Selected Bibliography for Melilite, Melilititic Rocks and Post-Precambrian Melilititic Intrusions of Southeast Missouri

by

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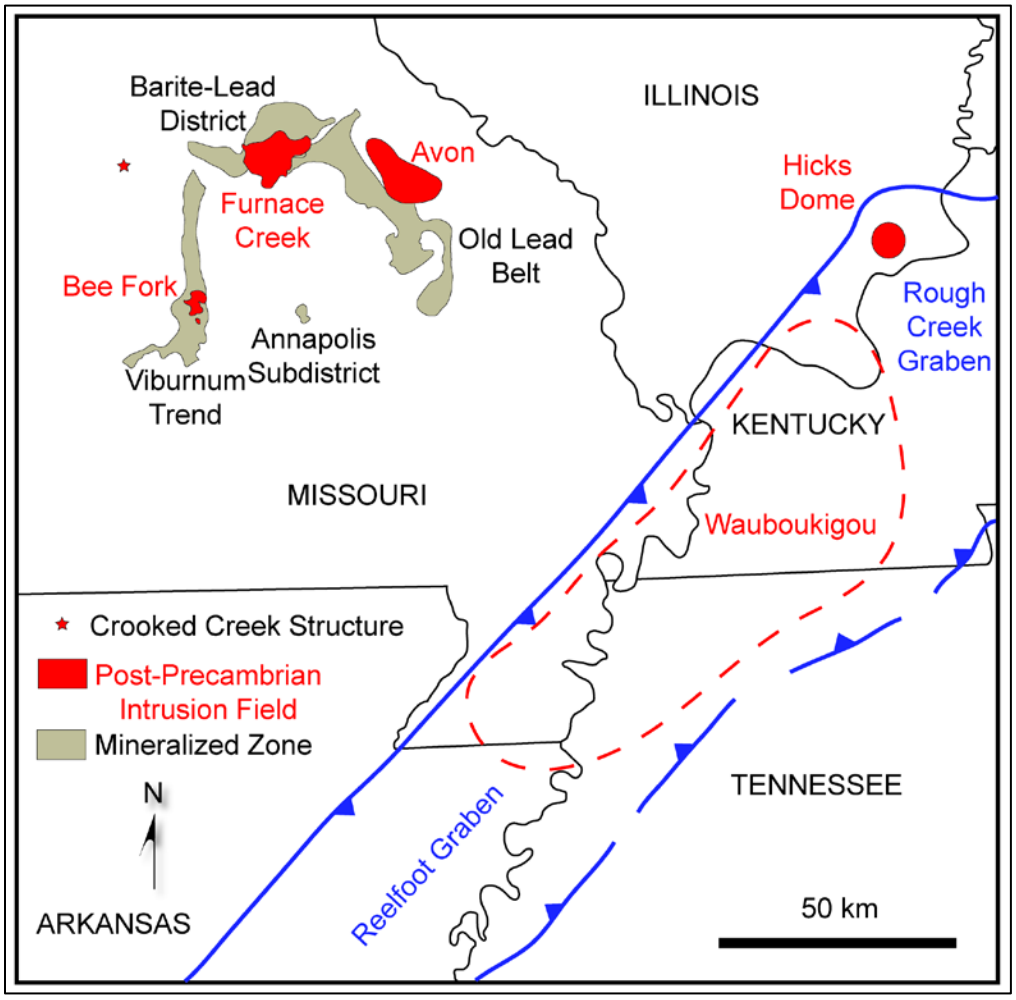

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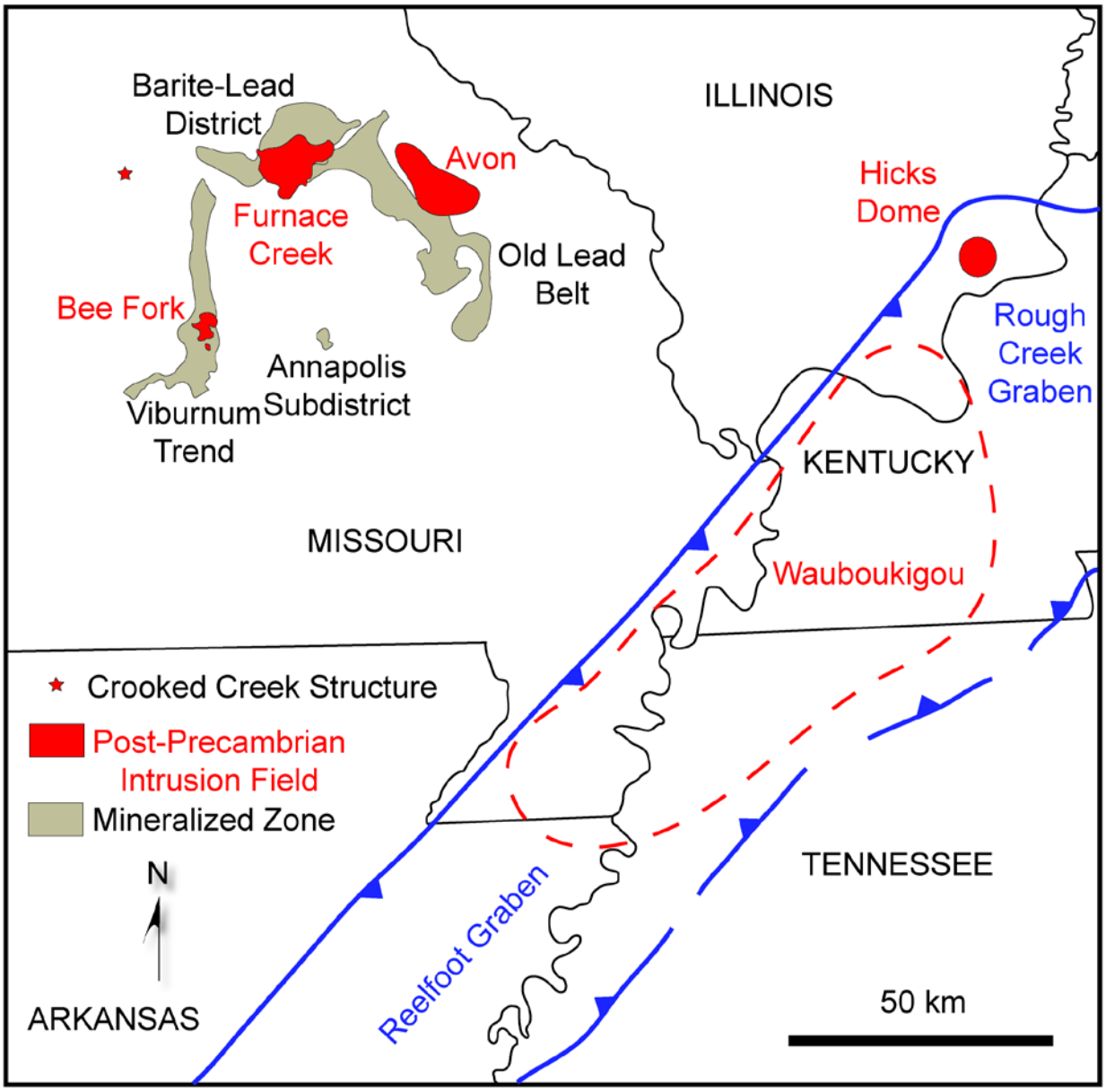

Figure 1. *Regional map showing known post-Precambrian igneous intrusion fields and major tectonic boundaries. Mineralized zones and Bee Fork field are from Kisvarsanyi and Howe (1983, a–d). Furnace Creek field adapted from Snyder and Gerdemann (1965). Wauboukigou is inferred from Lewis and Mitchell (1987). Hicks dome location adapted from Bradbury and Baxter (1992).*

INTRODUCTION

Southeast Missouri Post-Precambrian Melilititic Intrusions

A large province of melilititic intrusions is situated in southeast Missouri, southern, Illinois, western Kentucky and western Tennessee (Fig. 1). The province is characterized by ultramafic and carbonatitic intrusions that occur primarily as dikes and diatremes. Igneous intrusive activity in the province has been documented as having occurred during late Cambrian time (e.g. Wagner and Kisvarsanyi, 1969), Devonian time (e.g., Zartman et al., 1966) and Permian time (e.g., Lewis and Mitchell, 1987). The activity may be related to epeirogenic processes (e.g., Ste. Genevieve fault system) or periods of reactivation of the New Madrid seismic rift complex (Lewis and Mitchell, 1987) or some other unknown process.

Late Cambrian activity occurred primarily around the flanks of the St. Francois Mountains uplift, as did subsequent lead mineralization (Figure 1). The diatremes occur in the basal part of the Upper Cambrian Bonneterre Formation. Kisvarsanyi and Howe (1983) documented an ash field in the vicinity of Bee Fork, Reynolds County. Wagner and Kisvarsanyi (1969) and Snyder and Gerdemann (1965) documented an extensive volcanic field in Washington County. Melilititic rocks are suspected but not confirmed in these fields.

A petrologically enigmatic suite of rocks crop out in the vicinity of the village of Avon in Ste. Genevieve and St. Francois Counties (Fig. 1). The suite consists primarily of olivine melilite, alnöite and a subordinate amount of carbonatite. Two of the intrusions have yielded middle to late Devonian age dates (Zartman et al., 1966). Bridges and Hogan (2007) referred the Avon intrusions collectively as the Avon volcanic district (AVD).

Lewis and Mitchell (1987) described the Permian Wauboukigou alnöite province located in portions of Illinois, Missouri, Kentucky and Tennessee immediately southeast of the Avon melilitite field (Fig. 1). Wauboukigou is about 330 km long and 120 km wide. Twenty bodies of alnöitic composition with similar petrological, geochemical and geochronological (Permian) characteristics were reported by Lewis and Mitchell (1987).

Purpose

This report is a compilation of reference materials for many of the known occurrences of rocks containing igneous melilite that occur worldwide. For certain, the compilation does not contain every reference that addresses melilititic rocks and igneous melilitite; rather; it represents a broad survey of occurrences in many different petrological, tectonic and geographic settings. This report was produced as a derivative of a geochemistry database that likewise was developed to synthesize the published geochemical data available in the body of literature concerning melilite-bearing igneous rocks. It is hoped that this report serves as a foundation for the study of melilititic rocks in southeast Missouri and elsewhere.

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