

Lichens are symbiotic organisms in which fungi and algae and/or cyanobacteria form an intimate biological union. This diverse group is found in almost all terrestrial habitats from the tropics to polar regions. In this Second Edition, four completely new chapters cover recent developments in the study of these fascinating organisms, including lichen genetics and sexual reproduction, stress physiology, and symbiosis, and the carbon economy and environmental role of lichens. The whole text has been fully updated, with chapters covering anatomical, morphological, and developmental aspects; the chemistry of the unique secondary metabolites produced by lichens and the contribution of these substances to medicine and the pharmaceutical industry; patterns of lichen photosynthesis and respiration in relation to different environmental conditions; the role of lichens in nitrogen fixation and mineral cycling; geographical patterns exhibited by these widespread symbionts; and the use of lichens as indicators of air pollution. This is a valuable reference for both students and researchers interested in lichenology.

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"Nobody has done more than Thomas Nash III to demonstrate that lichens are living, breathing creatures ... A review volume of this sort is both a challenge and a credit to its editor."

S. Hammer, *Trends in Microbiology*

Cover illustration: *Letharia vulpina* and *Letharia columbiana* on a juniper tree in Yosemite National Park, photograph by Stephen Sharnoff.

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