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Taphonomy of Diptera in lacustrine environments: A case study from Florissant Fossil Beds, Colorado

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ABSTRACT

The purpose of this paper is to study the taphonomy of fossil flies (Diptera) preserved in the lacustrine deposits of the Florissant Fossil Beds (late Eocene), Colorado, United States. Three hundred and twenty-six fossil Diptera were examined, collected from a nearshore (n = 215) and an offshore (n = 111) site. The degree to which a specimen's preservation quality correlated with the ability to identify the specimen to various taxonomic levels and whether specimen size, orientation, or disarticulation has an effect on a preservation quality were evaluated. Also examined was the influence of depositional environment on these variables. Preservation quality was found to be important for identification to species level, but specimens of low preservation quality were still identifiable to the family and genus levels. Specimen size, orientation, and disarticulation were not correlated with the identifiability of a specimen. There was no significant difference in the orientation, disarticulation, or preservation quality of specimens found in the nearshore and offshore sites. There was a significant difference in the size of specimens preserved at each site, with larger specimens being found offshore. More specimens were found in the offshore site, but species richness did not differ between the two sites. Composition of taxa did differ depending on the site. These results demonstrate the importance of collecting all specimens, as even poor quality and disarticulated specimens are identifiable and useful in studies of insect ecology and evolution. In addition, depositional environments should be documented, as size sorting can bias the taxonomic composition of assemblages.