fitness as well as to the sexual performance of these flies.

