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View Abstract Details

Title: *A spatially-explicit, multiple-proxy reconstruction of maize agriculture from Laguna Zoncho, Costa Rica*

Keywords: Stable Carbon Isotopes, Lake Sediments, Prehistoric Agriculture, Costa Rica

Type: Paper

Abstract: Lake sediments can provide detailed archives of prehistoric agriculture. In the neotropics, sediment records from lakes such as Laguna Zoncho, a small lake in southwestern Costa Rica, complement archaeological evidence of maize agriculture. Palynological and geochemical techniques can be used to reconstruct maize agriculture, but both approaches have strengths and weaknesses. A majority of maize pollen falls within a few meters of the parent plant, so maize pollen in lake sediments likely indicates agriculture near the lakeshore, but pollen alone cannot exclude the possibility of agriculture occurring slightly farther away. Geochemical proxies, including organic content, total nitrogen, C/N ratios, and stable carbon isotope ratios, are also sensitive to agriculture and can provide a quantitative assessment of agriculture, but potential complications include the presence of autochthonous carbon and sediment focusing. To better assess the utility of these methods, we used a network of five sediment cores to create a high-resolution, spatially-explicit record of maize agriculture for Laguna Zoncho using maize pollen concentrations and the geochemical indicators. Maize pollen in relatively high concentrations was found in two of the four cores taken near the lakeshore, but the others contain little or no maize pollen. Geochemical proxies from all cores suggest agriculture activity, with a limited amount of intrabasin variation. Overall, there is little correspondence between maize pollen concentrations and the strength of the stable carbon isotope signal, but variation in maize pollen concentrations in the outer cores may indicate the location of agricultural fields or reflect the dominant direction of sediment focusing.

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