

# PETROGRAPHY AND PALEOBOTANY OF A PETRIFIED PALEOCENE PEAT AND ITS BEARING ON THE COALIFICATION OF LIGNITE

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## ABSTRACT

The discovery of a silicified Paleocene peat in a lignite bed in Western North Dakota has provided detailed anatomical information on the Paleocene peat-forming plants. It also provides an opportunity for investigating the processes of coalification of lignite by direct comparison of petrographic components of petrified peat and lignite.

Most of the well preserved plant debris consists of conifer stems, twigs, roots, and leaves. Other plant organs and tissues include seeds, pollen grains and spores, fern sporangia and annuli, and parenchymatous tissues of unknown origin. Palynological data indicate the presence of abundant angiosperms; yet, except for the presence of pollen grains and possibly certain unidentifiable, decomposed leaves and leaf cuticles, there is little evidence to indicate the presence of angiosperm wood in the petrified peat and the lignite. Field evidences indicate that the compaction ratio from peat to lignite is 3 or 4 to 1. Microscopic examination of the petrified peat and the lignite reveals that much of the compaction takes place at the expense of the interstitial spaces and the collapsing of cell cavities. The lignite also exhibits a much higher degree of gelification than does the peat.

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