

This Week's Citation Classic

CC/NUMBER 35
AUGUST 29, 1983

Moore R T & McAlear J H. Fine structure of Mycota. 5. Lomasomes—previously uncharacterized hyphal structures. *Mycologia* 53:194-200, 1961. [Dept. Plant Pathol., Cornell Univ., Ithaca, and Div. Laboratories and Research, New York State Dept. Health, Albany, NY]

Lomasomes are porous ingrowths on fungal cell walls. They are unique to fungi and are one of the kingdom's defining characteristics. They have been suggested as the sites of ergastic deposition, perhaps a consequence of the lysotrophic mode of nutrition of these organisms. [The SCI® indicates that this paper has been cited in over 135 publications since 1961, making it the most-cited paper published in this journal.]

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July 21, 1983

"G.W. Martin, under whom I did my MS degree, maintained that fungi were not plants. The problem of what, then, are fungi later became a major theme of my research. In 1958, during doctoral studies at Harvard University, James H. McAlear, a fellow student, developed a new electron microscopy (EM) fixative based on Luft's¹ recently published buffered $KMnO_4$ and asked me for a fungus to try it on (at the time he was heavily into Oparin and looking for the primitive cell). This was my introduction to both Jim and EM. The resultant paper² was among the first on fungal EM. Jim went to the New York State Health Laboratories where, in 1960, the death of George Edwards left him with the end of a National Institutes of Health (NIH) heart grant. At his invitation I temporarily left my NIH fellowship at Cornell University and

joined him. Early on, I went on the Peck autumn foray at nearby Paul Smith's College which provided us with a wealth of professionally identified fresh material.

"Jim and I spent many a pleasant evening at the microscope (an early Siemens Elmiskop brought in by Rushka) followed by a wind-down at the local pub. At the end of my visit we sorted the micrographs into what I would later write up as parts two to nine of the 'Fine structure of Mycota' series. (These studies were extended into the phycomyces and reviewed³ while I was at Berkeley.) Although we thought of these intumescences as 'excrescences,' I chose *loma-* (Gr. border) for the prefix because they were unquestionably *wall bodies*. We believed, and it has since proved to be so, that these structures were unique to fungi and were one of their defining characteristics.

"One reason why this paper may have been cited so often is that practically any EM study of fungi will encounter lomasomes; they are now so well accepted that they are often identified without citation. The function, ontogeny, and physiology of lomasomes are still unknown and only one later paper has treated them specifically.⁴ I have used the information from these and later EM studies to illustrate cell structure, possible ontogenies, and proposed taxonomic and phylogenetic relationships.⁵⁻⁷

"These publications have contributed largely to my being awarded the DSc degree by the New University of Ulster and to being elected a Fellow of the Institute of Biology."

1. Luft J H. Permanganate—a new fixative for electron microscopy. *J. Biophys. Biochem. Cytol.* 2:799-802, 1956.
2. Moore R T, McAlear J H & Chapman G B. *Stilbum zaccaloxanthum*: taxonomy, and conidial structure as seen by electron microscopy of thin sections. *Amer. Naturalist* 93:41-3, 1959.
3. Moore R T. The ultrastructure of fungal cells. (Ainsworth G C & Sussman A S, eds.) *The fungi, an advanced treatise*. New York: Academic Press, 1965, p. 95-118.
4. Marchant R & Moore R T. Lomasomes and plasmalemmasomes in fungi. *Protoplasma* 76:235-47, 1973.
5. Moore R T. An alternative concept of the fungi based on their ultrastructure. (Perez-Miravete A & Pelaez D, eds.) *Recent advances in microbiology*. Mexico City: Libreria Internacional, 1971, p. 49-64.
6. -----, Early ontogenetic stages in dolipore/parenthesome formation in *Polyporus biennis*. *J. Gen. Microbiol.* 87:251-9, 1975.
7. -----, Taxonomic proposals for the classification of marine yeasts and other yeast-like fungi including the smuts. *Bot. Mar.* 23:361-73, 1980.