

The taphonomic fidelity of seed size in fossil assemblages: A live-dead case study

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ABSTRACT

Trends in the size distributions of fossil seed assemblages over geologic time have been interpreted as evidence of fundamental changes in the structure of terrestrial ecosystems. It is not clear, however, how accurately fossil seed assemblages reflect the original flora. As a case study, the seed-size distribution of a living hardwood forest and a salt marsh community in Maryland was compared to that of its potential fossil assemblage, seeds extracted from sediment cored in the adjacent tidal estuary. Results indicated that the death assemblage was significantly different from the source community, lacking most of the smaller-seed morphotypes. The biased accumulation was not driven solely by over- or underrepresentation of plants of a particular dispersal mode or growth form. Although there was a sedimentological gradient along the transects, there was no correlation between grain size and seed-size distributions within the cores. The difference appears to be primarily an issue of transport: 45% of morphotypes identified in the death assemblage were present in the life assemblage, and only 33% identified in the life assemblage were also in the death assemblage. These results indicate that (1) estuarine deposits capture a partial representation of the local seed flora with significant regional influences, and (2) fossil seed assemblages should not be compared directly to seed-size distributions documented in living communities.