

NOTES

CARBONATITE BODIES OF DHANOTA-DHANCHOLI AREA IN MAHENDRAGARH DISTRICT, HARYANA

Introduction

The occurrence of lensoid carbonatite, closely associated with massive magnetite-ore bodies, in a small group of hills, about 1.5 km to the east of Dhancholi (28° 00' : 75° 59') in the Mahendragarh district of Haryana was reported by the author in a brief note that appeared in the G.S.I. News, (v.9, p.14, Feb. 1978). Earlier, the same magnetite-ore bodies were described by the author as of late magmatic injection type of Bateman, adducing the necessary evidence. The invariable association of the ore-bodies with quartz syenite was mentioned as significant. This prompted a later re-examination of the geological milieu and the resultant identification of the carbonatite bodies therein.

Geological Setting

The carbonatite-magnetite bodies of Dhancholi (Fig.1) occur associated with the metasediments of the Ajabgarh Series of the Delhi System (Late Pre-Cambrian). The latter consist of phyllite, impure limestone and dolomite, calc-silicate rock, slate, etc., which are intensely folded and weakly metamorphosed. The regional strike of the formations varies from NNE-SSW to NE-SW. The magnetite and carbonatite lensoids occur within the country rock, a pink granite, traversing the Ajabgarh metasediments. The pink granite consists mostly of quartz, microcline, and microcline-perthite, with hornblende, biotite and magnetite as accessories. The white ovoids of microcline-perthite, measuring, 3 to 5 mm across, are elongated across the fine

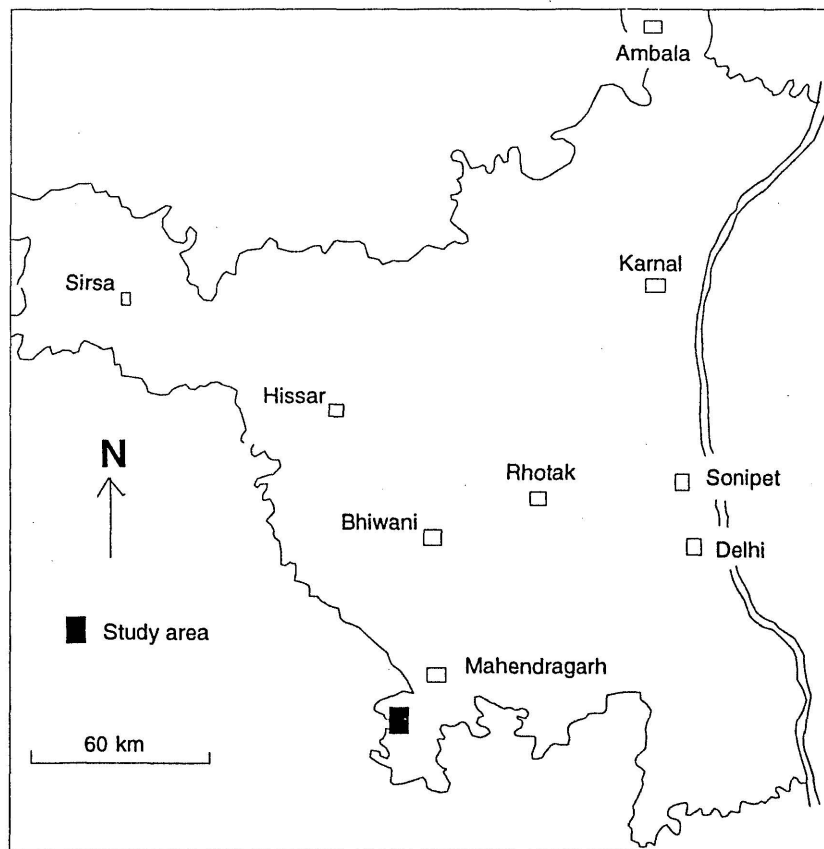


Fig.1. Location of the study area.

foliation of the granite, indicating albitisation and alkali metasomatism (Rapakivi texture). The syenite occurring as a marginal modification of the granite appears to have been brought about by partial desilication caused by the carbonatite injection. The syenite thus resulting from fenitisation consists mostly of large laths of microcline-perthite, and subordinate quartz and oligoclase. Accessories are sphene and magnetite.

These carbonatite bodies are emplaced along a curvilinear fault, which is seen to extend southward over several kilometres into Rajasthan; but its northward extension is concealed by sand dunes. Regionally, the faulted zone is a part of the major crustal dislocation, running along the crest of the Aravalli-Delhi system of fold with a NE-SW trend, representing an uplifted horst region of the Aravalli rift.

Magnetite Bands

The magnetite ore bodies occur as several parallel, disjointed lenses. The ore consists of 95% of magnetite with an intergrowth of apatite, and subordinate quartz and calcite. At places, it is oxidised into cherry red haematite and yellowish brown limonite. It is free from titanium and chromium, and low in vanadium.

Carbonatite Bodies

Carbonatite occurs in the area as lensoid bodies along the ridge east of Dhancholi over a strike length of 2 km in the NE-SW direction. They vary in size from a small pod of 1 m x 0.5 m to a large lens of 4 m x 20 m.

These carbonatites are petrologically classified into the following types based on their mineralogy: (i) Pure calcite sövites; (ii) apatite-sövite-diopside-vermiculite-magnetite carbonatite (silico-carbonatite); (iii) carbonatite agglomerate; (iv) diopsidite.

Silico-carbonatite is the most common amongst them, and it shows marked gradation to feldspathic sövite with large phenocrysts of brick red orthoclase. Within this silico-carbonatite, small lenticular veins of pure calcitic sövite are also seen. The carbonatite agglomerates and the diopsidites border the silico-carbonatite bands.

Pure calcitic sövites occur as large rhombohedral aggregates of calcite prisms of yellowish brown colour, carrying tiny inclusions of apatite. Silico-carbonatites consist of granular, medium to fine-grained mosaic of calcite, apatite, diopside and vermiculite. The rock is riddled with fine disseminations of magnetite grains. Apatite crystals occur as long euhedral prisms of brick red colour. Carbonatite

agglomerates occur along the borders of silico-carbonatites and enclose tiny grains of silico-carbonatite, angular fragments of pink granite and magnetite and coarse feldspar plates. They are bordered by a zone rich in epidote, diopside, and actinolitic aggregates, indicating fenitisation along borders. The pink syenite along the borders of the carbonatite agglomerates consists of aggregates of orthoclase, with profuse dissemination of magnetite and subordinate mafic minerals. Accessories are sphene, epidote, and biotite.

Diopsidites occur as large lenticular patches bordering the lenses of carbonatites, and they consist of large aggregates of euhedral prisms of diopside with minor amounts of hydrobiotite and narrow ribbons of calcite. Along the borders, the diopsidite is seen altered to hornblende aggregates. The diopsidite and the magnetite-ore are traversed by pink aplite.

Samples drawn from the carbonatites were studied qualitatively at the spectrography laboratory of the Atomic Minerals Division of the Department of Atomic Energy and they have indicated appreciable presence of Ba, Sr and Zr.

Chemical data furnished by the Chemical Laboratory of the Department of Mines and Geology, Government of Tamil Nadu, are tabulated below:

	SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃ (T)	MgO	CaO	Na ₂ O	K ₂ O	LOI	Total
DC-1	29.26	0.19	8.51	2.50	4.96	30.16	3.26	0.96	20.03	99.83
DC-2	11.92	Tr	8.35	75.80	0.44	2.42	-	-	1.10	100.03
DC-3	1-12	0.69	0.49	76.09	-	13.98	-	-	7.81	100.18

DC - 1: Carbonatite (silico-carbonatite) occurring at 1.5 km SE of Dhancholi

DC - 2: Magnetite body east of Dhancholi

DC - 3: Magnetite body east of Dhanota with calcite-apatite intergrowth.

Conclusions

The main purpose of this note is to draw the attention of interested younger workers to take up a detailed study of this occurrence to bring out its geochemical and petrographic significance and possible economic potential with reference to Rare Earths and others. Geophysical probing is indicated to establish the northward extension of the bodies, buried beneath the sand dunes.

C/o G.E. Spokes,
C-13, Industrial Estate,
Tumkur - 527 103
Karnataka

A.S. RAMIENGAR