granites. REE patterns show strong differences in their abundance and fractionation even within rock types with similar major element composition displaying a strong HREE fractionation in granites and in some tonalites. Geochemical and Sr isotopic data agree in indicating that the Rensen Massif was formed by emplacement of different indipendent batches of magmas. These was generated by several processs which include crystal fractionation, AFC and crustal melting. Fractional crystallization and AFC appear the main evolution processes in the diorite-granodiorite magmas, whereas melting played a major role in the generation of granitic liquids.

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Bhaskara Rao A.*, Adusumilli M.A.* - *Granites and spacial distribution of scheelite deposits in Northeastern Bazil*

Northeastern Brazil has been the top producer of scheelite ore in Brazil since about forty years, and several ideas have been postulated to account for the origin of the deposits. Granites have certainly played an important role, either as carriers of W metal or as mobilisers of the same from the surrounding lithologies. However, the skarns which are the main repositories of scheelite deposits have shown evidences of their origin due to thermal effects, either local or regional, and also indications of the epigenetic nature of scheelite deposition.

With the existent geological maps and mineral deposit locations, it is possible to reinterpret and re-evaluate the granites and their emplacement phenomenon, and support the hydrothermal origin of scheelite ore as follows: 1) The regional metamorphic and tectonic effects that contributed to the sequence of rock types with large-open anticlinal and closed-tight synclinal system, due to rigid gneissic, quartzitic bodies forming the nuclei of the anticlines; 2) Emplacement of granitic stocks in the anticlines with resultant vergence of local structural styles; and constant deviation of incompetent strata and their secondary tectonic styles; 3) Late influx of granitic mass with abundant fluids and metallic elements, forming a mushroom structure with enlargement of the cupola; fast distribution of fluids along fractures and other weak zones of less pressure; 4) a) Convergent convective circulation of fluids in reactive zones bordered by refractory fault planes with mylonitic system, and deposition of ore, forming the ore shoots; b) Dispersion of fluids due to release of pressure along fractures and migration to attain reactive zones for deposition in skarn and/or impure calcareous formations forming anticlinal structures in the axial planes and cupolas; 5) Distribution of the ore due to migration of mineralising fluids, with constant depletion of W-content, resulting in deposition with lesser tenor, away from the source of mineralising fluids; 6) Cycles of erosion resulting in: a) outcrops of weak upper zones of rich underlying deposits bordering the granite stock; and occasionally underlying mushroom cupola of the granite stock; b) destruction of rich anticlinal mineralised zones of thick saddle reef tops, resulting in bordering lenticular flanks on skarn and calcareous units; c) rare to occasional eluvial, and very rare to unknown placer types of scheelite occurrences.

The spacial distribution of the deposits and occurrences, and their characteristics indicate their relationship with granitic stock and emplacement phenomenon. The hydrothermal fluids rich in W and Bi-Mo-Fe-Cu-S-migrated and deposited corresponding paragenetic sequences in the Mg-skarns and impure crystalline limestones, muscovite schists, quartz lenses and veins, granitic pegmatites; and fault and shear zones in biotite schist system.

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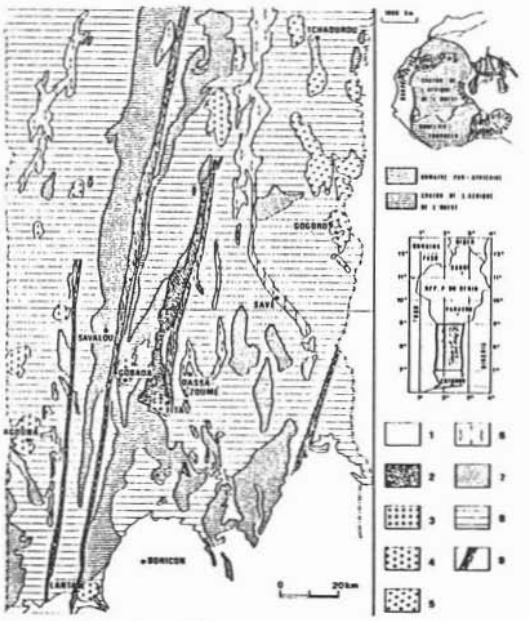
Bigioggero B.*, Boriani A.*, Cadoppi P.**, Sacchi R.** - *The granites of southern Benin (W-Africa)*

The basement of the southern part of the Pop. Rep. of Benin consists of high grade metamorphic rocks (mostly orthogneiss) and migmatites with relic Early Proterozoic ages and a widespread Panafrican overprint. The basement contains plutons of granitic rocks showing a wide range of textural and compositional features.

a) Porphyritic metagranite (here called «type Dassa» on account of its occurrence in the Dassa Zoumé area) forming concordant sheets involved in large-scale folds. Its parallel texture is due to the planar isoorientation of the feldspar megacrysts as well as to a blastomylonitic foliation. This granite occurs in two distinct textural types: a fine-grained variety has intruded in the fundamental coarse-grained type with spectacular stoping evidences near the village of the («type Tre»). Despite the different grain size, the two varieties share the same deformational history as well as the same petrochemical and geochemical characters. Only the coarse-grained type contains mafic xenoliths (fragments of syngranitic dykes). The abundance of high T metasomatic evidences (such as myrmekites, replacement dykes, granitised xenoliths) witnesses intrusion in a rather deep seated environment. A granite very similar in composition but not in texture and in petrochemical characters occurs near the Togo border at Agouna.

b) Crosscutting porphyritic granite («type Gogoro-Parakou») is texturally similar under many aspects to type a), except fot the absence of the blastomylonitic character, but mineralogically different from it. Myrmekites are scarce and K-feldspar is preferably replaced by albite; titanite and allanite, abundant in type a) are absent in type b). In both a) and b) biotite shows sub-solidus recrystallization.

c) Granular granite with isotropic texture was sampled in two plutons, near the localities of Lanta and Gobada respectively. This is very rich in quartz and feldspar, with no sign of subsolidus transformations,



Geological sketch-map of Benin (Breda Ricerche, Divisione Geomineraria, unpublished).

1 - Sedimentary cover
2 - Bimodal sub-volcanic and volcano-sedimentary complex
3 - Alkaline granite of Fita
4 - Granular granite (type Lanta and Gobada)
5 - Porphyritic granite (type Gogoro - Parakou)
6 - Porphyritic metagranite (type Dassa)
7 - Granulite, charnockite, hyperstene-biotite gneiss, quartzite (basement)
8 - Migmatites, amphibole-biotite gneiss (basement)
9 - Mylonite and blastomylonite

except for a late, partial albitization of K-feldspar. Mafic xenoliths, often biotitized, are frequent. Characteristic accessory minerals are titanite, allanite and fluorite. This granite displays overall features of shallow level intrusion.

d) Alkaline granite of Fita is associated with a bimodal subvolcanic and volcano-sedimentary complex, showing a late, almost static, recrystallization in the biotite zone. This granite is very rich in K-feldspar and poor in quartz; mafic minerals are green biotite and hornblende.

The few available radiometric data seem to indicate that all the considered granites belong to the Panafrican cycle, the youngest being probably type d).

28 analyses for major and minor elements reveal a rather limited scatter within each granite group; hence their primary chemical features were not spoiled by post-magmatic phenomena. A comparison based on Rb/Sr and Rb/Nb ratios indicate that the migmatites of the basement show a restitic character. The a)-type granites of Dassa and Tre (characteristically rich in K_2O and poor in Na_2O) show medium values of those ratios, but relatively high contents of Rb, Sr and Nb, whilst lower contents are shown in b)-type granite of Gogoro-Parakou (rich in Na_2O and poor in K_2O). The granite of Agouna shows low Rb/Sr and Rb/Nb ratios as well as a low content of those elements. The c)-type granites of Gobada and Lanta show high Rb/Sr ratio and high Rb and Nb content. The d)-type granite of Fita stands out for its alkaline signature, its high Nb content and low Sr.

If we use the relationship between Rb and Nb + Y as indicator of magma origin, the granite types a) and b) show a clear crustal signature (or at least and important crustal component), whilst types c), and especially d), have a subcrustal derivation.

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Bigioggero B.*, Colombo A.*, Del Moro A.**, Gregnanin A.*, Macera P.***, Tunesi A.* - *The Valle del Cervo pluton: an example of shoshonitic magmatism in the Alps*

Late alpine (mainly oligocenic) magmatic activity is widespread over the whole internal sector of the alpine chain.

A comprehensive study of the dyke magmatism led some of the writers to suggest a sort of zonal arrangement of the magmatic affinity with a change from low K-tholeitic activity to the eastern zone up to shoshonitic and ultrapotassic westwards. Also the plutonic bodies seem to fit well in this general scheme.

In this paper we present new field, geochemical and isotopic data on the Valle del Cervo pluton, intruded into the Austroalpine units of the Western Alps: the Sesia Lanzo Zone. The pluton shows a zonal arrangement with a monzogranitic core and outer rims of qz-syenites and qz-monzonites. Bi-WR Rb/Sr age determinations exhibit no significant differences in the ages of the different portions of the pluton (30 Ma). The general geochemical features show «orogenic» character with shoshonitic affinity. Lower LILE, higher $87_{Sr}/86_{Sr}$ are characteristic for the outer rims (mainly qz-monzonites) whereas, higher LILE and lower $87_{Sr}/86_{Sr}$ contents are typical for the «core» (mainly qz-sienites and monzogranites). These two different trends suggest slight differences in the degree of partial melting of an homogeneous mantle sources, enriched by a crustal component. Assimilation could be an important factor in the observed differences in $87_{Sr}/86_{Sr}$ and trace element contents.

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Blasi A.*, De Pol Blasi C.* - *Mineralogical and genetic aspects of alkali feldspars from granites and related rocks*

In the last two decades the use of a variety of experimental techniques and the development of theoretical approaches have considerably extended and