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ICHNOFABRICS AND FACIES IN THE PALEOCENE OF CHICXULUB: A RECORD OF THE RECOVERY OF LIFE POST-IMPACT. M.T. Whalen, K.O'Malley, C. Lowery, C., F.J. Rodríguez-Tovar, J.V. Morgan, S. Gulick, and the Expedition 364 Scientists

IODP/ICDP Expedition 364 recovered ~829 m of core at Site M0077A atop the Chicxulub impact crater peak ring and penetrated ~110 m of post-impact, (hemi)pelagic Paleogene sedimentary rocks overlying suevite, melt rock, and granitic basement. The transition between suevite and the basal Paleocene is a remarkable fining upward package of gravel to sand-sized suevite overlain by a laminated carbonate-rich "Transitional Unit" that records the settling of fine-grained material post-impact and contains a mix of Late Cretaceous and earliest Danian taxa. Rare oval structures (potential burrows) occur in the upper part of the unit. This study concentrates on the overlying Paleocene sedimentary rocks. The Ichnofabric Index (II), provides a semiquantitative estimate of burrow density to help assess the return of life to the crater.

The Paleocene is ~10 m thick with a sharp contact at the base of a greenish claystone (II 2) overlying the Transitional Unit. It consists mainly of cm-dm interbedded blue-gray marlstone (II 2) that grades upward into gray to blue-gray wackestone and packstone (II 3-5). Contacts between facies are mostly gradational due to burrowing. The upper 3 m of the unit is a yellow-brown burrowed packstone (II 4) intercalated with gray marlstone (II 2). The uppermost 7.5 cm is calcite cemented with 1 cm wide burrows (II 3-4) and fine to coarse sand size clasts including foraminifera. The upper surface of the unit is a hardground and minor unconformity overlain by Eocene rocks.

The first well-defined potential burrows occur in the upper part of the Transitional Unit. Unequivocal burrows (II 2) that disturb sedimentary facies occur just above in the Paleocene. IIs of 3-5 are recorded in the overlying 10 cm indicating significant disruption of primary sedimentary structures. IIs in the Paleocene vary between 2-5 with rare laminated intervals (II 1). II correlates well with facies changes, i.e. marlstones display lower IIs than more carbonate-rich facies implying a depth and/or redox control on the burrower distribution. The II data indicate that burrowers were re-established in the crater before the end of deposition of the Transitional Unit. The lowest Danian zone Pa is documented in the lowermost part of the overlying unit. Burrowers were thus active by the earliest Danian indicating a rapid return of life to the crater.