Title:	Biomarker signatures of the iconic Glossopteris plant
Authors:	Bhattacharya, S. (/jspui/browse?type=author&value=Bhattacharya%2C+S.)
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Abstract:	Glossopteris is the quintessential marker plant that dominated the forests of the Southern Hemisphere continents during the Permian before their abrupt extinction at the close of the Palaeozoic. Fossilized leaf and stem remains of Glossopteris plants, collected from the Permian succession of eastern India, were analysed to recognize the molecular signatures of solvent-extractable and non-extractable organic matter. Lipid-derived aliphatic and aromatic biomarkers were studied using GC–MS and GC×GC-TOFMS, while tetramethylammonium hydroxide (TMAH) thermochemolysis with GC–MS and GC×GC-TOFMS was used to reveal lignin precursors. The thermal maturity indices indicate low thermal rank for both samples. The presence of aromatic diterpanes in the leaf extract suggests that the Glossopteris plant was able to biosynthesize abietic acid and related plant terpenoids. The thermochemolysis products (thermochemolysates) of the samples contain monomethoxy-, and dimethoxybenzene derivatives produced from p-hydroxyphenyl and guaiacyl units of lignin, respectively, which are the main constituents of extant gymnosperm lignin. The thermochemolysates indicate that lignin biosynthesis had evolved in Glossopteris.
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