DACITE PEBBLES FROM THE HOSKERE-GURUSIDDAPURA CONGLOMERATE, DHARWAR GROUP, KARNATAKA

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Introduction

EARLY Precambrian Dharwar Group of rocks of Chitradurga schist belt were classified by Sampat Iyengar[1] into Javanahalli Formation, Chitradurga Formation and G.R. Formation in the order of younging. The Chitradurga Formation is composed of metavolcanic rocks, polymictic conglomerates, greywackes and banded iron formations.

The Hoskere-Gurusiddapura conglomerate (14° 35′ N; 76° 19′ E) is a polymict conglomerate interbedded with chlorite schist of greywacke parentage, belonging to the Chitradurga Formation. The 60-70 metre thick conglomerate can be traced over a strike length of 15 km from about ½ km west of Hoskere to about

2 km east of Gurusiddapura. The geological setting and structural aspects of this conglomerate have been described by Chaudhuri[3], and Bhasker and Fareed[3].

During the course of petrological and geochemical studies of the pebble constituents of this conglomerate, the presence of pebbles of dacitic composition has been recognised. Although island arc affinity for the volcanic rocks of Chitradurga schist belt has been suggested earlier by Sreenivas and Srinivasan[4] and Yellur and Nair[5], so far only basalts and andesites have been recognised from the Chitradurga schist belt. Field descriptions of rhyolites (felsites) also are available. As far as we are aware there are no reports of the occurrence of dacites from the Chitradurga schist belt or any other Dharwar schist belt of Karnataka.

Dacite Pebbles

The dacite pebbles occurring in the Hoskere–Gurusiddapura conglomerates are dark grey to black in colour, greasy in appearance, and medium grained in texture. In the field or in hand specimen it can be easily mistaken for a fine grained gabbro or even a charnockite. However, the rock when bleached by warm 1:1 hydrochloric acid brings out its felsic nature. The rock is holocrystalline, inequigranular on a micro-scale, and shows flow texture, emphasised by subsequent tectonic impress. The phenocrysts are andesine (An_{25-30}), and clinopyroxene (extinction angle 17°–22°, birefringence 0·02). The matrix is composed of chlorite, quartz and magnetite. Micro-pegmatitic intergrowth of quartz and plagioclase is frequently observed. Due to tectonic impress there has been marginal granulation of feldspar, partial obliteration of composition planes of feldspar, micro-faulting and bending of twin lamellae, granulation of pyroxene, and recrystallisation of matrix glass (?) into quartz-chlorite assemblages. Partial chloritisation of pyroxene and also alteration of feldspar are noticed. As in the case of propylitised andesites and dacites carbonate-chlorite veins are ubiquitous. The modal composition of the dacites is given in Table I.

Chemical Composition

The chemical composition of the pebbles is given in Table I. The mineral composition and chemical analysis conform to the dacitic composition as defined by Condie (p. 145)[6].

Dacite is known to be a typical member in the island arc volcanic association. However, the dacites of island arc and active continental margins could belong to either tholeiitic line of descent or calc-alkaline line of descent (Miyashiro[7]). The tectonic implication of distinguishing the andesites and dacites of tholeiitic descent from those of calc-alkaline descent in an island arc type of setting is that the calc-alkaline suite is emplaced on the continental side and the tholeiitic suite is emplaced on the oceanic side of an island are (Kuno[8], Jakes and White[9], Miyashiro[7]). This would imply that the calc-alkaline suite is derived from a zone of thickened crust as compared to the tholeiitic series that is emplaced over thinner oceanic type of crust.

The iron enrichment trend characteristic of tholeiitic series distinguishes it from the calc-alkaline series.

In FeO^t/MgO *vs* SiO_2 and FeO^t/MgO *vs* FeO^t binary variation diagrams, Miyashiro[7] could clearly distinguish the tholeiitic differentiation trend. When the analyses of dacites under study were plotted on these diagrams (Fig. 1) the tholeiitic line of descent is noticed. The dark colour of these pebbles is more similar to the dacites of tholeiitic suite than calc-alkaline suite (Miyashiro[7]).

TABLE I

Chemical analyses of dacite pebbles from Hoskere-Gurusiddapura conglomerates, Chitradurga Schist Belt Dharwar Group, Karnataka

SiO_2	61·50	67·60	63·12	67·59	67·23
TiO_2	0·38	0·16	0·18	0·10	0·21
Al_2O_3	13·01	13·40	12·36	12·67	12·51
Fe_2O_3		0·70	0·65	4·75	0·71
FeO	7·20	5·58	7·41	4·24	5·15
MnO	0·33	0·39	0·16	0·42	0·28
MgO	1·61	1·23	2·12	2·38	0·88
CaO	4·48	4·35	4·21	2·97	2·09
Na_2O	5·95	3·48	4·76	2·86	3·64
K_2O	0·77	0·78	1·20	0·71	1·65
CO_2	N.D.	1·35	2·62	0·72	2·46
H_2O^+	3·22	0·56	0·89	0·98	1·61
H_2O^-		0·12	0·10	0·11	0·24
Total	98·45	99·70	99·78	100·50	98·69
Modal Analysis					
Plagioclase	58·09	51·46	N.D.	53·10	47·06
Quartz	2·65	20·58	N.D.	17·10	14·20
Chlorite (with rare relict pyroxene)	21·79	11·95	N.D.	11·95	20·00
Calcite	16·06	14·05	N.D.	9·42	12·66
Magnetite and other opaques	1·35	1·95	N.D.	1·95	6·01

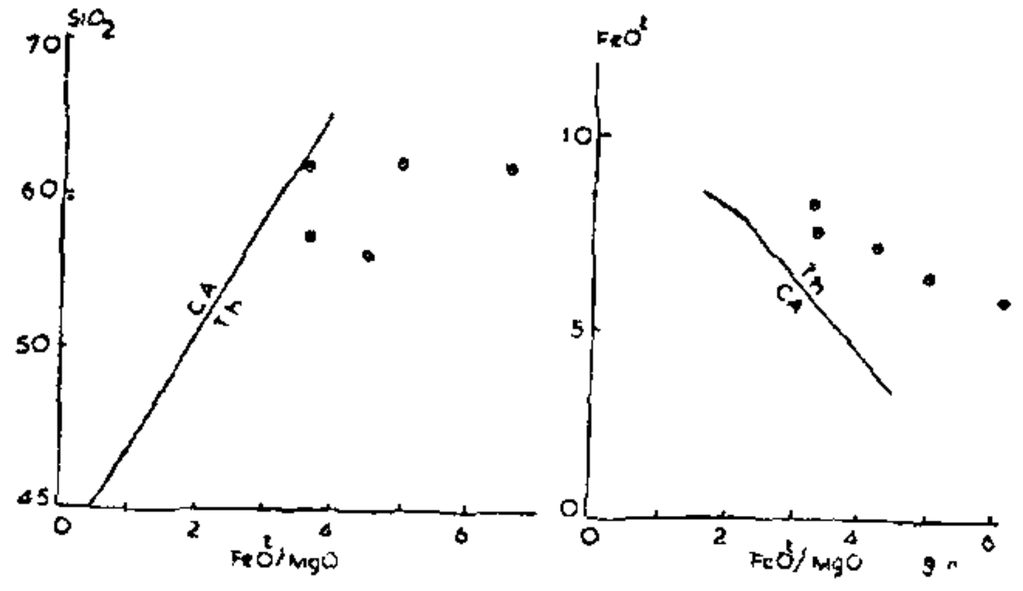

FIG. 1. FeO^t/MgO *vs* SiO_2 and FeO^t/MgO *vs* FeO^t variation diagrams after Miyashiro[7] for dacites of Chitradurga greenstone belt showing tholeiitic line of descent.

Discussion

The Hoskere-Gurusiddapura conglomerates are polymict conglomerates interbedded with meta-greywacke chlorite schist. The formation of such conglomerates under the influence of turbidity currents has been suggested by Sreenivas and Srinivasan[10] and Naqvi *et al.*[11]. The contribution of pene-contemporaneous volcanic rocks to the turbidite sequences is well known. It is suggested that the dacite pebbles have been derived from the pene-contemporaneous volcanic rocks of the Chitradurga Formation, since such rocks have not been noticed in the underlying Javanahalli Formation. The tholeiitic line of descent indicated by the composition of the dacites combined with the extensive geochemical data given by Naqvi[12], and Naqvi and Hussain[13] for the volcanic rocks of Chitradurga schist belt suggests that the volcanic rocks of the Chitradurga belt were emplaced over a thin mafic crust similar to the oceanic side of island arc type continental margin.

The dark colour and greasy appearance of these dacites renders it possible that such rocks are overlooked in the volcanic sequence of Dharwars, with an impression that they may be fine grained metagabbros. A closer examination of the volcanic suite of Dharwars may bring to light many more such occurrences of dacites.

Tholeiite-dacite type of magmatism has been recognised from the Early Precambrian sequences in other parts of the world (Barker and Peterman[14]). Further studies on trace elements and REE composition of these dacites are in progress.

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ANTIBACTERIAL ACTIVITY OF *RHIZOCTONIA BATATICOLA* (TAUB.) BUTLER

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DURING the routine screening of antimicrobial activities in fungal metabolites, the authors noticed the antibacterial activities of culture filtrate of *Rhizoctonia bataticola*. The present paper reports some preliminary data on the antibiotic substance produced by *R. bataticola*.

Material and Methods

The strain of *R. bataticola* used in this experiment was isolated from infected jute (root rot of *Corchorus capsularis*) obtained from the Jute Agricultural