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The mid-Pleistocene "*Stilostomella* extinction event" in the southeast Pacific Ocean: A review

Igor J. C. Gavriloff

Facultad de Ciencias Naturales e Instituto Miguel Lillo, Universidad Nacional de Tucumán, Miguel Lillo 205, 4000 San Miguel de Tucumán, Tucumán, Argentina
igor@csnat.unt.edu.ar

During the mid-Pleistocene several important geological events occurred globally and/or regionally (hemispheric), including: polarity reversal of the Earth's magnetic field at 0.78 Ma (Brunhes/Matuyama Boundary); changes in the amplitude of the glacial/interglacial cycles (from a dominance of 40 ka to that of 100 ka cycles) between 0.9-0.6 Ma (called Mid-Pleistocene Transition); at 0.793 Ma the Australasian Impact Event covered ~1/10 of the Earth's surface with its tektites strewn-field; and at 0.788 Ma the first super-eruption of the Toba Caldera Complex in Sumatra expelled *c.* 1000km^3 of equivalent rock-volume into the atmosphere. There are several global and/or regional changes in the marine biota in the mid-Pleistocene: the extinction of 30% of Plio-Pleistocene coral fauna in the Caribbean Basin between 0.9-0.5 Ma; and the global extinction of elongate and/or uniserial deep-sea! benthic foraminifera between 0.9-0.6 Ma (called the "*Stilostomella* Extinction Event", SEE). As recently described by several authors, the SEE comprises the diachronous extinction of two families and a subfamily (partim) of benthic foraminifera (32 cosmopolitan species plus several endemic forms) in the world ocean. In the Peru-Chile Trench area, however, a modern benthic foraminiferal bathymetric zone (upper limit 3257m), defined in the 1960s, is characterized by the *Stilostomella antillea* group, containing some living *Stilostomella* forms (e.g. *Stilostomella antillea*). This species was recently listed as extinct and therefore it should be considered as a "living fossil". In the Southeast Pacific, the SEE is present in the ODP Site 861 (45º 51'S, 75º 41'W, depth water 1652m), where it occurs at the upper boundary (1.3/3 Ma) of the Pliocene to lower-Pleistocene *Stilostomella* cf. *S. consobrina* Assemblage Zone. At Site 861, the SEE thus occurred earlier than elsewhere in the world's oceans (0.9-0.6 Ma). The SEE in the Southeast Pacific Ocean can also be recognized in Eltanin Core 3-9 (23º 15´S, 72º 49´W, depth water 3512m). At this site, the SEE occurred at 5.52 mbsf, where the genera of the *Stilostomella* extinction group have their Last Occurrence. The *S.* cf. *S. consobrina* Assemblage Zone is recognized between

5.52 mbsf and the core bottom (7.54 mbsf) and it is characterized by the following species: *S.* cf. *S. consobrina, S.* ex gr. *S. lepidula, Orthomorphina* cf. *O. challengeriana* and *Pleurostomella alternans*. The two benthic deep-sea foraminiferal species *Epistominella exigua* and *Eponides weddellensis* are the dominant components of the fauna in core E3-9 from the top down to 5.52 mbsf. In this core section, both species alternatingly are dominant. Below the SEE level (5.52 mbsf), these two species are no longer dominant in the fauna and *E. exigua* is always more abundant than *E. weddellensis*. The co-occurrence of the mid-Pleistocene global and hemispheric/regional geological events, such as paleoclimatic changes, impacts of extraterrestrial bodies and super-vulcanism, suggest that the SEE might be a smaller-scale event similar to greater Phanerozoic extinction events.