

Shelly microfossils from the Ediacaran Doushantuo Formation in Hunan province, China

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The Ediacaran and earliest Cambrian fossils from South China play a key role to reconstruct the early history of the animal evolution (Xiao et al., 1998; Hong et al., 2010). The reported fossils have been mainly animal bodies and embryos, however the microfossils are equally important in order to understand the Ediacaran-Cambrian ecosystems. Some microfossils have mineralized skeletons, such as the small shelly fossils and the vase-shaped microfossils. Among these, the vase-shaped microfossils have been recently reported from many localities around the world, and considered to be related with various animal groups, such as agglutinated foraminifella (Hong et al., 2007), tintinnids (Bosak et al., 2011) and testate amoebae (Potter and Knoll, 2003). However, the oldest known shelly fossil in South China is so far the Cloudina from the uppermost Ediacaran Danguying Group. This study reports the newly discovered shelly fossils from the lower-lying Doushantuo Formation in South China.

The studied material was collected from microfossils in the Fengtan section, Hunan Province. Here exposes the Ediacaran sediments in a basinal setting of the Yangtze platform (Jiang et al., 2011) covering a diamictite facies of the Nantio Formation correlated with the Marinoan glaciation. The Ediacaran sequence of this section consists of carbonate-shale sequence of the Doushantuo Formation (80 m), and the black chert of the Liuchapo Formation (20 m) in ascending order. The fossils were found from ca. 20 m above the base of the Doushantuo Formation. These are discoidal to spheroidal forms with frilly outer rim as viewed from above. The fossils have a wide range in size; 80-1000 micrometer long (median = 435, N = 127) and 80-800 micrometer wide (median = 347, N = 127). Side view of the fossils show lenticular shape and some specimens have a tapering end. They have single layered skeleton of ~10 micrometer in thickness.

These fossils reveal the first discovery, also in terms of fossil from the basinal facies of the Yangtze platform. Despite of an unknown affinity, the newly found fossil occurrence increases the animal diversity of the early Ediacaran ocean. The marine ecosystem was more developed than it was considered.

Keywords: Ediacaran, Shelly microfossils, Doushantuo Formation, China