



EVOLUZIONE

**BOOK OF  
ABSTRACTS**

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DIPARTIMENTO DI BIOLOGIA  
UNIVERSITÀ DEGLI STUDI DI PADOVA



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**A special case in ant-plant relationships: mutualism or partner manipulation mediated by extrafloral nectar?**

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Interactions involving ants and plants constitute textbook examples in animal-plant biology. Many plants bear extrafloral nectaries (EFNs) that seem to be specially designed to attract ants whose feeding ecology and behaviour make them very efficient plant defenders. Most data available on EFNs-based ant-plant interactions refer to tropical regions and no detailed study has been conducted so far in Italy. In order to reduce this gap we carried out a series of field and laboratory investigation involving different ant-plant study systems. Although, plant-ant associations based on trophobiosis (food in exchange of protection) are generally considered as mutualisms, with both parties gaining benefits from the association, it has recently emerged that some of these associations have evolved towards other forms of relationships and, in particular, that plants may manipulate their partner ants to make reciprocation more beneficial, thereby stabilizing the mutualism. In this context, our data confirm the importance of the ants for the associated-plant fitness showing their crucial role against herbivores. However, some aspects of the plant biology, such as nectar production, amount and composition, seem designed to affect ant behaviour, improving their attraction and performances. In fact, the ants that fed on nectar patrol restless the host plants and are strongly attracted towards EFNs. They showed a higher level of aggression against other insects and changes in response to social and environmental stimuli. Hence, data obtained from some of our model systems support the hypothesis that plants may engage in a sort of “coercive mutualism”, controlling the behaviour of the ants in order to maximize partner-derived rewards and get a better service as bodyguards without disrupting the association.



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