# PLUME WINTER: SCENARIO FOR THE GREATEST BIOSPHERE CATASTROPHE ACROSS THE PERMO-TRIASSIC BOUNDARY

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The greatest mass extinction of the Phanerozoic occurred at 251 Ma across the Permo-Triassic boundary (PTB), terminating numerous Paleozoic biota abruptly. The magnitude of the massacre suggests a global scale biosphere catastrophe, however, the ultimate cause has not yet been identified. Ancient deep-sea cherts in Japan and British Columbia originated from a mid-superocean (Panthalassa) span across the PTB. Their stratigraphy and lithologic characteristics indicate that 1) nearly 20 million years long anoxia (superanoxia) in deep superocean, 2) mass extinction of pelagic planktons (radiolarians), and 3) abundant accumulation of organic carbon in superocean. The existence of the supercontinent Pangea and the appearance of superanoxia, in addition to the unusually great mass extinction, are two extraordinary geologic phenomena in the Phanerozoic, and are unique to the PTB. Here I propose 'Plume Winter' scenario to explain such unique PTB events. The coincidence in timing of the initial break-up of Pangea, global anoxia, and biotic crisis suggests a sequence of events generated by mantle superplume activity. Episodic uprising of a superplume beneath Pangea may have ejected explosive kimberlitic magma and initiated partial melting of pre-existing crust, leading to supercontinent break-up coupled with violent volcanisms. This hyper-eruptive volcanism may have caused 1) formation of dust-screen in stratosphere, 2) stop of photosynthesis + rapid cooling, 3) collapse of food web, 4) mass extinction, 5) global anoxia, 6) gradual warming, and 7) organic carbon deposition.