

HOW IMPORTANT IS LITHOLOGY IN THE PRESERVATION OF FOSSIL INSECTS? A STUDY OF LATE EOCENE INSECTS FROM THE FLORISSANT FORMATION OF COLORADO

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Sedimentary environments play an important role in the selective preservation of different members of a community. This preservation bias, if not addressed or understood, may influence the reconstruction and interpretation of paleoenvironments, the composition of assemblages, and the comparisons that are made between communities. In this study, we examine the preservation of insect specimens found in three different lithologic settings (shale, mudstone and siltstone) to study how lacustrine depositional environments influence preservation. Eight hundred and twenty-three insect specimens were collected from a single stratigraphic section within the late Eocene Florissant Formation of Colorado, a lagerstätte deposit well-known for its exceptional preservation and high diversity of fossil insects. Overall insect collecting rates were unexpectedly low (3.7 – 5.6 insects collected per collector-day). The relative abundance of insect orders was found to be consistent across lithology, although specimens were significantly smaller in the siltstone when compared to shale and mudstone, likely due to differences in time-averaging. Over half of specimens were disarticulated and of low quality, demonstrating the need to collect many specimens in order to have an adequate sample of the high quality specimens typically associated with the Florissant Formation. Despite differences in the preservation of Coleoptera (beetles) in siltstone (less disarticulated and a greater proportion of laterally preserved specimens), overall insect disarticulation levels, preservation quality and specimen orientation were consistent across all lithologies. This indicates that insect specimens of the quality typically associated with deposition in shale also can be found in mudstone and siltstone. Thus, insect assemblages preserved in different lithologic settings within lake environments can be compared to one another, as there was little to no taphonomic bias found to be correlated with lithology at Florissant