

Relationship between shear zones and igneous activity: The Closepet Granite of Southern India

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Abstract. The late Archaean Closepet granite of southern India is bounded by N–S trending shear zone. At the southern end of the granite both charnockite and granite veins are spatially associated with ductile shears. These shears continue further north and are confined to the contact zones in the central part of the granite outcrop. The main component of the shear zone are highly deformed granite sheets, augen gneisses and mylonites. Field observations and microstructural fabric of mylonites indicate a dextral sense of shear movement. Field evidence suggests that shear deformation was active throughout the evolution of the Closepet granite

Keywords. Shear zone; granite; charnockite; mylonite; deformation.

1. Introduction

In continental crust high strain during tectonic evolution is recorded in shear zones (Nicolas *et al* 1977). Shear zones have been studied from various points of view, e.g. deformation mechanisms, secondary alteration effects of fluids and regional tectonic evolution. Of particular interest is the genetic relation of shear zones with igneous activity, especially in high grade metamorphic terrains. The formation of shear zones may be related closely to the generation and evolution of granitic magmas, both in time and space (Davies 1982; Hollister and Crawford 1986; Hutton 1988; Sylvester 1989).

In the Archaean terrain of southern India the Closepet granite is bounded by N–S trending shear zone. In the present paper the geological relationships between shear zone and the Closepet granite are described.

2. Field relations

The late Archaean polyphase Closepet granite is a linear body of granitic rocks, which traverses the Dharwar craton from south to north. The granitic rocks in the Closepet terrain range from centimetre scale network of veins to small plutons of porphyritic granite in the south and high level intrusions cutting across gneiss and greenstone belts towards north. In the southern portions of the Closepet Granite along the contact zones, the Peninsular gneisses show progressive modification in their structures and textures towards the granite outcrop. In many localities such rocks composed of layers of granite textured felsic material (leucosome) separated by layers