

# AMERICAN JOURNAL OF Botany

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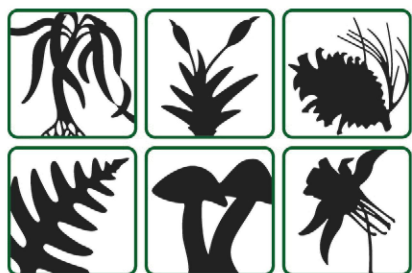
SPECIAL ISSUE

## GLOBAL BIOLOGICAL CHANGE



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**Cover Illustration:** Global changes in atmospheric carbon dioxide levels, weather patterns and climate, biogeochemical cycles, land use and habitat fragmentation, patterns of harvesting, introductions of alien species, and other human use of resources, will have far reaching consequences for the human population, which is now over seven billion people and projected to grow rapidly. Concern that these changes may lead to rapid and irreversible alterations in the global ecosystem has heightened the need to understand how organisms respond to and influence these processes. This Special Issue views global biological change from diverse botanical perspectives and disciplines essential for understanding how terrestrial plants at all levels of organization are responding to and affecting environmental change. The cover images represent some of the specific topics covered in this issue, including changes in the annual flora of the Sonoran Desert at Tumamoc Hill, Arizona, due to decreased precipitation (courtesy of Kathy Gerst), modifications of the phenology of flowering plants in the alpine environment (courtesy of David Inouye), the influence of a simulated decrease in precipitation on a hybrid zone (courtesy of Meike Meissner), studies of the effects of increased temperature and nutrient deposition in the alpine environment (courtesy of Emily Farrer), and past changes in floras due to CO<sub>2</sub>-induced climate change (courtesy of Scott Wing).



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## Abbreviations

**Miscellaneous:** AFLP, amplified fragment length polymorphisms; a.s.l., above sea level; bp, base pair; BP, before present; BSA, bovine serum albumin; cpDNA, chloroplast DNA; CTAB, hexadecyltrimethylammonium bromide; cv., cultivar; ddH<sub>2</sub>O, double-distilled water; dNTP, deoxyribonucleotide E.C., Enzyme Commission; EDTA, ethylene diamine tetra-acetic acid; f. sp., forma specialis; indels, insertions and deletions; ITS, internal transcribed spacer; LM, light microscopy; mya, million years ago; PAGE, polyacrylamide gel electrophoresis; PCR, polymerase chain reaction; RAPD, random amplified polymorphic dimorphism; SDS, sodium dodecyl sulfate; SEM, scanning electron microscopy; s.l., sensu lato; s.s., sensu stricto; subsp., subspecies; TEM, transmission electron microscopy

**Genetics:**  $A$ , mean number of alleles per locus;  $D$ , mean genetic distance; CI, consistency index;  $F$ , fixation index;  $F_{IT}$ , total deviation from Hardy-Weinberg expectations;  $F_{ST}$ , genetic diversity among populations;  $F_S$ , inbreeding within populations;  $G_{ST}$ , the proportion of genetic diversity among populations;  $H_e$ , Hardy-Weinberg expected heterozygosity;  $H_o$ , observed heterozygosity; MP, most parsimonious tree;  $n$ , individual chromosome number;  $N_m$ , mean number of migrants per generation;  $P_p$ , percentage of polymorphic loci; RI, retention index;  $x$ , base chromosome number

**Statistics and math:** ANOVA, analysis of variance; CV, coefficient of variation; df, degrees of freedom;  $N$ , number of individuals;  $p$ , probability;  $P$ , level of significance; PCA, principal components analysis;  $r$ , coefficient of correlation; SE, standard error; SD, standard deviation