

Quantitative Characterization of the Basal Middle Permian (Guadalupian) Series Boundary

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The type Guadalupian exhibits all desirable characteristics for an international chronostratigraphic standard. It is widely recognized by its distinctive fossil package, including *Jinogondolella*—the conodont clade whose first appearance marks its basal boundary. Characterized by anteriorly serrated Pa elements, *Jinogondolella* evolved from *Mesogondolella* through a mosaic paedomorphocline. The specific end-members of the transition were widely dispersed, but cladogenesis was limited to West Texas. There, incipient serrations were restricted to juveniles early in the transition. Incrementally, juvenile serrations became better defined and carried further through ontogeny in successive generations until the pronounced serrate margins of adult *Jinogondolella* were attained. Other characters evolved concurrently, undergoing juvenilization at different relative rates. The resultant mosaic paedomorphocline provides a complex pattern on which to quantify a precise basal boundary definition.

Allometries through the transition were analyzed independently from size, and as functions of both size and stratigraphic level. Results indicate that growth shifted from a posterior to anterior emphasis through the paedomorphocline. A distinctive point along that shift occurred when positive allometry of the anterior margins outpaced carina growth, minimizing free blade length in adult forms. That coincided with initial acquisition of serrations in adults. Later populations exhibit longer free blades with the increasingly pronounced serrations. The distinctive point is easily recognized both quantitatively and qualitatively. It occurs 42.7m above the base of the Cutoff Fm. in Stratotype Canyon, where it is recommended as the basal Middle Permian (Guadalupian) GSSP.