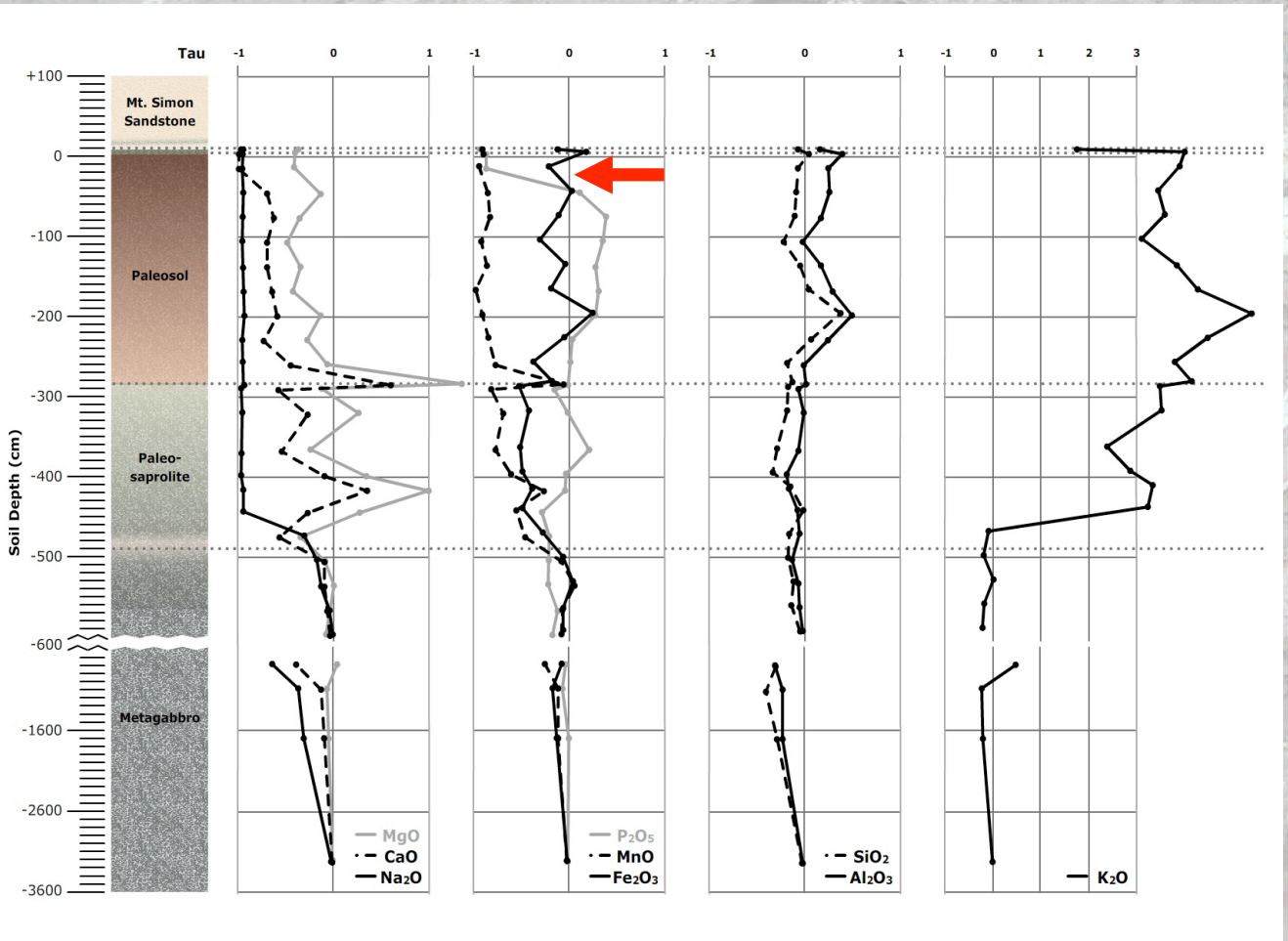
Middle Cambrian Surface Apatite Dissolution: A Mycorrhizal Fungi Biosignature?



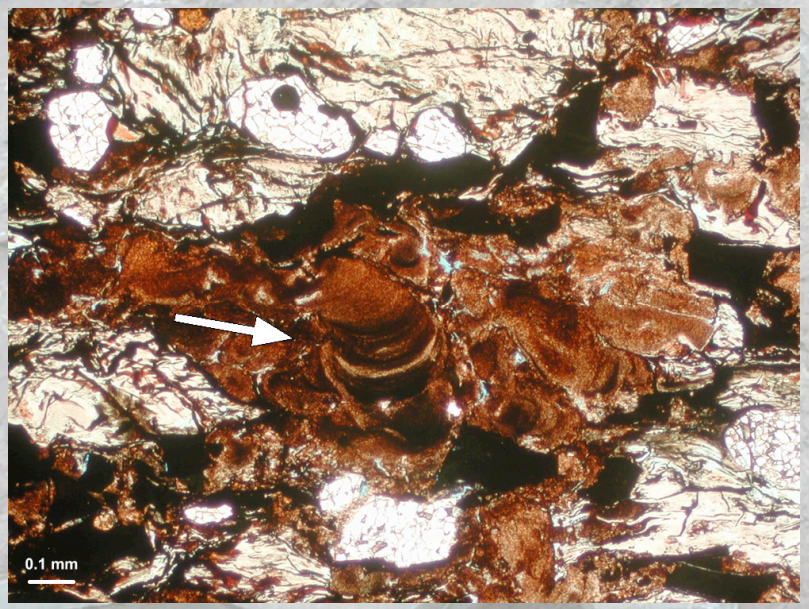
Elk Point

- SW South Dakota
- >504 Ma
- 5 m thick
  - 3 m clayey
    - paleosol
  - 2 m dolomite-rich saprolite
- Displays normal weathering patterns
- Complete surface P loss is unusual

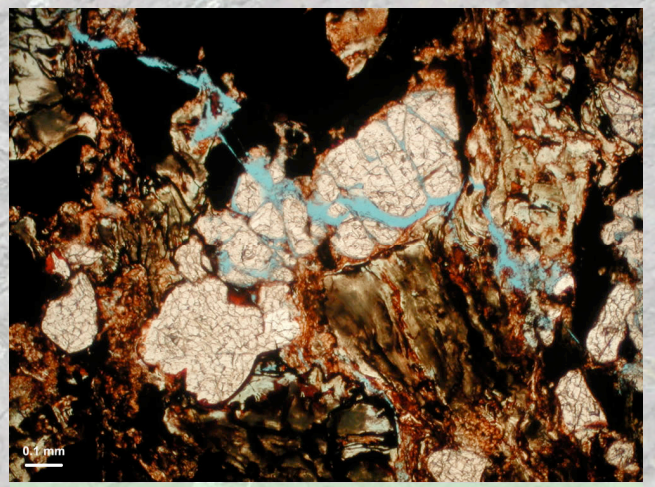
Lev Horodyskyj
July 2010

P is a limiting nutrient in terrestrial environments

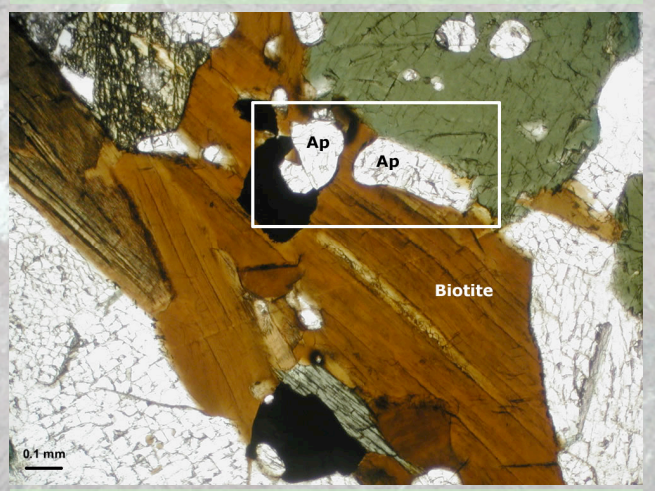
Apatite Dissolution and Argillan Formation



Clay film formation at -16 cm



Heavily weathered apatite grain at -36 cm



Unweathered apatite grain at -1576 cm

No secondary phosphates at depth
- Indicates biological uptake

- Argillans indicate high soil cations
  - Enhanced Ca from apatite dissolution resulted in enhanced clay flocculation
  - Pattern previously associated with mycorrhizal fungi (symbiotic fungi)

- Enhanced Middle Cambrian weathering?