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Research paper

Mesogondolella and *Jinogondolella* (Conodonta): Multielement definition of the taxa that bracket the basal Guadalupian (Middle Permian Series) GSSP

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Abstract

Multielement definitions are presented here for *Mesogondolella* and *Jinogondolella* based on species that bracket the basal Guadalupian (Middle Permian Series) GSSP. Distinctive apparatus characters that appear with the first *Jinogondolella* include several details of P_2 element dimorphism and process bifurcation in S_3 elements. The sequential expression of these multielement characters is traced through *M. idahoensis*, *M. lamberti*, and *J. nankingensis*. The resulting multielement definition of *Jinogondolella* serves to distinguish it from all other closely related genera. *Mesogondolella lamberti* is recognized as a distinct species, and *J. serrata* is formally designated a junior synonym of *J. nankingensis*.

Keywords: *Jinogondolella*; *Mesogondolella*; Middle Permian; Guadalupian; Multielement; West Texas

1. Introduction

It is appropriate in a volume dedicated to the memory and accomplishments of Jin Yu-Gan to demonstrate that a taxon named in his honor represents a distinct clade that should be recognized at the genus level. *Jinogondolella* is an important genus that provides the primary conodont indices for correlation of Middle Permian (Guadalupian Series) strata. These taxa are critical to defining as well as correlating the chronostratigraphic subdivisions of the Permian established by Jin et al. (1997) (Fig. 1).

Jinogondolella is a clade of Middle Permian gondolellid conodonts that primarily inhabited warm, shallower water masses in the Permian pan-tropical belt. Species of this clade evolved independently from those of coeval, mostly smooth-margined *Mesogondolella*, which predominantly inhabited cold water masses in temperate to polar shallow waters and deeper tropical settings (Wardlaw, 1995). The genotype, *J. nankingensis*, diverged from *M. lamberti* through a mosaic paedomorphocline (Lambert and Wardlaw, 1992, 1996), and forms a monophyletic group that includes the species *J. altudaensis*, *J. artafrons*, *J. aserrata*, *J. crofti*, *J. gladirobusta*, *J. granti*, *J. postserrata*, *J. shannoni*, and *J. xuanhanensis*. Most of these taxa have populations with transitional forms through strata that characterize ancestor–descendant evolutionary events. Points within transitional clines between the first three species (*J. nankingensis*, *J. aserrata*, *J. postserrata*) define stage boundary GSSPs for the Guadalupian

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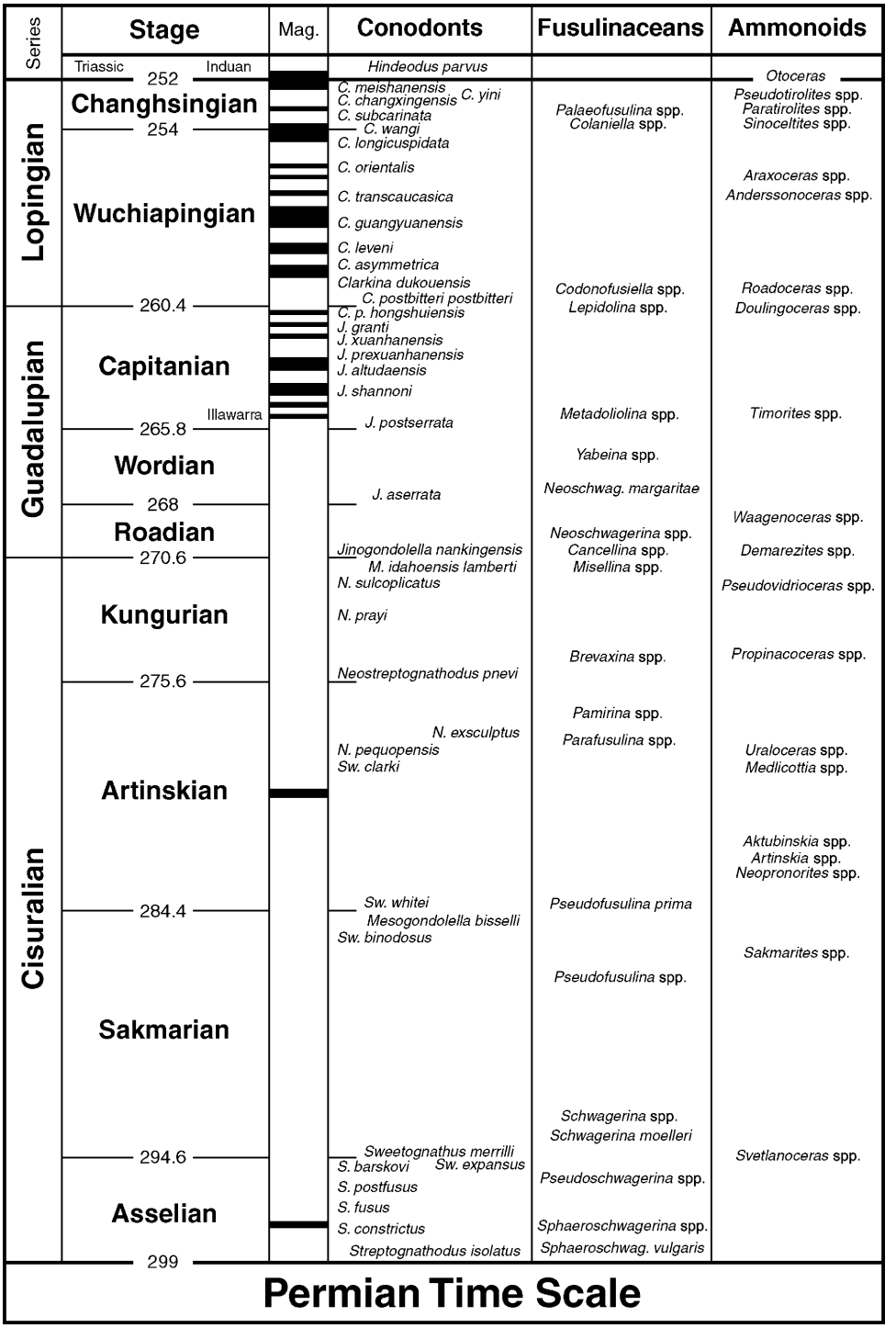

Fig. 1. The International Permian Time Scale, adapted from Jin et al. (1997), showing important taxa that define or characterize each chronostratigraphic subdivision. Modified from Wardlaw et al., 2004.

Series (Glenister et al., 1999; Wardlaw et al., in press; Figs. 2 and 3).

Jin erected the first species of the genus, both chronologically and evolutionarily it turns out, as *Gondolella nankingensis* (Ching, 1960). His paper described the first conodont taxon ever reported from China (Shen et al., 2006). His original specimen illustration, a camera lucida-based drawing, has been dismissed in the past