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Title of article U-Pb and Rb-Sr Geochronology of the Western Ethiopian Shield

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APPENDIX 1

Brief mineralogical and textural descriptions are provided here for samples dated by U-Pb method from the Birbir, Goma, Baro, Bonga and Mao plutonic units. Sample localities are given in Tables 2 and 3.

Birbir: Sample # T3G. Quartz diorite

Mesoscopic features:

- *fine-grained, strongly foliated; foliation defined by compositional layering of biotite and hornblende between layers approximately 0.5cm thick.*

Microscopic features:

- *Quartz: commonly as anhedral microcrystalline aggregates (recrystallized with mosaic microstructure), some flattened; few ribbons up to 2mm by 0.2mm and as matrix less than 0.5mm across, straight grain boundaries, uniform to undulose extinction. Minor K-feldspar occurs as anhedral interlocking grains with quartz.*
- *Plagioclase: subhedral-euhedral laths up to 5 mm by 1.5 mm occur as porphyroclasts, and 0.5mm in the matrix; some show concentric zoning, deformation twins, mantled by very fine-grained recrystallized plagioclase; slightly altered along cleavage traces and edges to epidote and calcite.*
- *Biotite: subhedral-euhedral plates, dark brown to light greenish-brown pleochroism, wrapped around hornblende porphyroclasts, define mylonitic foliation by their orientation.*
- *Hornblende: euhedral-subhedral crystals, strong pleochroism from*

light green to dark green, show preferred orientation

- *Accessory minerals: euhedral titanite, euhedral zircon commonly included in biotite; abundant apatite generally included in quartz and feldspar.*
- *Matrix minerals approx. 60-70%, composed of fine-grained continuous layers of quartz- plagioclase and biotite-hornblende-epidote.*

Goma: Sample # T6J. Granodiorite

Mesoscopic features:

- *uniform, medium-grained, porphyritic, subhedral-granular, weakly developed planar fabric.*

Microscopic features:

- *Quartz: commonly as fine-grained anhedral matrix and less commonly as stubby phenocrysts, 1 to 3 mm across, with strain features including undulose extinction and microfractures penetrated by stringers or irregular patches of secondary minerals, mainly epidote.*
- *K-feldspar: mainly microcline with subordinate orthoclase, microcline occurs as subhedral perthite phenocrysts, 3 to 5 mm in diameter, often clouded by sericite alteration.*
- *Plagioclase: subhedral laths, 2 to 5 mm in diameter, straight to somewhat embayed grain boundaries, oligoclase (An $_{12-20}$), some filled with granular aggregates of epidote and minor calcite, particularly along cleavage traces.*

- *Biotite: anhedral to subhedral grains, ragged to curved edges, pleochroic from greenish brown to brownish green, strongly altered and intergrown with sagenitic rutile and chlorite.*
- *Accessory minerals include allanite, titanite, zircon and apatite.*

Baro: Sample # T8F. Biotite granite

Mesoscopic features:

- *medium-grained, weakly deformed; leucocratic: colour index <10.*

Microscopic features:

- *K-feldspar: mainly microcline and some perthitic microcline, pervasive sericitization*
- *Plagioclase: subhedral, predominantly albite, some are myrmekitic*
- *Quartz: mainly recrystallized matrix; forms interlocking grains with feldspars, some with undulose extinction; some occurs as fracture fillings.*
- *Biotite: pale yellow to rusty brown pleochroism, some show chloritization with extensive hematite staining; numerous pleochroic haloes - radiation damage.*
- *Accessory minerals: zircon, apatite, titanite and opaque oxides.*

Bonga: Sample # T8L. Quartz monzonite

Mesoscopic features:

- *massive grey to pinkish grey, coarse K-feldspar and minor quartz mega-crysts; some feldspars are as large as 5 cm with plagioclase rims about 1 mm thick (rapakivi texture), fine-grained melanocratic matrix; shows a significant variation in quartz content and the relative*

proportion of feldspars as well as textural features (hybrid feature).

Microscopic features:

- *Microcline: large subhedral phenocrysts (1 to 4 cm) commonly mantled by plagioclase, slightly altered to sericite; also less commonly enclose plagioclase.*
- *Plagioclase: subhedral-euhedral laths, both as large phenocrysts and matrix, some zoned (An $_{40-28}$).*
- *Quartz: anhedral, sub-rounded or globular habit.*
- *Biotite: subhedral - euhedral plates and laths; poikilitically enclose allanite and zircon. Allanite occurs as non-metamict, euhedral reddish brown zoned crystals.*

Hornblende: subhedral, prismatic, pleochroic from dark green to light green, generally associated with biotite.

Plagioclase, quartz, biotite and hornblende, 0.5 to 1 mm across constitute the matrix; accessory minerals are allanite, apatite, zircon and titanite.

Mao: Sample # T9O

- *Sample, from the eastern margin of the pluton, shows shear band foliation; colour index of about 20; composed of quartz, microcline, plagioclase (sodic oligoclase), biotite and hornblende, and accessory zircon, allanite, apatite and titanite. Most samples contain stilpnomelane, chloritized biotite and slightly sericitized feldspar.*