

IDENTIFICATION OF CALCIUM OXALATE BIOMINERAL TRACES IN FOSSIL PLANT LEAVES OF THE OLIGOCENE AND EOCENE

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Calcium oxalate crystals and druses occur in different parts of many plant species, particularly in the leaves. In fossil plants, calcium oxalate crystals (CaOx) have not yet been identified. In this study for the first time we identify traces of CaOx druses and crystals in fossil leaves from the Rott fossil site (late Oligocene) and Indian amber (Eocene). Granular structures with various shapes, sizes, and distributions in fossil leaves and fresh leaves were investigated by Light microscopy (LM) and scanning electron microscopy (SEM) including energy-dispersive X-ray (EDX) element analyses. The patterns of granular structures in the parenchyma cells and vascular system of the fossil leaves bear a strong resemblance to the distribution of CaOx crystals in fresh leaves. Comparison of those granular structures in fossil leaves convinces us that they most probably originated from CaOx druses and crystals in plant leaves. Obviously, composition and size of the original CaOx crystals would be altered during fossilization by environmental factors. Our results showed they being filled with organic materials and minerals containing Ca, Si, Al, S, and Fe. The identification of CaOx remains will provide us better understanding of the role of CaOx in plant ecology through geologic time and a broader conception of the fossilization processes that can preserve plant biominerals. Key words: Calcium oxalate crystals (CaOx), fossilization, plant leaves, Oligocene, Eocene.