BIOSTRATIGRAPHY/ ECOSTRATIGRAPHY OF THE EARLY PENNSYLVANIAN OSHA CANYON FORMATION AT GUADALUPE BOX, JEMEZ MOUNTAINS, NEW MEXICO

Patrick James Carey1, Spencer Lucas2 and Deborah Petrak Green

1New Mexico Museum of Natural History, 3605 Dakota Street NE, Albuquerque, NM, 87110, raglandcarey@aol.com
2New Mexico Museum of Natural History & Science, 1801 Mountain Road NW, Albuquerque, NM, 87104

In 2005, Krainer and Lucas redefined the Morrowan Osha Canyon Formation to include an additional 5 m of fossiliferous limestone and shale that had been assigned to the overlying, Atokan Sandia Formation by DuChene et al. in 1977. With these added strata, the Osha Canyon Formation in the main area of outcrop, at and just north of Guadalupe Box, can be divided into three informal members based on stratigraphy and invertebrate fossil assemblages. The upper member equals beds 14-15 of Krainer and Lucas, i.e., the uppermost limestone bed and shale below it that were not included in the original formation definition. In this stratigraphic interval, the brachiopods Anthracospirifer, Derbyia and Linoproductus are prominent at over 15% abundance. Echinaria and the trace fossil Zoophycus are also present. Neochonetes, Hustedia, Punctospirifer, and Sandia are all less than 1% abundant.

The middle member encompasses beds 10-13 of Krainer and Lucas, while, in the original stratigraphy of Duchene et al., this member is probably represented by beds 5-8. Here, Anthracospirifer, Derbyia, and Linoproductus are less than 5% abundant. Composita is dominant at over 50% abundance. Hustedia becomes fairly common at about 10% abundance, and Punctospirifer and Sandia each occur at about 5%. In both the upper and middle members, Parajuresania is present at less than 1%. This is not true in the lower member, which includes beds 1-9 of Krainer and Lucas and beds 1-4 of the original stratigraphy of Duchene et al. Parajuresania is dominant at 40% abundance, followed closely by Composita at about 28%. Linoproductus is fairly common at about 6%, but Neochonetes, Punctospirifer, Hustedia, and Sandia are all less than 1% abundant. Schizophoria oklahomae is especially abundant at the type section. The changes in relative abundances of brachiopods and other taxa through the Osha Canyon Formation section are, in part, tied to lithologic changes that suggest ecological factors (water depth, temperature?) drove these changes, but the entire assemblage does not change in taxonomic composition through the section.

The “West Hill” exposure is situated just northwest of the main area of outcrop, on the west side of FR-376, on both sides of an arroyo that crosses the road via a culvert. A collection of 140 specimens, principally from the north side of the arroyo, suggests a fauna that most resembles that of the upper member. The fauna of the very productive roadcut exposure located about 5 km north of the main exposure on FR-376 was described by Kues in 2005. It most resembles the middle member exposed farther to the south but does contain a rather high percentage (15%) of Parajuresania, the signature genus of the lower member.

Some of the invertebrate fossils in the Osha Canyon Formation are silicified, usually only partially and frequently in the form of beekite rings. The most extensive silicification (90% of the Composita shells) occurs at the FR-376 roadcut about 5 kilometers north of the main exposure. At the main outcrop, the upper and lower members are the least silicified.