

In search of Neoproterozoic fungi microfossils

STEEVE BONNEVILLE¹, KITTY BEART², A. HUBIN² AND FRANCK DELPOMDOR¹³

¹Biogéochimie et Modélisation du système Terre, DSTE, Université Libre de Bruxelles, Brussels Belgium.

²Research Group Electrochemical and Surface Engineering, Vrije Universiteit Brussels, Brussels, Belgium.

³CPMTC-GEOLOGIA-IGC-UFGM, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil

Fossils of fungi are sparse and our knowledge of the early evolution of this major kingdom of life is notoriously lacking. While the Rhynie chert fossils with the superbly-preserved fungal and flora assemblages remain a milestone in the colonization of land in the early Devonian (~410 Ma)¹, older fungal remains were reported such as Glomales from the Ordovician (460 Ma) and the lichen-like fossils (~600 Ma)².

Here, we report the presence of microscopic filaments alone and/or connected to spore-like structure fossilized in Neoproterozoic rocks of the Mbuji-Mayi Supergroup (deposited between 1174 and *ca.* 800 Ma) located in the Kasai oriental region in Democratic Republic of the Congo (DRC). These fossils are composed of carbonaceous material (ESEM-EDS) as the original organic matter has been partially transformed into kerogens (Laser Raman micro-spectroscopy). However, chitin-forming compounds which are characteristics of the fungi cell wall have been detected in those filaments by WGA-FITC fluorescent staining. We interpret those fossilized remains as fungi with an estimated minimum age of 800 Ma. The fossils were preserved in shale beds deposited in very shallow lagoon and lacustrine environments subjected to terrestrial freshwater inputs³, this may indicate that land colonization by fungi was possibly underway in the early-Neoproterozoic.

[1] Redecker et al. (2000) *Science* **289**:1920-1921. [2] Yuan et al (2005) *Science* **308** :1017-1020. [3] Delpomdor et al. (2013) *J.Afr.Earth Sci.* **88**: 72-100.