

Leaves are among the most abundant organs on earth and are a defining feature of most terrestrial ecosystems. However, a leaf is also a potential meal for a hungry animal and the question therefore arises, why does so much foliage survive in nature? What mechanisms protect leaves so that, on a global scale, only a relatively small proportion of living leaf material is consumed? Leaf survival is in large part due to two processes: firstly, leaf-eating organisms fall prey to predators (top-down pressure on the herbivore); secondly, leaves defend themselves (bottom-up pressure on the herbivore). Remarkably, these two types of event are often linked; they are controlled and coordinated by plants and the molecular mechanisms that underlie this are now beginning to emerge.

This novel text focuses exclusively on the leaf, on the herbivorous organisms that attack leaves, and the mechanisms that plants use to defend these vital organs. It begins with an assessment of the scale of herbivory, before examining direct physical and chemical defences on leaf surfaces and within the leaf itself. Although some leaf defences are easily seen, most operate at the molecular level and are therefore invisible to the naked eye. Many of these recently elucidated mechanisms are described. Throughout the book, perspectives from both the laboratory and the field are combined. A central feature of the work is its emphasis on the coevolution of leaf defences and the digestive tracts of animals including humans, making the book of relevance in understanding the role of leaf defences in agriculture.

Leaf Defence is suitable for senior undergraduate and graduate students taking courses in plant science, as well as a broader audience of biologists and biochemists seeking a comprehensive and authoritative overview of this exciting and emerging topic.

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OXFORD
UNIVERSITY PRESS

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ISBN 978-0-19-967144-1



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