

NEW TAXA AND COMPREHENSIVE OVERVIEW OF DEVONIAN PALYNOMORPHS FROM THE OXY-MOBIL PANDO X-1 CORE, MADRE DE DIOS BASIN, BOLIVIA

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Recently analyzed palynological mounts from the Pando X-1, in combination with previously published information, affirm an excellent stratigraphic hierarchy of tops and bases. This summary integrates spore, acritarch, prasinophyte, and chitinozoan data to create a new palynofacies and stratigraphic framework applicable to thick subsurface sections and possible unconventional (shale-gas) plays. The Pando core yielded a well preserved assemblage that ranges from the ?Silurian through Upper Devonian. The stratigraphic intervals assigned to the ?Silurian-Lower Devonian and Middle-Upper Devonian are the Tequeje and Tomachi formations, respectively. Another unit, the Upper Devonian-Lower Carboniferous Toregua, is a challenge to interpret because of the impact of recycled organic-walled microfossils related to glacial processes in the area during deposition. The Tequeje Formation assemblage ranges from ?Silurian to Lower Devonian, and contains several undescribed (?endemic) forms. The species from this stratigraphic unit include *Brochotriletes hudsonii*, *Retusotriletes maculatus*, *Leiofusa berneseae*, *Onondagaella asymmetrica*, *Ozotobrachion furcillatus*, *Pterospermella circumstriata*, *Riculusphaera fissa*, *Schizocystia pilosa*, *S. saharica*, *Thysanoprobolus polykion*, *Cingulochitina serrata*, *Lagenochitina navicula*, *Margachitina catenaria*, *Pterochitina megavelata*, and *Urochitina* spp. Diagnostic species from the Tomachi Formation include *Campozonotriletes caperatus*, *Clivosispora verrucata*, *Cristatisporites triangulatus*, *Geminospora lemurata*, *Verrucosisporites bulliferus*, *Ammonidium garrasioni*, *Duvernaysphaera angelae*, *Evittia sommeri*, *Horologinella horologia*, *Maranhites mosesii*, *Multiplicisphaeridium escobaides* (*Pyloferites pentagonalis*), *Tunisphaeridium tentaculaferum*, and *Umbellasphaeridium saharicum*. The assemblage includes new forms, some with morphologies uncommon in Devonian sections (e.g., an acritarch with a diacrodian-like process distribution). The Toregua Formation assemblage include abundant spore species, such as *Ancyrospora langii*, *Auroraspora macra*, *Chelinospora cocinna*, *Lophozonotriletes grumosus*, *L. lebedianensis*, *Retispora lepidophyta*, and *Tumulispora rarituberculata*. Also present are the acritarchs/prasinophytes *Maranhites* spp., *Puteoscortum polyankistrum*, and *Umbellasphaeridium* spp. Previous studies of this well have concentrated primarily on bases (first occurrence) and assemblage zones. The present study combines published information with new taxa and palynofacies insights reported here, and focuses on palynomorph tops (first downhole occurrence). This approach can be used when analyzing cuttings samples from Gondwanan exploration and production wells to constrain stratigraphic architecture.

