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Preliminary report on aegerine augite bearing syenite near SuBia Town, Dakshina Kannada District, Karnataka

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Abstract

Occurrence of syenite with the mineral assemblages: aegerine-augite-ferroedenite, brownish biotite and mesoperthite is described. From the available data of the associated rocks, it is concluded that the syenite intrusion is late and is associated with major EW linears.

INTRODUCTION

Syenite occurrences are comparatively rare in Southern Peninsular Shield and quite rare in Karnataka State. We report here the occurrence of an aegerine-augite bearing syenite body near SuBia town (75°23'34"; 12°34'30"). SuBia, the head quarters of Sullia taluk is situated about 90 km east of Mangalore on the Mangalore-Mysore State Highway. Syenite exposures are found in a small hillock (602) about one km southeast of the town, between the Highway and Payaswini river (Fig. 1).

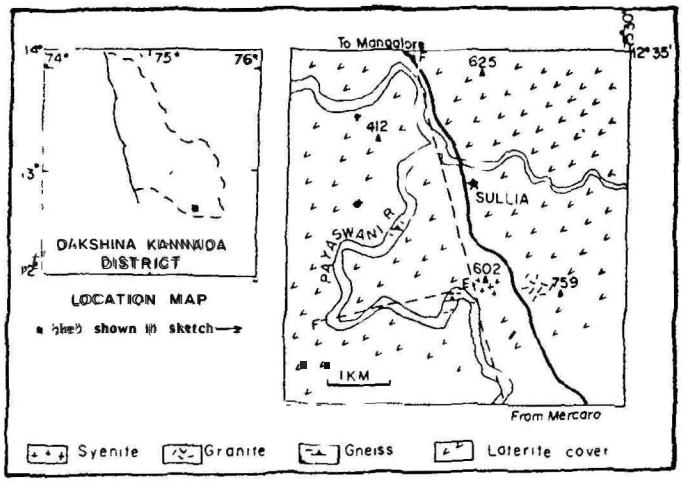

Figure 1. Location Map.

GEOLOGICAL SETTING

The greater part of the Sullia taluk is laterite covered. Beneath this cover, major rock types encountered are gneisses and granulites containing enclaves of kyanite-sillimanite ± corundum schist, kyanite-sillimanite-garnet-graphite schist, quartz-chlorite-biotite schist, quartzite, chlorite-talc-actinolite schist and amphibolite. The mineralogy of these assemblages are strongly reminiscent of Sargur supracrustals, though they could equally well be correlated with the khondalites. Younger augen granites are seen.These rocks show a general EW trend and dip steeply towards north. Towards the north, rocks show general EW trends. The EW trends appear to be late, and are superimposed

TABLE I. Chemistry of the minerals from Sullia syenite

	Aegerine augite SSA1	SSA6	Biotite SSB1	Ferro-edenite	Meso-perthite SSM3		*Pyroxene	*Biotite
SiO_2	48.13	48.51	35.21	44.83	64.82	SiO_2	52.25	33.11
Al_2O_3	1.39	0.95	11.81	4.21	18.72	Al_2O_3	2.86	18.52
TiO_2	–	–	1.61	0.56	–	TiO_2	0.92	2.19
FeO	29.32	29.78	38.63	31.75	–	FeO	7.82	23.56
MgO	0.34	0.67	0.63	0.51	–	Fe_2O_3	12.69	6.12
MnO	1.10	0.71	0.51	0.95	–	MgO	4.55	2.29
CaO	12.90	16.95	–	10.79	–	MnO	0.52	0.94
Na_2O	4.92	2.41	–	3.11	7.51	CaO	14.20	0.07
K_2O	–	–	8.46	0.96	5.77	Na_2O	3.76	0.43
						K_2O	0.37	9.12
						H_2O^+	0.06	3.54
						H_2O^-	0.03	0.03
Total	98.10	99.98	96.86	97.82	96.82		100.03	99.92
	6 (O) basis		22 (O) basis	23 (O) basis	8 (O) basis			
Si	2.016	1.998	5.834	7.295	2.935			
Al	0.068	0.046	2.306	0.807	1.016			
Ti	–	–	0.2	0.068	–			
Fe	1.627	1.026	5.352	4.30	–			
Mg	0.021	0.041	0.156	0.117	–			
Mn	0.039	0.025	0.07	0.127	–			
Ca	0.579	0.748	–	1.889	–			
Na	0.400	0.193	–	0.983	0.671			
K	–	–	1.787	0.235	0.339			

* Mineral analyses of Kannavaram syenites (after Subbarao, 1971)

SYENITE

The syenite body exposed on the lateritised △ 602 hill occurs mainly as boulders and occupies an EW shear/fault zone. This is strengthened by the sudden bend of the Payaswini river. The syenite body is coarse-grained and shows well developed laths of feldspar. The syenite rarely shows any foliation and becomes fine grained at its contact with the gneisses. Lack of foliation and fine grained contacts, indicate the possible intrusive nature of the body.

In thin section, the syenite is coarse-grained, essentially made up of K-feldspar perthite (Fig. 2), aegerine augite, reddish brown biotite and bluish green amphibole. Aegerine-augite occurs in clots (Fig. 3), shows strong pleochroism from light green to bright emerald green. It has 2V 84° with pyroxenic cleavages and low extinction

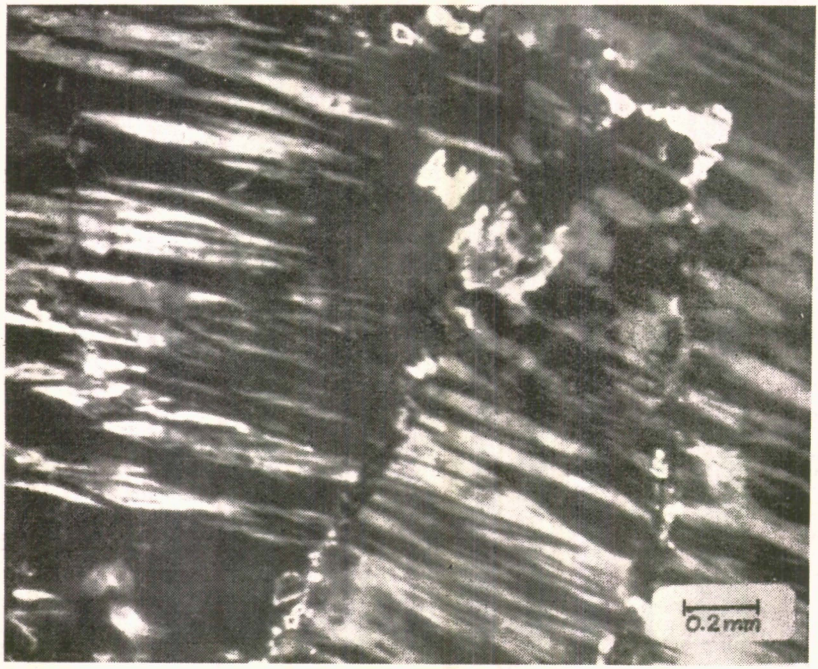

Figure 2
Thin section photograph of K-feldspar showing perthitic texture. X nicols.

Figure 3 Thin section photograph of syenite. Note the occurrence of Aegerine in clots with distinct pyroxenic cleavages. X nicols.

angle of 4-6°. It is enclosed in reddish brown biotite and at places seems to be breaking into light blue to indigo blue amphibole (?)

MINERALOGY

The pyroxenes, amphibole, biotite and the components of the meso-perthite were analyzed by Electron Microprobe. The data are presented in Table I. Chemistry of pyroxene and biotite from Kunnavaram nepheline syenite, Andhra Pradesh is given for comparison. The pyroxene can be classified as an aegerine-augite. The bluish green amphibole, according to Leake's (1978) recent classification falls in the field of ferroedenite (original magnesio-riebeckite) and biotite is highly iron rich. The mineralogy is thus characteristic of a typical syenite rock.

DISCUSSION

Balasubrahmanyan, (1978) has given 2670 m.y. as the general age of South Kanara granites and gneisses. Towards the east, the charnockites of Kushalnagar, Coorg District, have been dated around 2618 m.y. (Spooner and Fairbairn, 1970).

The almost total absence of foliation in the syenite, its obvious intrusive nature as deduced from the fine grained margins and the localisation of the body in the EW linears/shears (these shears are thought to be a late one, according to Srinivasan and Sreenivas, 1977; Drury and Holt, 1980) suggest that the syenite body post dates the 2670 m.y. gneisses of South Kanara. Further radiometric dating of this syenite occurrence and the associated granite are needed before correlating it to the well known Kangayam nepheline syenite of Tamil Nadu. This will then lead to a better understanding of the tectonic aspects and linear mosaic of Southern Peninsular shield.

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