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 Book Reviews
 

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**Brussard, P.F. (ed.): Proceedings in Life Sciences. Ecological Genetics: The Interface.**

Berlin-Heidelberg-New York: Springer 1979. 247 pp., 39 figs., 39 tabs. Hard bound \$ 25.30.

The book contains the proceedings of the Symposium of the Society for the Study of Evolution held at Ithaca, New York, June 12-15, 1977. This aimed to be an interface between genetics and ecology. Twelve speakers reported on different topics in ecological genetics to give some insights into the present state of this discipline.

In the section 'theory' S.A. Levine applies the classical models of population genetics, optimization theory and game theory, to explain adaptation to different environmental conditions. An important point in this and other papers is the problem of fitness optimization. Roughgarden deals with a co-evolutionary theory which is an extension to interspecific frequency dependence of his earlier theory. In the second part of the volume, 'Physiology, Biochemistry and Adaptation', Koehn defines ecological genetics as a subdiscipline of evolutionary biology. The adaptive value of genetic variation of enzymes depends on the phenotypic diversity which is ecologically relevant. He demonstrates the adaptive trait of variations in the *lap* (leucine aminopeptidase) locus of *Mytilus edulis*; for instance, acclimatization to osmotic stress is dependent on differences among *Lap* phenotypes. In 'Genes, Enzymes and Hypoxia' Schull et al. describe the adaptation of man to the special environmental conditions of the Andes. Three lectures deal with results on evolutionary mechanisms in *Drosophila*. Carson has studied the speciation of *D. silvestris* and *D. heteroneura*; the primary genetic change in speciation is the build-up of two distinct mate recognition systems. The second *Drosophila* lecture summarizes what is known on host plant selection, alcohol metabolism and sexual isolation of four species of the Sonoran Desert. The third *Drosophila* lecture (R.C. Richmond) is an excellent review on the ecological genetics of *Drosophila* with results from artificial populations and field studies. Besides the *Drosophila* studies, work on some other animals is presented: 'Ecological Parameters and Speciation in Field Crickets' (R.G. Harrison) and 'Some Contributions of Snails to the Development of Ecological Genetics' (B. Clarke). Two reports on ecological genetics in plants follow. Clegg, Kahler and Allard demonstrate that an increase in adaptation to environmental conditions is possible by change in demographic parameters. The same plant species is capable of rapid growth and high reproductive output in a highly disturbed environment but has long vegetative periods in stable undisturbed habitats. Although only limited data are available on plant genetic demography it is concluded that changes at different stages of the life cycle may lead to higher fitness. D.A. Levin entitles his report 'Some Genetic Consequences of Being a Plant' and the final report

by Sokol discusses: 'Population Differentiation: Something New or More of the Same?.'

The book is not only valuable to ecologists, but also for scientists interested in population genetics, evolution and speciation.

E. Günther, Greifswald

**Waters, M.D., Nesnow, S., Huisingh, J.L., Sandhu, S.S. (eds.): Application of Short-term Bioassays in the Fractionation and Analysis of Complex Environmental Mixtures. Environmental Science Research, Vol. 15.**

New York-London: Plenum Press 1978. 588 pp., 122 figs., 108 tables Hard bound \$ 49,50

The introduction of short-term tests for the elucidation of genetic hazards for man has been the most successful development in toxicological research in the last decade. A very recent extension of these methods concerns the testing of complex environmental mixtures. The present publication comprises 23 presentations at a meeting which was held at Williamsburg, Virginia, 1978. Complex mixtures include, in the light of this symposium, ambient water and air samples, industrial air effluents, drinking and waste waters, oils and fuels, engine exhaust, agents related to energy technologies, coal fly ash, tobacco smoke and food products. In the first chapter, essential and widely-used bioassays are introduced. Included are bacterial mutagenesis and repair tests, cell assays in vitro for detection of mutagenesis, transformation and cytotoxicity, plant mutagenesis systems and genetic tests with *Drosophila melanogaster*. This review of methodologies of major short-term tests provides only general information which is, in most cases, known to that scientist who wants to study more complex compounds, and which is sometimes unrelated to the aim of this publication. The other sections, 'collection and chemical analysis of environmental samples' and 'current research' provide information which is valuable for anyone who wishes to extent his studies into this field of environmental research. The detailed description of collection procedures, fractionation and concentration techniques for special cases, as well as the use of bioassays for preliminary characterizations of genotoxic properties, are the real value of this presentation, and on this basis its use as a laboratory standard book can be recommended. Further topics discuss the combination of short-term tests with chemical analytical methods for the final estimation of the genetically active agents and strategies for the identification of their origin. This book provides not only information about the present situation but also contains suggestions for further research relating to the practical application of bioassays in environmental research with respect to as yet unsolved problems.

R. Braun, Gatersleben