Evidence for early predation in Arctic Canada and implications for the evolution of Eukaryotes

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**ABSTRACT**

Predatory behavior (the action of killing for nutritional purposes) is a common feeding behavior in modern eukaryotes. Predation enhances fitness in prey and is viewed as one of the probable driver for biological transitions during the evolution the domain eukaryote. For instance, the major eukaryote diversification in the Neoproterozoic, around 800 Ma. Although, molecular clock estimates and earliest crown-group affiliated microfossils suggest that this diversification may have originated during the Mesoproterozoic. New assemblages of organic-walled microfossils are reported from the *ca*. 1151±13 Ma to 892±13 Ma lower Shaler Supergroup of Arctic Canada and include a variety of eukaryotic forms. Numerous specimens from various taxa display circular and ovoidal perforations on their wall which are interpreted as probable traces of selective protist predation, more than 100 Ma before their first reported incidence in the Neoproterozoic. This implies that the ~800 Ma eukaryotic diversification might had been more progressive, beginning prior to 800 Ma, and might have been associated with the evolution of selective eukaryovory, in parallel to the development of eukaryotic photosynthesis in marine environments.