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# Early organisms in the fossil record: paleontological aspects, evolutionary and ecological impacts

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With this abstract we introduce our session whose aim is twofold: 1) to gather information on the earliest foraminifera (single- organic and agglutinated taxa) which so far are sparse and uncoordinated in order to understand their evolution and their relationship with modern single-chambered taxa, contextualizing scientific current results in the geo-biological field. 2) to explore also every other early organism trace fossils or so far overlooked organisms coated with fine sediment (i.e. bacteria, testate amoebae) to understand how and if this coating might help these creatures to fossilize.
For this reason, this session will integrate many disciplines, from genomics to palaeo-environmental modelling to palaeontology and geochemistry.
Our experience starts from Foraminifera which are an ecologically important group of modern heterotrophic amoeboid eukaryotes whose naked and testate ancestors are thought to have evolved $\sim$1 Ga ago. However, the single-chambered agglutinated test of these protists is hypothesized to appear in the fossil record in the Neoproterozoic, before the rise of complex animals. In addition, the difficulty of recognizing unambiguously ancestral monothalamous foraminifera in the fossil record represents the main challenge and might be related to a combination of factors, such as preservation in the sediments, adverse palaeo-environmental conditions and the absence of clear morphological characters distinguishing them from other morphologically simple testate organisms. However, recent publications have evidenced the finding of such organisms in several sedimentary successions tracing back to the Neoproterozoic.
An integrate approach will result in profound insights about life—past, present, future— representing a new frontier in the palaeobiological studies. Therefore, aim of this session is to bring together specialists across all these disciplines to provide a uniquely rich and fertile intellectual environment for the pursuit of this intrinsically interdisciplinary topic.