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A NEW SPECIES OF ENDOGONACEAE: GLOMUS BOTRYOIDES

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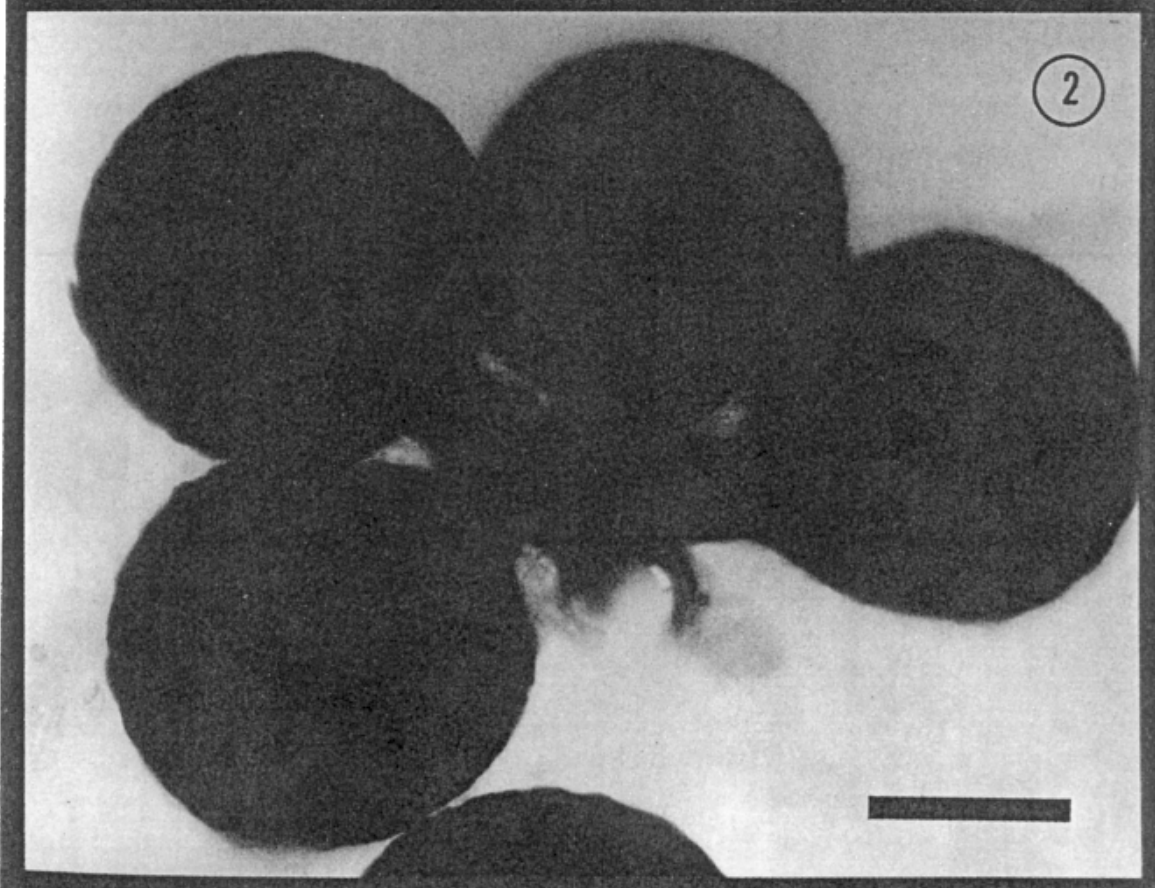
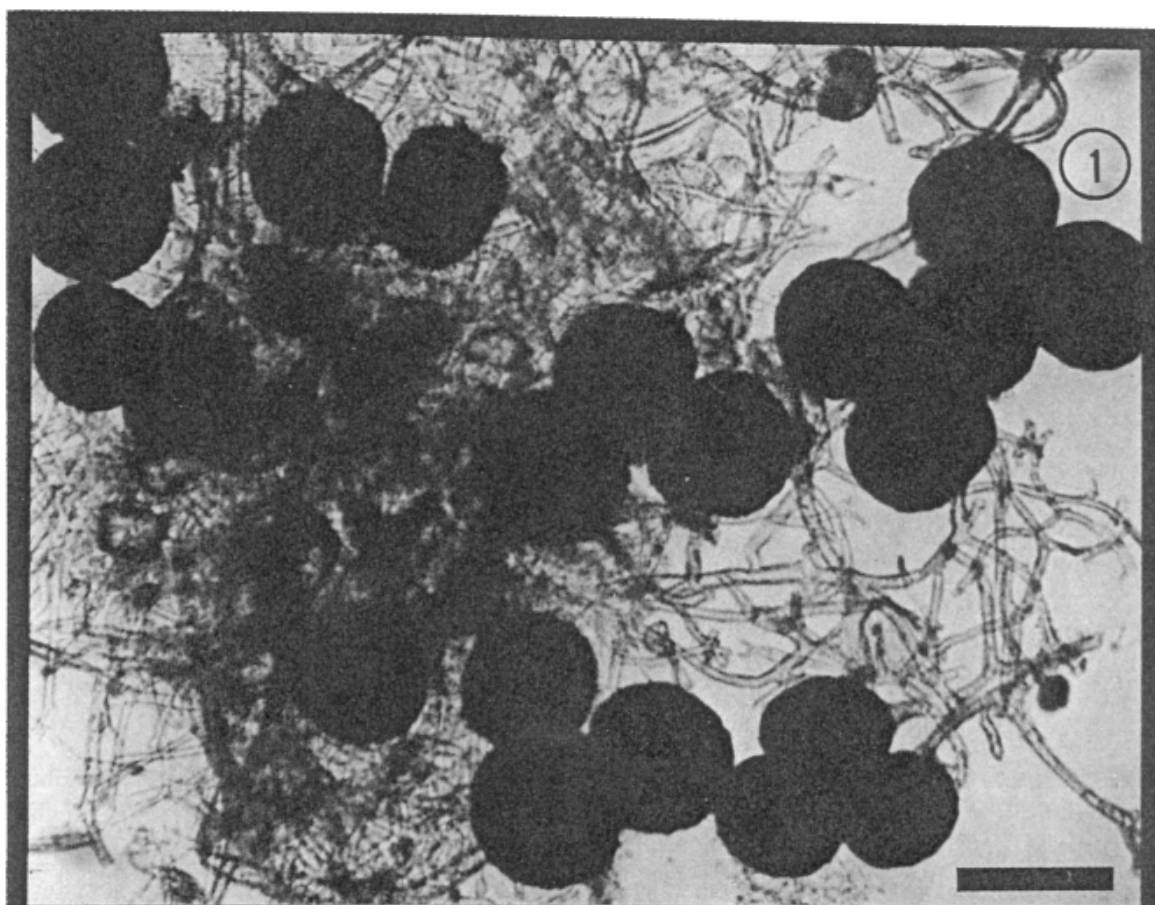
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Approximately 85 percent of the land area in the Appalachian Region that is being mined for coal is occupied by mixed hardwood forests (Vogel 1981). A number of the native tree species that are planted or volunteer on surface-mined sites readily form mycorrhizae with members of the Endogonaceae (Rothwell and Vogel 1982). Many of these fungi produce diminutive subterranean sporocarps which serve as a food source for mice and other small mammals, and it is presumed that the majority of spores are dispersed by mammalian mycophagists (Maser et al. 1978, Trappe and Maser 1976). Resident mammals in adjacent unmined areas probably are active vectors in the colonization of endophytes on newly vegetated mine sites. For example, cricetine mice have been trapped on freshly seeded mine sites up to 119 meters from protective cover (Rothwell and Holt 1978).

The new species of *Glomus* described was found in the stomach contents of an eastern chipmunk (*Tamias striatus* L.) and a whitefooted mouse (*Peromyscus leucopus* Raf.) which were trapped in a forested wildlife management area in central Kentucky.

GLOMUS BOTRYOIDES Rothwell and Victor sp. nov. (Figs. 1-5)

Chlamydosporae in laxo intexto peridio, peridiales hyphae frequenter bifurcatae, diametro mutabili, aliquando ad 60-80 μ m latae cum muris ad 20 μ m crassis; sporae singulae vel frequentius artae uvae sporarum ex auctis finibus hyphae, subglobosae vel globosae, 145-250 μ m in diametro, spadiceae vel nigrae in maturitate. Muri sporarum 5-7 μ m crassi cum duobus laminis murus exterior fulvus, 3-5 μ m crassus, densatus ad hypham affixam (ad 20 μ m) et patens in hypha affixa in parvo spatio, exterior superficies asperata, fragilis et facile separabilis cum premitur in maturitate; interior murus laminatus, circa 2 μ m crassus, cum parvis projectionibus ad 1.0 μ m longis et inaequaliter distributus in exteriori superficie. Hyphae affixae rectae vel recurvatae, locus adligationis frequenter inflatus, 38-45 μ m in diametro, decrescens ad 20-35 μ m in diametro cum flavis vel fulvis muris 4-6 μ m crassis.



Chlamydospores borne within a loosely interwoven peridium, the peridial hyphae frequently bifurcate, of variable diameter, some up to 60-80 μm in width with walls to 20 μm thick; spores occur singly, or more frequently as tight clusters of spores formed from swollen endings of a hypha, subglobose to globose, 145-250 μm in diameter; reddish-brown to black at maturity. *Spore wall structure* consisting of two walls; the outer wall yellowish-brown, 3-5 μm , thickened near the hyphal attachment (up to 20 μm) and extending along the attached hyphae for a short distance, outer surface roughened, becoming fragile and readily separable under pressure on mature spores; the inner wall laminated, ca. 2 μm thick, with fine projections up to 1 μm long and unevenly distributed over the outer surface. *Attached hyphae* straight to recurved, point of attachment frequently inflated, 38-45 μm in diameter, tapering to 20-25 μm in diameter with yellow to yellow-brown walls 4-6 μm thick.

OCCURRENCE AND HABITAT: Observed in wet-sieved stomach contents of small mammals that were trapped in a wildlife management area in which oak was the predominant plant cover.

MYCORRHIZAL ASSOCIATIONS: Unknown.

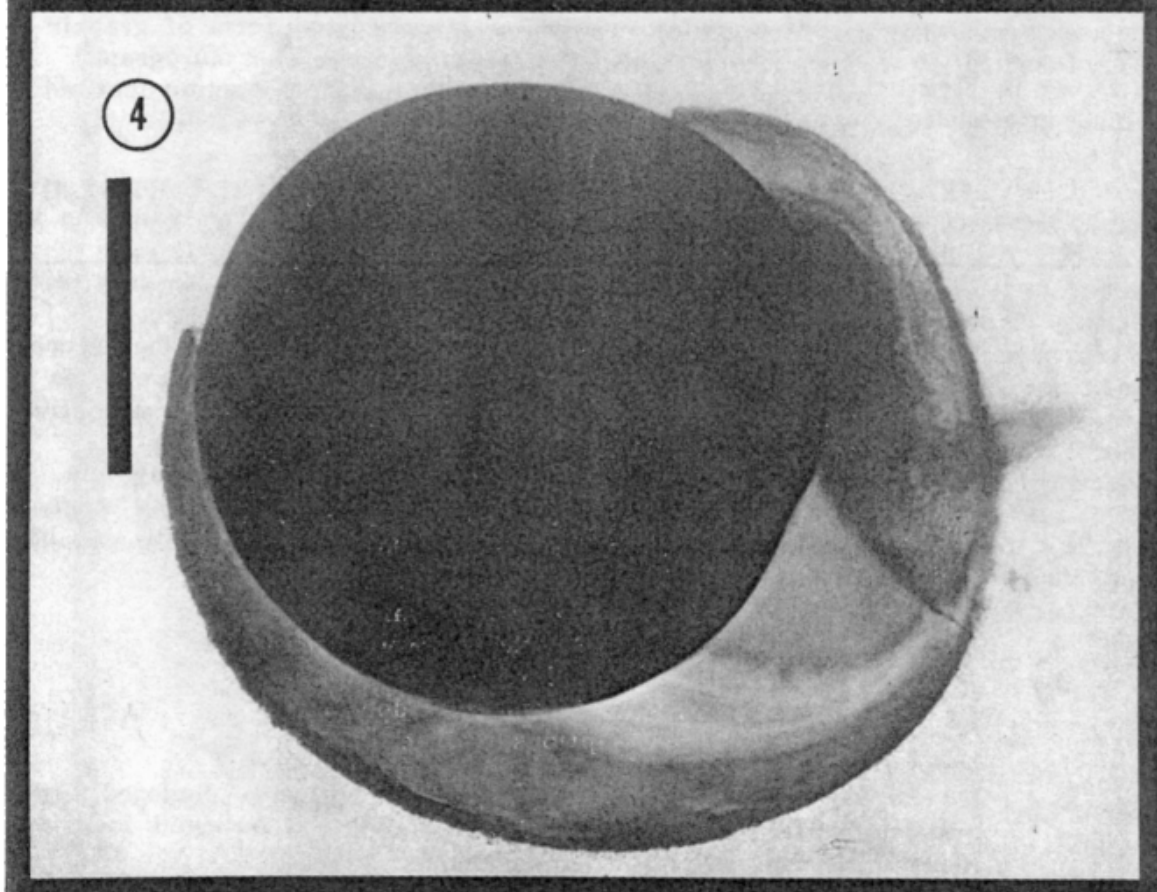
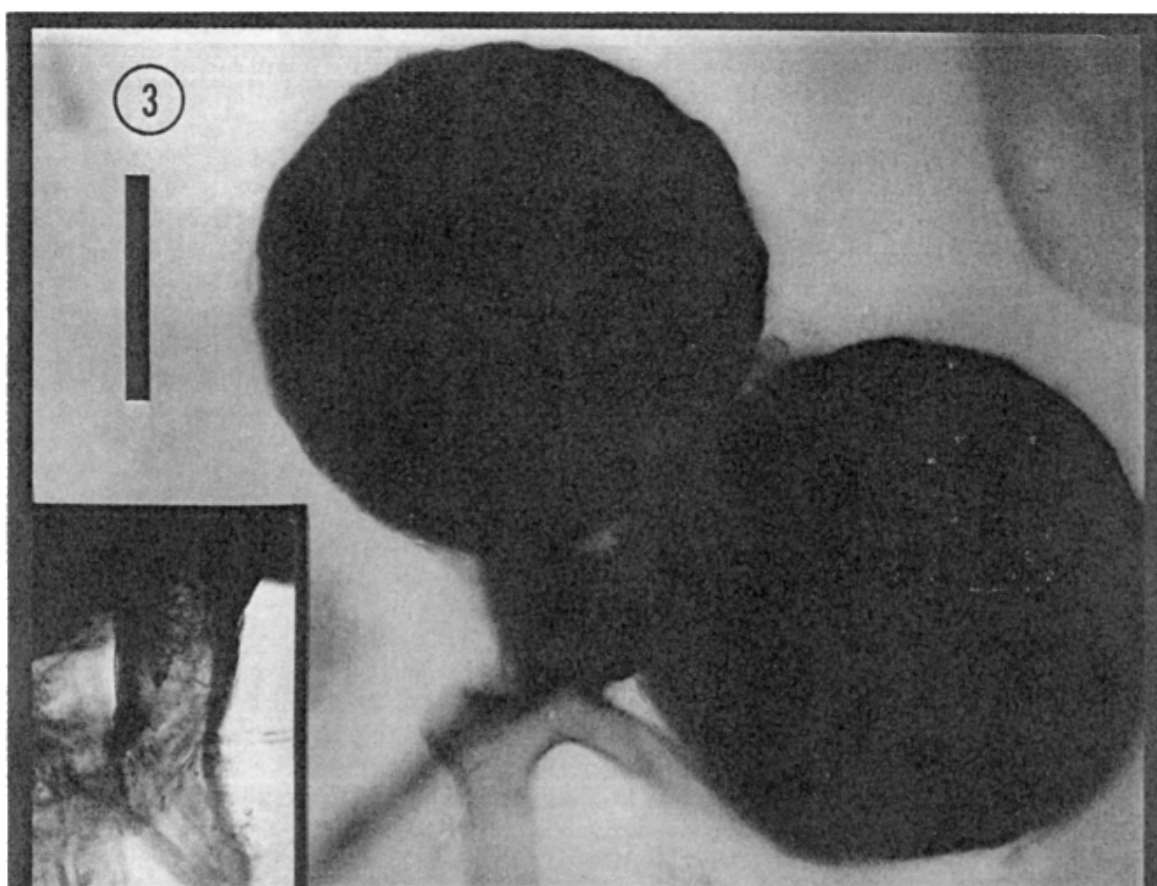
ETYMOLOGY: Greek, *botryoides*, referring to the grape-like clusters of spores.

COLLECTIONS: TYPE: KENTUCKY, Jackson County, Daniel Boone National Forest, August, 1982. Collections have been deposited in the herbaria of Oregon State University (HOLOTYPE: OSC Trappe 7219) and University of Florida (ISOTYPE: FLAS F53644).

Walker (1983) has recently proposed a standardized form of graphic representation of wall structure in the Endogonaceae. The micrograph shown in Figure 5 has been suggested by Koske (personal communication) as representing the spore wall structure for *Glomus botryoides*.

This species superficially resembles *Glomus constrictum* Trappe, but spores differ in having a roughened surface, a separable outer wall, and in often forming in tight clusters from bulbous endings of hyphae. Other dark-spored *Glomus* species with which this species might be confused, either because of color or overlapping spore sizes, are: *Glomus geosporum* (Nicolson and Gerdemann) Walker, which is not sporocarpic, and has spores which are formed only singly in soil; *G. halonatum* Rose and Trappe, has spores with a hyaline outer wall and light brown inner wall that collectively measure 18-35 μm ; *G. melanosporum* Gerdemann and Trappe, although sporocarpic, spores are enclosed in hyphal envelopes and have a hyaline inner wall; and *G. multicaule* Gerdemann and Bakshi, which occurs singly in soil, has rounded projections over the entire surface of outer wall, and has more than one hyphal attachment per spore.

Figs. 1-2. *Glomus botryoides*. 1. Tight clusters of spores enclosed within peridial hyphae. Bar = 200 μm . 2. Typical botryoid form of spore formation. Bar = 100 μm .



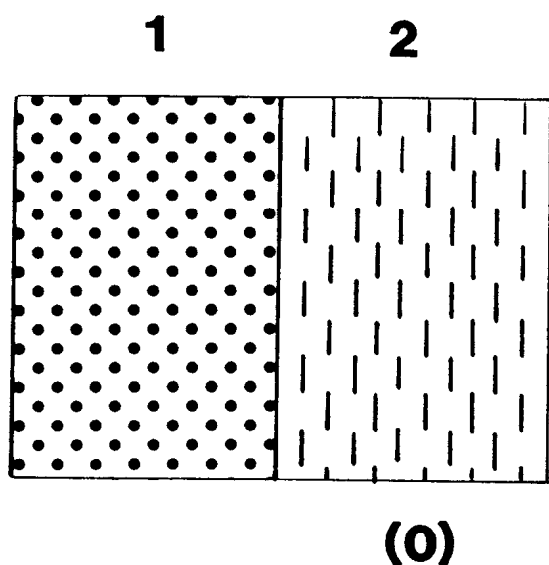


Figure 5: Murograph of
Glomus botryoides

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Figs. 3-4. *Glomus botryoides*. 3. Two spores with roughened surface of outer wall evident. Insert shows extension of outer wall on attached hypha. Bar = 100 μ m. 4. Fragile outer wall of a mature spore (separating only following application of pressure on mature spores). Bar = 75 μ m.