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Title: LATEST FAMENNIAN MIDDLE SAPPINGTON SHALE*: LEPIDOPHYTA-VERRUCOSISPORITES NITIDUS* (LN) ZONE AT THE LOGAN GULCH TYPE SECTION, MONTANA, USA

This abstract on which you are an author, has been accepted for presentation as indicated below. Your abstract will be published in GSA Abstracts with Programs Vol. 46, No. 6. Here are the details regarding this abstract:

- This abstract has been approved for an Oral presentation,
- In session number 60 titled "Paleontology: Temporal and Stratigraphic Resolution in the Fossil Record,"
- Scheduled for Sunday, 19 October 2014, in the Vancouver Convention Center-West, 221/222.

To view the entire technical program schedule, please visit https://gsa.confex.com/gsa/2014AM/webprogram/start.html.

LATEST FAMENNIAN MIDDLE SAPPINGTON SHALE*: LEPIDOPHYTA-VERRUCOSISPORITES NITIDUS* (LN) ZONE AT THE LOGAN GULCH TYPE SECTION, MONTANA, USA

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At many locations worldwide, the Devonian-Mississippian (D-M) boundary is characterized by relatively deeper water dark shale units often associated with shallow water, shoreface, and foreshore facies. Lower and upper black shales in the Sappington Formation, Central Montana Trough, correlate with those in the Exshaw and Bakken formations. These shales overlie basal sequence boundaries and contain internal stacking patterns. However, in the Sappington Formation, a dark middle shale is also present. Palynological analysis of each shale unit was performed in early 2014 at the Logan Gulch section with supporting analyses at two other sections. A total of 47 samples were collected and processed from the three localities: 7 samples from the Logan Gulch middle shale were productive, yielding well preserved, diverse assemblages of miospores (*Auroraspora macra, Emphanisporites rotatus, Endosporites micromanifestus, Grandispora clandestina, G. echinata, Knoxisporites concentricus, Lophozonotriletes* spp., *Punctatisporites hannibalensis, Pustulatisporites dolbii, Retispora lepidophyta, Retusotriletes crassus, Tumulispora rarituberculata, Vallatisporites drybrookensis, V. splendens, V. vallatus, and Verrucosisporites nitidus)* and acritarchs (*Dictyotidium fairfieldense, Gorgonisphaeridium absitum, G. ohioense, G. plerispinosum, Navifusa* sp., *Stellinium micropolygonale*, and *Veryhachium*

downiei). Many leiosphaerids were found. The co-occurrence of *R. lepidophyta* with *V. nitidus* in the middle shale indicates a late Strunian LN Zone (very latest Famennian) and places the D-M boundary at the top of this unit. These results confirm in a new location the previous report of *R. lepidophyta* in the middle shale at Peak 9559, Bridger Mountains, MT. Most of our taxa were recognized in the LN Zone of the Saverton Shale in Pike County, IL, USA, and in the Bakken Formation (subsurface), near Regina, southern Saskatchewan, Canada. Future research will include new palynological and conodont work to better elucidate the geometry of internal stacking patterns in the Sappington/Bakken system and associated reservoirs.