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Are the Diversity Change Horizons in Foraminifera near the Permian-Triassic Boundary in Shallow Water Carbonates Equivalent to Two Episodes of Extinction at the Meishan Section, South China? New Data from Turkish Sections

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In light of recent studies reporting two extinction episodes near the Permian-Triassic boundary (Song et al. 2007, 2013), here we use foraminiferal data to correlate the P-T boundary sections from South Turkey with the Meishan section in South China. The studied boundary sections are located on the outcrops of the Southern Biofacies Belt of Altiner et al. (2000), which is largely considered as the 'Neotethyan type' Middle-Upper Permian by some authors (Gaillot & Vachard, 2006). The studied samples were collected from five sections located on different tectonic units of the Tauride Belt. Taşkent (Taşkent 1 and Taşkent 2) and Hadim sections belong to the Aladag Unit, one of the northern allochthons of the Tauride Belt. Demirtaş section also belongs to one of the allochthonous units, known as the Antalya Unit. The fifth section, Köserelik Tepe, is located on the main authochton, which crops out as a large Paleozoic-Mesozoic carbonate belt in the eastern Taurides. Although these tectonic units belong to different paleogeographic belts in the Mesozoic to early Tertiary, their Permian-Triassic boundary sections exhibit similar successions. The successions consist of three main rock types within a few meters thick interval. Medium- to thick-bedded algal and foraminiferal wackestone to packstone facies of Changhsingian age are overlain by cross-laminated oolitic limestones with a sharp boundary. Oolitic limestones, usually composed of 2 to 6 beds, measure 40 to 60 cm in thickness in all sections. They are sharply truncated by microbialites and stromatolitic limestones. Along the studied sections, latest Changhsingian foraminifers display two marked reductions in diversity, the lower one corresponding to the base of oolitic limestones and the upper one to the base of microbialites. The upper diversity change horizon is sometimes recorded in the last oolitic bed with mixed fauna suggesting that oolitic limestones are slightly diachronic at the upper boundary. This upper pulse is associated with the nearly complete extinction of the Permian fauna and was probably immediately followed by a submarine dissolution event (Payne et al., 2007) that truncated the top of oolitic limestones. If the events causing these changes in the diversity pattern of foraminifera are isochronous both in South China and Taurides, then the base of the oolitic limestones correlates with the base of Bed 25 in the Meishan section correponding to the first episode of extinction in the P-T boundary interval. In this case, the top of the oolitic level in Taurides corresponding to the main extinction horizon of Permian foraminifera is best correlated with the base of bed 28 in Meishan section. If these correlations are correct, the first appearance of *Hindeodus parvus* marking the Permian-Triassic boundary should lie within the oolitic limestone in the boundary interval sections. The presence of the genus *Isarcicella* already reported by Crasquin-Soleau et al. (2002) and Angiolini et al. (2007) from the base of microbialites in the Antalya Unit strongly supports this interpretation.

Key words: Taurides (Turkey), Meishan section (South China), P-T boundary, two extinction episodes, foraminifera

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References

Altiner, D., Özkan-Altiner, S., and Koçyiğit, A., 2000. Late Permian foraminiferal biofacies belts in Turkey: paleogeographic and tectonic implications. In: Bozkurt, E., Winchester, J. A., and Piper, J. D. A. (eds.), Tectonics and Magmatism in Turkey and the Surrounding Area. *Geological Society, London, Special Publication*, 173: 83-96.

Angiolini, L., Carabelli, L., Nicora, A., Crasquin-Soleau, S., Marcoux, J., and Rettori, R., 2007. Brachiopods and other fossils from the Permo-Triassic boundary beds of the Antalya

Nappes (SW Taurus, Turkey). *Geobios*, 40: 715-729.

Crasquin-Soleau, S., Marcoux, J., Angiolini, L., and Nicora, A., 2004. Palaeocopida (Ostracoda) across the Permian-Triassic events: new data from southwestern Taurus (Turkey). *Journal of Micropalaeontology*, 23: 67-76.

Gaillot, J., and Vachard, D., 2007. The Khuff Formation (Middle East) and time-equivalents in Turkey and South China: biostratigraphy from Capitanian to Changhsingian times (Permian), new foraminiferal taxa, and palaeogeographical implications. *Coloquios de Paleontología*, 57: 37-223.

Payne, J. L., Lehrmann, D. J., Follett, D., Seibel, M., Kump, L. R., Riccardi, A., Altiner, D., Sano, H., and Wei, J., 2007. Erosional truncation of uppermost Permian shallow-marine carbonates and implications for Permian-Triassic boundary events. *Geological Society of America Bulletin*, 119: 771-784.

Song, H., Tong, J., and Chen, Z. Q., 2009. Two episodes of foraminiferal extinction near the Permian-Triassic boundary at the Meishan section, South China. *Australian Journal of Earth Sciences*, 56: 765-773.

Song, H., Wignall, P. B., Tong, J., and Yin, H., 2013. Two pulses of extinction during the Permian-Triassic crisis. Nature Geoscience, 6: 52-56.