

### **Handbook of Urban Insects and Arachnids**

This account provides the first comprehensive coverage of the insect and other arthropod pests in the urban environment worldwide. Presented is a brief description, biology, and detailed information on the development, habits, and distribution of urban and public health pests. There are 570 illustrations to accompany some of the major pest species. The format is designed to serve as a ready-reference and to provide basic information on orders, families, and species. The species coverage is international and based on distribution in domestic and peridomestic habitats. The references are extensive and international, and cover key papers on species and groups. The introductory chapters overview the urban ecosystem and its key ecological components, and review the pests' status and modern control strategies. The book will serve as a student textbook, professional training manual, and handbook for pest control professionals, regulatory officials, and urban entomologists. It is organized alphabetically throughout.

WILLIAM H ROBINSON is a major figure in the field of urban entomology. He works extensively on urban pest control strategies worldwide.

William H Robinson

# Handbook of Urban Insects and Arachnids



Cambridge University Press  
 0521812534 - Handbook of Urban Insects and Arachnids  
 William H Robinson  
 Frontmatter  
[More information](#)

CAMBRIDGE UNIVERSITY PRESS  
 Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press  
 The Edinburgh Building, Cambridge CB2 2RU, UK

[www.cambridge.org](http://www.cambridge.org)  
 Information on this title: [www.cambridge.org/9780521812534](http://www.cambridge.org/9780521812534)

© W. H Robinson 2005

This book is in copyright. Subject to statutory exception  
 and to the provisions of relevant collective licensing agreements,  
 no reproduction of any part may take place without  
 the written permission of Cambridge University Press.

First published 2005

Printed in the United Kingdom at the University Press, Cambridge

*A catalog record for this book is available from the British Library*

*Library of Congress Cataloging in Publication data*  
 Robinson, W. H (William H), 1943–  
 Urban insects and arachnids / William H Robinson.  
 p. cm.

ISBN 0 521 81253 4 (alk. paper)

1. Urban entomology – Handbooks, manuals, etc. 2. Insect pests – Handbooks, manuals, etc.

3. Arthropod pests – Handbooks, manuals, etc. I. Title.

QL472.7.R632 2005

595.7165'09173'2 – dc22 2004054537

ISBN-13 978-0-521-81253-4 hardback

ISBN-10 0-521-81253-4 hardback

---

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this book,  
 and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

---

# Contents

<i>Preface</i>	<i>page vii</i>
<b>Part I Urban entomology</b>	
1 Introduction	3
2 The urban ecosystem	6
3 Pest status and pest control	15
<b>Part II Insects in the urban environment</b>	
4 Blattaria	35
5 Coleoptera	65
6 Collembola, Dermaptera	139
7 Diptera, Ephemeroptera	147
8 Hemiptera, Homoptera	202
9 Hymenoptera	224
10 Isoptera	291
11 Lepidoptera	328
12 Mantodea, Neuroptera	346
13 Orthoptera, Phasmatodea	350
14 Phthiraptera	359
15 Plecoptera, Psocoptera	365
16 Siphonaptera	374
17 Thysanoptera, Thysanura, Trichoptera	382
<b>Part III Other arthropods in the urban environment</b>	
18 Arthropoda	389
Family, genus, species index	441
Index	456

## Preface

Hugo Hartnac, Arnold Mallis, James R. Busvine, Walter Ebeling, John Gerozisis, Phillip Hadington, Kazuo Yasutomi, and Kenji Umeya.

In their time and in their part of the world, these entomologists brought together in textbooks and handbooks information on the biology and control of household, structural, and public health pests. Their efforts to collect and summarize these data, and to provide their observations and practical experience on insects and other arthropods, have served entomologists and pest control professionals around the world, and are sincerely appreciated.

The goal of this book was to build on the foundation provided by these authors, then to expand the format and provide international coverage. The discipline of urban entomology is changing; it has grown from research and information exchange on a regional basis to international research and cooperation on pests. The modern student and research entomologist needs access to information and a basic understanding of a variety of insects and other arthropods, since distribution and pest status are much less static features of pest species. The objective of this text is to provide a concise and usable reference text on urban and public health insects and other arthropods around the world. In part, this is a global census. Listed here are the invertebrates known to occur, regardless of pest status, in domestic and peridomestic habitats in the urban environment. It provides a boundary for the discipline of urban entomology, and shows the overlap with public health and medical entomology, and stored-food entomology, and the arthropods considered a part of ornamental and turfgrass entomology.

All authors know the limitations of their work. We all know very well where and to what extent our product strayed or failed from the original intent, and what more time and talent would have done for the finished product. That is certainly true for this book. I intended to provide international coverage, including

peridomestic and domestic habitats, rural and urban location, and across the boundary of pest, nuisance, and occasional invader. I have certainly missed species or included some of limited importance; for some I failed to find biological data, or the data presented are incomplete, or worse. There are no excuses for the failings, but I resolve to improve what is here with the help of those using this book as a resource. Urban entomology and professional pest control can grow from shared knowledge and experience, and this work can benefit from such cooperation.

This text was prepared and organized in the format of a resource book, and a primary consideration was given to utility. The alphabetical arrangement of the orders (for the most part), families, and species used here removes phylogenetic relationships, and often sets apart related or natural taxonomic groups. The format may be very useful for some users, and may seem near-heresy for others – I apologize to the latter. There are other features that may cause problems. This text was not intended or written to be an organized whole that would be read from beginning to end. Rather it is a source book for the retrieval of information and perhaps a helpful illustration; there is some level of repetition. Morphological and biological information on groups and individual species is presented with key words (such as egg, larva, adult) as guides, with the minimum use of headings and bold type. Included are common or vernacular names for some household pests that occur around the world, and there are other names that are used regionally, locally, and sometimes only temporarily. When common names were available and appropriate, they were included; I may have missed some.

For some pest species or groups, we know perhaps too much. The pure weight of the published facts is daunting. In some groups the depth and volume of information can impede

attempts to arrange and present it in a useful and meaningful manner. It becomes a decision of at what level to stop and defer to the published information. The published data on termites, ants, and some species of cockroaches are large, and would be overwhelming without the help and order provided by the authors of bibliographies, books, and subject-matter reviews. Those individuals have provided a great service to this discipline. The reference literature provided here relies on the works that have collected and cataloged scientific papers, and reviewed urban pest concepts.

Control methods and materials are not included with the biological information or in the bibliography. This is often a subjective topic and to cover properly, it must be accompanied by a large amount of published data. Chemical control methods and application equipment are becoming more standardized around the world as manufacturers adopt a global approach to pest management. However, this aspect of urban and public health entomology will always be more dynamic than static, and difficult to put between the covers of a book.

This book could not have been prepared without the investigations, research, and careful observations of pest control professionals, urban entomologists, their students, and technicians around the world. At the local or regional level these entomologists collected and published data on the arthropods that are a small and large part of the urban ecosystem. This book is a collective of those published works. I sincerely appreciate their work and have attempted to share it with other professionals in urban entomology. The majority of the illustrations used here were adapted from various US Department of Agriculture publications. Urban entomologists around the world have provided help with illustrations and translations, and I greatly appreciate their contributions.