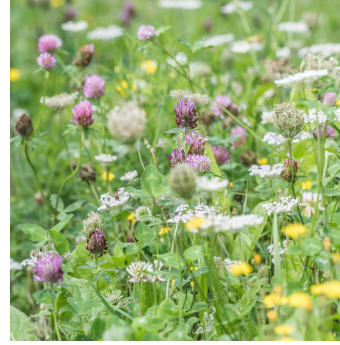


# Nutrition ecology of *Ascogaster quadridentata* (Hym., Braconidae) and its host in apple orchards.

Annette Herz, Nils Drexler, Silvia Matray, Oliver Veekmann  
Julius Kühn-Institut, Institute for Biological Control, Darmstadt/Germany

Contact: annette.herz@julius-kuehn.de

Apple orchards are perennial agroecosystems and offer the opportunity for habitat management and conservation biological control. Flowering plants within the orchard can support natural enemies by provision of shelter, nectar, pollen and alternative prey.



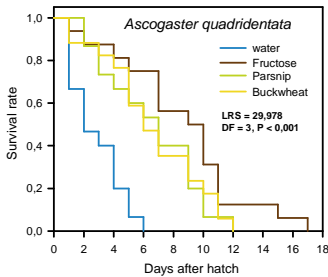
When designing flower-rich orchards it is important to exclude that also pests can profit. We compared the effect of offering sugar & nectar from various plants on survival and fecundity of the braconid wasp *Ascogaster quadridentata* and its host, the codling moth.



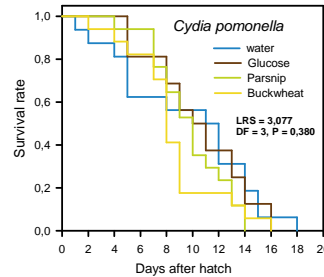
*Ascogaster quadridentata* is a egg-larval parasitoid of various Tortricidae. It is one key natural enemy of the codling moth. Females do not host-feed and visit flowers to receive nutritional resources.



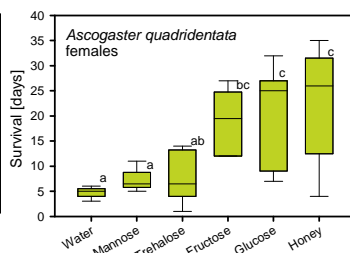
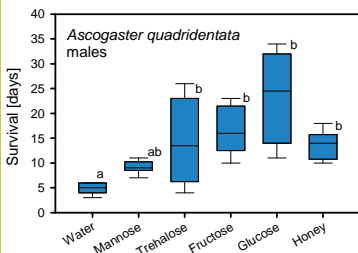
*Cydia pomonella* is the major pest in apple growing, causing direct fruit damage by larval feeding inside the apple. Adult moths have a short proboscis (~1 mm long) and are able to suck liquids.



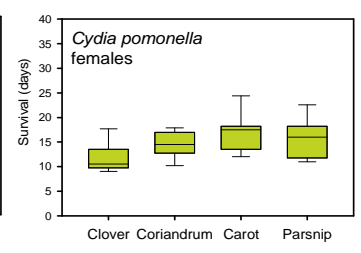
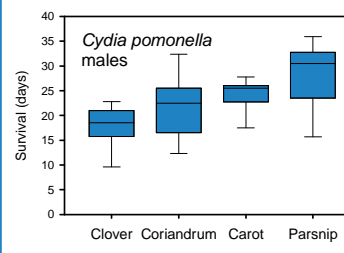
(1) Sugar provision (20% Fructose) prolonged survival of the parasitoid. Nectar from disk-type flowers prolonged survival too.



(1) Sugar provision did not prolong the lifetime of *C. pomonella*.

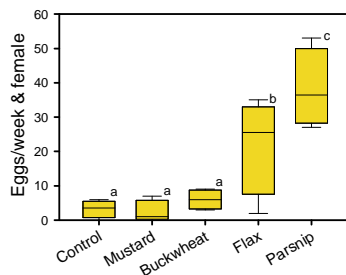


(2) Survival of *A. quadridentata* was affected by diet. Mannose and Trehalose (common in honey dew) did not increase lifetime. Fructose and Glucose enhanced survival significantly. *A. quadridentata* females were supported best by honey.

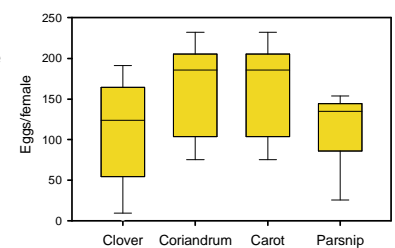


(2) When provided with different flower types, survival of male and female did not increase regardless of nectar accessibility. A positiv trend on longevity was observed in male codling moth when parsnip flowers were presented.

(3) In a field cage test, parasitism was enhanced by access of females to suitable flowers.



(3) Lifetime fecundity of female *C. pomonella* was not affected by provision with disk-type flowering plants.



➔ Fitness of *A. quadridentata* wasps can be increased by provision with open-disk flowering plants.

➔ *C. pomonella* does not profit from open-disk flowering plants. Their integration into the orchard is possible.

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