BULETINUL Universităţii Petrol – Gaze din Ploieşti	Vol. LXII No. 3B/2010	247 - 258	Seria Tehnică

Study of Metamorphosed Granitoidic Rocks from Eastern Part of Corbu Phyllites Unit from Valea Satului (Almăj Mountains)

Brănoiu Gheorghe, Ciocîrdel Mihai, Georgescu Octavian

Universitatea Petrol-Gaze din Ploieşti, Bd. Bucureşti, 39, 100680, Ploieşti,
e-mail: gbranoiu@yahoo.com, mihai_c@bigstring.com

Abstract

The area between Corbu phyllites unit on the west and Neamţu unit on the east outcrops on the slopes of the Valea Satului river (Dubova, Mehedinţi county), bordered by DN 57 Orşova-Moldova Nouă. In a broader scale, this area belongs to the major unit of the Southern Carpathians named Danubian Autochthon and it is a concordant igneous blade intrusion that developed in parallel with the crystalline schists of the two areas. The dioritic magmatic intrusion, in contact with Corbu phyllite unit, caused a number of effects evidenced by the development of metamorphosed granitoidic intrusions.

Based on the mineralogical-petrographical observations made on samples of rocks taken from the area in contact with Corbu unit, some generic considerations concerning the metamorphic transformations which took place in this region are made in the hereby paper.

Key words: *Southern Carpathians, Danubian Autochthon, muscovite-chlorite metagranites, metatonalites, granitoidic mylonite, mineralogical-petrographical observations*

Introduction

During the 2007 summer field campaign organised on the occasion of the practical activities carried out by the third-year students in geology at the Oil and Gas University in Ploieşti on the Danube River valley, specific studies of the outcrops either on the slopes of the Danube River valley and bordering valleys or on the slope of DN 57 Orşova-Moldova Nouă. Such an outcrop is represented by the concordant igneous intrusion occurring on the slopes of Valea Satului River (Dubova community, the county of Mehedinţi), bordered by DN 57 Orşova-Moldova Nouă (fig. 1, 2), lying between the Corbu phyllite unit on the west and the Neamţu crystalline unit on the east. There was observed that the igneous intrusion, developed in a blade shape in the NNW-SSE direction, which is considered rather homogenous by the classical geology literature (metadiorite – Codarcea et al., 1961; granodiorite – Savu and Ghenea, 1967, etc.), describes a range of interesting particularities, starting from the contact with the Corbu phyllite unit to Neamţu unit. For their thorough description, several samples were taken from the outcrop on Valea Satului.

Danubian Autochthon, developed as major unit of the Southern Carpathians, includes Upper Proterozoic – upper Ante-carboniferous crystalline formations and sedimentary formations belonging to the Paleozoic and Mesozoic eras (fig. 3, 4). The crystalline basement of the Danubian area comprises significant masses of granitoides and granites, as well as basic, ultrabasic and alkaline eruptive rock bodies. In the study area, the Danubian crystalline is made up of several metamorphic series: Poiana Mraconia zone, Corbu phyllite zone, Neamţu zone and the Vodna phyllites.

The Corbu phyllite zone developed between the Cherbelezu granite and the Plavişeviţa epigabbros on the west and the Neamţu zone on the east (fig. 3). The Corbu series can be continuously tracked from Plavişeviţa on the Danube River to Iablaniţa, where it enters the below sedimentary deposits.

Fig. 1. Outcrop in the igneous intrusion on the slope of Valea Satului river, adjacent road DN 57 Orşova-Moldova Nouă (view from river).

Fig. 2. Outcrop in the igneous intrusion on the slope of Valea Satului river, adjacent road DN 57 Orşova-Moldova Nouă (view from road DN 57).

The Corbu series is predominantly comprised of basic tufogene and tufogenous rocks with insertions of terrigenous and porphyrogene rocks and limestone. The predominant basic tufogene rocks are the green schists with paragenesis: albite-epidote-chlorite±calcite±actinolite (quartz-sphene). Terrigenous rocks are represented by sericite-chlorite quartzite schists with graphite, sericite schists, graphite schists. The area mostly includes the parts of an initial magmatic activity (basic tufogene rocks and porphyrogene rocks). The rocks were regionally metamorphosed under the conditions of the green schist facies in areas with chlorite (quartz-albite-muscovite-chlorite subfacies).

Mineralogical-petrographical investigations

By microscopic observations under polarised light of several thin sections, there was identified that rocks are made up of primary minerals, secondary minerals and metamorphic minerals. Their relative ratios vary dependent on the sampling area. Following field sampling and microscopic study on thin sections, several petrographic types were identified:

Type 1

Current mineral composition: quartz, sericite, oligoclase, biotite, chlorite, garnet, epidote, opaque mineral, potasic feldspar, calcite, apatite, zircon. Non-oriented xenoblastic microgranulare structure. The mineral ratios are as follow: oligoclase+sericite 50-60%, quartz 30-35%, biotite+chlorite 8-12%, garnet 2-4%, epidote <2%, opaque mineral <2%, apatite <1%.

The oligoclase occurs as anhedral crystals or twin crystals whose dimensions are comprised between 0.12 and 0.25mm. The mineral is partially substituted by the sericite (fig. 5).

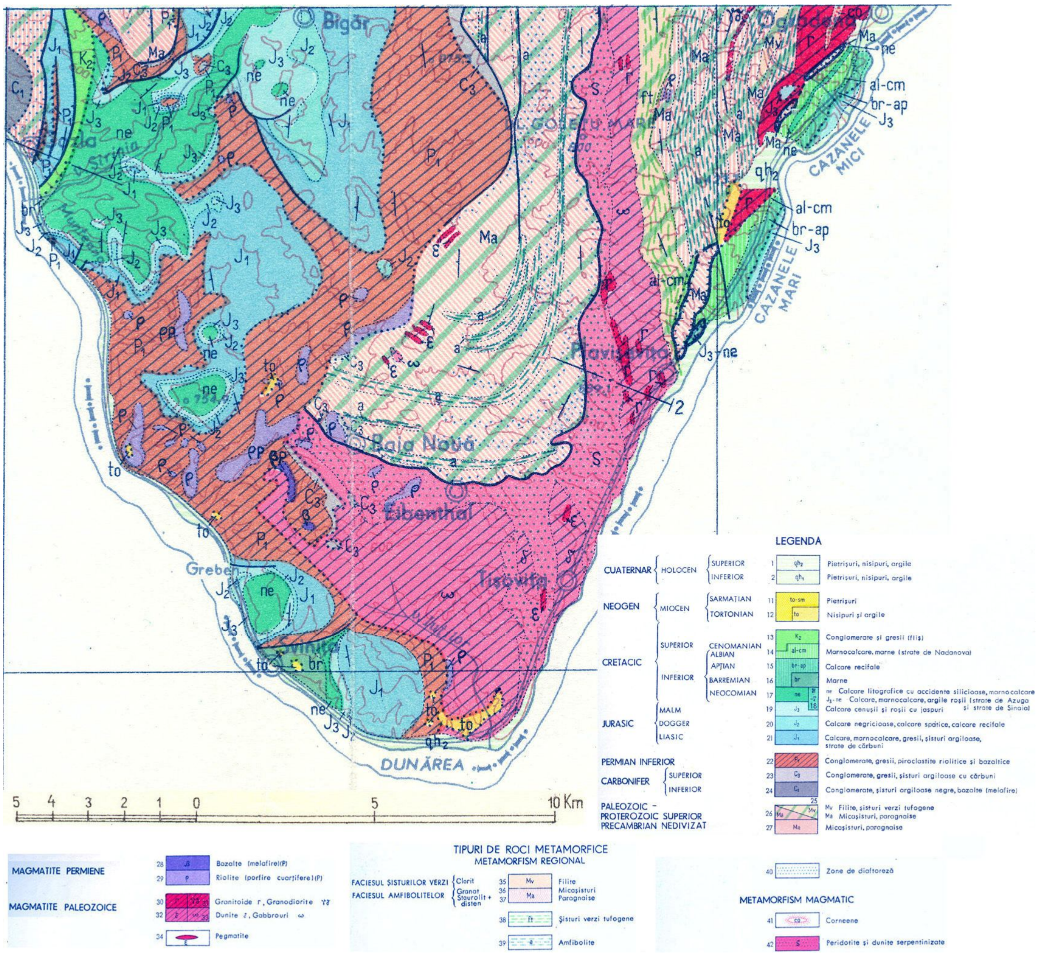

Fig. 3. Geological map fragment in studied area
(after Geological map of Romania, scale 1:200.000, Turnu Severin sheet, 1967).

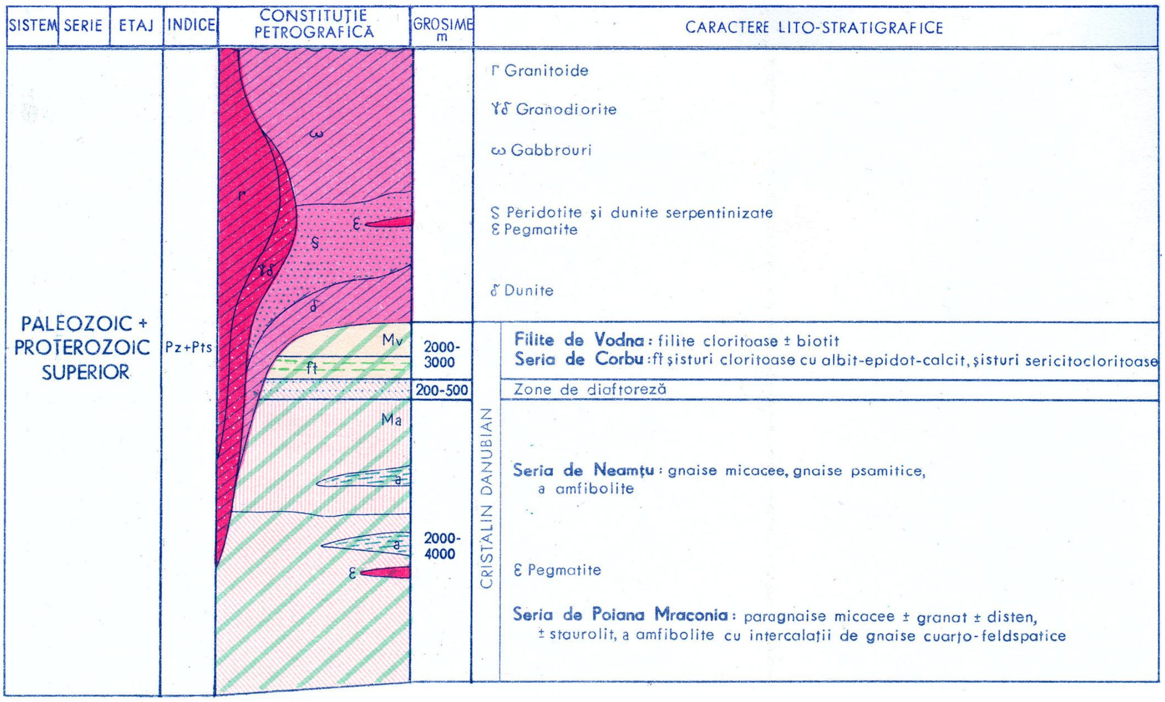

Fig. 4. Lithostratigraphical column fragment of crystalline formations in studied area
(after Geological map of Romania, scale 1:200.000, Turnu Severin sheet, 1967).

Quartz appears as poly-crystalline clusters or polycrystalline surfaces. All current crystals are formed by recrystallisation of previous crystals. The size of the current crystals ranges between 0.05-0.15mm (fig. 6). Locally, the tendency of quartz to segregate was recorded (fig. 7). Sericite is a metamorphic mineral exclusively formed on oligoclase. The optical properties are the ones belonging to muscovite (fig. 5). Biotite occurs in relics, which have not been substituted by chlorite yet. Some biotite crystals are grouped in clusters. The size of the biotite crystals varies, but does not exceed 0.08-0.17mm.

Chlorite is a metamorphic mineral predominantly with pseudomorphic development, mostly on biotite and less on garnet (fig. 8). Garnet occurs as anhedral crystals with the size ranging between 0.05-0.15mm (fig. 9). Epidote is a metamorphic mineral. It occurs as isolated crystals which preferentially created nucleuses next to chlorite, opaque mineral or are included in plagioclase (fig. 10). The opaque mineral is a magnetite and occurs as subhedral or anhedral crystals in the entire rock. Potasic feldspar and calcite are exclusively present on diaclase. Their layout does not permit highlighting of crystallization sequencing. Potasic feldspar is a low temperature variety (adular type). Apatite occurs as isolated anhedral crystals that are usually included in oligoclase. Zircon occurs rarely as smaller crystals of 0.02mm, being included in the biotite relicts or in chlorite.

Oligoclase, quartz, biotite, garnet, magnetite and apatite were primary minerals. Secondary minerals are as follows: potasic feldspar and calcite. The metamorphic minerals are the following: sericite, chlorite and epidote.

Type 2

Current mineral composition: microcline, oligoclase, quartz, chlorite, sericite, epidote, opaque mineral, titanite, apatite, zircon. The structure is xenoblastic inequigranulare. The mineral ratios are as follows – 45-50%, oligoclase – 20-25%, quartz – 25-30%, chlorite – 3-5%, epidote < 2%, opaque mineral < 1%, titanite < 1%, apatite < 1%.

Microcline occurs in the shape of grating-like twins (anhedral). It forms the biggest grains of the rock, most of its dimensions being comprised in the 0.70-1.75 mm interval (fig. 11). Microcline is not transformed. These twin crystals may have quartz, plagioclase and chlorite inclusions. Rare fine, peripheral mirmekitic-like intergrowths can be found in some of the twins.

Oligoclase occurs as simple crystals or twins that are partially or almost completely substituted by sericite. The optically identified content of An is below 20% (fig. 12). The size of the crystals ranges between 0.38 and 0.72 mm. Quartz generally occurs as anhedral crystal clusters. The crystals have a low wavy extension and have resulted from the process of recrystallisation of primary quartz (fig. 13). The size of the current crystals ranges between 0.14-0.41mm. Sericite exclusively substitutes oligoclase and has got optical features that are similar to the ones of muscovite (fig. 15).

Chlorite was exclusively formed by substitution of biotite. Relics of primary biotite cannot be found any longer. Biotite crystal sizes are comprised in the 0.30-0.55mm interval. “The mineral in the epidote group” occurs as rare anhedral crystals. In terms of space, most of them are associated to chlorite or opaque mineral (fig. 14). It is characterised by a higher relief than epidote and by a brown-red pleocroism. Apatite occurs as small and rounded anhedral crystals. Most of them occur as insertions in quarts and microcline. The opaque mineral is magnetite, which occurs as rare crystals that generally have an inter-grain layout (fig. 16). In terms of space, titanite is associated to chlorite. Its occurrence is related to the transformation of primary biotite.

Primary minerals are as follows: potasic feldspar, oligoclase, quartz, biotite, opaque mineral, zircon. The metamorphic minerals are the following: sericite, chlorite, epidote and titanite.

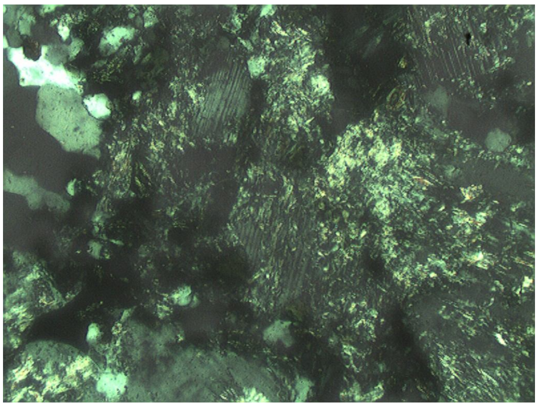

Fig. 5. Twin crystals and crystals of oligoclase partially substituted by sericite (N+, 100x)

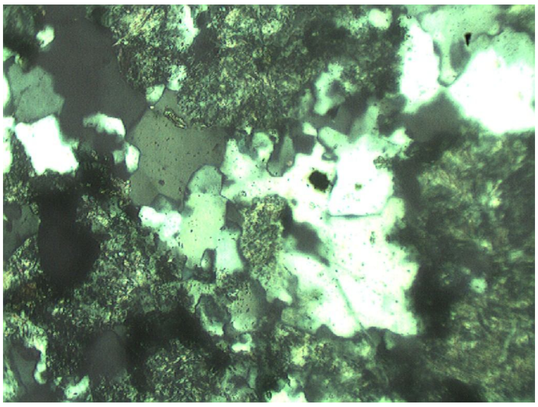

Fig. 6. Polycrystalline field with quartz (N+, 100x)

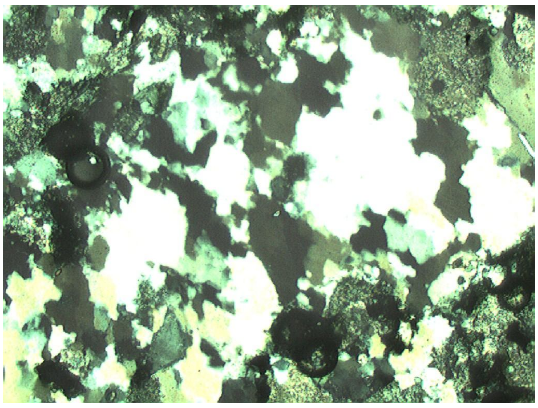

Fig. 7. Thin segregations of quartz (thickness range 0.5-2.5mm) (N+, 40x).

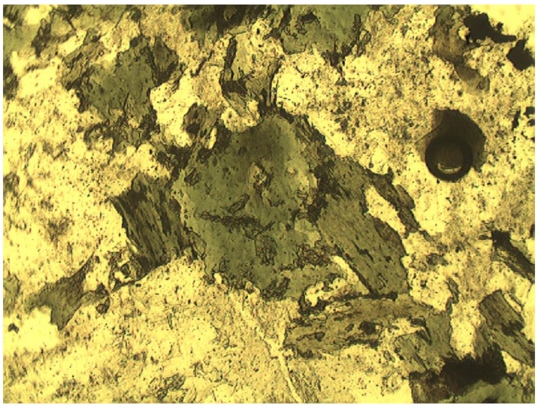

Fig. 8. Pseudomorphose of chlorite on biotite (N||, 100x).

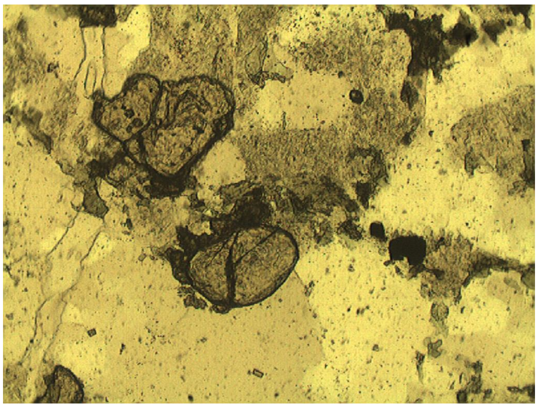

Fig. 9. Anhedral crystals of garnet partially surrounded by chlorite (N||, 100x).

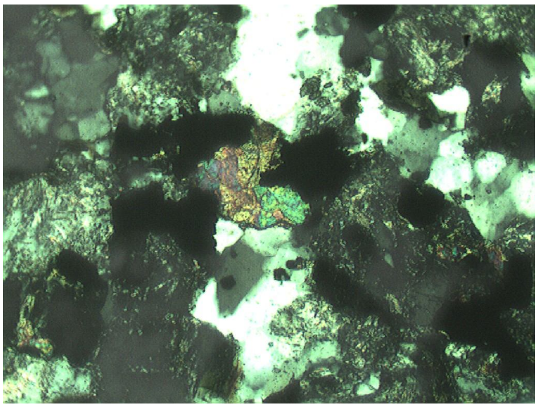

Fig. 10. Group of epidote crystals nucleated near opaque mineral (N+, 100x).

Type 3

Current mineral composition: oligoclase, quartz, microcline, albite, sericite, muscovite, chlorite, opaque mineral, clay mineral, calcite, epidote. The structure is mediogranulare, xenoblastic, weakly oriented. The mineral ratios are as follows: oligoclase + sericite – 35-40%, microcline + clay mineral – 30-35%, quartz – 25-30%, muscovite + chlorite – 2-3%, opaque mineral < 1-2%, calcite < 1-2%, epidote < 1%.

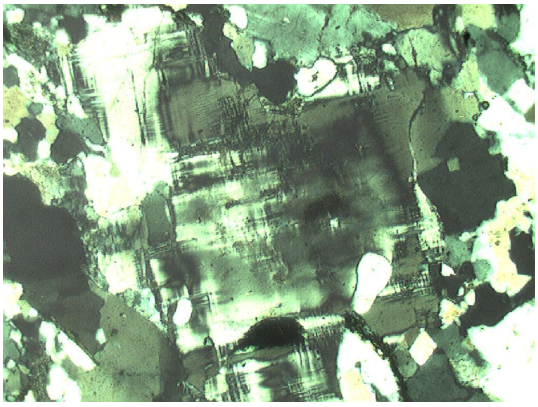

Fig. 11. Microcline with inclusions of quartz and chlorite (N+, 40x)

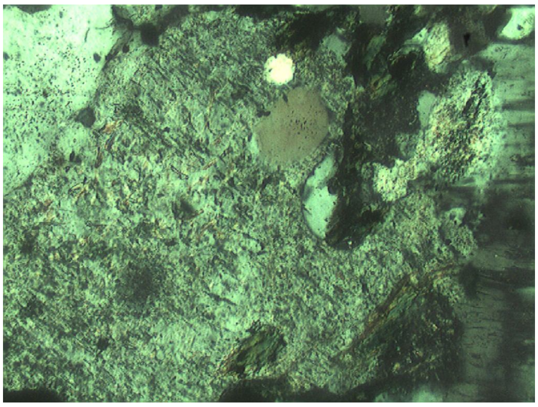

Fig. 12. Anhedral crystal of plagioclase partially substituted by sericite (N+, 100x)

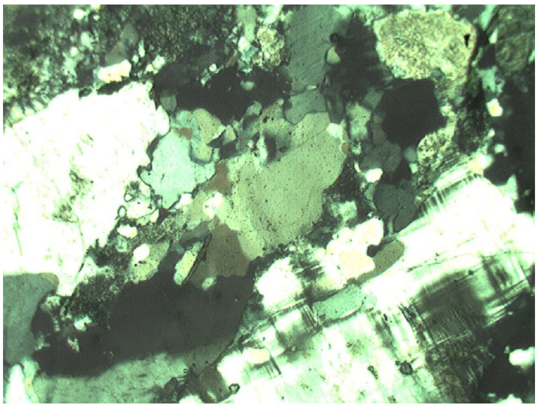

Fig. 13. Group of anhedral crystals of quartz (N+, 40x).

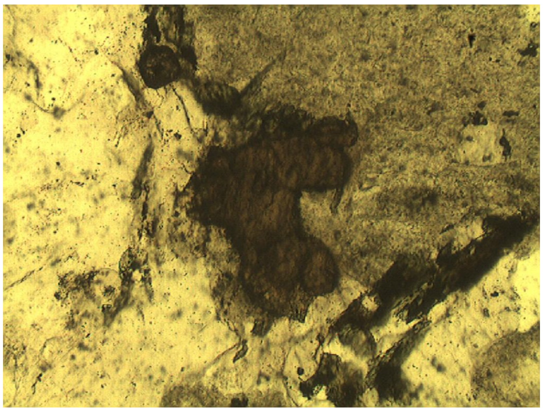

Fig. 14. Anhedral crystals of a mineral from epidote group (N||, 100x).

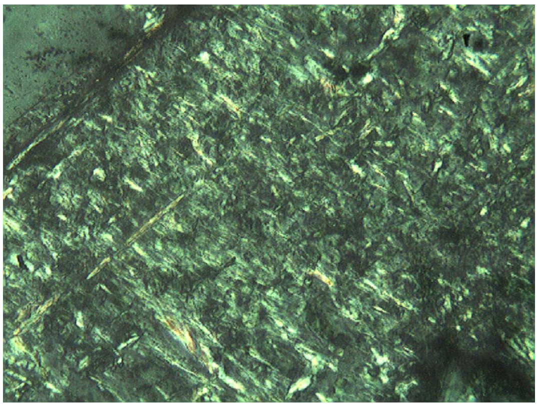

Fig. 15. Sericite resulted from oligoclase substitution (N+, 250x).

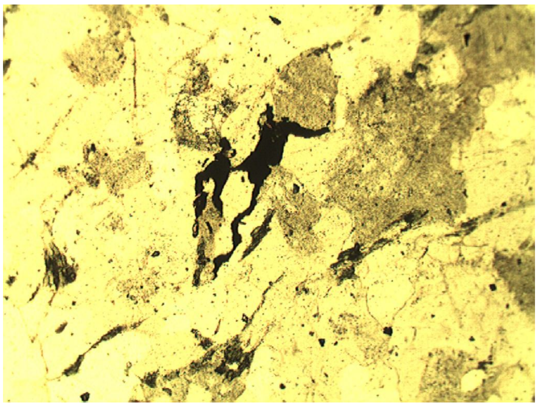

Fig. 16. Magnetite (black) ordered intergranular between quartz and feldspar crystals (N+, 40x).

Oligoclase occurs as twin crystals that are partially substituted by sericite. Parts of the twin crystals have subhedral or almost euhedral shapes as compared to quartz (fig. 17). The twin crystal sizes are usually comprised in the 0.55-0.80mm interval. Oligoclase crystals are bordered by secondary edges of monocrystalline albite (being unitarily extended), which most probably appeared by substitution. Quartz occurs as anhedral crystals with sizes comprised between 0.20-0.30mm. These crystals are the result of primary quartz recrystallisation. Locally, quartz inter-crystals have an inter-grain layout among the feldspar crystals (fig. 18).

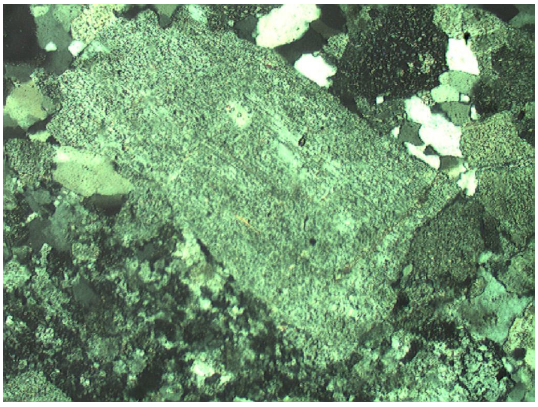

Fig. 17. Subhedral crystals of oligoclase (N+, 40x)

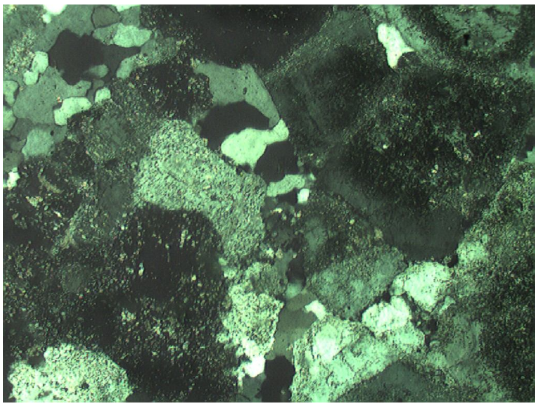

Fig. 18. Crystals group of quartz between larger crystals of feldspar (N+, 40x)

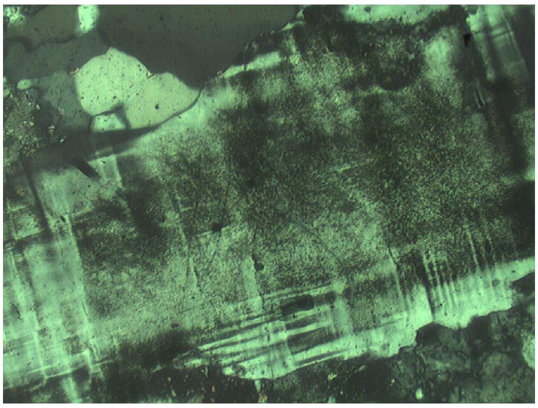

Fig. 19. Twin crystal of microcline partially argilised (N+, 100x).

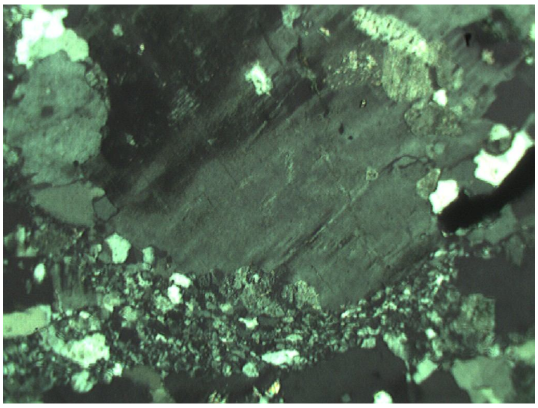

Fig. 20. Untwined microcline marginally substituted by polygranulare albite (N+, 40x)

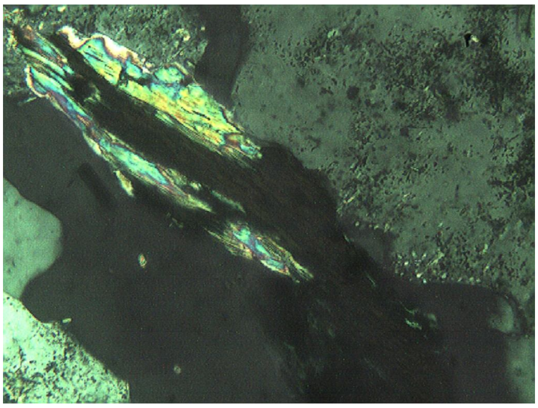

Fig. 21. Intergrowing muscovite-chlorite (N+, 250x).

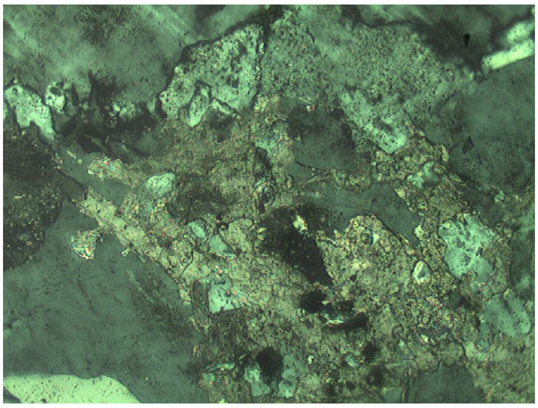

Fig. 22. Calcite locally substituted potasic feldspar (N+, 100x).

Potasic feldspar is currently a kind of microcline, which can be found in the shape of grating-like twins having anhedral forms. Microcline twins sometimes comprise oligoclase inclusions and rarely muscovite inclusions. In certain areas, microcline is clay (fig. 19). The marginal substitution of these twins by polygranular albite is something particular. This polygranular albite can form crowns around the twins (fig. 20). Moreover, incipient mirmekitic-like structures can be found towards the edge of the twins. The current sizes of the microcline twin crystals range between 0.35-0.50mm.

Sericite is exclusively formed on oligoclase and its optical properties are specific to muscovite. Muscovite especially occurs in concretions with chlorite (fig. 21) and rarely as inclusions in feldspar. The crystals are relatively small having dimensions of 0.15mm. Chlorite crystals are rare. They can be isolated or accreted with muscovite. Most probably, all chlorite is formed by substitution of a biotite. Thus, current concretions of chlorite and muscovite were concretions of biotite and muscovite previously (fig. 21). The opaque mineral is magnetite. The crystals are anhedral or subhedral and rare.

The clay mineral exclusively substitutes potasic feldspar. Individual crystals cannot be distinguished by optical microscopy (fig. 19). Calcite is a metasomatic mineral and substitutes potasic feldspar locally (fig. 22). It is also present on diaclase with variable thickness (the thickness of the ones observed in thin sections ranges between 0.03-0.04mm). Epidote occurs as isolated crystals, sometimes having a euhedral profile. Most of them are included in plagioclase. Primary minerals are as follows: oligoclase, quartz, microcline, biotite, muscovite. The metamorphic minerals are the following: sericite, chlorite, epidote, metasomatic calcite.

Type 4

The rock has a porphyroclastic structure, with a micro-crystalline matrix having a poorly-defined schistosity (especially upon microscopic examination). (a) Porphyroclasts are exclusively oligoclase that reached a high level of sericitisation (fig. 23). The size of the examined porphyroclasts ranges between 0.50 and 1.10 mm.

The volume of porphyroclasts exceeds 40%, local concentration being recorded. (b) The micro-crystalline matrix is mainly made up of quart and sericite. The following minerals are subordinated minerals: oligoclase, calcite and rarely zircon. Micro-areas of quartz and sericite concentration can be found in the matrix, as a result of the sin-cinematic mechanical differentiation processes. Quartz forms small poly-crystalline clusters (fig. 24). Sericite tends to orient and aggregate: (1) in areas that are parallel to foliation; (2) on transversal fractures to foliation (fig. 25). The current ratio of the main minerals as follows: oligoclase – 40-45%, quartz – 25-30%, sericite – 30-35%.

Type 5

The rock has a porphyroclastic structure and a well-defined schistosity. The matrix is microcrystalline. Porphyroclasts are represented mainly by microcline-pertite (fig. 26) and subordinate of oligoclase. The ratio between them is approximately 5 : 2. The sizes of the microcline crystals are comprised in the interval 0.85-1.65mm. Porphyroclasts represent over 60-65% of the total volume. Oligoclase porphyroclasts are partially sericitised (fig. 27) and locally the microcline ones are marginally substituted by polygranular albite (the same phenomenon occurring in the 3rd metagranite sample). The size of the oligoclase crystals ranges from 0.40 to 1.20mm.

The matrix is mainly made up of quartz and albite (fig. 28) and subordinate of quartz, sericite and opaque mineral. The chlorite in the matrix exclusively resulted from the substitution of some biotite crystal fragments. The opaque mineral subsided preferentially on schist layers post-cinematic. It preferentially created nucleases locally on chlorite crystals. A late argilisation process, which took place under hypergene conditions, locally affects some feldspar crystals.

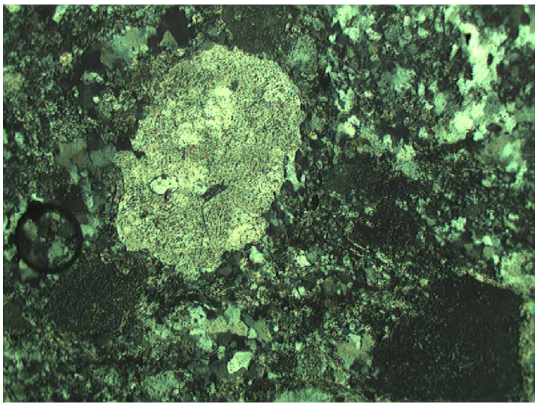

Fig. 23. Oligoclase porphyroclast partially sericitized (N+, 40x)

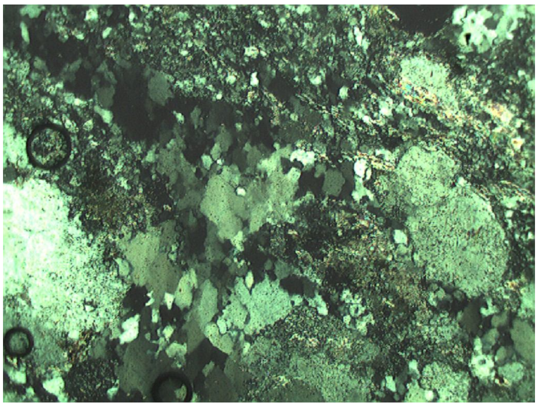

Fig. 24. Microfield of quartz concentration in mylonite matrix (N+, 40x)

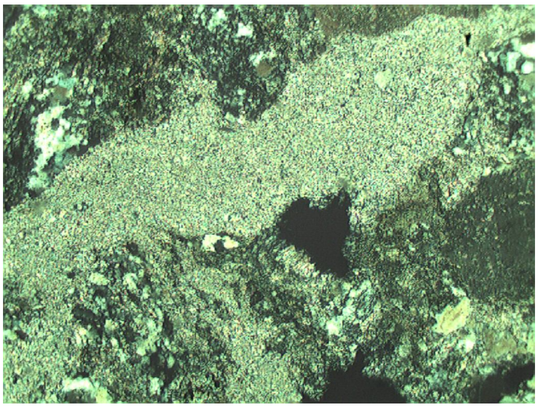

Fig. 25. Microfield of sericite concentration in mylonite matrix (N+, 40x).

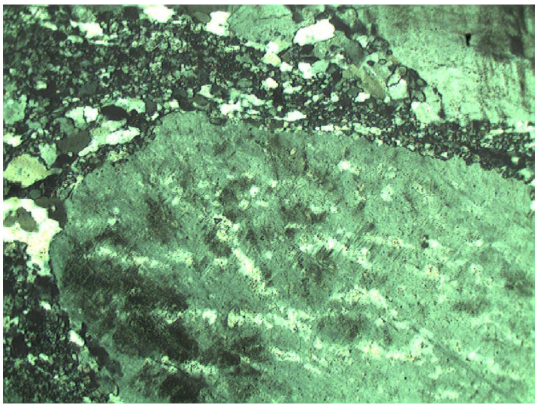

Fig. 26. Microcline-pertite porphyroclaste and surrounding matrix (N+, 40x.)

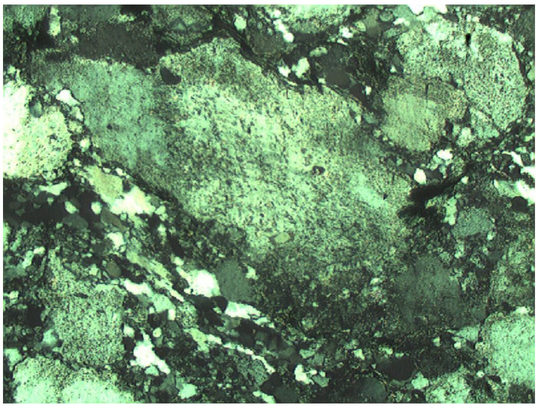

Fig. 27. Oligoclase porphyroclaste partially sericitized (N+, 250x)

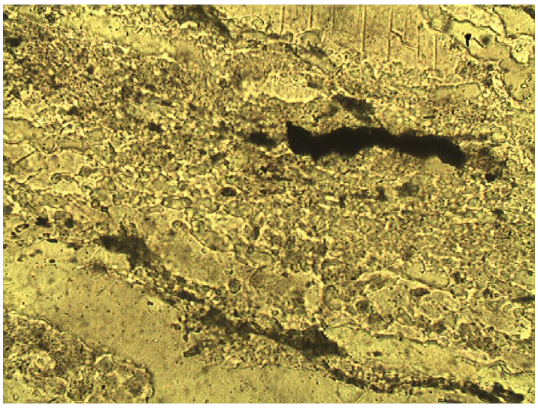

Fig. 28. Mylonite matrix made up predominantly by quartz and albite (N||, 100x).

Type 6

Current mineral composition: plagioclase, quartz, sericite, chlorite, muscovite, calcite, opaque mineral. The structure is undirected, microgranulare to mediogranulare. The mineral ratios are as follows: plagioclase 65-70%, quartz 20-25%, sericite 3-5%, chlorite 3-4%, muscovite 2-3%, calcite < 2%, opaque mineral < 2%, apatite < 1%, zircon < 1%. Plagioclase is an oligoclase having less than 20% of anorthite in its composition. It occurs as twin crystals that are sometimes euhedral (fig. 29). Crystals and twin crystals are partially substituted by sericite. Their sizes are comprised between 0.10 and 0.22mm. Quartz occurs as anhedral crystals with low extension (fig. 30). Rarely, it has inclusions in oligoclase (fig. 31). Maximum sizes range from 0.05 to 0.15 mm. Sericite has optical properties that are specific to muscovite and it was exclusively formed in oligoclase crystals. Chlorite and muscovite are frequently associated thus generating either parallel concretions (fig. 32), or concretions where the layout of crystals is random (fig. 33). Phyllosilicate crystals are small compared to the feldspar and quartz ones.

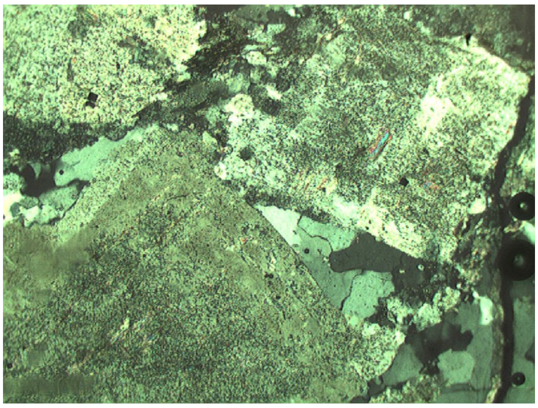

Fig. 29. Subhedrale twin crystals of plagioclase partially substituted by sericite (N+, 40x)

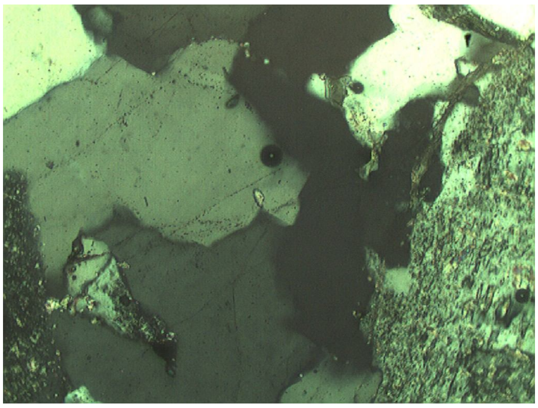

Fig. 30. Anhedrale quartz with weak ondulatory extinction (N+, 100x)

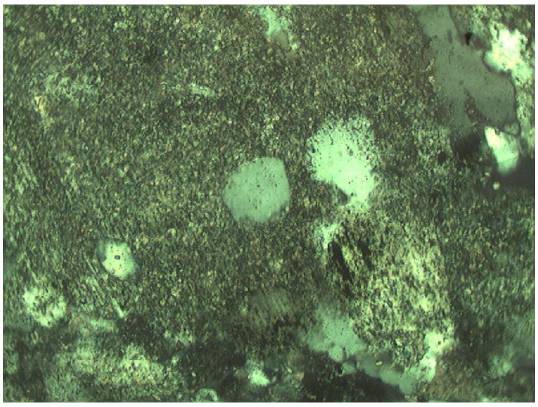

Fig. 31. Inclusions of quartz in some oligoclase crystals (N+, 100x).

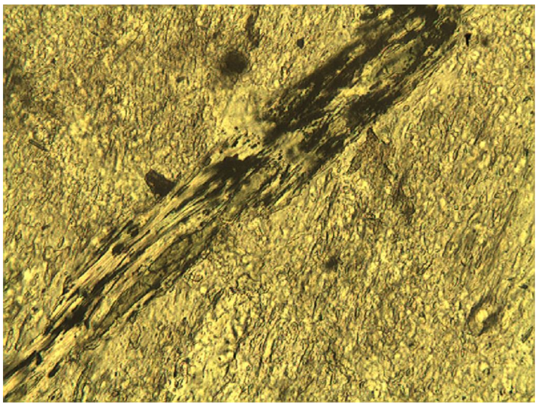

Fig. 32. Paralel intergrowing muscovite-chlorite (NII, 250x)

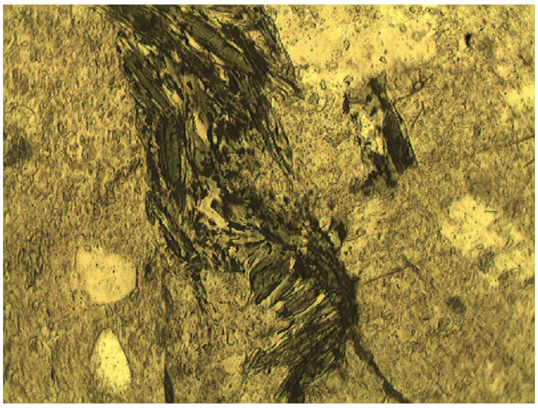

Fig. 33. Intergrowing muscovite-chlorite with random orientation of phyllosilicates crystals (N+, 100x)

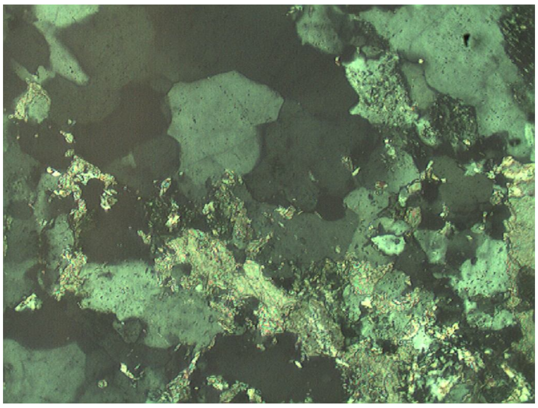

Fig. 34. Calcite in a field of quartz (N+, 100x)

Calcite rarely occurs in groups of microscopic crystals generally in quartz domains (fig. 34). It is also present on very thin microdiaclase and sometimes on the feldspar space.The opaque mineral is very rare and it occurs as isometric crystals, having a cubic habit. Apatite is also very rare. The crystals are exclusively anhedral. Zircon occurs as rare euhedral crystals included in the feldspar. An unidentified semitransparent mineral is present in small quantities, and it is associated only to chlorite and muscovite in their concretions.

Genetical remarks

Type 1 – Considering the ratios of primary minerals, one can certainly state that the protolith is a tonalite. The primary mineral association indicates a crystallisation process taking place at depth lower than 15km, and all metamorphic transformations are a consequence of the emergence of the object towards the surface. The structure of the rock changes in process of blasthesis under static conditions. The main metamorphic transformations are the chloritisation of biotite, sericitisation of plagioclase and formation of epidote. The correct diagnosis of the rock is ***metatonalite with biotite***.

Type 2 – Considering the ratios and nature of primary minerals, protolith was a granite cu biotite. The main mineralogical transformations were the following: biotite chloritisation, plagioclase sericitisation, formation of epidote. Besides the mineralogical changes, metamorphism meant the change in rock structure, especially by: quartz and potash feldspar recrystallisation processes and, to a lesser extent, by occurrence of mirmekites. It was not preserved in any primary igneous structure. The correct diagnosis of the rock is ***metagranite with chlorite***.

Type 3 – The main contribution to the change in the rock structure was brought by the recrystallisation processes undergone mainly by microcline and quartz, which is subordinated to the substitution processes (substitution of potasic feldspar and oligoclase by albite). The main mineralogical transformation processes are as follows: biotite chloritisation (led to the change of the biotite – muscovite pre-metamorphic concretions into chlorite – muscovite concretions), plagioclase sericitisation, local occurrence of epidote, the formation of metasomatic albite. Considering the ratios of the primary materials, protolith was certainly a type of granite with biotite. The correct diagnosis of the rock is ***metagranite with muscovite and chlorite***.

Type 4 – The high percentage of sericite indicates the prior existence of a potasic feldspar, which was involved in the sericite formation process. In this case, it is difficult to precisely mention the type of protolith that the general term of granitoide was used for. The rock diagnosis is ***granitoide mylonite***.

Type 5 – Rock diagnosis is ***granite mylonite***.

Type 6 – The only retromorph metamorphic transformation that can be certainly mentioned in relation with this rock is the plagioclase sericitisation. The reaction surely includes a levigation of calcite and a potasic contribution besides the contribution of water, which is specific to this type of retromorph transformation. Chlorite-muscovite concretions can be interpreted as pseudomorphoses, yet it is difficult to determine the pseudomorphed mineral due to the absence of any relict. The fact that these concretions do not always have the same structure complicates the interpretation even more. Moreover, it is impossible to identify the semitransparent mineral, whose crystals are very fine; the mineral being associated to these phyllosilicates. The rock diagnosis is ***metatonalite with muscovite and chlorite***.

Conclusions

The intrusions of granitoidic rocks and granodiorite in the Danubian Autochthon represent the old sinorogene magmatic activity before the Carboniferous. The analysed intrusion is a magmatic body of small dimensions, which developed in the shape of a blade that can be located at the limit between the Corbu phyllites zone and the Neamţu crystalline zone. The intrusion can be interpreted as an apophyses of Ogradena granite that penetrated the area of weak resistance between the Corbu phyllites and the Neamţu series. The initial granite composition changed into the granodiorite and even dioritic one, following the reaction with intrusive rocks. The reaction varies in the two contact areas due to the different mineralogical-petrographical composition of the two crystalline areas.

The mineralogical-petrographical study of the rocks in the area of contact between the intrusion and the Corbu phyllites zone reveal the occurrence of granitisation and feldsparisation phenomena, which, in some of the parts, were accompanies by contact metamorphism phenomena. The diagnosis of the studied rocks confirms prevalence of granitoidic rocks (metatonalites, metagranites, granite mylonites).

References

1. Codarcea, Al., Răileanu, Gr., Pavelescu, L., Gherasi, N., Năstăseanu, S., Bercia, I., Mercus, D. – *Privire generală asupra structurii geologice a Carpaţilor Meridionali dintre Dunăre şi Olt*. Ghidul excursiilor. C – Carpaţii Meridionali. Congresul al V-lea al Asoc. Geol. Carp.-Balk., 4-19 septembrie, Bucureşti, 1961.
2. Ciocîrdel, M., Brănoiu, Gh. – *Mineralogical-petrographical observations on metamorphic transformations in the gabbroids from transitional zone of the Iuţi-Tişoviţa-Plavişeviţa ophiolitic complex*, Petroleum-Gas University of Ploiesti Bulletin, Technical Series, vol. LX, no. 4A/2008, p. 273-278, 2008.
3. Costin, G., Ciocîrdel, M. – *Recomandări privind nomenclatura şi clasificarea rocilor magmatice şi metamorfice*, Editura Cartea Universitară, Bucureşti, 2004.
4. Georgescu, O., Brănoiu, Gh. – *Mineralogie şi petrologie*, Editura Universităţii Petrol-Gaze din Ploieşti, 2010.
5. Iancu, V., Berza, T., Seghedi, A., Mărunţiu, M. – *Palaeozoic rock assemblages incorporated in the South Carpathian Alpine thrust belt (Romania and Serbia): A review*, Geologica Belgica, vol. 8/4, p. 48-68, 2005.
6. Kräutner, H.G., Krstić, B. – *Alpine and pre-alpine structural units within the Southern Carpathians and the Eastern Balkanides*, Proceedings of XVIIth Congress of Carpathian-Balkan Geological Association, Bratislava, vol. 53, special issues, 2002.
7. Savu, H., Ghenea, C. – *Harta Geologică a României, scara 1:200.000, foaia Turnu Severin*, Comitetul de Stat al Geologiei, Institutul Geologic, Bucureşti, 1967.
8. Seghedi, A., Berza, T., Iancu, V., Mărunţiu, M., Oaie, Gh. – *Neoproterozoic terranes in the Moesian basement and in the alpine Danubian nappes of the South Carpathians*, Geologica Belgica, vol. 8/4, p. 4-19, 2005.

Studiul granitoidelor metamorfozate din partea estică a seriei filitelor de Corbu de pe Valea Satului (Munţii Almăjului)

Rezumat

Zona cuprinsă între unitatea filitelor de Corbu la vest şi unitatea cristalinului de Neamţu la est apare la zi în versanţii pârâului Valea Satului (com. Dubova, jud. Mehedinti), limitrof DN 57 Orşova-Moldova Nouă. Această zonă aparţine la o scară mai largă marii unităţii a Carpaţilor Meridionali numită Autohtonul Danubian şi reprezintă o intruziune magmatică concordantă sub formă de lamă ce se dezvoltă paralel cu şisturile cristaline ale celor două zone. Intruziunea magmatică de tip dioritic a determinat la contactul cu unitatea filitelor de Corbu o serie de efecte materializate prin dezvoltarea unor intruziuni granitoidice metamorfozate. Pe baza observaţiilor mineralogo-petrografice efectuate asupra probelor de roci prelevate din zona de la contactul cu unitatea de Corbu în lucrare se fac consideraţii genetice referitoare la transformările metamorfice suferite de rocile din zona studiată.