Title:	Transformation of chitinous tissues in elevated P-T conditions: additional insights from experiments from plant tissues
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Abstract:	Modern arthropod cuticles consist of chitin protein complex, but fossil arthropods older than Cenozoic, contain a significant amount of aliphatic component with or without any chitin. Such a transformation is observed in leaves of plant fossils where the bulk composition has been modified. This apparent contradiction was examined by subjecting modern animal cuticles to confined heating (350°C/700 bars/24 h) following various chemical treatments. Analysis of artificially matured untreated cuticle, yielded moieties related to phenols and alkylated substituents, pyridines, pyrroles and possibly indenes (from chitin). Components such as n-alkyl amides, fatty acids and alkane/alkene homologues ranging from C9 to <C20 were also generated, indicating the presence of an n-alkyl component, similar in composition to that encountered in fossil arthropods. Analysis of cuticles that had been heated after lipid extraction and hydrolysis did not yield any aliphatic polymer. This provides evidence that lipids incorporated from the cuticle were the source of aliphatic polymer. Similar heating of plant tissues generated an aliphatic macromolecule similar to that found in fossils. Comparison of the products derived from maturation of different pre-treated plant tissues demonstrates that solvent-extractable and hydrolysable lipids were precursors of the generated macromolecular material. Thus, the experiments indicate that labile alkyl compounds can be a source of the insoluble aliphatic component of fossil organic matter in the absence of a resistant aliphatic precursor in the living organism.
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