DOWNLOAD PDF CUTICLE ANALYSIS OF LIVING AND FOSSIL METASEQUOIA QIN LENG

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Qin Leng. ; Bryant University review of the existing data and methods used in the past to analyze living and fossil cuticle, as well as the impact of cuticle analyses for interpreting the.

Morphological Stasis and Genetic Variation. Distribution of Metasequoia glyptostroboides. Putative Metasequoia Remains from Europe. Orogenies and Ecological Competition. References for Metasequoia-Bearing Fossil Sites. Extinction and Survival of Metasequoia in East Asia. Richter and Ben A. Ecological Implications and the History of Research xxi Detailed Table of Contents Herbert W. Metasequoia in the Bridge Creek Flora. The Odyssey of Metasequoia Seeds from the s? Cuticle of Living Metasequoia glyptostroboides. Cuticle of Fossil Metasequoia. Qualitative Observations on Fossil Leaf Ultrastructure. Condition of Preserved Chloroplasts and Components. Negative Staining of the Chloroplast Membranes. Quantitative Analysis of Chloroplast Preservation. Implications of Quantitative Analysis. Senescence versus Trauma Induced Detachment. Biological and Geological Applications Hong Yang 1. Biomolecules and Applied Technology. DNA and Proteins from Metasequoia glyptostroboides. Molecular Phylogeny and Evolution. Population Genetics and Conservation. Biochemistry of Ancient Biomolecules from Fossil Metasequoia. Polysaccharides and Bound Fatty Acids. Source and Role of Labile Biomolecules. Bound Alkanes and Alkenes. Fossil Taphonomy and Paleoenvironmental Applications. Paleophysiological and Paleoclimatic Signals. General Implications and Conclusions. Williams Detailed Table of Contents 1. Habitat and Native Range. Climate of Native Range. Geographic Distribution of Cultivated Metasequoia. Growth Rates and Tree Form. Response to Light Intensity. Response to Relative Humidity of Air. Response to CO2 Concentration in Air. Paleoecological and Evolutionary Aspects. Equiza xxiv 1. Detailed Table of Contents Introduction. History of Metasequoia glyptostroboides. General guidelines for Resource Protection. Preservation of the California Redwood Forests. Preservation Issues in California. Preservation Strategies for California Redwoods. Essentials of a Metasequoia Conservation Plan. Management Scheme for Project Oversight. Formal Proposal for Metasequoia Protection. Communication Network for Metasequoia Conservation. Permit Program for Scientists and Bioresource Specialists 8. Effective Marketing Program for Metasequoia Conservation. Phasing of Implementation of Metasequoia Conservation Plan. Funding for the Metasequoia Conservation Plan. Assessment Tools for Evaluating the Conservation Plan. Lessons Learned from Efforts to Preserve Rainforests. Distribution of Metasequoia Glyptostroboides. The fossil record of Metasequoia Miki is extensive and demonstrates that the genus was widely distributed throughout North America and Eurasia from the early Late Cretaceous to the Plio-Pleistocene. Exchange of Metasequoia between Asia and North America probably occurred across Beringia, which had become functional at the Albian-Cenomanian boundary ca. However, if the inter-continental exchange of the early representatives of this genus occurred prior to the establishment of Beringia, migration would have still been possible across the Spitsbergen Corridor, which was functional during the Early Cretaceous. By the early Tertiary, the distribution patterns do not appear to have changed considerably from that seen during the Late Cretaceous, except that Metasequoia became a dominant constituent of the polar Broad-leaved Deciduous Forests. More importantly, the distribution of Metasequoia indicates that the genus grew and reproduced under a diverse range of climatic and environmental conditions throughout geologic time, including the cold and unique lighting conditions of the polar latitudes. Of particular interest is the apparent lack of Metasequoia fossils in Europe despite the presence of two land bridges linking North America and Europe throughout the early Tertiary and the drying of the Turgai Straits that separated eastern and western Asia up until Oligocene time. Metasequoia persisted in western Siberia and the Canadian Arctic until late Pliocene time, and in western Georgia and Japan until the late Pliocene-early Pleistocene. Following the apparent early Pleistocene extinction, Metasequoia re-appeared in southeastern China. The pronounced reduction in distribution during the Miocene appears to be coupled with increasing global aridity and cooling and increased competition for resources and habitat from representatives of the Pinaceae. With few exceptions, the bulk of the Metasequoia fossils described in the literature indicate that the fossils assigned to M. The remarkable morphological stasis observed in Metasequoia demonstrates that the genus has remained unchanged, at least morphologically, since the early Late Cretaceous. China; Cretaceous; evolution; mycorrhiza; land bridges; Napartulik; orogeny; paleogeography; Shui-sha-ba Valley; systematics; taxonomy; Tertiary; Turgai Stait. Rainfall is seasonal with a mean annual precipitation of about 1, mm climate data from Lichuan [â€”] ; Wang, ; Bartholomew et al. For a detailed discussion on the ecology and environment of M. Snow and freezing temperatures were reported to occur regularly during the winter months by local residents of Modaoxi Modaoqi , which is located within the Shui-sha-ba Chinese for Metasequoia Valley where M. Metasequoia glyptostroboides trees growing in Montreal, Canada and St. Wang indicates that the genus probably had a much more extensive distribution during Recent time and grew under a wider range of environmental conditions than that indicated by the modern, geographically restricted, native populations. Moreover, such a wide distribution in space and in time indicates that representatives of the genus probably grew under a diverse range of climatic and environmental conditions throughout geologic time. In fact, in almost every report where Metasequoia fossils have been described, the authors point out that they are more or less identical to living M. Nevertheless, the practice of erecting new names for fossil species of Metasequoia based on slight differences in the size and shape of the fossil remains, or geologic age has, and continues to pervade the literature. Mesozoic and Cenozoic chronostratigraphic chart. In this paper, the evolution and biogeographic history of the genus are discussed in light of the tectonic and climatic history of the Northern Hemisphere. Examination of the fossils reported in the literature indicate that most of the fossils conform morphologically to the living species M. His work along with studies by Schlarbaum et al. Combining the molecular and morphological data, Gadek et al. Metasequoia is one of the most abundant and easily recognized plant fossils found in the Late Cretaceous and Tertiary fossil plant record of the Northern Hemisphere Chaney, ; Florin, ; Liu et al. Prior to the discovery and description of fossil Metasequoia from the late Miocene and Pliocene of Japan Miki, ; Momohara, this volume , most Metasequoia remains, commonly seed cones and leaves, were assigned to Glyptostrobus Endlicher, Sequoia, Taxites Brongniart or Taxodium Richard Appendix A. In his seminal paper, Chaney provided the most up-to-date account of fossil Metasequoia in North America. He recognized two fossil species that corresponded to different geologic ages and assigned fossil Metasequoia remains from Cretaceous deposits to M. Following the establishment of the fossil genus Metasequoia more than 20 names for extinct species of the genus were erected over the next 60 years Liu et al. Recently, Liu et al. More recently, Stockey et al. The establishment of this new species was based on the examination of more than 10, specimens. Most parsimonious tree for genera of the Taxodiaceae and Cupressaceae s. The number above each branch is the number of steps separating each node and the numbers below indicate the percent of bootstrap values estimated from bootstrap replicates. The tree is rooted with Cunninghamia. The longevity of biological species is estimated to be The Evolution and Biogeographic History of Metasequoia 9 less than 10 million Ma years and presumed to be the same for all taxa Raup, Most species gymnosperms are arborescent and the time from germination to sexual maturity is considerably longer then most engiosperms. Therefore species longevity of the gymnosperms is likely between 3. However, the mechanism s responsible for such prolonged morphological stasis are still poorly understood. Omland suggested that the frequency of species bottlenecks and founder events might either accelerate or slow morphological and molecular evolutionary rates. If the rates of morphological and molecular evolution were correlated, the lack of morphological variability seen in taxa such as M.

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Abstract. The recent discovery of two distinct cuticle types, Uneven Type and Even Type, within the native population of Metasequoia glyptostroboides Hu et Cheng has prompted re-evaluation of the taxonomic utility of cuticle characters in *both living and fossil Metasequoia Miki.*

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Chapter 6 Cuticle Analysis of Living and Fossil Metasequoia QIN LENG Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing & State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing , China.

Chapter 4 : The Geobiology and Ecology of Metasequoia : Ben A. LePage :

The book reviews what is known about the biology, ecology and physiology of fossil and living Metasequoia, current research directions and problems that remain unresolved. This book presents a definitive overview of fossil and living Metasequoia and was written by sixteen of the world's experts on this important genus.

Chapter 5 : Academic Departments | Faculty | Qin Leng

Cuticle analysis of living and fossil Metasequoia / Qin Leng Ultrastructural preservation in middle Eocene Metasequoia leaf tissues from the Buchanan Lake Formation / Karimah Schoenhut Biomolecules from living and fossil Metasequoia: biological and geological applications / Hong Yang.

Chapter 6 : The Geobiology and Ecology of Metasequoia - PDF Free Download

A living fossil is a species that is known from fossils looking just the way it looks today. Among animals, the most famous living fossil is probably the blog.quintoapp.com are three living fossils from the plant kingdom.

Chapter 7 : Arboretum de Villardebelle

Using living and fossil Metasequoia as an example, we review the technology of online GC-IRMS that made the molecular analysis of hydrogen isotope possible and discuss critical issues concerning.

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Wang, L., Yang, H., Leng, Q., Variations of leaf stomatal frequencies complicate the reconstruction of ancient atmospheric CO2 concentration using Metasequoia fossil leaf cuticles, Abstract # SSO10 () in the Programs and Abstracts of SSThe evolutionary history of conifers that are now endemic to Asia at the 13th International.