

Summary

Silicified woods of the Permocarboniferous abundantly occur in a Czech part of the Intra Sudetic Basin and Krkonoše Piedmont Basin. They grew in Westphalian and Stephanian, about 300 million years ago. They were firstly mentioned in the second half of the 19th century. Exactly speaking, they represent silicified stems of the Permocarboniferous arborescent plants that belong to five palaeobotanical divisions of evolution grades Pteridophyta and Gymnosperms. There are still a lot of unanswered questions related to the origin of this silicified wood. One aim of this work is to describe the way of silicification which would be best suited to environmental conditions in these two basins. Up to now, the relationship between the actual anatomy of the wood and a specific way of their permineralization has not been clarified from the petrographic point of view. Thin sections of silicified stems were first studied by light and polarized-light microscopy and then cathodoluminescence spectroscopy and electron microscopy with EDX analysis. Differences in quartz crystallinity in individual original plant tissues have been obvious, e.g., macro- and microquartz crystals were present, mostly respecting structures of plant tissues, spherulitic chalcedony sometimes crystallizing irrespectively of these tissues, and agate-like structures in places lacking the former tissues. We also used analysis of detritic mineral grains enclosed in a compact silicified body. Understanding to mechanism of silicification should contribute to our comprehension of basinal palaeoecology. Fossil Permocarboniferous woods of dadoxylon type, so called "araukarity", have been preserved mostly in sedimentary environment of alluvial plains, probably in riparian forests on banks of anastomosing rivers and/or in their aggradating barriers (levees), today belonging to arkoses and arkosic sandstones to conglomerates. We believe that the silicification has been caused by input of chemically poorly weathered material, first of all biotite and feldspars, which then became a source of silica necessary for the wood silicification. This is the case of Žaltman and Štikov arkoses and perhaps sandstones of Stará Paka. Petrified stems of hygrophilous plants, such as horsetails, ferns, and pteridosperms, were mostly embedded in finer sediments, probably of a lacustrine type. In these environments, the Upper Carboniferous volcanic material was probably the source of silica, such as in the case of "Balka" locality near Nová Paka of Semily formation.