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Plant and Insect Response to Rapid Environmental Change: Insights from Fossils (and some light statistics)

ABSTRACT

Plants and herbivorous insects have dominated terrestrial ecosystems for over 300 million years. Uniquely in the fossil record, insect-eaten leaves offer abundant and diverse information about both producers and consumers in food webs. Such information is ideally suited for investigating how food webs respond to environmental changes, and they represent an invaluable deep-time complement to current studies of global climate change. Correlations between feeding diversity and temperature, between herbivory and climate-related leaf traits, and between insect diversity and plant diversity can all be investigated in deep time. To illustrate, I emphasize recent work on the time interval from the latest Cretaceous through the middle Eocene (67–47 million years ago), including two significant events that affected life worldwide: the end-Cretaceous mass extinction and its ensuing recovery, and globally warming temperatures across the Paleocene–Eocene boundary. The findings have major predictive importance for current global warming.

TUESDAY, NOVEMBER 29, 2011 • TEA AT 4:15, TALK AT 4:30 • SCIENCE CENTER 199