mineral mean	melilite 1 n = 22	melilite 2 n = 9	pyroxene n = 18	$Ca_2Fe_2O_5$ n = 15	$CaFe_4O_7$ n = 4
SiO_2	31,01	21,51	32,97	7,03	1,37
TiO_2	0,13	0,16	2,05	5,58	0,12
Al_2O_3	18,61	26,12	17,57	3,04	7,58
Fe_2O_3	5,71	11,71	18,85	40,50	73,95
MnO	0,20	0,00	0,23	0,86	0,87
MgO	4,39	0,59	4,53	0,17	5,23
CaO	38,42	38,50	23,57	42,45	11,21
Na_2O	0,90	0,34	0,44		
K_2O	0,19	0,00	0,07		
Total	99,56	98,93	100,28	99,63	100,33
Si	2,886	2,075	1,284	0,293	0,079
Ti	0,009	0,011	0,060	0,175	0,005
Al	2,041	2,970	0,807	0,149	0,520
Fe^{3+}	0,400	0,850	0,553	1,270	3,237
Mn	0,015	0,000	0,008	0,030	0,042
Mg	0,609	0,084	0,263	0,010	0,454
Ca	3,831	3,980	0,984	1,894	0,699
Na	0,162	0,063	0,033		
K	0,026	0,000	0,003		
total	9,979	10,033	3,995	3,821	5,036
oxygens	14	14	6	5	7

*Camscan – Link ISIS, Czech Geological Survey, I. Vavřín, analyst

Tab. 1. Average compositions of melilites, clinopyroxene and "calciferrites"*.

Peacor 1987, Cosca et al. 1989) and from the Chelyabinsk coal district in Russia (Chesnokov and Shcherbakova 1991, Kabalov et al. 1997).

The samples (collected in abandoned porcelanite quarry in 1994 by Mr. Mikoláš Mag) were examined in thin sections, by electron microprobe analysis and using XRD at Laboratories of the Czech Geological Survey in Prague. They have massive to porous, slag-like appearance and very heterogeneous mineral distribution. Two types of calcic rocks were distinguished:

1) Massive, medium-grained, dark green to yellow-green rock with abundant vugs composed of melilite, clinopyroxene and minor spinel.
2) Dark brown, medium- to fine-grained, strongly magnetic crystalline rock composed of prevailing melilite and minor larnite (Ca_2SiO_4); two "calciferrites": srebrodolskite ($Ca_2Fe_2O_5$) plus unnamed $CaFe_4O_7$, besides rare barite were also identified. Late aragonite and calcite fill cavities in both rock types.

Melilite is pale- to honey-yellow, and forms lath shaped to sub-equant crystals up to 3 mm long. In the vugs, it forms honey-yellow pseudocubic crystals. Two compositionally different melilites occur; melilite associated with "calciferrites" is significantly richer in the gehlenite component. *Clinopyroxene* is strongly pleochroic (orange-brown – brown-green – bottle green) and forms in vugs euhedral prismatic to stubby crystals up to 3 mm long. It corresponds to diopside – esseneite solid solution with the amount of the esseneite component ($CaFe^{3+}AlSiO_6$) varying in the range of 35–72 mol.%. "Calciferrites" form irregular opaque aggregates up to 1 mm long associated with melilite and larnite. *Srebrodolskite* (*$Ca_2Fe_2O_5$*) forms cores and *unnamed $CaFe_4O_7$* the rims of such aggregates. Srebrodolskite contains increased concentrations of TiO_2 (1–13 wt.%) and Al_2O_3 (1.8–4.5 wt.%); *$CaFe_4O_7$* is substituted predominantly by Al and Mg (7–8 wt.% Al_2O_3 and 4.8–5.5 wt.% MgO).

Spinels occur as abundant tiny inclusions in melilite and clinopyroxene, but locally are concentrated into discrete zones. They correspond to spinel – magnesioferrite – hematite solid solution members with widely variable concentrations of Al and Mg (1.5–30.5 wt.% Al_2O_3, 0.0–22.0 wt.% MgO). For the mineral compositions see Table 1.

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Syn–tectonic Emplacement of Island-Arc Calc-Alkaline Magmas during Oblique Transpression: SE Margin of the Teplá--Barrandian Zone (Bohemian Massif)

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Syn – tectonic emplacement of Variscan island-arc calc-alkaline magmas and coeval gabbros during oblique transpression was studied in the SE margin of the Teplá-Barrandian Zone (Bohemian Massif). Variscan granitoids of the Central Bohemian Plutonic Complex are exposed along the boundary of the Teplá – Barrandian Zone with Moldanubian Zone, represented in the study area by the amphibole – biotite tonalite of the Sázava type, dated at 349 ± 12 Ma (Holub et al. 1997).

The main Variscan deformation event is characterized by the development of major buckle folds, L_1 subhorizontal stretching lineation trending NNE or SSW and S_1 cleavage (the Jílové cleavage). The S_1 cleavage is very steeply dipping to the ESE or WNW penetrative cleavage superimposed on the pre-existing sedimentary (S_0) or magmatic fabrics. In the contact zone of the Sázava tonalite the S_1 cleavage is developed as high-temperature foliation. Major folds are represented by upright large scale open buckle folds with steep axial planes and sub-horizontal hinges trending NNE-SSW. The S_1 cleavage is sub-parallel to axial planes of the folds and sub-horizontal stretching lineations are sub-parallel to fold hinges indicating their intimate temporal and spatial relationship. Continuing compression was also accommodated by large scale overthrusting superimposed on S_1 cleavage fabric. Strain analysis of deformed conglomerates in the country rock revealed mostly oblate character of the finite strain ellipsoid associated with the D_1 deformation as well as increasing intesity of deformation towards intrusion margin.

In the Sázava tonalite, is preserved transition from magmatic fabric to solid-state fabric, typical of syn-tectonic intrusions. Internal parts of the intrusion are characterized by magmatic fabric with no visible foliations and lineations. The intensity of magmatic foliation increases towards the intrusion margins. Foliations are nearly paralell to the intrusion margins, sub-vertical or steeply dipping to the ESE and WNW. The magmatic foliations show pervasive character towards intrusion margins and grade into sub-solidus S-C fabrics which bear lineation plunging under shallow angles to the NNE and SSW.

Anisotropy of magnetic susceptibility was studied in the Sázava tonalite, in the mafic enclaves and mafic synplutonic dikes exposed in the Teletin quarry, in order to complement mesoscopic structural data and strain pattern throughout the intrusion. In the western part of intrusion, the magnetic fabric reflects the transition from magmatic to solid-state mesoscopic fabric. Very high values of P parameter correspond to the sub-solidus deformed S-C mylonites from the intrusion margin and the degree of anisotropy decreases towards the central part of intrusion. Susceptibility elipsoids show mostly oblate character. Magnetic lineations plunge to the NE-SW at low to moderate angles; magnetic foliations are steeply dipping to the ESE or WNW. The degree of anisotropy in the mafic magmatic enclaves and mafic synplutonic dikes is very low, the susceptibility ellipsoid is mostly oblate. Magnetic lineations are steeply inclined; magnetic foliations are subparallel to the magnetic foliations in the host tonalite. Thus, magnetic fabric in the MME and in the host tonalite is non-coaxial. Central part of the intrusion yields very low degree of anisotropy and shows both prolate and oblate character of magnetic elipsoid. Magnetic lineations are inclined at moderate to steep angles mostly to the SW, magnetic foliations dip at moderate to steep angles to the NE, E and SE.

Structural analysis revealed that orientation of the regional S_1 cleavage, stretching lineation and magmatic and sub-solidus fabric in the Sázava-type tonalite are coaxial. Also, the magnetic fabric in the tonalite (magnetic lineation and magnetic foliation) is concordant with the observed mesocopic structures in the country rocks. The increasing intensity of deformation and its ductile character close to the contact with tonalite is interpreted in terms of possible thermal weakening due to syn-tectonic heating. Above-mentioned observations confirm coeval development of these structures and their Variscan age. Non--coaxial magnetic fabric in the MME and in the host tonalite could be interpreted as a result of ductile strain partitionig in a transpressional regime. Therefore, the Sázava-type tonalite represents syntectonic intrusion emplaced into the upper crust during highly oblique transpression.

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