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A RAPAKIVI GRANITE OCCURRENCE FROM SWAT

INTRODUCTION

Rapakivi granite is characterized by the occurrence of pinkish phenocrysts of orthoclase mantled by white sodic plagioclase set in a matrix of alkali granite (Marmo, 1971). The alkali feldspar is perthitic orthoclase and the plagioclase is oligoclase to andesine. Chemically, the granites are alkalic and iron-rich. They are considered to be anorogenic, post-tectonic, post-metamorphic, and of shallow emplacement. They are characteristic of Precambrian shields and have been described from the Baltic shield, Brazil, Maine and Wisconsin (U.S.A.), India, and the western plateaus of Central Asia (U.S.S.R.) (Marmo, 1971; Stewart, 1959; Anderson, 1980; Adyalkar *et al.*, 1973; Yudalevich *et al.*, 1973; Sviridenko and Verkhalo-Uzkiy, 1980).

DESCRIPTION

The Rapakivi granites of Swat are locally developed facies within large lensoidal bodies of biotite granites occurring in a mylonite zone at the base of the Swat granitic gneisses (Humayun, 1985). Large bodies occur just south-east of Manglaur and extending north of Dangram to Shamelai (Humayun, 1985, Fig. 1). They show intrusive relations with associated mafic rocks. The biotite granites have been tourmalinized in places. These appear to be the first known metamorphosed Rapakivi granites and the first reported occurrence from Pakistan.

The typical rapakivi texture consists of euhedral pinkish phenocrysts of orthoclase mantled by plagioclase. Unmantled ovoids and euhedral phenocrysts of orthoclase are also common. The biotite granites are apparently undeformed in the centre of a typical body, such as that at Shamelai, but show incipient metamorphism, mortar texture and recrystallization of biotite. On the contacts, however, the granites are mylonitized. A spectacular spotted gneiss results when a mylonite of rapakivi granite is seen in a section perpendicular to the lineation.

Petrographically, they consist of perthitic orthoclase, saussuritized plagioclase, quartz, biotite, secondary epidote and sphene. The associated mafic rocks have clinopyroxene, biotite, hornblende, plagioclase and sphene. The clinopyroxene has a lilac pleochroism and is probably titanaugite indicating an alkaline affinity. Enclaves of these mafic rocks occur in the granites.

CONCLUSION

The recognition of these rocks as a distinct lithology requires a three-fold subdivision of the granitic rocks of Swat :

1. Swat gneisses : gneissose, porphyritic granodiorite of probable calcalkaline affinity (Jan *et al.*, 1981) with white microcline megacrysts.

2. Biotite granites : equigranular to porphyritic granites, with rapakivi texture locally developed, of probable alkaline affinity. They have higher alkali feldspar/plagioclase ratios and total feldspar content than the other granites.

3. Tourmaline granites : equigranular, tourmaline-muscovite subsolvus granites.

The rapakivi granites are anomalous in their present position in an orogenic belt. Their faulted contacts, however, indicate what must be typical of orogenic terrains: the involvement of pre-existing basement rocks.

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