

Insect–Plant Interactions: A Multilayered Relationship FREE

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Abstract

During herbivory, insects recognize their host plant based on specific chemical cues, whereas the plants induce various chemical and morphological defense responses to resist this attack. However, the seemingly bidirectional insect–plant interaction involves various confounding aspects that influence the performance and fitness of the two participants. These interactions are often mediated by associated microbiota, competitors, predators, and parasitoids that interact in either obligate or facultative manner. Insect endosymbionts play a crucial role in the perception, nutrition, metabolism as well as reproduction of their host, which together determine its survival and fitness on the plant. Endosymbionts also help their host to overcome plant defenses by detoxifying plant metabolites. On the contrary, plant-associated microbes contribute in induced systemic plant resistance by enhancing chemical and morphological defense. These interactions determine the association of insect and plant, not only with the high trophic levels but also with the ecosystem as a whole. Thus, insect–plant interaction is a multilayered relationship extending to various micro- and macro-organisms associated either temporally or spatially. All these relationships may be considered to obtain a wholesome perspective of the natural environment.

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