

Molecular Evolution and Adaptive Radiation

Edited by

Thomas J. Givnish and Kenneth J. Sytsma
University of Wisconsin – Madison



CAMBRIDGE
UNIVERSITY PRESS

CONTENTS

| | |
|--|------|
| Preface | xiii |
| List of Authors | x |
| I. Introduction | |
| 1. Adaptive radiation and molecular systematics: issues and approaches <i>Thomas J. Givnish</i> | 1 |
| 2. Homoplasy in molecular vs. morphological data: the likelihood of correct phylogenetic inference <i>Thomas J. Givnish and Kenneth J. Sytsma</i> | 55 |
| II. Integrative studies | |
| 3. Adaptive radiation of the Hawaiian silversword alliance: congruence and conflict of phylogenetic evidence from molecular and non-molecular investigations <i>Bruce G. Baldwin</i> | 103 |
| 4. The chronicle of marsupial evolution <i>Mark S. Springer, John A. W. Kirsch, and Judd A. Chase</i> | 129 |
| 5. Evolutionary origins of phenotypic diversity in <i>Daphnia</i> <i>John K. Colbourne, Paul D. N. Hebert, and Derek J. Taylor</i> | 163 |
| 6. Evolutionary trends in the ecology of New World monkeys inferred from a combined phylogenetic analysis of nuclear, mitochondrial, and morphological data <i>Inés Horovitz and Axel Meyer</i> | 189 |
| 7. Adaptive radiation in the aquatic plant family Pontederiaceae: insights from phylogenetic analysis <i>Spencer C. H. Barrett and Sean W. Graham</i> | 225 |
| 8. Molecular evolution and adaptive radiation in <i>Brocchinia</i> (Bromeliaceae: Pitcairnioideae) atop tepuis of the Guayana Shield <i>Thomas J. Givnish, Kenneth J. Sytsma, James F. Smith, William J. Hahn, David H. Benzing, and Elizabeth M. Burkhardt</i> | 259 |

III. Convergence

9. You aren't (always) what you eat: evolution of nectar-feeding among Old World fruitbats (Megachiroptera: Pteropodidae) 313
John A. W. Kirsch and François-Joseph Lapointe
10. Leapfrog radiation in floral and vegetative traits among twig epiphytes in the orchid subtribe Oncidiinae 331
Mark W. Chase and Jeffrey D. Palmer
11. Adaptation, cladogenesis, and the evolution of habitat association in North American tiger beetles: a phylogenetic perspective 353
Alfried P. Vogler and Paul Z. Goldstein

IV. Rapid radiations

12. Molecular phylogenetic tests of speciation models in Lake Malawi cichlid fishes 375
Peter N. Reinthal and Axel Meyer
13. Rapid radiation due to a key innovation in columbines (Ranunculaceae: *Aquilegia*) 391
Scott A. Hodges
14. Origin and evolution of *Argyranthemum* (Asteraceae: Anthemideae) in Macaronesia 407
Javier Francisco-Ortega, Daniel J. Crawford, Arnoldo Santos-Guerra, and Robert K. Jansen

V. Reproductive strategies

15. Plant-pollinator interactions and floral radiation in *Platanthera* (Orchidaceae) 433
Jeffrey R. Hapeman and Ken Inoue
16. Phylogenetic perspectives on the evolution of dioecy: adaptive radiation in the endemic Hawaiian genera *Schiedea* and *Alsindendron* (Caryophyllaceae: Alsinoideae) 455
Ann K. Sakai, Stephen G. Weller, Warren L. Wagner, Pamela S. Soltis, and Douglas E. Soltis
17. Ecological and reproductive shifts in the diversification of the endemic Hawaiian *Drosophila* 475
Michael P. Kambyzellis and Elyse M. Craddock

VI. Character divergence and community assembly

18. History of ecological selection in sticklebacks: uniting experimental and phylogenetic approaches 511
Eric B. Taylor, John Donald McPhail, and Dolph Schluter
19. Phylogenetic studies of convergent adaptive radiations in Caribbean *Anolis* lizards 535
Todd Jackman, Jonathan B. Losos, Allan Larson, and Kevin de Queiros

VII. Macroevolutionary patterns

20. Molecular and morphological evolution during the post-Palaeozoic diversification of echinoids 559
Andrew B. Smith and D. T. J. Littlewood
21. How fast is speciation? Molecular, geological, and phylogenetic evidence from adaptive radiation of fishes 585
Amy R. McCune

Index 611

