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A PRECISE U-PB ZIRCON AGE FROM VOLCANIC ASH IN THE PENNSYLVANIAN COPACABANA FORMATION, BOLIVIA

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We present the first U-Pb zircon age determination for volcanic ash in the Carboniferous of Bolivia. The Titicaca Group in the Madre de Dios Basin includes, in northern Bolivia, the Pennsylvanian-Permian Copacabana Formation, a 200-800m thick succession dominated by fossiliferous carbonates, with intercalated siliciclastic facies in some intervals. Ash beds in the formation are numerous (at least 20 occur alone in outcrop on the Copacabana Peninsula), though they rarely exceed 15 cm thickness. Some are bioturbated, while others appear to have been deposited subaerially. Core from the Mobil-Oxy Manuripi X-1 exploration well in northern Bolivia presents a nearly-continuous subsurface section through biostratigraphically well-characterized Copacabana Formation carbonates, preserves several glacioeustatic cycles, and also contains numerous thin ash horizons. Ages of the Copacabana Formation from the Manuripi X-1 and nearby Pando X-1 cores were originally assumed to be Permian. Subsequent studies by Mamet (in Isaacson et al., 1995), however, identified calcareous foraminifera of Bashkirian age (Zone 20). Moreover, recent work on conodonts (Schiappa, this meeting) demonstrates a Bashkirian through Middle Moscovian age for the lower Copacabana Formation in the Manuripi core. In the present study, we targeted a massive, fractured siliceous green tuffaceous interval occupying depths of 882.4-883.2 m, where it is surrounded above and below by carbonate. The ash bed contained a modest amount fine zircon, the most prismatic, colorless and sharply-faceted of which cluster tightly as a youngest concordant population yielding a weighted average $^{206}\text{Pb}/\text{U}^{238}\text{CA-ID-TIMS}$ age of 316.0 ± 0.4 Ma (2σ ; single grain analyses). The radiometric age therefore establishes a robust Lower Pennsylvanian (Bashkirian) age for this interval of the Copacabana Formation. This result (a Bashkirian age) confirms that the Copacabana carbonates formed contemporaneous with glaciogenic deposits of nearby Gondwanan basins of the time of, for example, Brazil (e.g. Parana, Tarija).

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