Late Ordovician-Early Silurian palynomorphs from the Cordillera Oriental, Central Andean Basin, northwestern Argentina: a contribution to the advent of vascular plants in South America

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PALYNOCOLUMN RESULTS

Pollen-pollen assemblages of the Ordovician Silurian boundary are nearly rare, exhibiting a clear predominance of eukamptosporic and oligosporous peltate phytopollenites.

CHITINOZANS

In the Cordillera Oriental, chitinoclasts were recovered from the lower levels of the gracilis (samples 81/6-02D) characterized by extensive erosion. The assemblages printed Italian chitinoclasts mainly represented by brochidoceran. The lower samples (81/6-017 and 81/6-018) contain an early Italian association mainly composed of Ranchoceras, incertae sedis, and Brochidoceras. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis.

ORGANIC-MAGMALE PLANTALE (ASTACARIDOS)

Archaean assemblages from the Cordillera Oriental are relatively diverse, with scars late Ordovician (Krakan Hirnantia) diagnostic assemblages such as non-radiocarbon-dated and radiocarbon-dated samples. In Morocco, 1982 and the youngest at the base of the Ordovician system in this area.

GEOGRAPHICOCYTOLOGICAL MALINDE PLANLAIMEN

In the Cordillera, the presence of abundant Ordovician palynomorphs indicates that the Cordillera Formation was deposited in an ultra-deep marine environment. The Ordovician system in this area is characterized by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis.

CONCLUSIONS

Under the current state of knowledge, there is no doubt that land plants appeared first on the Ordovician system, and that vascular plants in South America also appeared prior to the Ordovician system. This is particularly evident in the Cordillera, where the Ordovician system is characterized by the presence of Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis. The samples treated with NaOH and potassium hydroxide, respectively, were dominated by Ranchoceras species such as Ranchoceras incertae sedis.

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