Silica–rich felsitic dikes from southeastern part of the Bohemian Massif

Felzitické žíly bohaté SiO_2 z jv. části Českého masívu (Czech summary)

(6 text–figs)

DUŠAN NĚMEC

Katedra mineralogie, petrografie a geochemie Masarykovy university, Kotlářská 2, 611 37 Brno

Submitted November 9, 1992

Scarce dikes of Hercynian silica–rich felsitic microgranites and granite porphyries occur in eastern and southeastern parts of the Central Bohemian Pluton, in southern part of the Českomoravská vrchovina highland and in the adjacent Waldviertel in Austria. They are associated with long regional faults. In spite of their vast distribution across a large territory they are mineralogically and chemically uniform. Chemically, they represent acid magmas corresponding to the thermal minimum of the haplogranite system. They are extremely low in CaO and femic components, and mostly enriched in fluorine. They approach topaz rhyolites not only chemically but also through their links to greisen–like assemblages. The dikes are occasionally affected by greisenization and display spatial relations to plugs and dikes of young, partly greisenized, granites. According to their trace element characteristics, they may be classified as syn–collision granitic magmas.

Introduction and geology

A specific type of felsitic dikes occurs in southeastern part of the Bohemian Massif, differing from all other acid dikes of the region by their striking leucocracy. They are known from central and southern parts of the Bohemian–Moravian Highland (Českomoravská vrchovina), from adjacent Austria and from eastern and southeastern parts of the Central Bohemian Pluton. In spite of their occurrence in a large area they are strikingly uniform. Their descriptions are given in many papers (Ginejko–Savicka 1928, Kodym - Suk 1959, Němec 1970, 1972, Žežulková 1982, 1989, Žežulková et al. 1977, Novák 1982, Klečka 1984, 1992, Klečka - Vaňková 1988, Vrána 1990). Hence, their common characterization is desirable.

The felsitic dikes are scarcely scattered in identical tectonic setting in the following areas (numbering of the areas is identical to Fig. 1): Surroundings of the Příčovy village (west of the Sedlčany town) in the central Bohemian Pluton (1). Surroundings of the Milevsko town (2). They are there mostly confined to the granite of the Čertovo břemeno type. Area between the towns Pelhřimov and Počátky (3). Area north of the Raabs town in Austria (4). Area around the Kozí hora hill (5, SW of the Staré Město village, in the Central Massif of the Bohemian–Bohemian Highland). Surroundings of the Albeř and Klášter villages (6, east of the Nová Bystřice town). Surroundings of the Lásenice village (7, south of the Jindřichův Hradec town); the dike at the Sedlo village lies a bit away from other dikes, belonging probably also to the dike swarm of Lásenice. Area between the Sušice and Nalžovské Hory towns, at SW margin of the Central Bohemian Pluton (this area lies outside Fig.1).

In general, the dikes are scarce. In some areas one dike (Raabs) or two dikes (Příčovy) occur. Only around Lásenice they are numerous. In some areas (Pelhřimov, Sušice), they are the only dike type present, no other dike type occurring there. They are associated with long straight regional faults. In the south and west, they mostly run approximately N–S, at Příčovy, however, their strike is WSW–ENE (Fig. 1). Their lenghts are often considerable: 2.5 km at Příčovy, 2 km at Lásenice, 4 km at Milevsko, 4 km at Sušice, 5 km at Raabs. The fissures filled by them evidently originated in an extensional tectonic strength field, as the dikes are often thick: up to 15 and 20 m at Raabs and Lásenice, respectively.

Petrographically, the felsitic dikes mostly differ markedly from all other dikes of the region and are not linked with them by any transitions. However, north of Raabs, the felsitic rock and a more basic rock fill together the same fissure showing limited interactions along the contacts (Němec 1972), and some transitions cannot be excluded in the dike belt near Nová Bystřice, where, in terrane, pieces of a felsitic rock and of granodiorite and diorite porphyries

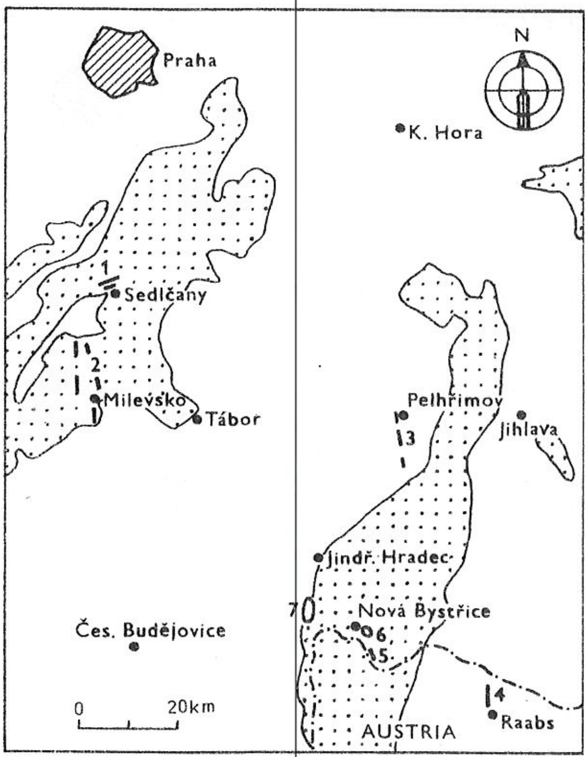

Fig. 1. Sketch map showing location of silica-rich felsitic dykes. Dotted area – plutonic rocks. Numbering of areas: Sedlčany (*1*), Milevsko (*2*), Pelhřimov (*3*), Raabs (*4*), Kozí hora hill at Staré Město (*5*), Albeř – Klášter (*6*), Lásenice (*7*)

are closely associated (Němec 1970). However, their relations cannot be deciphered without trenching.

Majority of the dikes fill up parallel, approximately N–S striking fissures, and seem to be comtemporary. If the age of these fissures were identical with that of the main faults of the Blanice furrow, this would make their Upper Permian age probable. For more detailed discussion, see Vrána (1990). However, the dikes of Příčovy are associated with another fracture system. There, the felsitic dikes are older than all other dikes (Žežulková et al. 1977, Novák 1982. By mistake, Žežulková 1989 gives for them another time relations). Of special interest are the time relations between the felsitic dikes and young leucocratic muscovite granites which form dikes and plugs in the territories where the felsitic dikes occur. At Příčovy, the intrusion of felsitic dikes preceded that of the granites (Novák 1982), at Lásenice, the felsitic dikes and the granite seem to be approximately contemporaneous (Klečka – Šrein 1992). The silica-rich felsitic dikes under consideration are clearly different from similar but less acid dikes described by Žežulková et al. (1977) from the area between the Sedlčany and Krásná Hora towns under the name "banded spherulitic granite porphyries". The latter rock is considerably poorer in quartz but richer in K-feldspar, and contains some clinopyroxene. These dikes are associated with minettes, being probably genetically linked with them (Žežulková et al. 1977).

Petrography and chemistry

The dikes, when observed by naked eye, are felsitic (porphyritic variety has felsitic groundmass) and are milky white due to absence of femic constituents. Čech (in Kodym et al. 1963) compares their appearance to Cretaceous calcareous sandstones. Locally, they are flow-banded which indicates high viscosity of their magmas. They often display spherulitic textures. Sericitization is their characteristic feature.

Modal composition of the dikes is very simple. The microgranite type is equigranular, the porphyritic variety exhibits variable proportions of phenocrysts which include quartz, acid plagioclase, K-feldspar (cf. Pivec – Klečka 1984) and minor biotite which is mostly altered. The groundmass consits of quartz, plagioclase, K-feldspar, sericite, occasionaly biotite and accessories, particularly apatite, fluorite and, especially in the surroundings of Milevsko, also pyrite. Fluorite is dispersed within the dikes but in the Pelhřimov area, it is also accumulated in highly siliceous portions of the dikes (Ginejko-Savicka 1928). In the Lásenice dikes, Klečka – Vaňková (1988) mention further rare accessory minerals.

Chemically, the dikes represent melts of the granitic thermal minimum (Fig. 2), being, however, extremely evolved, so that they are very low in CaO and femic components (Table 1). Their FeO_t lies largely below 1 wt. %, whereas FeO_t of other granitic dikes of the region always exceeds 3 wt. % (Němec 1970, 1974b). The rocks are mostly enriched in fluorine (see Table 1 and also Němec 1968). Their chemical variability is small being probably controlled by insignificant quantitative changes of the main rock constituents, and by the degree of sericitization which simultaneously accentuates the peraluminous character of the rocks (they are corundum normative). Slight departures from the granitic thermal minimum melts can be observed in some of the Příčovy dikes which are somewhat K-feldspar-enriched, and in the Lásenice dikes, where microgranites slightly differ chemically from the granite porphyries (for discussion, cf. Klečka – Vaňková 1988). However, these relations are only valid in the Lásenice dike swarm. The content of Fe_t is always small but variable, perhaps due to some local contamination of the magma. The fugacity of oxygen during the

Table 1. Chemical composition of silica–rich felsitic dikes of eastern Moldanubicum (% wt). If no source cited, H. Červená, the analyst

Rock	Granite porphyry	Granite Porphyry	Microgranite	Microgranite	Granite Porphyry	Microgranite	Microgranite, granite porphyry	Microgranite	Granite Porphyry	Microgranite	Microgranite	Topaz rhyolite	Rhyolite
Area or locality	Lásenice	Lásenice	Lásenice	Lásenice	Sedlo (Lásenice area)	Pelhřimov	Pelhřimov	Alberndorf (Raabs area)	Hrejkovice (Milevsko area)	Příčovy	Stará Hutě (Kozí hora hill area)	U.S.A.	Global average
Area No.	7		7	7	7	3	3	4	2	1	5		
Author	Klečka – Vaňková (1988)		Klečka – Vaňková (1988)				Vrána (1990)		Žežulková (1982)			Christiansen et al. (1986)	La Maitre (1976)
Number of analyses	7.00	1.00	3.00	3.00	1.00	1.00	1.00	1.00	1.00	4.00	1.00	118.00	116.00
SiO_2	73.13	74.46	73.48	74.72	74.77	73.43	73.72	75.50	74.31	74.99	78.70	76.00	72.80
TiO_2	0.01	0.16	0.01	0.06	0.04	0.08	0.04	0.04	0.02	0.04	0.10	0.06	0.28
Al_2O_3	14.57	14.39	14.73	14.43	14.08	15.80	15.15	13.48	14.86	14.19	12.50	13.00	13.30
Fe_2O_3	–	–	–	–	0.69	0.46	0.31	0.37	0.46	–	0.60	–	–
FeO	1.35*	0.73*	1.69*	0.76*	0.24	0.36	0.55	0.03	0.25	0.27*	0.35	0.9*	2.44*
MnO	0.03	0.01	0.05	0.03	0.03	0.03	0.04	0.01	0.09	0.07	0.01	0.06	0.06
MgO	0.19	0.22	0.07	0.07	0.05	0.19	0.14	0.37	0.10	0.08	0.37	0.06	0.39
Ca_2O	0.51	0.40	0.54	0.32	0.34	0.62	0.45	0.45	0.28	0.42	0.43	0.06	1.14
Na_2O	3.70	2.95	4.13	3.83	3.44	3.79	3.82	4.19	3.91	3.40	1.52	4.00	3.55
K_2O	4.73	4.67	3.88	3.70	3.65	3.69	4.21	4.42	3.43	5.46	3.06	4.80	4.30
P_2O_5	0.45	0.32	0.43	0.40	0.41	0.43	0.36	0.02	0.33	0.01	0.05	0.01	0.07
F	0.12		0.07			0.16	0.09		0.20			0.30	
H_2O^+					1.13	0.93	0.85	0.48	1.16		1.48		
H_2O^-					0.13	0.04	0.09	0.20	0.02		0.36		
Total					99.00	100.01	99.82	99.56	99.42		99.53		

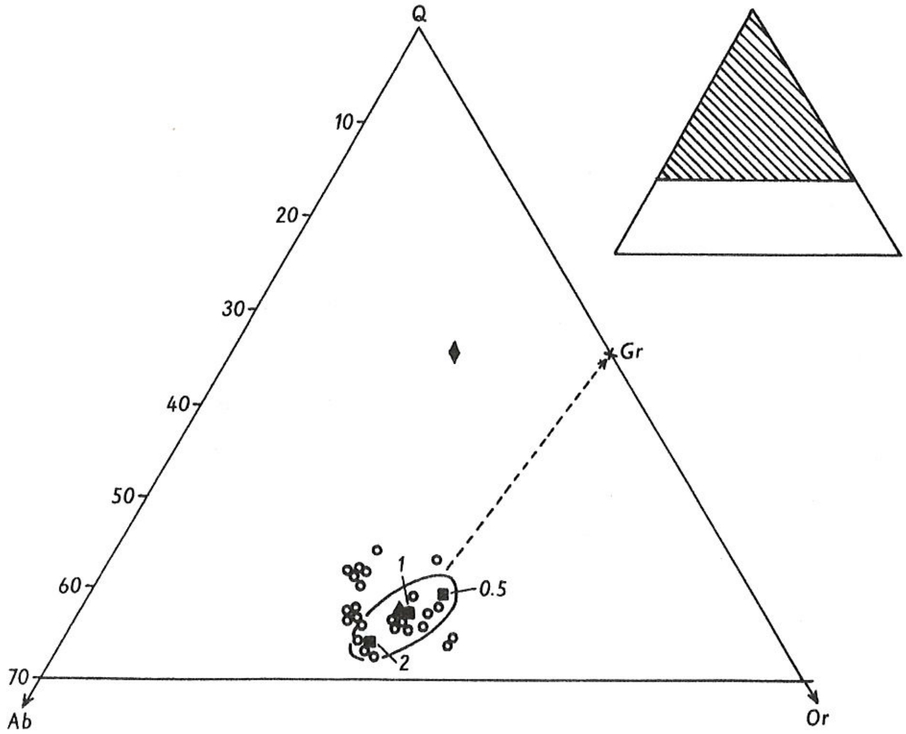

Fig. 2. Normative composition of felsitic dikes in terms of quartz (Q), albite (Ab), and orthoclase (Or) compared to experimentally established ternary minima in the hydrous system at 0.5, 1 and 2 kb H_2O pressure (quadrangles, after Tuttle – Bowen 1958). Triangle – average rhyolite, diamond – greisenized granite porphyry, Stará Hutě field marked by full line – topaz rhyolites (after Christiansen et al. 1968), Gr – theoretical greisen

magma consolidation and its secondary alteration must have been mostly high. This is proved by strong predominance of Fe^{3+} over Fe^{2+} (Table 1) and by the presence of pyrite instead of pyrrhotite. However, Klečka – Vaňková (1988) also point out in the Lásenice dikes the presence of almost pure ilmenite coexisting with Fe-biotite which would indicate reducing conditions in some stages of the magma consolidation. The CaO contents are low and constant. A comparison of the CaO, P_2O_5 and F contents clearly shows that, in general, almost all CaO of the rock is confined to apatite and fluorite. In samples in which the P_2O_5 exceeds that of CaO, an accessory triplite is likely to occur which was really identified in the Lásenice dikes (Klečka – Vaňková 1988). The fluorine contents vary considerably (in the Lásenice dikes between 0.01 and 0.21 wt. %, Klečka – Vaňková 1988) according to the presence or absence of fluorite in the rock. The P_2O_5 content is of special interest. The dikes can be divided into P_2O_5–poor dikes whose P_2O_5 content corresponds to its level common in rhyolitic magmas (Table 1), and into P_2O_5–rich with P_2O_5 unusually high for this type of magma. The differences seem to be regional (see Table 1). Klečka – Vaňková (1988) assume the high P contents to be linked with postmagmatic alteration of the rocks but it is significant that the P_2O_5 content of these rocks is

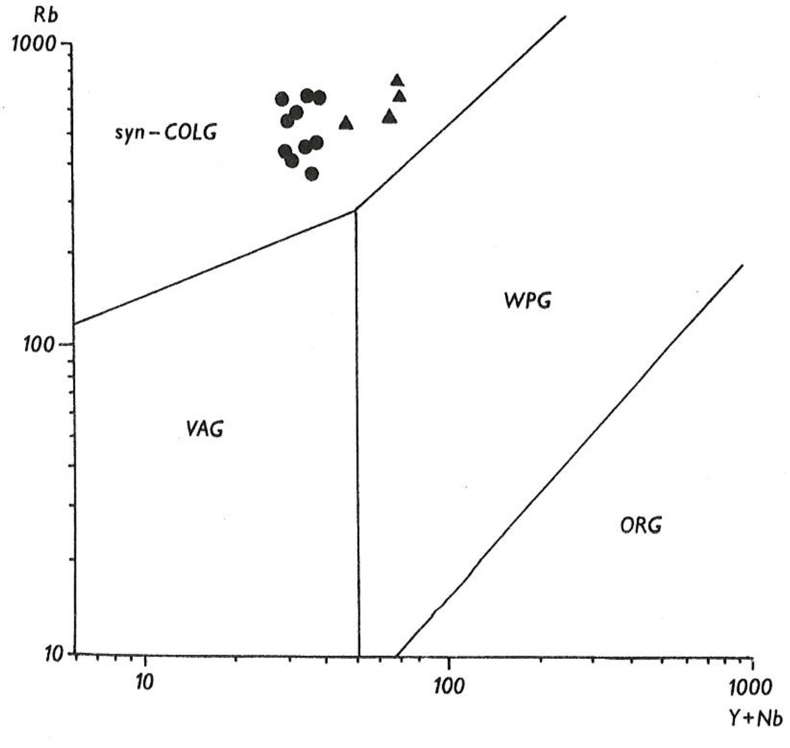

Fig. 3. Trace element discrimination diagram of granitic rocks (after Pearce et al. 1984) showing composition of felsitic dikes of the Lásenice area (*dots*) and the Pelhřimov area (*triangles*). Data from Klečka – Vaňková (1988) and Vrána (1990). VAG – volcanic arc granites, ORG – ocean ridge granites, WPG – within plate granites, COLG – syn-collision granites

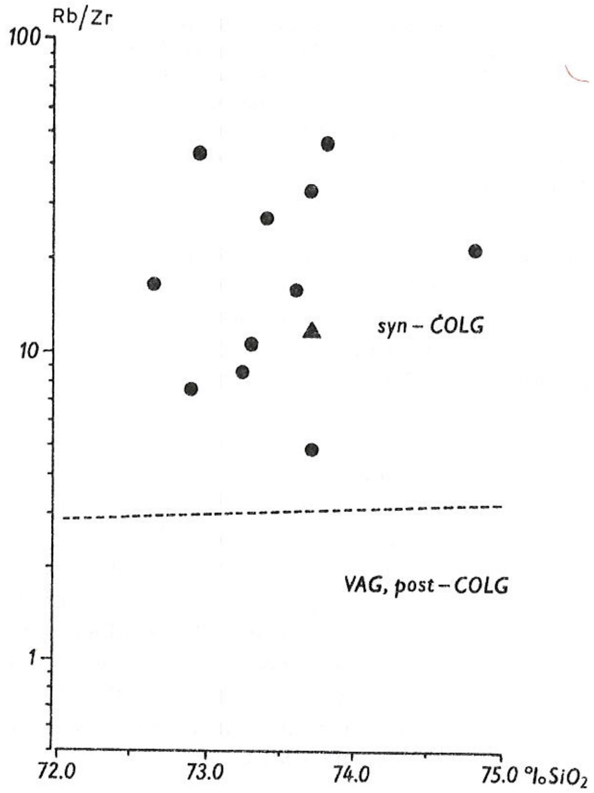

Fig. 4. Rb/Zr vs. SiO_2 discrimination diagram (after Harris et al. 1986) showing composition of felsitic dikes of the Lásenice (*dots*) and Pelhřimov (*triangle*) areas. syn–COLG syn–collision granite magmas, post–COLG post–collision granite magmas

nearly constant (mostly 0.44 – 0.46 wt. %). Such stability could hardly exist if P were additionally introduced into the rock. Phosphorus seems to have been already present in the consolidating magma. Postmagmatic alterations are documented by sericitization, by local presence of quartz veinlets and by drusy cavities (Raabs, Sedlo) around which occasionally (Lásenice) wolframite and arsenopyrite are present in the rock (Klečka 1986). The sample analyzed from the Kozí hora hill (Table 1) is chemically considerably different from all other samples (Fig. 2). It appears to have been probably affected by greisenization. The dike lies in a territory where greisenization of granite is widespread. Greisenized porphyries are also known, for instance, from Cornwall in England (Henley 1972).

Origin of the magma

Žežulková et al. (1977) already pointed out that the felsitic dikes of the Příčovy area differ markedly from all other dikes of the region. Hence, they suggest that the felsitic dikes have another origin. In eastern Moldanubicum and in the Central Bohemian Pluton, type and petrographic character of other dikes vary considerably from one area to another (Němec 1970, 1974a, b), whereas the felsitic dikes remain petrographically uniform. In trace element discriminant diagrams of granitic magmas (Pearce et al. 1984, Harris et al. 1986) their points are confined to the field of syncollision granites (Fig. 3, 4). Similar setting exhibit, for instance, the leucogranites of the Himalayas. Consequently, the felsitic dikes differ from the dike granites and the biotite granite porphyries of the Central Bohemian Pluton which, according to their tectonomagmatic setting, may be classified as postcollision granite magmas (their SiO_2 contents and their Rb/Zr ratios are 69.2, 61,8 and 2.0, 0.91, respectively; data of Žežulková and unpublished data of Vlašímský).

The Lásenice dikes correspond with some geochemical features to strongly peraluminous S–type granites but some other features and their geological setting and position show affini–

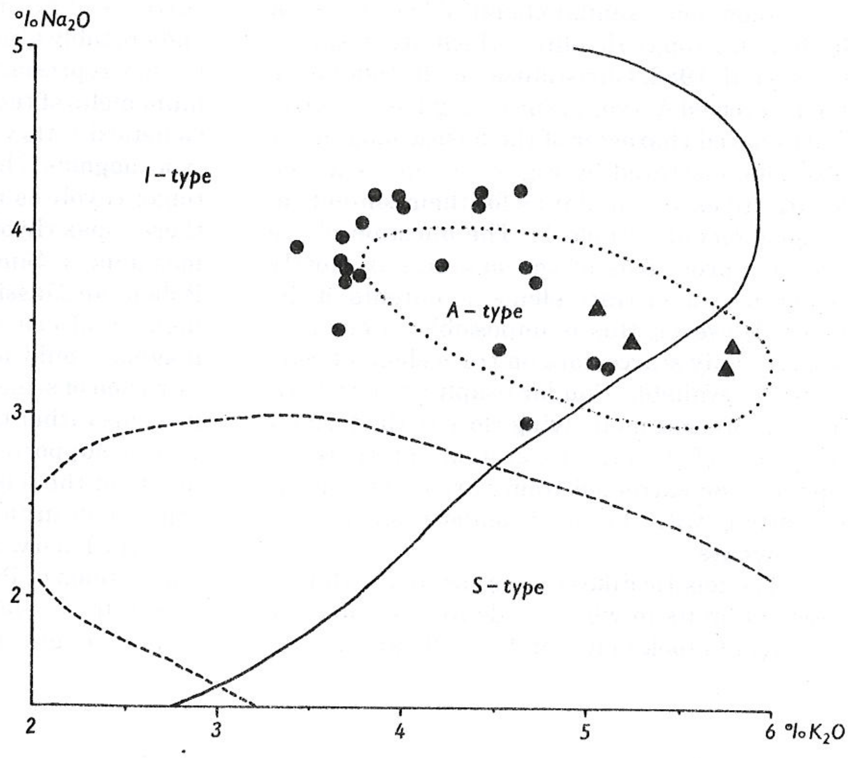

Fig. 5. Relationship between Na_2O and K_2O contents (wt. %) of the felsitic dikes showing the fields defined by the Australian I, S and A-type granites (after White – Chappell 1983)

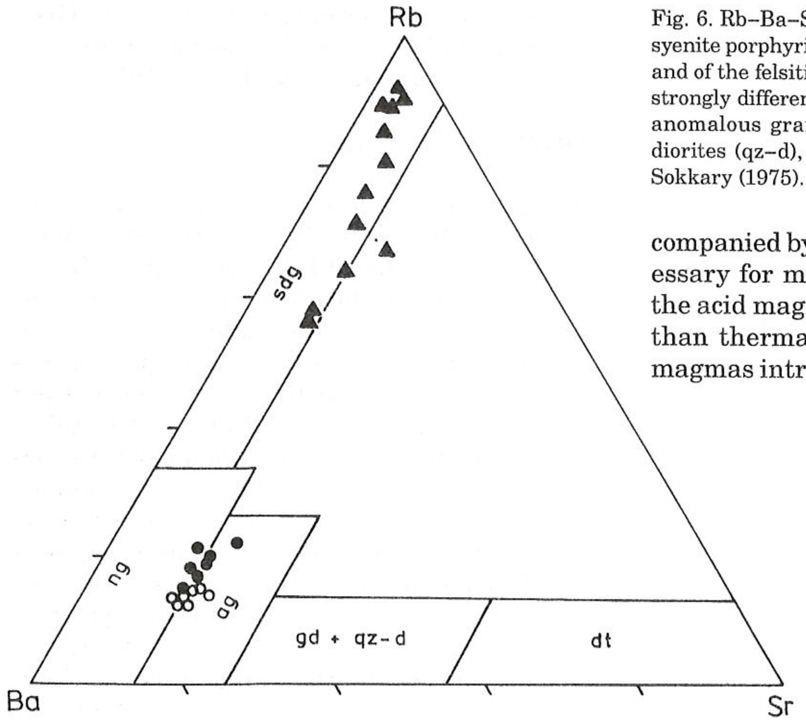

Fig. 6. Rb–Ba–Sr diagram of granite porphyries (*dots*) and syenite porphyries (*circles*) of the Central Bohemian Pluton, and of the felsitic rocks (*triangles*). The fields correspond to strongly differentiated granites (sdg), normal granites (ng), anomalous granites (ag), granodiorites (gd) and quartz diorites (qz–d), and diorites (dt). After El Bousseily – El Sokkary (1975).

ties to A–type granites (for discussion, see Klečka – Vaňková 1988). The latter view is also supported by Na_2O – K_2O diagram (Fig. 5). The fluorine contents of the dikes vary considerably in accordance with the amount of fluorite, but are mostly enhanced (see Table 1 and Němec 1968). In some dikes, the fluorite content is so high that fluorite was looked for within a mineral exploration project. Higher fluorine contents are also characteristic of A–type granitic magmas. The dikes show some similar chemical features with high–silica topaz rhyolites which are assumed (Burt et al. 1982, Christiansen et al. 1986) to be highly evolved A–type granitic magmas. Strongly fractionated character of the felsitic magmas is also demonstrated by Fig. 6. All investigated felsitic dikes are similar as for their contents of major elements (Table 1). The question of the original protoliths of the magmas is mostly solved by use of trace element contents of the rocks. However, this is impossible in our case because only scarce data on trace element contents are available. Similar to aplites, the felsitic dikes represent melts lying close to the ternary minimum of the granitic system and therefore they can be extracted from various protoliths, essentially with the same composition of major components.

The felsitic dikes are associated with long regional faults in which evidently considerable movements took place, and usually are not accompanied by basic rocks. Thus, the energy necessary for melting of the protoliths to produce the acid magmas could have been rather kinetic than thermal, supplied, for instance, by basic magmas intruded into the crust. The latter case is evident in the topaz rhyolites of the USA (Christiansen et al. 1986).

Klečka – Šrein (1992) point in the Lásenice area to spatial links between the felsitic dikes and a plug of a young highly evolved granite partly affected by greisenization. Similar relations are likely to exist in the Kozí hora hill area and in the Příčovy area (Novák 1982).

Conclusions

The Variscan silica–rich felsitic microgranites and granite porphyries of eastern Moldanubicum and of the Central Bohemian Pluton are widely distributed over an extensive area having similar tectonic setting. They are always associated with regional faults often of considerable lengths. In spite of their widespread occurrence they are mineralogically, chemically and probably also genetically similar. Chemically, they represent highly evolved thermal minimum melts of the ternary haplogranitic system. Genetically, they probably represent granitic A–type magmas. They show many similarities with topaz rhyolites of USA. In the occurrences of these topaz rhyolites both acid and basic magmas appear. Similar cases are unknown in the Bohemian Massif. Thus, the energy needed for melting of crustal material to produce their magmas could not have been derived from an intrusion of some basic magma into the crust but it seems rather to be linked with tectonics. This view is supported by the contents of trace elements of the felsitic dikes which point to syn-collision granitic magmas.

A c k n o w l e d g e m e n t s. Many useful suggestions of Professor M. Suk and of the referee (Dr. J. Slabý, Czech Geological Survey, Praha) are gratefully acknowledged.

Translated by the author

R e f e r e n c e s

Burt, D. M. – Sheridan, M. F. – Bikun, J. V. – Christiansen, E. H. (1982): Topaz rhyolites – distribution, origin. and significance for exploration. – Econ. Geol., 77, 1818–1836. Lancaster, Pa.

Christiansen, E.H. – Sheridan, M. F. – Burt, D. M. (1986): The geology and geochemistry of Cenozoic topaz rhyolites from western United States. – Geol. Soc. Amer. Spec. Pap., 205, Boulder, Co.

Ginejko–Savicka, A.(1928): On granite porphyry, amphibole rocks and quartz veins from Pelhřimov. – Spisy přírodověd. Fak. Karl. Univ., 83. Praha. In Czech.

El Bousseily, A. M. – El Sokkary, A. A. (1975): The relation between Rb, Ba and Sr in granitic rocks. – Chem. Geol., 16, 207–220. Amsterdam.

Harris, N. B. V. – Pearce, J. A. – Tindle, A. G. (1986): Geochemical characteristics of collision–zone magmatism. *In*: *M. P. Coward – A. C. Ries* (eds.), Collision tectonics. – Geol. Soc. Spec. Publ., 19, 67–81. Oxford.

Henley, S. (1972): Petrogenesis of quartz porphyry dikes in South–West England. – Natur phys. Sci., 235, 95–97. London.

Klečka, M. (1984): Felsitic and vitreous rocks from the vicinity of Lásenice near Jindřichův Hradec. (English summary.) – Čas. Mineral. Geol., 29, 3, 293–298. Praha.

– (1986): New find of tungsten mineralization in the area of Jindřichův Hradec. (In Czech.) – Čas. Mineral. Geol., 31, 3, 314–315. Praha.

– (1992): Lásenice near Jindřichův Hradec, a subvolcanic felsitic dike with tungsten mineralization. – Intern. Symp. "Lepidolite 200", Field trip guidebook 53–55. Brno.

Klečka, M – Vaňková, V. (1988): Geochemistry of felsitic dikes from the vicinity of Lásenice near Jindřichův Hradec (South Bohemia) and their relation to Sn–W mineralization. – Čas. Mineral. Geol., 33, 3, 225–249. Praha.

Klečka, M. – Šrein, V. (1992): The Homolka hill near Lásenice, a topaz–bearing muscovite granite with Sn–(Nb–Ta) mineralization. – Intern. Symp. "Lepidolite 200", Field trip guidebook, 47–51. Brno.

Kodym, O. et al. (1963): Explanations to the geological map M–33–XXI (Tábor).(In Czech.) – Ústř. úst. geol. Praha.

Kodym, O. – Suk, M. (1959): Über die geologische Position der "Variolite", Amphibolite und Orthogneise bei Kašovice im SW Teil des mittelböhmischen Plutons. (Germany summary.) – Věst. Ústř. Úst. geol., 34, 388–391. Praha.

Le Maitre (1976): The chemical variability of some common igneous rocks. – J. Petrology, 17, 589–637. Oxford.

Němec, D. (1968): Fluorine in lamprophyre and lamproid rocks. – Geochim. cosmochim. Acta, 32, 523–529. London.

– (1970): Lamprophyrische und lamproide Ganggesteine im Südteil der Böhmisch–Mährischen Anhöhe (ČSSR). – Tschermaks mineral. petrogr. Mitt., 14, 235–284. Wien.

– (1972): Ganggesteine aus der Umgebung von Raabs (Niederösterreichisches Waldviertel). – Verh. geol. Bundesanst., 247–262. Wien.

– (1974a): Lamprophyrische und lamproide Ganggesteine im Nordteil der Böhmisch–Mährischen Höhe. – Verh. geol. Bundesanst, 223–268. Wien.

– (1974b): Petrochemistry of the dike rocks of the Central Bohemian Pluton. – Neu. Jb. Mineral., Mh., 193–209. Stuttgart.

Novák, J. K. (1982): Die leukokraten Ganggranite aus der westlichen Umgebung von Sedlčany und ihre Kluftveränderungen. (Germany summary.) – Sbor. geol. Věd, Geol., 36, 163–182. Praha.

Pearce, J. A. – Harris, N. B. W. – Tindle, A. G. (1984): Trace element discrimination diagrams for tectonic interpretation of granitic rocks. – J. Petrology, 25, 956–983. Oxford.

Pivec, E. – Klečka, M. (1984): Phenocrysts of microcline-microperthite in dykes from Lásenice (Jindřichův Hradec area). – Acta Univ. Carol., Geol., 4, 353–360. Praha.

Tuttle, O. F. – Bowen, N. L. (1958): Origin of granite in light of experimental studies in the system $NaAlSi_3O_8$ – $KAlSi_3O_8$– SiO_2 – H_2O. – Mem. Geol. Soc. Amer., 74. New York.

Vrána, S. (1990): The Pelhřimov volcanotectonic circular structure. – Věst. Ústř. Úst. geol., 65, 143–156. Praha.

White A., J. R. – Chappell, B. W. (1983): Granitoid types and their distribution in the Lachlan Fold Belt, Southeastern Australia. *In: A. J. Roddick* (ed.), Circum-Pacific plutonic terranes. – Mem. Geol. Soc. Amer., 159, 21–34. New York.

Žežulková, V. (1982): Dike rocks in the southern part of the Central Bohemian Pluton.(English summary.) – Sbor. geol. Věd, Geol., 37, 71–102. Praha.

– (1989): The sequence of dike rocks of the Central Bohemian Pluton. (English summary.) – Věst. Ústř. Úst. geol., 64, 277–286. Praha.

Žežulková, V. – Rus, V. – Turnovec, I. (1977): Dike rocks of the Krásná Hora-Sedlčany area and their relation to Sb-Au mineralization. (English summary.) – Sbor. geol. Věd, Geol., 29, 33–60. Praha.

Felzitické žíly bohaté Si z jv. části Českého masívu

Variské silně kyselé felzitické mikrogranity a granitové porfyry jv. části Českého masívu jsou rozšířeny na rozsáhlém území, a to vždy ve stejné geologické pozici. Jsou vázány na regionální zlomy často značné délky. Mineralogicky, chemicky a patrně i geneticky jsou jednotné. Chemicky představují extrémně vyvinutá granitová magmata, která odpovídají taveninám termálního minima haplogranitového systému. Geneticky jsou snad žilným ekvivalentem granitů typu A. Chemicky se blíží topazovým ryolitům. Zatímco ty ve svých výskytech ukazují často bimodalitu magmatu (je přítomno magma kyselé i bazické), podobný případ je u popisovaných felzitických žil atypický. Proto tepelná energie potřebná k roztavení krustálního materiálu pro vznik jejich magmatu nemůže být hledána v intruzi nějakého bazického magmatu do kůry, ale spíše spojována s tektonikou. V souladu s tím by mohla být i okolnost, že stopové prvky felzitických žil ukazují na synkolizní granitová magmata.

RECENZE

Dietmar Meier: Abschiebungen: Geometrie und Entwicklung von Storungen im Extensionregime. – Enke Verlag, Stuttgart, 1993

Práce je metodická příručka podávající ucelený přehled o křehké poklesové tektonice. V knize je uveden výklad podmínek extenze ve vztahu k hlavním geotektonickým pochodům, které k extenzním režimům vedou. Hlavní částí práce je popis geometrie poklesových zlomů a architektury zlomových sítí v extenzních režimech. V práci je stručně pojednána i reaktivace poklesů v následném kompresním režimu. Práce obsahuje velké množství recentních citací z oblasti mechanismu vzniku fraktur i regionálních aplikací strukturního výzkumu.

Kniha je velmi přehledná a udává řadu dobře dokumentovaných geologických příkladů poklesové tektoniky s důrazem na moderní geologické modely. Vzhledem k tomu, že se jedná o studium křehkých poruch, jsou popisy orientovány výhradně na svrchní patra zemské kůry. Tím poněkud uniká v dnešní době tak propagované termální pojetí extenzní tektoniky vztažené ke gravitačním nestabilitám a k pozdnímu rozpadu orogenů. Z tohoto důvodu je práce především vhodná pro kolegy pracující v sedimentárních bazénech a pro ty, kteří chtějí interpretovat seismické modely. Práce bohužel neobsahuje popis vztahu extenzní tektoniky k susbsidenční bazenové analýze. Kniha kolegy Meiera má nesporný význam pro naftové a uhelné geology, neboť poskytuje aparát pro studium poklesových struktur jak pomocí geofyziky, tak i při práci v terénu.

Karel Schulmann