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Ultrastructure of Sporodochium and Conidium Development in the Fungus *Epicoccum purpurascens*

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Epicoccum purpurascens, also known as *E. nigrum*, is a common anamorphic fungus present in both outdoor and indoor environments. While a primary decomposer of plant tissues in nature, *E. purpurascens* also poses health risks for humans. Inhalation of its conidia (asexual spores) commonly causes allergic responses in humans. Conidia are produced in tremendous numbers from specialized sporogenous cells borne primarily on the surfaces of superficial cushion-shaped masses of hyphae termed sporodochia. This study examines ultrastructural details of sporodochium and conidium development using a combination of scanning (SEM) and transmission electron microscopy (TEM). Although some ultrastructural data are available on sporodochium and conidium in *E. purpurascens* from the early work of Griffiths [1], results of this study should provide a much more complete understanding of the formation of both these structures.

In this study *E. purpurascens* was grown in culture plates on either potato dextrose or corn meal agar. Small block of agar bearing sporodochia in various stages of development were removed from culture plates and prepared for study with either SEM or TEM. For SEM, samples were fixed in glutaraldehyde and $Os0_4$ and prepared for examination using the procedures of Enkerli et al. [2]. Samples for TEM were prepared for study using either a conventional chemical fixation protocol [3] or high pressure freezing followed by freeze substitution [4].

A developing sporodochium first appeared as a small loose aggregation of hyphae on the agar surface. These hyphae quickly proliferated to form a raised mass of branched and more densely packed hyphae (Fig. 1). Numerous short sporogenous cells then arose from the surfaces of these hyphae (Fig. 2). The tip of each sporogenous cell enlarged to form a single swollen conidium initial that soon became delimited from the sporogenous cell by a septum. Once delimited, the young conidium quickly enlarged and became divided into multiple cells as the result of the formation of both transverse and longitudinal septa (Fig. 3) within the developing conidium. Each conidium possessed a thick multilayered wall with very rough, irregular surface features (Fig. 3). Mature conidia were roughly spherical in shape and quite variable in size with some reaching 25 μm in diameter (Fig. 4). As evident in Fig. 4, conidia accumulated in large masses on the surface of a sporodochium.

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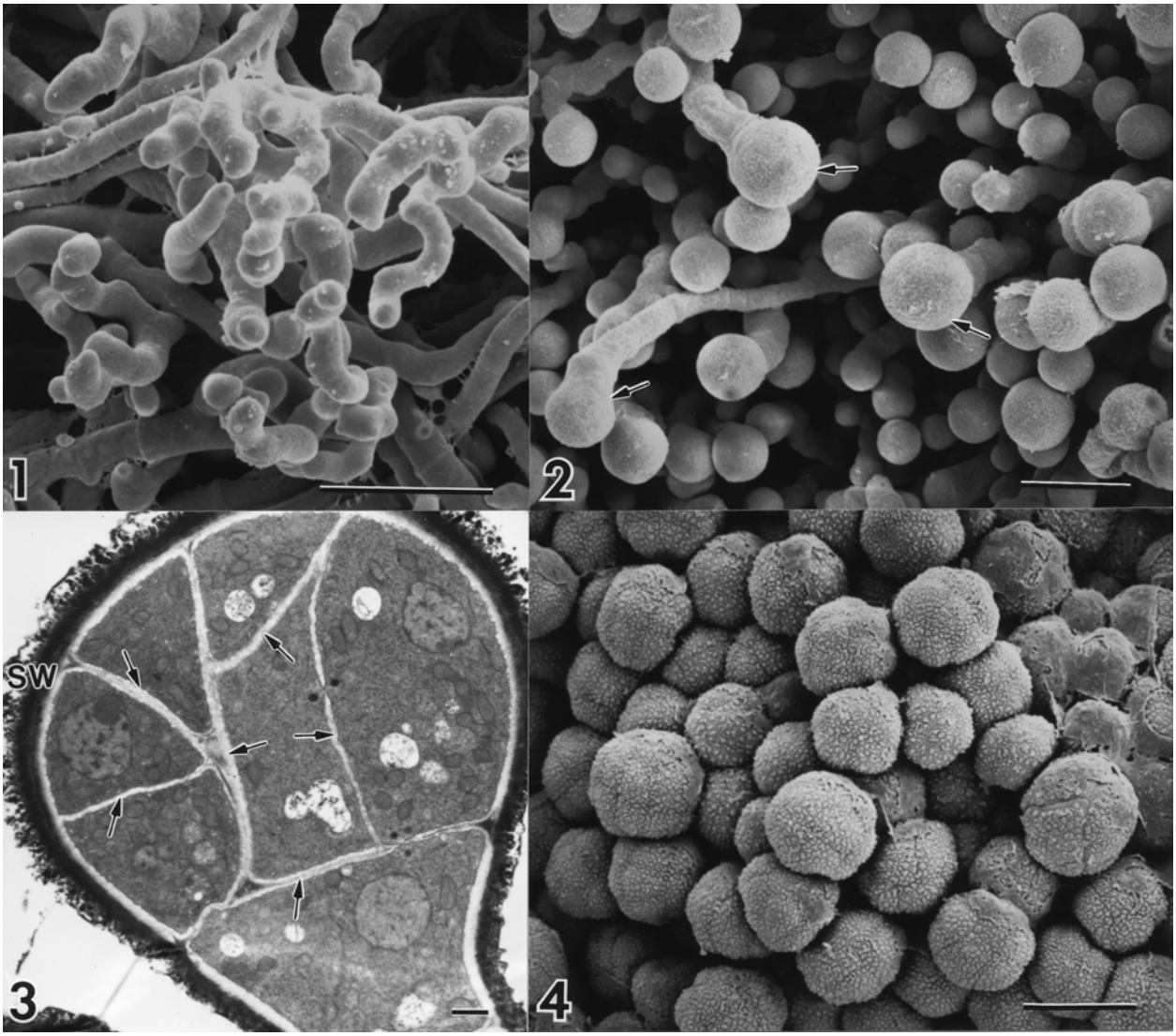

FIG. 1. Scanning electron micrograph of the hyphae comprising a developing sporodochium. Bar = 10 μm.

FIG. 2. Scanning electron micrograph of numerous sporogenous cells on the surface of a sporodochium. Swollen conidium initials (arrows) are evident at the tips of many of the sporogenous cells. Bar = 10 μm.

FIG. 3. Transmission electron micrograph of a maturing conidium. Note the thick multilayered spore wall (SW) and the septa (arrows) dividing the conidium into multiple cells. Bar = 1 μm.

FIG. 4. Scanning electron micrograph showing a mature sporodochium covered by numerous conidia. Bar = 20 μm.

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