

***Geochemistry and geochronology of York River Formation volcanic rocks
and associated intrusive of the Gaspé Peninsula, Quebec***

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The Lower Devonian York River Formation and Lemieux Dome porphyritic rhyolite intrusive are found within north-central Gaspé Synclinorium in the Gaspé Peninsula, Quebec. Preliminary results indicate the York River Formation consists of a bimodal volcanic sequence of silica-undersaturated alkali basalt and oversaturated rhyolite tuffs with alkalic tendencies. The mafic volcanic rocks are interbedded with shallow marine arkoses (upper Siegenian to lower Emsian age, Boucot et al. 1967). Previous geological interpretation of the volcanic

rocks have been based on field mapping in the area.

Major and trace elements describe an olivine controlled crystal fractionation path for the alkali basalt. Geochemistry of the rhyolite tuff shows alteration involving alkalis; however concentrations of MgO, CaO, TiO₂, Nb, Zr, Y are comparable to saturated comendites. The major element geochemistry of an associated porphyritic rhyolite intrusive shows similar SiO₂, TiO₂, Fe₂O₃, CaO, and MgO concentrations to the York River Formation rhyolite tuffs.

Rb-Sr geochronological analysis of the York River volcanic succession provides an age of 380 ± 3 ma with an $^{87}\text{Sr}/^{86}\text{Sr}_i$ of 0.7041 ± 0.0003 . The Rb/Sr isotopic data suggest a time association between mafic and felsic volcanic and implies a cogenetic relationship. However strong major element contrasts argue against crystal fractionation as a viable mechanism for the rhyolite genesis.

A well constrained Rb/Sr isochron on the Lemieux Dome porphyritic rhyolite gives

an age of 381 ± 4 ma with an $^{87}\text{Sr}/^{86}\text{Sr}_i$ ratio of 0.7087 ± 0.003 . The high initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of the Lemieux Dome intrusive indicates incorporation of radiogenic crust in its genesis.

This study, when incorporated with regional analysis (by Carbonneau, C., 1959) indicates that the York River Formation volcanic rocks probably lie on the northern side of a pull-apart basin (the eastwest trending Berry Mountain Synclinorium).