

Systematics Research¹

Donald E. Bright²

The following comments about bark beetle genetics reflect my current thoughts on the status of bark beetle systematics and present some of my ideas concerning future needs.

The basic alpha taxonomy of North American bark beetles is essentially finished. All of the species occurring in North America are, more or less, well characterized at the alpha level and their taxonomy is well established. An authoritative name can now be consistently given to almost any specimen or series of specimens. Keys and descriptions to all species in all genera of North American scolytids are now available. A catalog of the world fauna will soon be available. It is extremely unlikely that very many morphologically distinct, unnamed species of North American Scolytidae remain to be discovered. Any newly discovered species will probably be found in either host plants of very restricted distributions (e.g., Santa Lucia fir), in the various desert shrubs or deciduous trees, or as currently unrecognized sibling species. I would estimate that fewer than 10 morphologically distinct, unnamed species remain undiscovered in North America.

This, however, does not mean that systematic investigations are no longer needed. Indeed, we are now able to embark on the most exciting aspect of systematic research. With all of this basic knowledge, we are now left with the task of resolving a number of species groups, subspecies, host/geographic races, sibling species, and so on. Unresolved species groups are known to exist in *Dendroctonus*, *Ips*, *Pityophthorus*, probably *Scolytus*, and undoubtedly in a number of less studied genera. Also, on a more fundamental level, there is a need to develop information

that will improve understanding of phylogeny, evolution, generic and tribal relationships, and other such basic systematic questions.

Morphological studies have been the backbone of taxonomic research for decades and will probably remain of primary importance for decades to come. However, we now have an exciting array of other methods that may prove to be of immense importance. Isozyme analysis, cuticular hydrocarbon analysis and PCR techniques will be increasingly used in the future to help resolve some of the questions mentioned above.

A molecular systematics laboratory is being established at the Biological Resources Division, Canada Department of Agriculture, in Ottawa, Ontario. I hope it will be able to address some of the questions raised above.

One concern for the future of scolytid systematics is that in less than 10 years the currently working North American systemists will have all retired. I am not aware that any current graduate student is working on scolytid systematics, nor are any young, currently employed researchers working on this group. I urge university faculty to seek out qualified individuals and guide them into the systematic study of the Scolytidae. Forest entomology has been fortunate during the past three decades in having several active individuals interested in systematic studies of bark beetles, and this interest needs to be continued.

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²Research Scientist, Canada Dept. of Agriculture, Systematics Research, Centre for Land and Biological Resources Research, Ottawa, Ontario K1A 0C6