

Contents

Preface	xiii
Acknowledgments	xxi
Contributors	xxiii

1. Macroecology of Sexual Selection: Large-Scale Influence of Climate on Sexually Selected Traits	
<i>Rogelio Macías-Ordóñez, Glauco Machado and Regina H. Macedo</i>	
Introduction	1
Defining the Neotropics	1
Climatic Regions	3
How Much Do We Know About the Influence of Sexual Selection in Each Environment?	7
Macroecology of Sexual Traits	9
Animal Functional Groups to Test Predictions on Sexual Selection	14
Arthropods	17
Ectothermic Vertebrates	19
Endothermic Vertebrates	21
Concluding Remarks	27
Acknowledgment	27
References	28
2. Sexual Selection in Neotropical Species: Rules and Exceptions	
<i>Alfredo V. Peretti</i>	
Introduction	33
Interactive Link Between Rules and Exceptions	34
Situation "Rule-Rule"	36
Situation "Exception-Exception"	36
Situation "Rule-Exception"	38
Situation "Exception-Rule"	40
An Example from the Neotropics: Scorpion Sexual Biology	40
"Rule-Rule": On Spermatophores and Cheliceral Massages	40
"Exception-Exception": On Males that Want but Can't	43
"Rule-Exception": Facts and Fiction on Sexual Cannibalism	44
"Exception-Rule": Subtle vs Conspicuous Displays	45
Concluding Remarks	46
Acknowledgments	48
References	48

3. Secondary Sexual Traits, Immune Response, Parasites, and Pathogens: The Importance of Studying Neotropical Insects

Jorge Contreras-Garduño and Jorge Canales Lazcano

Introduction	53
Sexual Selection: Hamilton and Zuk's Hypothesis	54
The Immune System of Insects	56
Humoral Response	56
Cellular Response	58
Ecoimmunology: Costs of the Immune Response and Biotic and Abiotic Factors that Facilitate its Variation	59
Costs of the Immune Response	59
Biotic and Abiotic Factors Facilitating Variation in the Immune Response	61
Signaling of the Immune Response Through Secondary Sexual Traits in Insects	62
Mechanisms Behind the Immune Response and Sexual Signals Relationship	69
Hormones	70
The Oxidative Stress Damage Hypothesis	72
Availability of Resources	73
Interaction Between Sexual Traits, Immunity, and the Effect of Parasites and Pathogens	74
Acknowledgments	76
References	76

4. Territorial Mating Systems in Butterflies: What We Know and What Neotropical Species Can Show

Paulo Enrique Cardoso Peixoto and Luis Mendoza-Cuenca

What are the Original Concepts for Territorial Mating Systems?	85
What has been Confirmed for Butterflies, and in which Parts of the Globe?	87
What Do We Suggest after Looking at the Accumulated Knowledge?	101
Where Should More Territorial Species Occur?	105
What Do We Need to Learn about Mating Systems in Butterflies? A Neotropical Perspective	106
Acknowledgments	107
References	107

5. Macroecology of Harvestman Mating Systems

Bruno A. Buzatto, Rogelio Macías-Ordóñez and Glauco Machado

Introduction	115
Harvestmen: What They are and What They Do	117
Sympathy for the Harvestmen	117

Sex and Violence: The Mating Systems of Harvestmen	125
Bizarre Love Triangle: Alternative Mating Tactics in Harvestmen	128
Macroecology of Harvestman Mating Systems	132
It's My Life: Environmental Effects on Harvestman Development	134
Mother Love: Environmental Effects on Maternal Care	136
Summertime: Environmental Effects on the Length of the Mating Season	141
Concluding Remarks	145
Acknowledgments	146
Appendices	147
References	157
6. Adventurous Females and Demanding Males: Sex Role Reversal in a Neotropical Spider	
<i>Anita Aisenberg</i>	
Introduction	163
Exceptions that Test General Rules: Sex Role Reversal	165
Sex Roles and Sexual Dimorphism in Spiders	166
A Neotropical Wolf Spider as a Model of Sex Role Reversal	168
Male's Revenge: Reversed Sexual Cannibalism in <i>A. brasiliensis</i>	171
Foraging Opportunities and Cannibalism	173
Burrow Digging, Spatial Distribution, and Male Adaptations as Nest Provider	174
When Hunters are Hunted	175
What are the Causes Driving Sex Role Reversal in this Species?	176
Acknowledgments	177
References	177
7. Sexual Selection, Ecology, and Evolution of Nuptial Gifts in Spiders	
<i>Maria J. Albo, Søren Toft and Trine Bilde</i>	
The Sublime Treasures: Nuptial Gifts	183
Nuptial Gifts in Spiders	184
Male Body	184
Glandular Secretions	185
Wrapped Prey Items	185
Wrapped Prey Gifts in an Ecological and Evolutionary Context	186
Phylogenetic Constraints: Ritualized Behaviors	186
Ecological Constraints: Variable Behaviors	188
Functional Explanations of Nuptial Gifts	190
Sexual Cannibalism Avoidance	191
Paternal Investment	191
Mating Effort	192
Silk-Wrapping: Potential Functions	193
Silk-Wrapping Triggered by Female Silk Cues	193
Female Attraction	194

Mating Control and Hiding of the Gift Content	195
Sexual Selection: Cooperation and Conflict	195
Acknowledgments	196
References	196
8. Paternal Care and Sexual Selection in Arthropods	
<i>Gustavo S. Requena, Roberto Munguía-Steyer and Glauco Machado</i>	
Introduction	201
Historical Perspective on Sex Roles and Parental Investment	207
Those 1970s Theories	207
Challenging Classic Theories	209
Paternal Care in Arthropods	211
Overview of Cases	211
Costs and Benefits of Paternal Care	213
Caring Male Attractiveness, a Neglected Benefit	217
Sex Role Reversal	220
Macroecology of Paternal Care	223
Concluding Remarks	226
Acknowledgments	228
References	228
9. Underestimating the Role of Female Preference and Sexual Conflict in the Evolution of ARTs in Fishes: Insights from a Clade of Neotropical Fishes	
<i>Molly R. Morris and Oscar Ríos-Cardenas</i>	
Introduction	235
Consequences of Not Considering the Role of Female Mate Preference in the Bourgeois-Parasitic Paradigm and Associated Assumptions	237
ARTs in the Swordtail Fishes: An Example	239
Evidence that Circumventing Female Mate Preference is Important for "Parasitic" Males	240
Do "Parasitic" Sneaker Males Rely On "Bourgeois" Courter Males to Reproduce?	244
Is Bourgeois the Ancestral State?	247
Concluding Remarks	248
Acknowledgments	249
References	249
10. Mode of Reproduction, Mate Choice, and Species Richness in Goodeid Fish	
<i>Constantino Macías García</i>	
Biogeography: Northern Origin and Southern Differentiation	253

Ecological Consequences of Invading the Neotropics	255
Speciation and Extinction in the Empetrichthynae	255
Speciation and Extinction in the Goodeinae	257
Ecology and Species Richness	257
Paleoclimate, Glaciations, and Volcanism	264
Viviparity and its Consequences	267
Viviparity	267
Sexual Selection in the Goodeidae	273
Male Mate Choice?	278
A Single Explanation? If so, which One?	280
Acknowledgments	281
References	281
 11. Parental Care, Sexual Selection, and Mating Systems in Neotropical Poison Frogs	
<i>Kyle Summers and James Tumulty</i>	
Introduction	289
Theoretical Background	290
The Evolution of Parental Care in Tropical Frogs	292
Patterns of Parental Care in Neotropical Poison Frogs	295
Evolution of Male Care	297
Evolution of Female Care	300
Territoriality and Mating Systems	303
Parental Investment and Sexual Selection	306
Parental Investment, Sex Role Reversal, and Sexual Conflict	308
Biparental Care and Monogamy	310
Conclusions and Future Research	313
References	314
 12. Testosterone, Territoriality, and Social Interactions in Neotropical Birds	
<i>John C. Wingfield, Rodrigo A. Vasquez and Ignacio T. Moore</i>	
Introduction	321
Life Cycles and Endocrine Regulatory Systems: A Northern Perspective	322
What Does Testosterone Do?	326
Social Modulation of Testosterone and the Challenge Hypothesis	327
Life Cycles and Testosterone, A Neotropical Perspective	329
Patterns of Testosterone Secretion and Action in Neotropical Birds	329
Hormones, Behavior, and Sociality in the Neotropics	333
Life Cycles and Testosterone, A Southern Perspective	336
Conclusions	337
Acknowledgments	337
References	337

13. Sexual Selection and the Evolution of Vocal Mating Signals: Lessons from Neotropical Songbirds

Jeffrey Podos

Introduction	341
Song and Sexual Selection	344
Song and Signal Efficacy	346
Song and Morphological Evolution	349
Song and Evolutionary Drift	352
Conclusion	353
Acknowledgments	355
References	355

14. Impacts of Mating Behavior on Plant-Animal Seed Dispersal Mutualisms: A Case Study from a Neotropical Lek-Breeding Bird

Jordan Karubian and Renata Durães

Introduction	365
Overview and Predictions	367
Focal Study Species	371
General Methods	373
How Does Lekking Behavior Affect Seed Dispersal Outcomes in Long-Wattled Umbrellabirds?	376
Prediction One: Umbrellabird Movement	376
Prediction Two: Seed Movement and Deposition	379
Prediction Three: Demographic Consequences	380
Prediction Four: Genetic Consequences	381
Comparisons with Other Lekking and Non-Lekking Species	383
Conclusions	385
Acknowledgments	386
References	386

15. Flights of Fancy: Mating Behavior, Displays and Ornamentation in a Neotropical Bird

Lilian T. Manica, Jeffrey Podos, Jefferson Graves and Regina H. Macedo

Introduction	391
Sexual Selection and Bird Mating Systems	393
Extra-Pair Paternity in Tropical Birds	394
The Blue-Black Grassquit	396
Structural Plumage	397
Acoustic Signals	399
Leap Flight	399
Multimodality Aspect of the Leap Display	400
Sexual Signals and Breeding System	401

Concluding Remarks	402
References	403
16. Sexual Selection in Neotropical Bats	
<i>Christian C. Voigt</i>	
Introduction	409
Bats: Large Mammals Trapped in Small Bodies	409
Sensory Constraints for Communicating in the Darkness of the Night	410
Examples of Sexual Selection in Neotropical Bats	412
Garlic Smell in Fish-Eating Bats (Genus <i>Noctilio</i>)	412
Protective Greater Spear-Nosed Bats (<i>Phyllostomus hastatus</i>)	415
Nest-Excavating Round-Eared Bats (<i>Lophostoma silvicolium</i>)	416
Self-Flagellating Long-Nosed Bats (<i>Leptonycteris curasoae</i>)	417
Luring Songs and Scents in Greater Sac-Winged Bats (<i>Saccopteryx bilineata</i>)	419
Are Neotropical Bats Special with Respect to Sexual Selection?	425
Acknowledgments	427
References	427
Index	433