

## **Can fossil fragments tell the story of an ancient ecosystem? An analysis of Devonian crinoid stems from upstate NY**

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Our study explores fossilized crinoid stem fragments (called columnals) from a previously undescribed Devonian outcrop in upstate New York to determine the range of variation present and whether this variation is reflective of species biodiversity within the group. This will allow us to establish what kinds of questions can be asked and answered about extinct crinoids and their ecosystems when only the stem fragments are preserved.

Our initial analysis revealed a bimodal distribution in the size (diameter) of crinoid columnals. Other features such as the shape, number of articular ridges, or proportions of the columnals did not demonstrate any particular pattern of variation. We hypothesized that the difference in diameter might indicate the presence of two taxonomic groups (such as two different species). Alternatively, the difference could indicate two types of columnals within a single species. To differentiate between these alternatives, we looked for a specimen in which the columnals have not separated. The single specimen we found consisted of only one type of columnal. Therefore, we drew the tentative conclusion that the bimodal distribution of columnals represents two taxonomic groups.

Our research contributes to the field by highlighting the potential of crinoid columnals to serve as indicators of crinoid biodiversity. Since crinoid fossils mainly consist of stalks and columnals, such an approach would allow researchers to make use of a vast, previously underutilized source of paleontological data.