

URBAN ENTOMOLOGY PERSPECTIVES

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Abstract—Modern society has moved from an agricultural base to one that is urbanized. A majority of the world's population, in both developed and developing countries, lives in towns, cities, or large metropolitan areas. Urbanization can often lead to conditions of overcrowding, substandard or inadequate housing, air and water pollution, and increases in vector-borne diseases. The scientific discipline of urban entomology, the study and of invertebrate pests in the urban environment, can help to improve living conditions in urban areas by designing insect management and control programs that are effective, economical, and environmentally compatible. The contribution this discipline can make to the quality of life in urban environments will depend on an increase in the level of national and international organization, a broad and responsive base of both basic and applied research, and adequate research funding. Activities that will strengthen the contributions of urban entomology to modern society include a regular schedule of formal conferences for exchange of ideas and information, a computer-based network that links research laboratories and scientists around the world, and a subject-specific journal for urban entomology research.

INTRODUCTION

Cities and large urban metropolitan areas have come to characterize, and will soon dominate modern society. Along with increasing size, many of the major cities around the world have increased their power base and function as independent "city states". They have International Offices at home and abroad, mayors that engage in foreign trade missions and meet with heads-of-state, and they negotiate independently for water rights, joint-venture factories, and world sports events. In the future, it will be these large and powerful cities that determine the wealth of a nation; and the overall "health" of those cities will very likely determine the future of a nation. The growth of cities creates a variety of cultural, medical, and physical problems on a large scale. Urban governments will struggle with the pressures of crowding, limited social services, substandard or unavailable housing, pollution of air and water supplies, poor sanitation, and increases in communicable and vector-borne diseases. Providing and maintaining an appropriate level of health and sanitation in urban areas can be critical to stable national governments, and for a developing world society.

Urban entomologists, along with other biologists, will play a key role in maintaining the quality of life in urban society. Within this discipline are the scientists conducting basic and applied research on invertebrate pests associated with household and structural environments, and the professionals dedicated to transferring research-based information to the user and decision-making urban audience. The contributions available from urban entomologists include designing modern structures to resist decay and pest infestation, and pest management and control programs based on strategies that are effective, economical, and environmentally compatible. Although these contributions are important, they are often unrecognized or overlooked. Urban entomology has one of the largest benefiting audiences--urban residents, but one that is the least organized to provide support.

The science of urban entomology can and will make significant contributions to the quality of life of modern society. However, before the importance of this discipline is fully realized and better supported, the participating scientists must take some decisive actions. The objectives of this review are to present aspects of the current status of urban entomology, and to suggest actions and directions appropriate for the immediate future. The most important of these suggestions include increasing or better defining the sense of identity in this science, and to broaden and bolster the foundation of research and communication. In general, to seriously consider for this discipline "where we are" and "where we are going".

CURRENT STATUS

The current status of urban entomology can be evaluated on the basis of the level of national and international organization, the diversity and depth of the research base, and the available research funds. These criteria can vary with industry, academia, and business; and certainly from country to country. However, there are some general features that can serve indicate current status and future trends.

Organization

The current strength and continued development of urban entomology is linked to the level of organization. This is defined by structured and scheduled opportunities for scientists to gather and share ideas and information—either in a conference or journal setting. In the United States the National Conference on Urban Entomology has become a major focus point for urban entomologists. In recent years, this conference has attracted scientists from Canada, Japan, England, and several European and Middle Eastern countries. This organization base was enlarged with the establishment of a yearly, formal conference for urban entomology at the national meeting of the Entomological Society of America. Now, we have an International Conference on Insect Pests in the Urban Environment with over 200 participants from around the world. This level of national and international organization provides increased identity, puts scientist in contact with scientist and student, contributes to the expansion of the university and industry research base, and in a small way helps to increase research funding. We have now in place an excellent organizational framework. But great potential is the heaviest burden.

Research Base

The current status of the research base is not as good as the level of organization. The people and places for basic and applied research on household and structural insect pests has grown little in the last eight to ten years (Robinson, 1986). Economic recessions, coupled with industry and academic reorganizations has lead to severe reductions in funding and personnel in England, the United States, and other major countries. There are critical needs for research scientists and laboratories around the world.

A significant growth in the overall research base is the opening of the Urban Entomology Research Center at Zhejiang Agricultural University in Hangzhou, China. This is the first such laboratory/research building in China dedicated to research on household and structural pests. Scientists at this laboratory hope to share with other laboratories data bases and research expertise.

Support Funding

The sources and funds available to urban entomologists have not significantly increased in recent years (Robinson, 1986). In fact, they may have actually decreased because of worldwide economic problems. But even during better economic conditions the competitive funds for basic and applied research in urban entomology were limited (Robinson, 1990). The majority of academic and even government agency research on household and structural pests is coupled with industry-sponsored evaluations of pest control strategies. While this coupling serves as an important link between industry and academic scientists, it may do little to encourage research in new directions (Negin, 1993). Clearly, there is need for more funds for independent research in urban entomology. This may happen as elected representatives from urban areas gain greater influence in local and national governments, and these representatives are encouraged to support individual or a consortium of institutions conducting research. While this may happen tomorrow, what can happen today is more inter-agency or inter-institution cooperative research projects. Such projects can better utilize specific talents and expertise at several locations.

FUTURE GOALS AND DIRECTIONS

Recommendations for future directions of urban entomology are difficult, especially for a discipline that is still growing and developing. I will propose actions and activities that I think will strengthen and increase the leadership role of this science.

- Establish a regular schedule for this International Conference on Insect Pests in the Urban Environment. The exchange of ideas and information that will characterize this conference is crucial for this region, and for urban entomology throughout the world. The formation of a small Conference Standing Committee can provide the necessary support and guidance for future Conference Organizing Committees. It can help establish a calendar, suggest meeting sites, and identify potential organising groups.
- Establish a computer-based link of urban entomology research laboratories and scientists around the world. This network can help scientists share bibliographic data bases, research project summaries, and perhaps some preliminary findings. Most important, it may lead to more cooperative research projects between individuals and laboratories. The urban pests and the available management and control strategies change little around the world. Cooperative research can often be a more effective use of limited personnel and funding resources. In the future, communication between scientists will become as important as the communication of research results to the user community. Without communication, there will certainly be duplication--and that can be wasteful. A communication network can be accomplished easily with current computer technologies, and the future explosion of satellite dishes. But it will require the participation and leadership of dedicated scientists in academia and industry.
- Establish a Journal of Urban Entomology. I think it is time to consider seriously the consolidation in one place some of the regularly published research on household and structural pests that is now scattered through several journals around the world. A journal devoted to urban entomology can develop gradually. Perhaps by first publishing the Proceedings of this conference, and the Proceedings of the National Conference on Urban Entomology in the U.S., and special symposia and seminars. In time the journal can be expanded to include submitted papers.

CONCLUSIONS

For 99% of our history we were a hunter-gather society. During that time we came together in small, family groups, and cooperated to live successfully within the natural environment. Indeed, some would say that we were better off then. We had a more varied diet, perhaps were more fit, that society had no class distinctions or gender inequalities, and we were free of the problems of crowding, and war (Cohen, 1989). The advent of organized agriculture changed all that. It seems that for the remainder of our history we will be an urban society. The future will see an increasing majority of the world's population, in both developed and developing countries, living together in large numbers in a completely altered, man-made environment—cities (Povolny, 1971). The science of urban entomology will contribute to the quality of life in this environment by providing the methods and the materials that influence interactions between pests and man, and his pets, plants, and structures.

The contribution urban entomology makes to our society will be determined by the scientists at work today. In this discipline there is great diversity and great talent, but limited opportunities for synthesis and collective planning. Given the opportunity, a cooperative environment, and sufficient funds the laboratories and individuals around the world can become teams, and these teams can address and answer existing and potential pest problems. Clearly, the contributions of this discipline will be measured not in the size of the knowledge base it developed, but in the amount of knowledge it shared between scientists, gathered together into programs, and transferred to society.

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