

Preface

Insects are a class of invertebrates within the arthropod phylum that have a chitinous exoskeleton, a three-part body, three pairs of jointed legs, compound eyes and one pair of antennae. They are among the most diverse groups of animals on the planet, including more than a million described species and representing more than half of all known living organisms. The text *Molecular Insect Science* presents all aspects of the biology of insects and other arthropods and their agricultural and medical impact. Molecular evolution of ultraspiracle protein (USP/RXR) in insects has been presented in first chapter. In second chapter, we demonstrate the P450 gene, *Cyp301a1*, present in all insect genomes sequenced to date, affects the formation of the adult cuticle in *Drosophila melanogaster*. The aim of third chapter is to identify the attacker-specific and general defense response signatures in *A. thaliana* when attacked by phloem-feeding aphids or pathogenic bacteria. Structures and functions of insect arylalkylamine N-acetyltransferase; a key enzyme for physiological and behavioral switch in arthropods have been discussed in fourth chapter. The view beyond immunity of insect prophenoloxidase has been proposed in fifth chapter. Sixth chapter reviews the currently available information about *L. oblique* venom, and focuses on strategies to unveil molecular aspects of toxins and the perspectives for therapeutic and biotechnological applications. In seventh chapter, the differences in glycoproteomes between insects belonging to several economically important insect orders have been studied. A molecular phylogeny of the chalcidoidea (hymenoptera) has been introduced in last chapter.