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Morphological Bases of the Systematics and Phylogeny of Nototheniid Fishes [Routledge](#) . **Morphological Bases of the Systematics and Phylogeny of the Nototheniid Fishes** Morfologicheskoye Osnovy Sistemiki i Filogenii Nototenyevykh Ryb. (Morphological Bases of the Systematics and Phylogeny of the Nototheniid Fishes.) Foundations of Phylogenetic Systematics Phylogeny inference and the classification of organisms are indispensable for all fields of biology. On the basis of a well corroborated tree of life it is possible to understand the evolution of structure and function, of genomes, of gene families, of cascades of developmental genes, and the origin of genes of medical importance. Ecologists need a stable classification of organisms to identify organisms, to find their correct names and thus further information on relevant species. This book offers an introduction to the theory of Phylogenetic Systematics and is a companion for all biologists who want to analyze morphological or molecular data with classical methods or with modern computer programs. The first part of the book explains the epistemological basis that is independent of the type of method used to construct phylogenetic trees. Unlike other empirical sciences, the estimation of data quality in phylogenetics is still little developed and very often neglected. Here a theoretical basis is presented that enables the systematist to assess critically and objectively the quality of different data sets and to make statements on the plausibility of results. This requires a conception of the notions of information content, probability of homology, probability of cognition, probability of events, the principle of parsimony, the differentiation of phenomenological and modelling methods. Willi Hennig's original method is compared with modern numerical systematics and an updated Hennigian procedure of data analysis is discussed. The difference between phenetic and phylogenetic cladistics is explained. Popular tools for data evaluation implemented in computer programs are explained including their axiomatic assumptions, sources of error and possible applications. For the more common tools the mathematical background is explained in a simple, easy-to-understand way. Johann-Wolfgang Wägele was until recently head of the Department for Animal Systematics (Lehrstuhl für Spezielle Zoologie) at the University of Bochum and is now director of the Museum Alexander Koenig in Bonn (Germany). His main research interests are the taxonomy, phylogeny and biodiversity of Isopoda, which implies observations of life history, biogeography and ecology in combination with phylogeny inference. Further subjects include arthropod phylogeny and tools for explorative data analyses. The author is president of the Gesellschaft für Biologische Systematik, a Central European society of systematists, and he is actively promoting biodiversity research. **Volume 1: Morphology and Systematics (Archostemata, Adephaga, Myxophaga, Polyphaga partim)** [Walter de Gruyter](#) Dieses Buch ist der erste von vier Bänden der Reihe Handbuch der Zoologie zur Systematik und Biologie der Coleoptera. Mit ca. 350.000 beschriebenen Spezies sind die Coleoptera die bei Weitem reichste Ordnung und die größte Gruppe von Tieren mit vergleichbarem geologischem Alter. Die Käfer-Bände des HdZ bieten modernen Biologen Antworten auf Fragen zur Phylogenese, Evolution und Ökologie der Coleoptera. Der erste Coleoptera-Band umfasst die Unterordnungen Archostemata, Myxophaga und Adephaga und die Serie Polyphaga mit Informationen zur weltweiten Verbreitung, Biologie, Morphologie aller Lebensabschnitte (einschließlich Anatomie), Phylogenese und Erläuterungen zur Taxonomie. **Carcharhinoid Sharks Morphology, Systematics, and Phylogeny** Morphology, Phylogeny, Biogeography and Systematics of Phoxinus (Pisces: Cyprinidae) [Plant Systematics Academic Press](#) Plant Systematics, Third Edition, has made substantial contributions to plant systematics courses at the upper-undergraduate and first year graduate level, with the first edition winning The New York Botanical Garden's Henry Allan Gleason Award for outstanding recent publication in plant taxonomy, plant ecology or plant geography. This third edition continues to provide the basis for teaching an introduction to the morphology, evolution and classification of land plants. A foundation of the approach, methods, research goals, evidence and terminology of plant systematics are presented, along with the most recent knowledge of evolutionary relationships of plants and practical information vital to the field. In this new edition, the author includes greatly expanded treatments on families of flowering plants, as well as tropical trees (all with full-color plates), and an updated explanation of maximum likelihood and Bayesian inference algorithms. Chapters on morphology and plant nomenclature have also been enhanced with new material. Covers research developments in plant molecular biology Features clear, detailed cladograms, drawings and photos Includes major revisions to chapters on phylogenetic systematics and plant morphology **Systematics and Phylogeny of Weevils Volume 2** [MDPI](#) This Special Issue on the Systematics and Phylogeny of Weevils presents 31 new research papers on one of the most diverse and successful groups of animals on Earth, the beetle superfamily Curculionidae. It was in part inspired to commemorate the extraordinary life and scientific achievements of Guillermo ("Willy") Kuschel (1918-2017), who shaped this field of science over the last century like no other weevil systematist. The papers in this memorial issue span weevil faunas from all over the globe, including South and Central America, Africa, Europe and the Near East, South-East Asia, New Guinea, Australia and New Zealand. They include major advances on the phylogeny and classification of the "broad-nosed" weevils (Entiminae), on the weevils associated with American cycads and on the unique extinct weevil fauna preserved in the 100-million-year-old Burmese amber, when weevils started to diversify alongside the oldest angiosperm plants. They comprise a tribute to Willy Kuschel, the proceedings of a weevil symposium held in his honor in 2016 in Orlando, Florida, 24 systematic studies (including seven phylogenetic analyses) and five other contributions on the diversity, biology, distribution, evolution and fossil history of weevils. In the papers collated in this volume, 30 new genera and 92 new species of weevils are described and a new family of extinct weevils is recognized. **A Morphological Examination of Nearctic Sminthurus (Collembola: Sminthuridae)**, with Reference to Systematics and Phylogeny **The Antarctic Silverfish: a Keystone Species in a Changing Ecosystem** [Springer](#) This book encompasses the body of available scientific information on the nototheniid fish *Pleuragramma antarctica* commonly known as Antarctic silverfish. This plankton-feeder of the intermediate trophic level is the most abundant fish in the coastal regions of high Antarctica, and plays a pivotal ecological role as the main prey of top predators like seals, penguins, whales and Antarctic toothfish. Broad circum-polar distribution, a key role in the Antarctic shelf pelagic ecosystem, and adaptations makes understanding the species' likely response to environmental change relevant to foresee the potential responses at the local ecosystem level. Additionally, a detailed understanding of the abundance and trophic interactions of such a dominant keystone species is a vital element of informing the development of marine spatial planning and marine protected areas in the Antarctic continental shelf region. Experts in the field provide here unique insights into the evolutionary adaptation, eco-physiology, trophic ecology, reproductive and population ecology of the Antarctic silverfish and provide new clues about its vulnerability in facing the challenges of the ongoing environmental changes. **Phylogenetic Systematics Haeckel to Hennig** [CRC Press](#) **Phylogenetic Systematics: Haeckel to Hennig** traces the development of phylogenetic systematics against the foil of idealistic morphology through 100 years of German biology. It starts with the iconic Ernst Haeckel-the German Darwin from Jena-and the evolutionary morphology he developed. It ends with Willi Hennig, the founder of modern phylogenetic **Phylogenetic Systematics University of Illinois Press** **Phylogenetic Systematics**, first published in 1966, marks a turning point in the history of systematic biology. Willi Hennig's influential synthetic work, arguing for the primacy of the phylogenetic system as the general reference system in biology, generated significant controversy and opened possibilities for evolutionary biology that are still being explored. **Functional Morphology and Diversity** [Oxford University Press](#) Crustaceans are increasingly used as model organisms in all fields of biology, including neurobiology, developmental biology, animal physiology, evolutionary ecology, biogeography, and resource management. One reason for the increasing use of crustacean examples is the wide range of phenotypes found in this group and the diversity of environments they inhabit; few other taxa exhibit such a variety of body shapes and adaptations to particular habitats and environmental conditions. A good overview of their functional morphology is essential to understanding many aspects of their biology. This volume is the first in The Natural History of Crustacea series, a ten-volume series that will treat all aspects of crustacean biology, physiology, behavior, and evolution. The series updates and synthesizes a growing wealth of information on the natural history of this remarkable group. **Functional Morphology and Diversity** explores the functional morphology of crustaceans, which cover the main body parts and systems. The book brings together a group of internationally recognized-and up-and-coming-experts in fields related to systematics and morphology. Contributing authors study a range of crustacean taxa and topics, and thus the volume provides a compact overview of the great phenotypic diversity and their function found among crustaceans. The first broad treatment of Crustacea in decades, the book will be invaluable for researchers and students in this and related fields. **Refining Phylogenetic Analyses Phylogenetic Analysis of Morphological Data: Volume 2** [CRC Press](#) This volume discusses the aspects of a phylogenetic analysis that go beyond basic calculation of most parsimonious trees. Practical application of all principles discussed is illustrated by reference to TNT, a freely available software package that can perform all the steps needed in a phylogenetic analysis. The first problem considered is how to summarize and compare multiple trees (including identification and handling wildcard taxa). Evaluation of the strength of support for groups, another critical component of any phylogenetic analysis, is given careful consideration. The different interpretations of measures of support are discussed and connected with alternative implementations. The book reviews rationales for estimating character reliability on the basis of homoplasy, with particular attention to morphological characters. The main methods for character weighting and their practical implementation, several of them unique to TNT, are discussed ad libitum. Also unique to TNT is the ability to directly analyze morphometric data (including landmarks), on the same footing as discrete characters. Finally, the scripting language of TNT is introduced. With scripting, it is possible to "program" TNT to create personalized routines and automate complex calculations, taking analyses to the next level and allowing exploration of new methods and ideas. **Key Features** Discusses the treatment of ambiguity in phylogenetic analyses in depth, for summarizing results or comparing trees **Reviews literature** on arguments and methods for weighting morphological characters and their practical application **Describes theory and application of methods** for evaluating strength of group support, based on either resampling or comparisons with suboptimal trees **Discusses the use of morphometric characters** in phylogenetic analysis **Presents extensive information** on commands and options of the TNT computer program, including the use and creation of scripts **Insect Morphology and Phylogeny A Textbook for Students of Entomology** [Walter de Gruyter](#) In the last decades a remarkable renaissance has materialized in insect morphology, mainly triggered by the development of new cutting-edge technologies.

This is an exciting time for biological synthesis where the mysteries and data derived from genomes can be combined with centuries of data from morphology and development. And, now, more than ever, detailed knowledge of morphology is essential to understanding the evolution of all groups of organisms. In this "age of phylogenomics" researchers rely on morphological data to support molecular findings, test complex evolutionary scenarios, and for placing fossil taxa. This textbook provides an in-depth treatment of the structures and the phylogeny of the megadiverse Hexapoda. The first part presents an up-to-date overview of general insect morphology with detailed drawings, scanning electron micrographs, and 3-D reconstructions. Also included is a chapter covering innovative morphological techniques (e.g., μ -computer tomography, 3-D modeling), brief treatments of insect development and phylogenetic methods, and a comprehensive morphological glossary. The second part is of a modern synthesis of insect systematics that includes taxon-specific morphological information for all Orders. The work is an invaluable reference for students and researchers working in all facets of biology and is a must for evolutionary biologists. A detailed understanding of morphology is essential in unraveling phylogenetic relationships and developing complex evolutionary scenarios. Increasingly researchers in phylogenomics are re/turning to morphological data to support their findings, while the development of new cutting-edge technologies has further increased interest in this growing field. This definitive handbook provides an in-depth treatment of insect morphology. The first part presents an up-to-date overview of insect morphology with detailed drawings, brilliant scanning electron micrographs and 3-D reconstructions as interactive PDFs. This is complemented by a chapter on innovative morphological techniques (e.g., μ -computer tomography, 3-D modeling) and a comprehensive morphological glossary. The second part treats the state of the art in insect systematics and includes taxon-specific morphological information for all orders. Systematics are treated formally, with for example the arguments for relationships ("apomorphies") always listed explicitly. The work is a useful reference for students and researchers working in different fields of biology and a must for those dealing with insects from an evolutionary perspective. Fossils and Strata, Morphology, Phylogeny and Taxonomy of Osteolepiform Fish [John Wiley & Sons](#) Systematic Revision and Morphological Phylogenetic Analysis of Anchyrorhynchus Schoenherr, 1836 (Coleoptera, Curculionidae: Derelomini) "Abstract: Anchyrorhynchus Schoenherr is a genus of palm-associated weevils currently including 22 described species in the Neotropics. These weevils engage in brood pollination interactions with species in at least four genera of palms (Arecaceae), representing an emerging system for the study of mutualisms. Here we revise the taxonomy of Anchyrorhynchus and propose the first phylogenetic hypothesis for the group, based on morphology. Anchyrorhynchus chrysoloides sp. nov., Anchyrorhynchus goiano sp. nov., Anchyrorhynchus imitator sp. nov., Anchyrorhynchus latipes sp. nov., Anchyrorhynchus multisquamis sp. nov. and Anchyrorhynchus rectus sp. nov. are described, Anchyrorhynchus gottsbergerorum Vanin is a new junior subjective synonym of Anchyrorhynchus bicarinatus O'Brien, and Anchyrorhynchus eriospathae Bondar and Anchyrorhynchus pictipennis Hustache are new junior subjective synonyms of Anchyrorhynchus tremolerasi Hustache, resulting in 25 valid species for the genus. We provide genus and species descriptions with a new dichotomous key to the species and updated information on geography and host associations based on museum records and extensive new collections. We also produce a new morphological matrix with 113 characters, 11 of them based on measurements while accounting for allometry, correlation and power to delimit groups. The software pipeline to produce these characters was encoded in a graphical user interface named DiscretzR, made available here. Analysis of this matrix under parsimony and Bayesian inference resulted in strong support for the monophyly of Anchyrorhynchus, but weaker support for most clades within the genus. Reconstruction of the host plant associations indicates that the common ancestor of Anchyrorhynchus visited flowers of Syagrus Mart., with later transitions to other genera restricted to one of the major clades of Anchyrorhynchus. This taxonomic revision with the first phylogeny for the group provides a foundation for future evolutionary studies in the genus. Keywords: Coleoptera, systematics, morphology, taxonomic revision, Coleoptera, Curculionidae, Arecaceae, Syagrus, Butia, Oenocarpus, Euterpe"--Page 3. Morphology and Systematics Phytophaga [Walter de Gruyter](#) This book is the third volume in the Handbook of Zoology series which treats the systematics and biology of Coleoptera. With approximately 350,000 described species, Coleoptera are by far the most species-rich order of insects and the largest group of animals of comparable geological age. This third Coleoptera volume completes the Morphology and Systematics volumes with 43 chapters and covers one of the largest radiations of beetles, the mainly plant-feeding Phytophaga, with information on world distribution, biology, morphology of all life stages (including anatomy), phylogeny and comments on taxonomy. Antarctic Journal of the United States Comparative Morphology and Phylogenetic Systematics of the Families Cheilodactylidae and Latridae (Perciformes: Cirrhitioidea), and Proposal of a New Classification "The phylogenetic relationships of the families Cheilodactylidae and Latridae, plus related taxa, are examined from a detailed osteological perspective. The monophyly of each family is re-evaluated and a new classification is proposed on the basis of phylogenetic relationships. A phylogenetic analysis of characters in 67 transformation series showed Latridae to comprise a monophyletic group nested within cheilodactylids. Cheilodactylidae was non-monophyletic, but rather was formed by a clade including Cheilodactylus fasciatus and C. pixi having a sister relationship with a second clade comprising remaining cheilodactylids and latrids. A new classification is proposed, Cheilodactylidae, including only genus Cheilodactylus, and Latridae, including six genera (Latris, Nemadactylus, Mendosoma, Goniistius, Latridopsis and Dactylophora). Keywords: Pisces, Percoidei, phylogeny, osteology, cladistics, monophyly."--Page 3. Sport Fishery Abstracts Phylogenetic Systematics as the Basis of Comparative Biology [Smithsonian Books \(DC\)](#) Phylogenetic Systematics Haeckel to Hennig [CRC Press](#) Phylogenetic Systematics: Haeckel to Hennig traces the development of phylogenetic systematics against the foil of idealistic morphology through 100 years of German biology. It starts with the iconic Ernst Haeckel-the German Darwin from Jena-and the evolutionary morphology he developed. It ends with Willi Hennig, the founder of modern phylogenetic The Primitive Epidendroideae (Orchidaceae): Phylogeny, Character Evolution and the Systematics of Psilochilus (Triphoreae). Considering the significance of the basal Epidendroideae in understanding patterns of morphological evolution within the subfamily, it is surprising that no fully resolved hypothesis of historical relationships has been presented for these orchids. Morphology, Shape and Phylogeny [CRC Press](#) Generally, biologists and mathematicians who study the shape and form of organisms have largely been working in isolation from those who work on evolutionary relationships through the analysis of common characteristics. Increasingly however, dialogue between the two communities is beginning to develop - but other than a handful of journal papers, t The Orchid Genera Anacamptis, Orchis and Neotinea Phylogeny, Taxonomy, Morphology, Biology, Distribution, Ecology and Hybridisation Morphology, Ontogeny and Phylogeny of the Phosphatocopina (Crustacea) from the Upper Cambrian Orsten of Sweden [John Wiley & Sons](#) A detailed investigation of Phosphatocopina Fossils and Strata, Number 49: Morphology, Ontogeny, and Phylogeny of the Phosphatocopina (Crustacea) from the Upper Cambrian Orsten of Sweden presents a detailed look at Phosphatocopina through the rigorous lens of modern scientific study. Fully examined here in study form, this monograph details methods, materials, systematics, phylogenetic analysis and more to bolster discussion and back analyses of comparative morphology. Extensive figures and photos clarify qualitative data, while detailed explanation of analysis methods provide a firm foundation for conclusions and future research. Fishes of Antarctica A biological overview [Springer Science & Business Media](#) The Antarctic fish fauna has evolved over a long period of geographic and climatic isolation. In the course of this evolution, Antarctic fish have developed specialized adaptations, some of which characterize these organisms as unique. In strong contrast to the continental shelf faunas elsewhere, the Antarctic shelf ichthyofauna is dominated by a single highly endemic group, the Notothenioidae. This group of perciform fish probably first appeared and diversified in the early Tertiary. The development of the Polar Front (referred to as the Antarctic Convergence in the older literature) resulted in a natural oceanographic barrier to migration in either direction, and thus became a key factor in the evolution of Antarctic fish. The dominance of the Antarctic continental shelf fauna by a single taxonomic group of fish provides a simplified natural laboratory for exploring the wealth of physiological, biochemical and ecological adaptations that characterize the fauna. Understanding of the patterns of adaptation in this highly specialized group of fish can tell us much about of evolution. Morphology and Systematics (Elateroidea, Bostrichiformia, Cucujiformia partim) [Walter de Gruyter](#) Dieses Buch ist der zweite von vier Bänden der Reihe Handbuch der Zoologie zur Systematik und Biologie der Coleoptera. Mit ca. 350.000 beschriebenen Spezies sind die Coleoptera die bei Weitem reichste Ordnung und die größte Gruppe von Tieren mit vergleichbarem geologischem Alter. Die Käfer-Bände des HdZ bieten modernen Biologen Antworten auf Fragen zur Phylogenese, Evolution und Ökologie der Coleoptera. Der zweite Coleoptera-Band umfasst alle nicht im ersten Band behandelten Polyphaga-Taxa (außer Phytophaga) sowie erst kürzlich beschriebene Gruppen mit Informationen zur weltweiten Verbreitung, Biologie, Morphologie aller Lebensabschnitte (einschließlich Anatomie), Phylogenese und Erläuterungen zur Taxonomie. Umfassender Überblick neueste Informationen Coleoptera, Beetles. Morphology and Systematics [Walter de Gruyter GmbH & Co KG](#) This book is a revised edition of the first of three volumes in the Handbook of Zoology series which treats the systematics and biology of Coleoptera. With over 380,000 described species, Coleoptera are by far the most species-rich order of insects and the largest group of animals of comparable geological age. Moreover, numerous species are tremendously important economically. The beetle volumes meet the demand of modern biologists seeking to answer questions about Coleoptera phylogeny, evolution, and ecology. This first Coleoptera volume covers the suborders Archostemata, Myxophaga and Adepaga, and the basal series of Polyphaga, with information on world distribution, biology, morphology of all life stages, phylogeny and comments on taxonomy. A Monograph of Paris (Melanthiaceae) Morphology, Biology, Systematics and Taxonomy [Springer Nature](#) This book provides essential information on the morphology, biology, phytochemistry, pharmaceutical prospects, evolution, phylogeny, biogeography, and taxonomy of Paris (Melanthiaceae), a morphologically distinctive plant genus with great economic importance. Since the establishment of this genus, 70 species and 24 subspecific taxa have been described, resulting in considerable confusion in species delimitation. In this book, the taxonomy of all described taxa is carefully revised. Based on multi-disciplinary evidences, a revised classification system of Paris containing five sections is outlined. Every species is provided with a concise but diagnostic description, a color illustration, photographs that highlight distinguishing characters, examined specimens and distribution range. The interspecific relationships are clarified with an identification key. This monograph offers taxonomists, evolutionary biologists, ecologists, horticulturalists, phytochemists, and practitioners a thorough and up-to-date overview about this interesting plant group. It is equally valuable for undergraduate and graduate students, teachers and professionals engaged in related fields. Plant Systematics A Phylogenetic Approach [Sinauer Associates, Incorporated](#) A comprehensive introduction to vascular plant phylogeny, the third edition of "Plant Systematics" reflects changes in the circumscription of many orders and families to represent monophyletic groups, following the most recent classification of the Angiosperm Phylogeny Group. Molecular taxonomic methods are fully presented, as are the results of many recent studies, both molecular and morphological. Phylogeny, biography and systematics of Soldanella L. and Primula L. sect. Auricula Duby (Primulaceae) based on molecular and morphological evidence [Cuvillier Verlag](#) Taxonomy, Morphology, Masticatory Function and Phylogeny of Heterodontosaurid Dinosaurs [PenSoft Publishers LTD](#) This major study on heterodontosaurid dinosaurs is the first to review the taxonomy, morphology, functional anatomy, and phylogeny of this important early radiation of small-bodied herbivores. Heterodontosaurids persisted for approximately 100 My, from Late Triassic to Early Cretaceous time, during which they evolved some of the most sophisticated dentitions for processing plant materials. Some species required reevaluation to establish unequivocally their status as heterodontosaurids, such as Echinodon from rocks in southern England, one of the first and smallest dinosaurs ever described. Tianyulong from northern China is described in more detail in the study and is shown to have unusual skeletal proportions, including a relatively large skull and very short forelimb. A new taxon, Pegomastax africanus gen. n. sp. n., is described from southern Africa with a short parrot-shaped bill. Tooth replacement and tooth-to-tooth wear is more common than previously thought among heterodontosaurids, which the author argues are herbivores despite their prominent caniniform teeth. Heterodontosaurids appear to have split early in their history into a northern group with primitive, subtriangular crowns and a southern group with deeper crown proportions. Evolution of the Rodents Advances in Phylogeny, Functional Morphology and Development [Cambridge University Press](#) A valuable resource for the latest research on rodents, highlighting links across palaeontology, developmental

biology, functional morphology, phylogenetics and biomechanics. *Biology of Turbellaria and some Related Flatworms Proceedings of the Seventh International Symposium on the Biology of the Turbellaria, held at Åbo/Turku, Finland, 17-22 June 1993* Springer Science & Business Media Turbellaria, the mainly free-living flatworms, and some of their parasitic relatives, are among the simplest of the metazoa and, as such, provide ideal models for a wide range of fundamental studies. The 60 contributions to *Biology of Turbellaria and some Related Flatworms* cover taxonomy and phylogeny, biogeography and genetics, ecology and behaviour, Anatomy and ultrastructure, development and regeneration, genes and sequences, and neurophysiology. *Biology of Turbellaria and some Related Flatworms* is the most recent compilation in the series published in *Hydrobiologia* since 1981, covering research on these flatworms assembled by the world's leading authorities on the group. Audience: These papers present the advanced student and serious researcher with up to date information on an important, but often neglected group whose place in the animal kingdom demands greater attention. *Molecular Systematics of Fishes* Elsevier Sequenced biological macromolecules have revitalized systematic studies of evolutionary history. *Molecular Systematics of Fishes* is the first authoritative overview of the theory and application of these sequencing data to fishes. This volume explores the phylogeny of fishes at multiple taxonomic levels, uses methods of analysis of molecular data that apply both within and between fish populations, and employs molecule-based phylogenies to address broader questions of evolution. Targeted readers include ichthyologists, marine scientists, and all students, faculty, and researchers interested in fish evolution and ecology and vertebrate systematics. Focuses on the phylogeny and evolutionary biology of fishes Contains phylogenies of fishes at multiple taxonomic levels Applies molecule-based phylogenies to broader questions of evolution Includes methods for critique of analysis of molecular data *Phylogeny of the SE Australian Clade of Hibbertia Subg. Hemistemma (Dilleniaceae)* Hibbertia Andrews (Dilleniaceae) has been studied for 200 years, but the systematics of species from SE Australia have not been addressed. Many of the taxa placed into 16 informal groups by Toelken are undescribed and their phylogenetic relationships are unknown. Therefore, a comprehensive morphological and molecular phylogenetic analysis of 87 SE Australian taxa within Hibbertia subg. Hemistemma was conducted. Morphological studies were carried out including vegetative, indumentum, floral and leaf cuticular characters to assess intra-specific variation, determine any major lineages and taxon boundaries as well as to explore character evolution. Nuclear rDNA (ITS) and intergenic spacer regions of cpDNA (trnL-F) were amplified and the results compared and combined with morphological phylogenetic analysis. The results, all the 16 informal species groups proposed by Toelken were placed instead into eight clades, with strong support for different species pairs and sister relationships. Most infrataxa within more variable species were not part of monophyletic lineages and none of the 16 informal species groups of Toelken were supported. Vegetative, floral and leaf cuticular characters were important in understanding species of Hibbertia phylogenetic relationships, with general variation in numerous morphological characters such as hair type and density, androecium and gynoecium characteristics, stomata (shape and size), anticlinal and periclinal cell walls and trichome bases. The molecular data and combined data analysis enabled us to recognise eight clade, most with low support, with different groups of closely related taxa received strong support. Several infrataxa within more variable species did not form monophyletic lineages. Despite a high number of homoplasious, several morphological synapomorphies for Clade/taxon definition were discernible such as: lack of indumentum on stem, revolute leaf margins, acuminate inner sepal bases, >15 mm leaf blade width, 10.1-15 mm leaf blade width, absent of inner sepal, ≥10.1 mm inner sepal width, terminal pores anther dehiscence, ovate petal shape, spherical seed shape and 3.1-4 abaxial epidermal cell length to width ratio. *Molecular Evolution and Adaptive Radiation* Cambridge University Press *Molecular Evolution and Adaptive Radiation* surveys recent advances in the study of adaptive radiation by bringing together a set of international experts investigating a wide range of organisms in a variety of geographic settings. Givnish and Sytsma show how family trees derived from molecular characters can be used to analyze the origin and pattern of ecological and morphological diversification within a lineage in a noncircular fashion. They synthesize the recent explosion of research in this area, involving organisms as diverse as epiphytic and terrestrial orchids, water hyacinths, African cichlids, New World monkeys, tropical fruit bats, carnivorous bromeliads, Hawaiian silverswords and fruit flies, North American Daphnia, Caribbean anoles, Canadian sticklebacks, and Australian marsupials. This volume will be of interest to graduate students and professional scientists in ecology, evolutionary biology, systematics, and biogeography.