

Preface

The arthropods that were once grouped within the class Insecta have recently been separated into several separate classes. Those with fully developed or vestigial wings, the vast majority of the species, are still classified in this way, while the completely wingless ones have been moved into new classes. All of these are grouped in a sub-phylum called Hexapoda. It is by far the largest taxon, both in terms of the number of species it encompasses and in the number of living organisms.

The typical hexapod lives on land or under the earth and breathes air throughout all stages of its life. Entomology, the scientific study of the group, is vastly complex, and it will provide interesting fields of study for the natural sciences for centuries to come. This book is meant to focus on the opportunities for needed research on a very small number of the relatively small minority of the hexapod species that live on, in, or under water. From among this group of aquatic insects and wetland collembolans, some of the most remarkable groups of species are selected for special consideration because they display adaptations, which could be the subjects of interesting and rewarding scientific studies.

For students of entomology and for entomologists seeking research areas in which to specialize, this book is meant to highlight aquatic species displaying some of the most unusual adaptations to extreme habitats and discuss the state of our knowledge about the morphological, physiological, biochemical, ecological, and behavioral modifications necessary to sustain them in the biological communities that they have been able to colonize. It is meant to point out the peculiarities of these aquatic species and indicate the greatest gaps in our knowledge about their ways of life.

For aspiring biologists with interest in pursuing careers in the fields of taxonomy, systematics, physiology, anatomy, ecology, zoogeography, behavioral studies, or related fields, the study of hexapods offers the best opportunity for exploring new fields of science and making new and surprising discoveries, as well as going deeper into the still poorly explained phenomena that have been observed and reported by earlier researchers.

First, as the largest group of described species by far, hexapods present the largest number of individual research subjects. Second, insects go through a series of metamorphoses, and each stage has its own distinct morphology, physiology, diet, behavior, and ecology. All of these and other features are distinctive, and there is still a great deal to learn and to find explanations for. There are undoubtedly many surprising

facts to learn, because there are vast regions of the earth that can be considered *terra incognita* for entomologists.

It is hoped that this book will inspire scientists to turn their eyes and intellects toward the world of aquatic insects and begin unravelling some of the greatest remaining puzzles in the world of these many insects and collembolans.