

ABSTRACT

This study involves deciphering 1) fabric development with regional deformation, 2) time-relationship between vein formation with respect to the regional deformation and granite emplacement and 3) the paleostress evolution during the episodes of deformation in the Precambrian rocks of Hutti Maski Greenstone Belt, Eastern Dharwar Craton. Since the metavolcanic and granitic rocks of the region lack visible foliation and/or lineation, the author performed Anisotropy of Magnetic Susceptibility (AMS) analysis. It is established that the fabric (magnetic foliation) in the rocks is NNW-SSE oriented, which implies development during D1/D2 (NE-SW to ENE-WSW compression) regional deformation commonly reported from the Dharwar Craton. Further the magnetic lineation is doubly plunging that indicates superposition of regional D3. The metavolcanic rocks are replete with veins that have N-S strike and developed during D3 N-S directed regional compression. In order to decipher the kinematics, rock thin sections were studied in the XZ equivalent section defined by the AMS ellipsoid. SEM-EBSD studies establish a down-dip sense of shear as well as strain partitioning at the vein scale. Vein orientations in the granite are also used to develop a kinematic model for their formation during D3. The veins in the granite are also faulted and the fault-slip data are used to perform paleostress analysis. This late stage faulting in granitic rocks suggest a local compression direction of NNE-SSW which is due to late-D3 brittle deformation during cratonization of the Dharwar Craton at ca 2.5 Ga.

Keywords: Fabric analysis, Anisotropy of Magnetic Susceptibility, Electron Backscattered Diffraction, Paleostress, Dharwar Craton.