

Peperite in the Pontiac Subprovince: Evidence for a Distinct, Younger Episode of Synsedimentary Mafic-Ultramafic Volcanism

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The Pontiac subprovince is an Archean sedimentary subprovince situated south of the Cadillac Larder-Lake Fault. The Pontiac subprovince comprises sequences of turbiditic metagreywackes which are intruded by felsic to intermediate plutons, and interlayered with horizons of mafic-ultramafic volcanic rocks. The deposition of the Pontiac metasedimentary rocks has been estimated from U/Pb detrital zircon ages to be 2682 Ma, making them slightly younger than the turbidites of the 2690-2985 Ma Porcupine assemblage and older than the fluvial conglomerates of the 2679-2669 Ma Temiskaming assemblage. This study focuses on a mafic-ultramafic volcanic package situated at Lac Bellecombe, 20 km south of Rouyn-Noranda, Quebec. This horizon was previously interpreted as an unrelated volcanic event that was emplaced tectonically into the Pontiac metasedimentary rocks. Contrary to previous interpretation, detailed mapping during this study identified multiple occurrences of peperites in the contact zone between the volcanic and sedimentary packages. These peperites comprise fluidal and blocky clasts of mafic-ultramafic igneous material within bedded and non-bedded sedimentary rocks. Textures in these rocks include isolated clasts of igneous and sedimentary clasts, intense brecciation at sill margins, wispy dyke splays, and complete disintegration of the intrusive body within the sediments. In addition, the mixing of different juvenile clast populations and cross-cutting peperitic sills and dykes at the same outcrop locally indicates multiple generations of synvolcanic intrusions. These relationships and textures suggests that mafic sills and dykes were emplaced into the Pontiac sediments before they were consolidated. Thus, implying the possibility of a different, distinct mafic-ultramafic volcanic event than those recognized in the Abitibi Subprovince. These magmas would have originated from the mantle and migrated along a deep-penetrating structure. For future work, the geochemistry of mafic dykes and sills will be compared to that of the pillow and spinifex textured volcanic rocks to confirm the origin of the Pontiac peperites, and U/Pb detrital zircon ages will be calculated from sedimentary rocks and tonalitic dykes to provide age constraints on the magmatism in the Pontiac.