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Preferences of the Aphid Parasitoid *Diaeretiella rapae* (Braconidae) for Different Aphid-Host Plant Combinations

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Abstract

The cabbage aphid is a damaging pest with increasing importance in many Brassica production areas worldwide. Management of the pest is mainly by use of pesticides. Therefore promotion of biological control agents is a sustainable tool to reduce the indiscriminate employment of agrochemicals. The aphid parasitoid *Diaeretiella rapae* is specialised on the mealy cabbage aphid *Brevicoryne brassicae* and is always present in the field. Nevertheless its efficiency is frequently too low to maintain the pest below the economic threshold. Hence, it is important to investigate factors related to the host location process of this parasitoid in more detail to improve its use in field.

In order to investigate the preferences of *D. rapae* for different host-plant-systems, a multiple-choice experiment with 12 choices was conducted. Treatments included the interaction of three factors: host plant (broccoli var. Marathon F1, Brussels sprouts var. Hilds Ideal, cauliflower var. Fremont), aphid species (*B. brassicae*, *Myzus persicae*) and aphid population density (8 or 12 aphids per plant). Number of developed mummies was the indicator for preference of the parasitoid. Overall results indicate that *D. rapae* preferred the host-plant-system on which it was reared, i.e. *B. brassicae* / Brussels sprouts, due to the larval conditioning. However, *D. rapae* frequently accepted also alternative host-plant-systems (i.e. *B. brassicae* / cauliflower and *B. brassicae* / broccoli), which indicates that associative learning, i.e. the acceptance of new host-plant-combinations might play an additional role in the host searching process. Finally there is a trend in the results that wasps select plants with higher host population levels despite the fact that resource limitation never occurred. The results of this study suggest that the host plant species, aphid species and population density significantly influence the efficiency of the parasitoid.

Keywords: Cabbage aphids, *Diaeretiella rapae*, preferences, vegetables materials