
Preface

The sense of smell is the most basic and universal sense. Even bacteria have mechanisms to detect the presence of chemicals in their environment. The scents that emanate from flowers have been noticed by humans since antiquity; a fact that has been documented in ancient texts. In 3000 B.C., when the Egyptians were learning to write and make bricks, they were already making primitive perfumes and using them for religious rituals. Humans' admiration for the fragrances of flowers has made these volatile substances into many commercial products. Volatiles are heavily used in the perfume, cosmetics, and fragrance industries, which are continually researching new and unusual volatile compounds and scents. Consumers are also constantly searching for new scented ornamental crops. However, the biosynthesis of floral volatiles and the roles of floral scents in plants are topics that have only recently begun to receive serious scientific attention. While we can certainly detect scent molecules in the air, the sheer number of such scents, and their complexity, confound us. Our olfactory sense is simply not good enough to separate the components and identify each one with any certainty. The consequences of our inability to clearly and objectively measure smells with our nose mean that, in the absence of appropriate instrumentation, scientific research in this area is greatly impeded.

Recent advances in practical methodologies and affordable instrumentation to collect, separate, and identify volatile compounds have allowed floral scent research to become a standard scientific research topic accessible to many investigators, which in turn has resulted in many exciting new discoveries. Thus the fourteen chapters of this book summarize and represent the progress in our current understanding of the major areas of investigation into floral scent: the techniques used to study it, how the various scent compounds are made, where they are made and how they are emitted from the flower, the effect of floral scent on the various ecological interactions between insects and flowers, and finally, how researchers are using the newly identified scent genes to genetically engineer flowers that will produce new scents. We realize that there is much more to be learned in this area and we hope that this book will stimulate new research to advance our understanding of floral scent biology.