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Applied Myrmecology

A World Perspective

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Foreword

"Man tends to look up and tries to figure out what is happening up above and at the same time he cannot even figure out the ants. I wish I could figure out ants. I suggest let's deal with ants. If we get the chance to understand them, this world would run on a different basis. Without understanding ants, I don't think we can understand other things."

--Lech Walesa

About thirty-one years ago I was assigned to organize a small laboratory in Gulfport, Mississippi, with the sole purpose of developing safe and effective methods to control the imported fire ant, then known as *Solenopsis saevissima* var. *richteri*. The U.S. Congress had just initiated a new control program and the only available control technology required large amounts of the insecticides heptachlor and dieldrin. Little did I know how controversial this new invader from South America would become. I doubt many other insects have presented such a challenge to our ingenuity and resourcefulness. While we have had considerable success in developing methods for their control, heightened environmental awareness and increasingly stringent pesticide regulations have forced us to continually research and develop new control strategies. For example, Mirex bait was the crowning achievement of our research in the early 1960s, and millions of pounds were applied in the southern United States. Unfortunately, application rates as low as 500 milligrams per acre left residues in nontarget animals. Despite scant evidence for its mammalian toxicity, the detection of residues, especially in humans, dictated its withdrawal by the U.S. Environmental Protection Agency. Thus, we had to look elsewhere to provide new, environmentally safe control strategies.

This search made us aware of the parochial nature of our overall research program. We had always tried to satisfy the needs of the federally-supported Imported Fire Ant Control Programs for immediate control techniques. As a result, our research on the fire ant's biology, ecology, physiology and biochemistry lagged far behind. We knew little about pheromones and even less about the ants' natural enemies in South America. In fact, we are only now learning the exact location of their homeland.

For the first time, we realized that maximum efficiency on our part meant a free trade of information with scientists working on other pest ant

species. We felt that the resulting data base would give all of us added insight into pest control. A new field was born: "applied myrmecology."

However, there were some initial problems. In 1981, I received an invitation to present a paper on the fire ants' economic impact for a symposium on "Economically Important Social Insects" at the 9th Congress of the International Union for the Study of Social Insects (IUSI) in Boulder, Colorado. To my dismay, interest and attendance at the symposium were poor. The vast majority of myrmecologists were not studying pest ants; instead, they emphasized the basic aspects of behavior, caste determination and origin of sociality. While these challenging long-range research areas could lead to new control techniques, they did not help solve our immediate problem of how to control the fire ant. Fortunately--as a result of prior contacts with Dr. Alain Kermarrec (INRA, Guadeloupe)--we were able to gather a small but determined group of scientists working on fire ants and leaf-cutting ants. Our purpose? To organize a symposium specifically aimed at an interchange of research objectives and ideas on control and management of these two pest ants. Our efforts eventually culminated in the March 1985 symposium "Fire Ants and Leaf-Cutting Ants," which we hosted in Gainesville, Florida. This highly successful meeting demonstrated how interactions between researchers of the two different ant groups could be greatly beneficial to both. The symposium resulted in the publication of a book entitled *Fire Ants and Leaf-Cutting Ants: Biology and Management*.

Another result of the symposium was the decision to broaden "Attini," the newsletter started by Dr. Cherrett as a vehicle for leaf-cutting ant news. We decided that the newsletter would now publish information on all pest ants. And, although no specific plans were made for a second conference, Klaus Jaffe arranged a "Pest Ants" colloquium in Caracas, Venezuela (October 1988). The papers presented at this meeting--in addition to other solicited manuscripts--are included in this book.

While both conferences successfully provided a medium for exchange of applied myrmecology research data, we must now re-evaluate our accomplishments and decide the direction of future research. Would we be better off working within the framework of already-existing international organizations? The answer is a resounding "No," if the papers presented at the past two IUSI meetings and the International Congress of Entomology are any indication. IUSI's 9th Congress in Boulder, Colorado (1982), presented only fourteen papers or posters related to pest ants: five on fire ants, four on carpenter ants, two on leaf-cutting ants and one each on pharaoh and harvester ants. The numbers for the 10th Congress in Munich, Germany (1986), were somewhat better (seventeen total), but they still represented only about 5% of the 350 papers presented. The numbers according to pest ant species were: nine on fire ants, two on leaf-cutting ants, three on carpenter ants, three on harvester ants and one on the Argentine ant.

The July 1988 International Congress of Entomology in Vancouver, Canada, suffered from a shortage of papers specifically on pest ants: There were four papers on fire ants (all presented by USDA/ARS scientists) and one each on leaf-cutting, Argentine and carpenter ants. Either there is a lack of interest in pest ant research or pest ant researchers are uninterested in presenting their research at meetings.

Whatever the cause, this lack of representation does not reflect the large volume of pest ant literature. Cherrett (1986) stated that some 1300 papers

and four books have been published on leaf-cutting ants. Wojcik (in a personal communication) recorded the following publications on fire ants: 973 research papers, 88 theses and dissertations, 220 review articles or bibliographies and 214 popular articles or extension and regulatory bulletins. Numerous papers have been published on other pest ants. It appears to me that, at some level, researchers in applied myrmecology are not effectively organized and that improved communication needs to be a primary goal. A structured approach to pest ant meetings and an emphasis on "Attini" as an instrument for dialogue and discussion may be the answer.

Fortunately, Harold Fowler organized a third pest ant conference (Brazil, 1989) and Robert Vander Meer is organizing a "Pest Ant" symposium for the 11th International IUSSI meeting (Bangalore, India, 1990). Perhaps we have awakened a broad interest in pest ants.

We should also consider broadening our scope of interest to include researchers who study ants as biocontrol agents. With the current trend toward reduced pesticide usage and management of insect populations, we need to emphasize ants as predators of pest insects. This is a real factor in fire ant control strategies since *S. invicta* is being promoted for control of several pest species. (Majer, 1982, has published an interesting review of the manipulation of ant species in agricultural and forest ecosystems.)

Applied Myrmecology: A World Perspective represents the first effort to bring together a broad range of pest ant articles in a single volume. For this, the editors need to be commended. I urge the contributors and others interested in applied myrmecology to continue these essential interactions.

C. S. Lofgren

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