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SUBVOLCANIC BASALTIC DYKE FROM BEREMEND, SOUTHEAST TRANSDANUBIA, HUNGARY

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ABSTRACT

Penetrating Aptian limestones (Nagyharsány Limestone Formation) a narrow subvolcanic body (dyke) has been found in the quarry of Beremend Cement-Plant. Based on its bulk composition this rock can be ranged into the basalt group in general and its low alkaline content suggests a picrobasaltic character. K/Ar age determination (from the whole rock) show a Late Cretaceous subvolcanic event, but the petrochemical data suggest a conection with Miocene basalts and andesito-basalts from Podravska Slatina and Popovac Hill.

INTRODUCTION

Brecciated volcanic body was found by MANGULT (1995) in the Aptian limestone of quarry of Beremend Cement-Plant (*Fig. 1.*) with about 180° strike in perpendicular position. The lava rock terminates 12 m below the surface. Two narrow vein-like fractured zone join to it filled by clay minerals running up to the surface (*Fig. 2.*). Thickness of the dyke does not exceed 2 m accompained by several dm thick contact zones, wich latters are represented by weathered ankerite-siderite enrichment (*Fig.3.*). Rock material of the lava body is also weathered in some degree.

PETROGRAPHY

Brecciated subvolcanic rock macroscopically may be subdevided into two types, as follows: (1) a fine-grained, compact black rock with dense carbonatic veinlets and (2) green-coloured highly altered rock without any visible minerals. This latter group forms xenolites in the first one.

Microscopically the black rock type shows a tipical micro-holocrystalline porphyric texture (*Fig.4.*) with microcrystalline groundmass (about 50%) and 100-150 μm large porphyric clinopyroxene crystals. A fairly low portion of the porphyric ingredients are euhedral (?) labradorites measuring 50-100 μm size. This rock is rather rich in accessories, mostly rutiles and magnetites and/or ilmenites. The light green-coloured type does not contain microscopically determinable minerals. By X-ray measurements it consists of predominant calcite and fairly big portion saponite minerals. *(Fig. 5)*.

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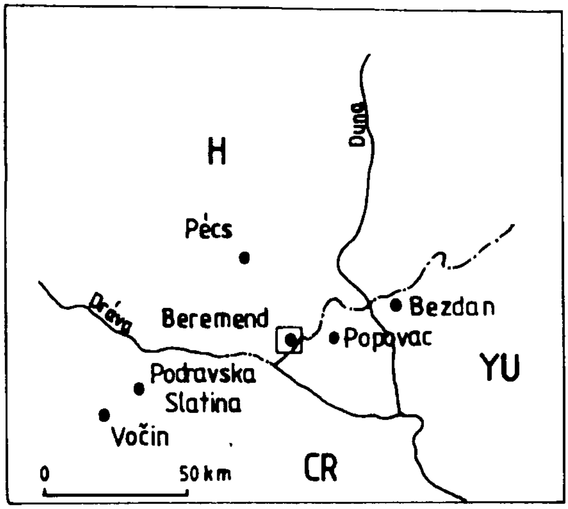

Fig. 1. Site of Beremend occurence.

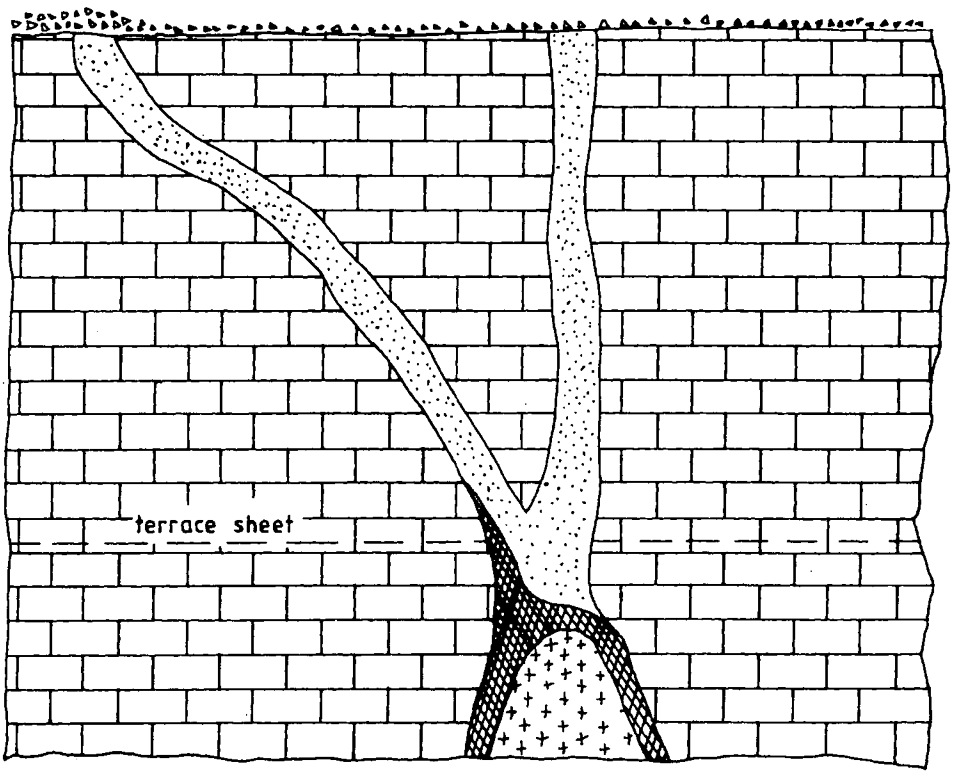

Fig. 2. A sketch about volcanic body and its continuation (MANGULT 1995).
1. Vein-like fractured zone. 2. Contact zone. 3. Aptian limestone. 4. The volcanic body. 5. Recent sediments.

Fig. 3. The volcanic body in Aptian limestone
1. The volcanic body. 2. The Aptian limestone

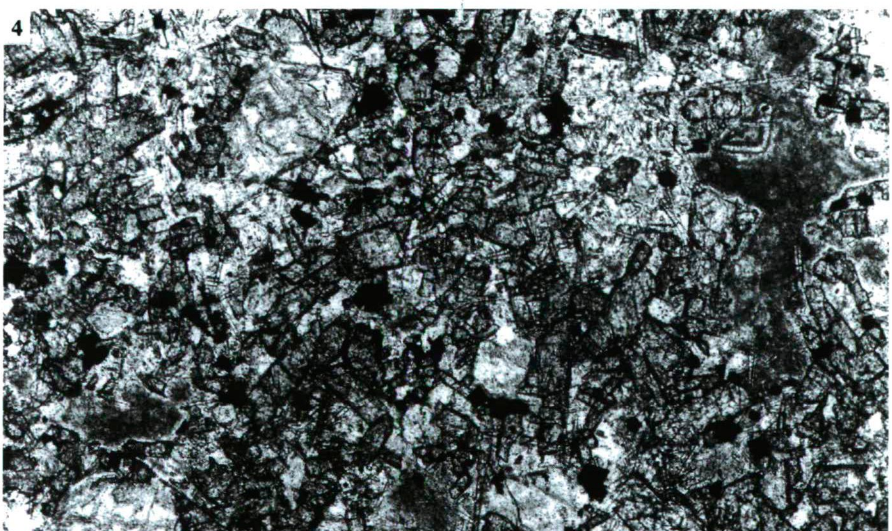

Fig. 4. Texture of the basalt xN n=36

CHEMICAL CHARACTER

Representing mainly of inner part of the dyke the chemical analyses are prepared from the first type (black, relatively fresh) of subvolcanic rock and two ones were made from the xenolites (Table 1.). Most conspicuous chemical characteristics of this bulk compositions are as follows:

– extraordinarily low SiO_2, Al_2O_3 and alkalines and extremly high CaO, CO_2 and H_2O content,

– approximately high Fe_2O_3 + FeO, MgO, P_2O_5 and H_2O content (the last may be faulty).

Taking into account the carbonatic environment, the high CO_2 and CaO content are understandable. Excess of Fe_2O_3 versus FeO is also acceptable in this oxidative surroundings. X-ray measurements show a lack of dolomite in the samples, so the MgO content belongs to the rock-forming minerals, really. Calcite occurs in a fairly big quantity everywhere. Nevertheless, discounting the Ca quantity bound in the calcite, the remaining CaO content is still considerably high may be due to the assimilation. Using the TAS diagram (LE BAS et al. 1986, *Fig. 6.*) this rock in its present state can be classified as picrobasalt, by STRECKEISEN method it is basalt and andesito-basalt.

TABLE 1

The bulk composition of the rocks

	1 ÁGK-6819/a	2 ÁGK-6819/b	3 ÁGK-6819/c	4 ÁGK-6817/a	5 ÁGK-6817/b
SiO_2	36.90	35.00	35.70	22.20	27.40
TiO_2	1.91	1.74	1.77	0.03	0.11
Al_2O_3	10.70	10.20	10.10	1.54	3.10
Fe_2O_3	8.79	7.86	8.12	3.69	4.32
FeO	1.99	2.29	2.24	0.50	0.72
MnO	0.10	0.13	0.13	0.09	0.05
MgO	7.16	7.38	7.57	5.46	5.98
CaO	15.80	17.40	17.60	35.80	31.50
Na_2O	0.61	0.78	0.77	0.04	0.09
K_2O	0.95	0.92	0.94	0.06	0.07
H_2O^+	5.41	5.79	5.94	2.73	2.48
H_2O^+	4.17	2.86	2.75	2.40	2.33
CO_2	3.99	5.66	5.10	25.50	22.10
P_2O_5	1.39	1.22	1.21	n. d.	0.05
Sum.	99.87	99.23	99.94	100.04	100.30

Analysed by FARKAS, J. Hung. Geol. Survey 1996.

AGE AND VOLCANIC CONNECTIONS

Two K/Ar isotopic age determinations were carried out in the Nuclear Research Institute, Debrecen by BALOGH KAD. Age of the black rock (measured from whole rock) proves to be a 76-3 Ma, i.e. younger than that of Nagyharsány Limestone Formation, but this datum requires further confirmation. Age of green-coloured xenolite (also from whole rock) is 129,5-14.2 Ma. Due to very-low radiogene potassium content this datum particularly requires further confirmation.

Fig. 5. Rutiles in the gruondmass 1N n=7O

Regarding possible areal connections of this subvolcanic body it is clear, that nearest Upper Cretaceous magmatite occurence can be found in Hungarian Bácska (Kunbaja No. 5 borehole) belonging to so-called Banatite Association (SZEDERKÉNYI 1984). But the Beremend volcanics are not granitoids, so, there are no any relationships between them. Moreover, no traces of Upper Cretaceous magmatic events are pointed out in the area of Tisia Terrane, except banatites. Thus, it needs to take into consideration some possible connections with Miocene volcanism took place in the vicinity. E.g. basalts and andesites from Popovac Hill (GOLUB 1957), and basalts and andesito-basalts from Podravska Slatina and Vočin (LUGOVIĆ, 1983, GOLUB and MARIĆ 1968, PAMIĆ 1986, 1987, LUGOVIĆ et al. 1990), which show fairly close petrogenetic relationships with the Beremend basalt.

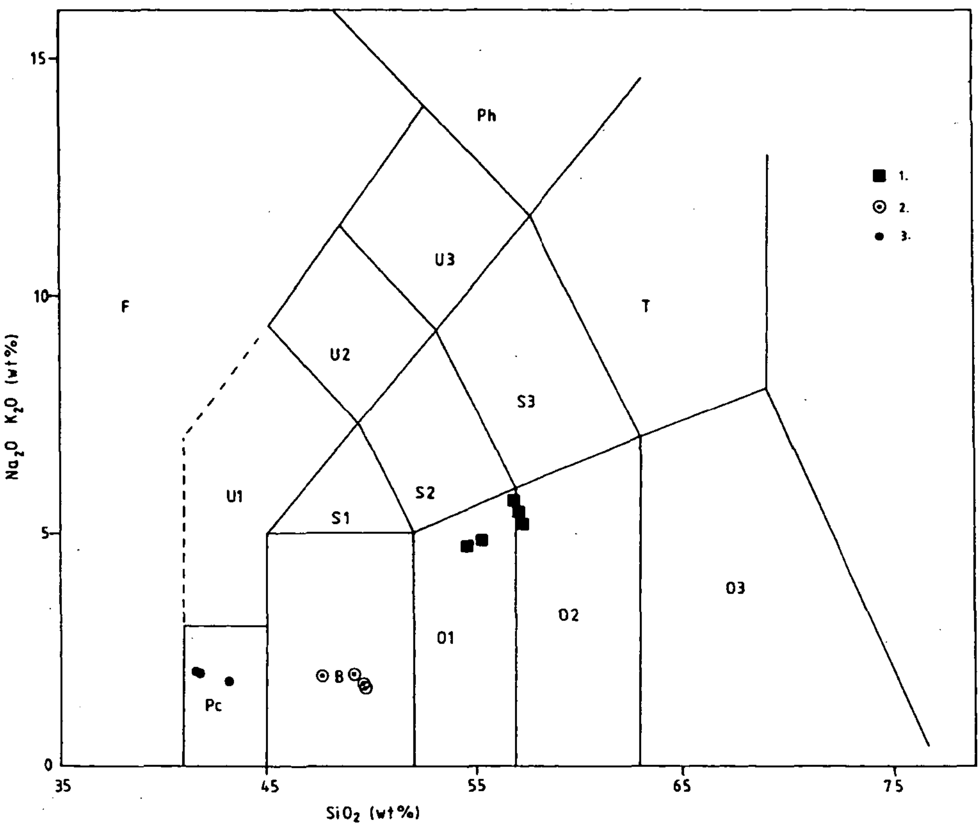

Fig. 6. The TAS diagram for Beremend basalt (LE BAS et al. 1986)
F=Foidite; Pc=Picrobasalt; B= Basalt; U1= Tephrite/basanite; U2= Phonotephrite;
U3 = Tephriphonolite; Ph = Phonolite; S1 = Trachybasalt; S2 = Basaltic trachyandesite; S3 = Trachyandesite;
T= Trachyte/trachiandesite; 01 = Basaltic andesite; 02 = Andesite; 03 = Dacite . 1. Andesito-basalts from Pdravska Slatina (LUGOVIĆ et al. 1990) 2. Basalts from Popovac Hill. (GOLUB 1957) 3. Picrobasalts from Beremend.

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