GSA Connects 2022 meeting in Denver, Colorado

Paper No. 135-2
Presentation Time: 2:00 PM-6:00 PM

NEW INSIGHTS INTO DEVONIAN–CARBONIFEROUS GEOLOGICAL RELATIONSHIPS IN THE NORTHEASTERN BROOKS RANGE OF ALASKA

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The middle Paleozoic tectonic history of the Arctic Alaska terrane is critical for constraining models of subduction initiation along the western margin of Laurentia. However, conflicting observations from outcrop and seismic studies present ambiguities in the tectonic setting of Devonian–Carboniferous rocks in northern Alaska. Here, we present new mapping and detrital zircon U-Pb and biostratigraphic data from Devonian–Carboniferous units exposed near the headwaters of the East Fork of the Chandalar and Sheenjek Rivers. In addition to recognizing new outcrops of the Ulungarat Formation, we have identified that two previously unnamed Devonian–Mississippian units of Brosgé et al. (2001) define a Brookian thrust sheet situated between the Endicott Mountain allochthon and North Slope parautochthon. These two units are informally designated as: 1) the Double Mountain complex, which consists of a heterogeneous package of mafic and felsic volcanic and volcaniclastic rocks, as well as interbedded chert pebble conglomerate, lithic arenite, and black shale; and 2) the Chandalar unit, which consists of interbedded chert pebble conglomerate, quartz and lithic arenite, and fossiliferous siltstone/shale. The Chandalar unit rests with pronounced angular unconformity on the Double Mountain complex, and Tournaisian palynological constraints from these strata indicate they are equivalent with the Kekiktuk Conglomerate and the upper Kanayut Conglomerate. Detrital zircon U-Pb age signatures of samples from the Chandalar unit contain multiple age populations between 3000–1000 Ma and large peaks centered around ~370 Ma, which are similar to other samples of the Kekiktuk Conglomerate in adjacent regions. Detrital zircon U-Pb age populations from the Ulungarat Formation and Double Mountain complex are dominated by ca. 430-405 Ma populations, along with older populations like other basement samples throughout the northeastern Brooks Range. Further work on these new units will help clarify ambiguous tectonic relationships in Arctic Alaska.

Session No. 135--Booth# 148

T23. The Geological Evolution of Northern Alaska (Posters): A Session in Honor of Charles "Gil" Mull
Monday, 10 October 2022: 2:00 PM-6:00 PM

Exhibit Hall F (Colorado Convention Center)

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