

## Burned and buried by the Siberian traps: tree trunks in volcaniclastics and lavas

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Major Phanerozoic mass extinctions could be explained by intense volcanic activity related to the formation of Large Igneous Provinces (LIPs). The Siberian Traps LIP possibly caused the most severe mass extinction on the Earth, the end-Permian extinction. This event is documented by global data showing the extinction of floral and faunal species and by stable isotope excursions. Information about the direct impact of the Siberian Traps on the local flora and fauna is scarce. By our knowledge, no detailed description has been done on the faith of trees in Siberia. However, the story of Late Permian giant trees like Cordaites and wood ferns, could shed light on the impact of the onset of the LIP magmatism and the related mass extinction. For the first time we describe that Late Permian tree trunks were buried in volcaniclastic deposits and at the footwall contact of the oldest lava flows of the Siberian Traps, and despite that this phenomenon is known by local geologists it is not well described in the literature. Tree trunks in volcaniclastic deposits were compressed during consolidation of the volcaniclastic material originated from pyroclastic density currents from nearby volcanic centers. Tree petrification is presented by quartz with minor sulphides, zeolite, calcite and sulphates. Tree trunks at the footwall contact of the lava flows have a better preserved year rings structure and late permineralization presented by calcite with minor quartz and sulphides. Our results demonstrate that intensive magmatic activity related with LIP formation affects land vegetation at various grades. Lavas have had a local violent impact, but burned and buried tree trunks have a better preserved structure reflecting single dominated permineralization processes than the tree trunks buried by pyroclastics that have covered extensive areas and followed by trees compression and later multistage permineralization. In a global context, such type of volcanic activity has a variable influence on vegetation realms. Lava flows have had a harsh impact on land flora locally, but in some cases was favorable for preservation of tree remnants. Volcaniclastic deposits covered a wide area, but tree trunks were deformed due to compaction of the pyroclastic rocks. Late water circulation is reflected in multistage permineralization phenomena. Further ash expansion and settling could have a global impact and accelerate the mass extinction.