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ICHNOLOGY APPLIED TO SEQUENCE STRATIGRAPHIC ANALYSIS OF SILURO-DEVONIAN MUD-DOMINATED SHELF DEPOSITS, PARANÁ BASIN, BRAZIL

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ABSTRACT: Previous studies of the Paraná Supersequence (Furnas and Ponta Grossa formations) of the Paraná Basin in southern Brazil have yielded disparate sequence stratigraphic interpretations. An integrated sedimentological, paleontological, and ichnological model was created to establish a refined sequence stratigraphic framework for this succession, focusing on the Ponta Grossa Formation. Twenty-nine ichnotaxa are recognized in the Ponta Grossa Formation, recurring assemblages of which define five trace fossil suites that represent various expressions of the Skolithos, Glossifungites and Cruziana ichnofacies. Physical sedimentologic characteristics and associated softground ichnofacies provide the basis for recognizing seven facies that reflect a passive relationship to bathymetric gradients from shallow marine (shoreface) to offshore deposition. The vertical distribution of facies provides the basis for dividing the Ponta Grossa Formation into three major (3rd-order) depositional sequences— Siluro-Devonian and Devonian I and II—each containing a record of three to seven higher-order relative sea-level cycles. Major sequence boundaries, commonly coinciding with hiatuses recognized from previously