

Spatial distribution and possible explanations for post-Carboniferous Rb-Sr and Ar-Ar mica ages in Central Maine belt, Northern Appalachians

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The polymetamorphic metasedimentary rocks of Central Maine belt of Northern Appalachians contain micas as (i) matrix grains within the regional metamorphic assemblage of Acadian Orogeny (~405 Ma); and (ii) replacement phases often interpreted as a product of contact metamorphism from surrounding plutons [1]. Recently developed methods for *in situ* Rb-Sr mica geochronology are the ideal tool for dating these micas because of the preservation of textural information and rapid speed of analyses. Here, we re-evaluate the tectonic history of western Maine by presenting our pressure and temperature estimates from mineral thermobarometry (e.g., garnet-biotite thermometry and GASP barometry), *in situ* Rb-Sr mica dates, and U-Pb monazite dates from metasediments and surrounding plutons. We expand on our previous work that focused on the contact aureole of Mooselookmeguntic pluton, where micas are texturally associated with regional (~405 Ma) and contact metamorphism (~370 Ma). However, previously published amphibole, muscovite, and biotite Ar-Ar plateau ages are concentrated between 320 and 250 Ma [1], and single-spot Rb-Sr dates (by LA-MC-ICP-MS/MS) on biotite yield age peaks at 300, 270, and 240 Ma [2]. The young ages may be the result of partial resetting during mid to late Carboniferous igneous activity across western Maine, including the ca. 325 Ma Sebago Batholith that is currently located <50 km south of the contact aureole. To test this hypothesis: (i) we provide *in situ* Rb-Sr mica dates along several transects towards younger plutons, including the Sebago Batholith, (ii) re-evaluate the pressure and temperature estimates within the contact aureole, and (iii) better constrain the timing of contact metamorphism with U-Pb monazite dating by LA-ICP-MS.

[1] DeYoreo et al. (1989), *Journal of Metamorphic Geology* 7, no. 2 (1989): 169-190.

[2] Cruz-Urbe et al. (2023), *Geostandards and Geoanalytical Research*, 47(4), 795-809.