ORIGIN AND HISTORICAL DEVELOPMENT OF FRESHWATER FOSSIL DIATOMS OF THE ORDERS AULACOSEIRALES, THALASSIOSIRALES, STEPHANODISCALES, AND COSCINODISCALES, FROM ASIA VERSUS WESTERN USA: SINGLE OR PARALLEL EVENTS?

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The origin and development of fossil freshwater diatom communities from the Asia and Western USA have been documented for the last 70+ years, and within the last 20 years our understanding of the taxonomic diversity of the floras has increased dramatically. There are similarities in the timing, taxa and sequence of community development of the floras on both sides of the Pacific, and the similarities between them have long been recognized. In this presentation we describe the late Cretaceous origin and development through to the Pleistocene of the floras from eastern and southeastern Asia and western North America, and examine similarities and differences between the two regions. Twenty-five genera from these groups are known from the Cenozoic freshwater sediments within Asia, while the representatives of sixteen genera were reported from the Cenozoic freshwater deposits of North America. The freshwater extinct centric genera of *Concentrodiscus, Mesodictyopsis, Tertiariopsis, Stephanopsis, Cyclostephanopsis, Thalassiobeckia, Ectodictyon, Pseudoaulacosira, Undatodiscus* and *Lobodiscus* are known, at present, only from Asia, and the extinct genus *Eoseira* is known only from North America**.** While fossil *Thalassiosira* species were not found, some fossil species of the new genus *Spicaticribra* were observed both from North America and Asia. We explore the ideas of whether invasions of representatives of marine lineages have happened separately several times, leading to independent floras in Asia and western North America, or whether the invasions of each lineage have happened once, followed by subsequent dispersal in one or both directions. We document the taxa found in each region, their origin (and in some cases extinction) as well as relationships to other taxa within their Orders.