

Hydrothermal vent biota in basal Cambrian black shales of the Yangtze platform in China and their bearing on the so-called "Cambrian Explosion" of metazoa

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Among the examples of transitional sedimentary sections across the Neoproterozoic III (Sinian or Vendian) to Cambrian boundary the Yangtze Platform in south-central China is unique due to its representation in both shallow shelf (incl. estuarine) to deep-water black shale facies. Several of the SW-NE striking facies belts are crossed by a narrow fault-bounded zone (striking ca. 1.600 km E-W) which exhibits rich layers (lenticular bodies) of syngenetic sulfide ores containing high contents of nickel, molybdenum and PGE, which are geochemically indicative of hydrothermal vent activities. These up to several dm-thick lenticular ore bodies occur generally at or near the base of the organic-rich Niuitang black shales which are considered of upper Tommotian (lowermost Cambrian) age. Within shallower lithotopes these black shales delineate a sharp contact downsection with upper Sinian lime- and dolostones replete with cone-shaped "Small Shelly Fossils", which are correlated with the Nemakit-Daldyn of the Lena-Aldan region of Siberia. Within a few tens of meters upsection of the Niuitang Fm. Chengjiang-type biota occur at one recently discovered locality in Guizhou.

The hydrothermal ore zone itself contains a low-diversity fauna consisting of hexactinellid sponges and scattered spicules together with organic-bivalved arthropods which are provisionally referred to *Perspicularis*. In horizons above the ore layer and just below the Chengjiang-type biota, appear very small carapaces of the eodiscid trilobite *Tsunyidiscus* and sponges. However, within the ore-related basal black shales only mass occurrences of hexactinellid sponges and *Perspicularis* are observed. This association is here considered to represent at least the fossilised part of the earliest known hydrothermal vent community. This ancient vent association differs strongly from recorded Silurian to typical Recent vent faunas because, so far, no vestimentiferan tubes have been recognized nor early mollusc or brachiopod elements are seen in this assemblage.

It is surmised that this sponge-*Perspicularis* assemblage, which is associated with massive sulfide ore, represents (as far as fossilized) a bacteriophagous primitive metazoan "pioneer community" which may already translate a "relic" or "antiquity" fauna having been established in pre-Phanerozoic times and been preserved only in connection with volcanic seafloor activities, which are usually not preservable resulting from their consumption at subduction margins. On the Yangtze Platform hydrothermal vents appear to be related to a pre-Sinian arc system which was active farther south and expired during the Tommotian as „diffuse" back-arc exhalative vents. This Neoproterozoic arc system is also made responsible for the early silicification of massive (pre-diagenetically) slumped upper Sinian Liuchapo Cherts of the Yangtze Platform.