Pergamon

Phytochemistry, Vol. 46, No. 2, p. 393, 1997

Printed in Great Britain
0031-9422/97 $17.00+0.00

PII: S0031-9422(97)00300-2

BOOK REVIEW

Phytochemical Diversity and Redundancy in Ecological Interactions—edited by J. T. Romeo, J. A. Saunders and P. Barbosa, in the *Recent Advances in Phytochemistry* Series, Vol. 30, Plenum Press, New York, 1996. 319 pp. $89.50. ISBN 0-306-45500-5.

Some Symposium proceedings can be devoured at one sitting and they age rapidly, so that they can be cast aside after a year or so. Others have so much meat in them that they require several sittings for digesting the contents. Furthermore, they appreciate with time and many of their contents can be consumed with pleasure several years later. The present Symposium volume on phytochemical ecology definitely belongs in the latter category and I am sure it will be regularly referred to over the next decade.

The proceedings open auspiciously with a well argued case that phytochemical diversity has arisen by adaptation through coevolution and is not the result of random variation. The distinguished authors are May Berenbaum and Arthur Zangerl and they are in effect replying to an earlier review by Jones and Firn, published in the Royal Society Transactions in 1991. Good evidence is presented here, from the authors' work on Umbelliferae furanocoumarins, that toxin mixtures are always more effective feeding deterrents than single toxins. The same theme is taken up by Lindroth and Hwang in the second chapter on the phenolic defences of aspen trees, where different phenolics are only effective against particular pathogens or herbivores. The defensive role of phenolics is also one topic in the review of Renwick on cabbage butterflies and their food plants, where it is shown that even chlorogenic acid under the right circumstances can be defensive against Lepidopteran feeding.

The next two chapters usefully review the grass–fungal–endophyte associations (Siegel and Bush) and the multiplicity of defence signals in plants against pathogens and herbivores (Hammerschmidt and Schultz). Then Murray Isman and co-workers ask the question: Why so many terpenoids and so few insecticides in plants of the Meliaceae? The answer lies in the fact that plants can erect a wide variety of feeding barriers, without the need to form especially toxic insecticidal agents in the process. Further support for the Berenbaum–Zangerl view, that toxin mixtures make the most effective feeding barriers, is provided by Cates in a review of conifer–insect–pathogen interactions. Nahrstedt then discusses the cyanogenic system of plants and of the moth *Zygaena trifolii*, Ryan the role of polyphenol oxidases in the inducible defence response in the tomato plant, Uknes the role of benzoic acids in systemic resistance and Jarvis with Miller the complexity and evolution of natural products. The last word goes to Firn and Jones who propose yet another theory for secondary product redundancy. This last chapter will no doubt encourage workers like Berenbaum and Zangerl to carry out yet further experiments to refute such a bizarre hypothesis!

School of Plant Science, University of Reading, U.K. JEFFREY B. HARBORNE