

Geology of subsheets Q and W of Yabello map sheet (NB37-14)

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ABSTRACT

The report deals about the geology of Dubluk (Q) and Mega (W) subsheets of the Yabello map sheet (NB 37-14), which is located in the southwestern part of Ethiopia, Oromia regional state. The study area is bounded between 38° 15'- 38° 30' E and 4° 00'- 4° 30' N, covering about 1500 sq. km areal extent.

The mappable units of the area are, Precambrian rocks (Mega banded felsic granulite, banded biotite gneiss, granitic gneiss and weakly deformed granite), Quaternary (late-Pleistocene) central type volcanic rocks (microporphyritic vesicular basalt, scoriaceous basalt and pyroclastic falls) and Quaternary sediments (calcrete, black cotton and red sandy soil). The microporphyritic vesicular basalt and scoriaceous basalt contain subrounded mantle nodules with spinel lherzolite and spinel pyroxinite composition; designating relatively deeper upper mantle source.

Two cycles of deformation have been observed in the area: the first cycle is pre-granulite facies metamorphism phase of deformation, which formed the oldest structures (isoclinal folds, boudinage and relict band) in the granulite. The second cycle is post-granulite facies metamorphism phase of deformation. This cycle includes three major deformation events. D₁ probably formed the gneissosity in the gneissic units. D₂ presumably produced NW-SE trending subhorizontal upright large-scale fold, producing a series of antiforms and synforms, and foliation in the weakly deformed granite. The D₃ resulted in NW-SE and NE-SW dextral and sinistral conjugate shear zones. Three metamorphic episodes were recognized in the area: M₁ is a granulite facies metamorphism in the granulite, M₂ is an amphibolite facies metamorphism in the gneissic units and weakly deformed granite, and M₃ is a retrogressive and associated regional K- metasomatic event in all the basement rocks of the area. The structural conformity of the granulite with the adjacent ophiolite belt and its structural continuity with the mozambiquian granulite, indicate its participation during Neoproterozoic Pan-African continental collision. The gneissic units and weakly deformed granite are interpreted as part of an island-arc complex.