

Decapod Crustacean Phylogenetics

Edited by

Joel W. Martin

Natural History Museum of L. A. County
Los Angeles, California, U. S. A.

Keith A. Crandall

Brigham Young University
Provo, Utah, U. S. A.

Darryl L. Felder

University of Louisiana
Lafayette, Louisiana, U. S. A.



CRC Press

Taylor & Francis Group

Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business

Contents

ix

Preface

JOEL W. MARTIN, KEITH A. CRANDALL & DARRYL L. FELDER

I *Overviews of Decapod Phylogeny*

On the Origin of Decapoda	3
FREDERICK R. SCHRAM	
Decapod Phylogenetics and Molecular Evolution	15
ALICIA TOON, MAEGAN FINLEY, JEFFREY STAPLES & KEITH A. CRANDALL	
Development, Genes, and Decapod Evolution	31
GERHARD SCHOLTZ, ARKHAT ABZHANOV, FREDERIKE ALWES, CATERINA BIFFIS & JULIA PINT	
Mitochondrial DNA and Decapod Phylogenies: The Importance of Pseudogenes and Primer Optimization	47
CHRISTOPH D. SCHUBART	
Phylogenetic Inference Using Molecular Data	67
FERRAN PALERO & KEITH A. CRANDALL	
Decapod Phylogeny: What Can Protein-Coding Genes Tell Us?	89
K.H. CHU, L.M. TSANG, K.Y. MA, T.Y. CHAN & P.K.L. NG	
Spermatozoal Morphology and Its Bearing on Decapod Phylogeny	101
CHRISTOPHER TUDGE	
The Evolution of Mating Systems in Decapod Crustaceans	121
AKIRA ASAKURA	
A Shrimp's Eye View of Evolution: How Useful Are Visual Characters in Decapod Phylogenetics?	183
MEGAN L. PORTER & THOMAS W. CRONIN	
Crustacean Parasites as Phylogenetic Indicators in Decapod Evolution	197
CHRISTOPHER B. BOYKO & JASON D. WILLIAMS	
The Bearing of Larval Morphology on Brachyuran Phylogeny	221
PAUL F. CLARK	

II *Advances in Our Knowledge of Shrimp-Like Decapods*

Evolution and Radiation of Shrimp-Like Decapods: An Overview CHARLES H.J.M. FRANSEN & SAMMY DE GRAVE	245
A Preliminary Phylogenetic Analysis of the Dendrobranchiata Based on Morphological Characters CAROLINA TAVARES, CRISTIANA SEREJO & JOEL W. MARTIN	261
Phylogeny of the Infraorder Caridea Based on Mitochondrial and Nuclear Genes (Crustacea: Decapoda) HEATHER D. BRACKEN, SAMMY DE GRAVE & DARRYL L. FELDER	281

III *Advances in Our Knowledge of the Thalassinidean and Lobster-Like Groups*

Molecular Phylogeny of the Thalassinidea Based on Nuclear and Mitochondrial Genes RAFAEL ROBLES, CHRISTOPHER C. TUDGE, PETER C. DWORSCHAK, GARY C.B. POORE & DARRYL L. FELDER	309
Molecular Phylogeny of the Family Callianassidae Based on Preliminary Analyses of Two Mitochondrial Genes DARRYL L. FELDER & RAFAEL ROBLES	327
The Timing of the Diversification of the Freshwater Crayfishes JESSE BREINHOLT, MARCOS PÉREZ-LOSADA & KEITH A. CRANDALL	343
Phylogeny of Marine Clawed Lobster Families Nephropidae Dana, 1852, and Thaumastochelidae Bate, 1888, Based on Mitochondrial Genes DALE TSHUDY, RAFAËL ROBLES, TIN-YAM CHAN, KA CHAI HO, KA HOU CHU, SHANE T. AHYONG & DARRYL L. FELDER	357
The Polychelidan Lobsters: Phylogeny and Systematics (Polychelida: Polychelidae) SHANE T. AHYONG	369

IV *Advances in Our Knowledge of the Anomura*

Anomuran Phylogeny: New Insights from Molecular Data SHANE T. AHYONG, KAREN E. SCHNABEL & ELIZABETH W. MAAS	399
--	-----

V *Advances in Our Knowledge of the Brachyura*

Is the Brachyura Podotremata a Monophyletic Group? GERHARD SCHOLTZ & COLIN L. MCLAY	417
--	-----

Assessing the Contribution of Molecular and Larval Morphological Characters in a Combined Phylogenetic Analysis of the Superfamily Majoidea	437
KRISTIN M. HULTGREN, GUILLERMO GUERAO, FERNANDO P.L. MARQUES & FERRAN P. PALERO	
Molecular Genetic Re-Examination of Subfamilies and Polyphyly in the Family Pinotheridae (Crustacea: Decapoda)	457
EMMA PALACIOS-THEIL, JOSÉ A. CUESTA, ERNESTO CAMPOS & DARRYL L. FELDER	
Evolutionary Origin of the Gall Crabs (Family Cryptochiridae) Based on 16S rDNA Sequence Data	475
REGINA WETZER, JOEL W. MARTIN & SARAH L. BOYCE	
Systematics, Evolution, and Biogeography of Freshwater Crabs	491
NEIL CUMBERLIDGE & PETER K.L. NG	
Phylogeny and Biogeography of Asian Freshwater Crabs of the Family Gecarcinucidae (Brachyura: Potamoidea)	509
SEBASTIAN KLAUS, DIRK BRANDIS, PETER K.L. NG, DARREN C.J. YEO & CHRISTOPH D. SCHUBART	
A Proposal for a New Classification of Portunoidea and Cancroidea (Brachyura: Heterotremata) Based on Two Independent Molecular Phylogenies	533
CHRISTOPH D. SCHUBART & SILKE REUSCHEL	
Molecular Phylogeny of Western Atlantic Representatives of the Genus <i>Hexapanopeus</i> (Decapoda: Brachyura: Panopeidae)	551
BRENT P. THOMA, CHRISTOPH D. SCHUBART & DARRYL L. FELDER	
Molecular Phylogeny of the Genus <i>Cronius</i> Stimpson, 1860, with Reassignment of <i>C. tumidulus</i> and Several American Species of <i>Portunus</i> to the Genus <i>Achelous</i> De Haan, 1833 (Brachyura: Portunidae)	567
FERNANDO L. MANTELATTO, RAFAEL ROBLES, CHRISTOPH D. SCHUBART & DARRYL L. FELDER	
Index	581
Color Insert	