Petrology and geochemistry of the Jeffers Brook pluton, western Cobequid Highlands, Nova Scotia, Canada

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The Cobequid Highlands of northwestern mainland Nova Scotia have a complex tectonic history, and are considered to form part of the southern margin of Avalonia. The area is generally interpreted to have developed as a series of volcanic arcs and back-arc basins on the periphery of Gondwana. The highlands are divided into two distinct fault-bound crustal blocks - the Jeffers block to the north and west, where the Jeffers Brook pluton is located, and the Bass River block to the south and east. Although the Bass River block contains widespread late Precambrian plutons, the Jeffers Brook pluton is the only dated late Precambrian pluton in the Jeffers block. Although mineral analyses and petrological studies have previously been done, the field relations have not been examined in detail and the pluton has not been systematically compared to plutons of similar age in the Bass River block. For this study, the pluton was mapped and sampled for petrographic study. It consists dominantly of coarse-grained granodiorite, with quartz diorite and tonalite components. They all contain fine-grained enclaves of diorite, quartz diorite and tonalite. Preliminary whole-rock chemical data from 10 samples of the granodiorite indicate that they are a calc-alkalic suite likely formed in a continental margin subduction zone, similar to coeval and potentially co-genetic plutons in the Bass River block. This project will lead to better understanding of the significance and implications of the current lithotectonic subdivision of the Cobequid Highlands.

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