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Continued work on well-preserved plant fossils from Eocene deposits of the Mississippi embayment has yielded several forms of epiphyllous fungi. Members of the Pyrenomycetes are represented by the genus Meliola in the family Meliolaceae. Meliola is characterized by creeping mycelia which produce setae and short 2-celled capitate hyphopodia. The perithecia are not preserved in the specimens found in this investigation. The modern forms of this family are particularly abundant in the tropics as obligate parasites of plants; the only other fossil record of this genus is from the Eocene brown coals of Germany. The Loculoascomycetidae are represented by members of the family Microthyriaceae in the order Microthymiales. Two forms of this family are considered. The first form is characterized by superficial stromata that are flattened, radiate, and astomate, associated with free mycelia, which produce hyphopodia. The second form has an epiphyllous stroma composed of disintegrated hyphal masses and has a prominent ostiole. These fruiting bodies are generally associated with dichotomizing, anastomosing, free hyphae in various stages of decay. The transverse walls of the hyphae are incomplete septa with prominent central perforations, a typical feature of the modern Ascomycetes. The vast majority of modern Microthyriaceae are tropical. This is the first record of such fungi from the Eocene of North America and their presence substantiates previous climatic interpretations of the Mississippi embayment area during the Eocene.

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