

Preface

The field of plant ecology includes the study of plants and their environment. Rather than just looking at plants in a vacuum, researchers consider how they interact with each other and their environment to create an interconnected system. Plant ecology can include the study of entire ecosystems, such as the rainforest or plateau, or the study of specific areas of interest, like plant populations which manage to survive next to a polluted stream. Plant ecologists also look at animals, soil conditions, and other influences on a plant's environment.

Ecology is a complex and vast field of study which can encompass everything from understanding how natural environments function to how humans interact with the natural world, and how various behaviors can fundamentally alter the natural environment. In plant ecology, people can focus on topics like climate change and its effect on plants, plant evolution, how plants disseminate themselves in nature, symbiotic relationships between plant species, plant diseases, and so forth.

Plant geography as a subject in its own right is relatively modern. It is true that records of plant ranges, as then known, are given by many early authors but they are usually incidental to other studies. For several reasons phytogeography is becoming of increasing importance. The rejuvenation of taxonomy along the lines of the "new systematics" or synthetic taxonomy, the application of data derived from the newer branches of ecology and cytogenetics, the extending realization that man is destroying the natural flora and vegetation of many parts of the world, and, perhaps, one may add, the greater facilities for overseas travel are all stimulating to phytogeographical research.

Ecology is concerned with the relationship between plants and their surroundings and with the grouping of plants into kinds of vegetation. On the whole, plant ecology is intensive while plant geography is extensive in outlook, but both are concerned with plants and, in attempting to correlate observed structure and behaviour with "causes," both refer to the same sum total of environmental factors though the emphasis varies. The purpose of this book is to consolidate all this information and present it in a simple way for the benefit of the students, as well as teachers and researchers.

Plants containing volatile oils, which are readily converted into resins by the action of oxygen, or those containing tannin or other readily oxidizable substances,

take up the largest quantity. This is remarkably illustrated by an experiment in which the leaves of the *Agave americana*, after twenty-four hours' exposure in the dark, were found to have absorbed only 0.3 of their volume of oxygen, while those of the fir, in which volatile oil is abundant, had taken up twice, and those of the oak, containing tannin, eighteen times as much oxygen.

In the flowers, both by day and night, there is a constant absorption of oxygen, and evolution of carbonic acid. In fact, an active oxidation is going on, attended by the evolution of heat, which, in the *Arum maculatum* and some other plants, is so great as to raise the temperature of the flower 10° or 12° above that of the surrounding air.

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—Editor