

1. Record Nr.	UNINA9910830444703321
Autore	Smith Andrew B.
Titolo	Systematics and the fossil record : documenting evolutionary patterns / / Andrew B. Smith
Pubbl/distr/stampa	Oxford, [England] : , : Blackwell Science, , 1994 ©1994
ISBN	1-282-37175-4 9786612371752 1-4443-1391-6 1-4443-1390-8
Descrizione fisica	1 online resource (233 p.)
Disciplina	560
Soggetti	Evolutionary paleobiology Cladistic analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Systematics and the fossil record: documenting evolutionary patterns; Contents; Preface; 1: Introduction; Methods for reconstructing evolutionary patterns; The taxic approach; Cladistics and the phylogenetic approach; Palaeontological data and evolutionary trees; Species, taxa, and macroevolution; 2: Species in the fossil record; Species concepts; Process-related definitions; Pattern-based definitions; Species in palaeontology; Are species different from other taxa?; How phena are recognized; Examples in practice; Samples from a single locality/horizon; Phena within a single evolving lineage Sexual dimorphism in ammonitesSummary; 3: Parsimony, phylogenetic analysis, and fossils; The cladistic revolution; Characters in phylogenetic analyses; Homology; Choosing and defining characters; Types of characters; Should characters be weighted a priori?; Missing data; Presentation; Cladograms and their construction; Numerical methods; Evaluating the information content of cladograms; Testing the support for individual branches; Multiple equally parsimonious solutions; Rooting and character polarization; Fossils and cladogram rooting; Fossils and phylogenetic reconstruction

The failure of palaeontological methods in phylogeny reconstruction
Empirical tests showing the importance of fossils; Total evidence as the most stringent test of homology; Simulation studies; Why fossils are important; Summary; 4: Higher taxa; Why higher taxa are needed in evolutionary studies; The construction of higher taxa; Monophyletic taxa; Paraphyletic taxa; Polyphyletic taxa; Monotypic taxa; What defines a taxon?; Status of our current taxonomic database; Higher taxa and evolutionary patterns; Higher taxa as meaningful biological entities; A case study: paraphyly and rudists
Non-monophyletic taxa as samples of phena
Classification and rank; Attributes of rank; Cladistic classifications and the problem of fossils; Macroevolution and emergent characters of higher taxa; Macroevolutionary processes: essential requirements; A case study: onshore origination of higher taxa; Summary; 5: The nature of biostratigraphic data; Biases affecting taxonomic ranges; Factors intrinsic to taxa; Factors extrinsic to taxa; Estimating absolute taxonomic ranges; Quantitative biostratigraphic correlation; Confidence intervals on taxon ranges
Taxonomic ranges: do they provide a test of phylogenetic hypotheses? Summary; 6: The construction of evolutionary trees; Trees, cladograms, and ancestors; The concept of ancestry; A pragmatic approach to ancestry; How phylogenetic trees are constructed; When all phena are demonstrably monophyletic; When there are plesiomorphic phena; Unresolved trichotomies; Pitfalls to be avoided; Range extensions, Lazarus taxa, pseudoextinction, and ghost lineages; Using phylogenetic trees to estimate absolute taxonomic ranges; Examples of phylogenetic tree construction in practice; Arbacioid echinoids
Asaphine trilobites

Sommario/riassunto

This new text sets out to establish the key role played by systematics in deciphering patterns of evolution from the fossil record. It begins by considering the nature of the species in the fossil record and then outlines recent advances in the methodology used to establish phylogenetic relationships, stressing why fossil evidence can be crucial. The way species are grouped into higher taxa, and how this affects their utility in evolutionary studies is also discussed. Because the fossil record abounds with sampling and preservational biases, the book emphasizes that observed patterns can rare
