

## PALYNOZONATION OF THE PERMIAN OF BOLIVIA AND PERU

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The Cisuralian Vitiacua Formation in southern Bolivia is partially time-correlative with the upper Copacabana Formation from north- and western Bolivia and Peru. Palynological information here analyzed comes from Apillapampa, Yesera, Canaletas, Iglesias and Angosto de Beu in Bolivia, and Cuzco in Perú. Also, new information from sections at Morochata and Via Molino (Bolivia), and Pongo de Mainique (Perú) is provided in this study. Forty-one selected Permian species recovered from at least two of the 13 sections analyzed support the palynozonation proposed herein. Long-ranging species (13 spores and 36 pollen grains and 8 microplankton), documented in most of the sections, and 56 species (20 spores, 32 pollen grains and 4 microplankton) found at single localities were not considered. Ten selected taxa appeared in the oldest *Vittatina* Zone (VZ), such as the Permian species *Vittatina costabilis*, *V. subsaccata*, *V. vittifera*, *Marsupipollenites striatus*, *Pakhapites fusus*, *Pakhapites ovatus*, and *Striatopodocarpites cancellatus*. This zone is found in the Copacabana Formation at Apillapampa, Via Molino, Angosto de Beu and Pongo de Mainique. The appearance of *Lueckisporites virkkiae* and other species of this genus supports the homonymous *Lv* Zone, which is subdivided in the *Lv* (*sensu stricto*) and the *Lv-Hamiapollenites karrooensis*-*Polypodiisporites mutabilis* (*Lv-Hk-Pm*) Subzones. The former is characterized by the appearance of 18 species such as *Lueckisporites nyakapendensis*, *Lunatisporites noviaulensis*, *Lunatisporites pellucidus*, *Pakhapites fasciolatus*, *Protohaploxypinus rugatus*, *Protohaploxypinus samoilovichii*, *Protohaploxypinus varius*, *Striatopodocarpites phaleratus*, *Striomonosaccites cicatricosus*, *Vittatina corrugata*, and *Weylandites* spp. The *Lv-Hk-Pm* Subzone is defined by the appearance of 13 species, with abundant monolete (e.g., *Polypodiisporites mutabilis*, *Reticuloidosporites warchianus*, *Thymospora rugulosa*) and trilete spores (*Lundbladispore braziliensis*, *Convolutispora uruguayensis*) and few pollen grains (e.g., *Hamiapollenites karrooensis*, *Scheuringipollenites circularis*). Two assemblages of the Vitiacua Formation at Iglesias are attributed to the *Lv* Zone. The *Lv* (*s.s.*) Subzone occurs in the Vitiacua Formation at Yesera, Canaletas, and two more sections at Canaletas and Narváez, and in the Copacabana Formation at Apillapampa and Via Molino. The *Lv-Hk-Pm* Subzone is documented in the Vitiacua Formation at West Yesera, and the Coal Member of the Copacabana Formation at Apillapampa, Morochata, Pongo de Mainique and Cuzco. The *Vittatina* (Asselian) and the *L. virkkiae* (late Asselian-?Guadalupian) Zones are similar in composition and correlated with the Brazilian *V. costabilis* (Asselian-mid Artinskian) and *L. virkkiae* (middle Artinskian-Wuachiapingian) Zones of Paraná Basin and the Argentinian *Pakhapites fusus*-*Vittatina subsaccata* (Asselian-Artinskian) and *Lueckisporites* – *Weylandites* (middle Artinskian-Wuachiapingian) Zones of western basins. [PIP CONICET 0305].

