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Jurassic volcano-sedimentary serie in inner Albonides

iç "Albonides"lerdeki Jura volkano-sedimanter seri (ofiyolit).

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ABSTRACT: Volcano-sedimentary serie is situated in peripheral parts of ophiolites of the mirdita zone. It is normally set above the Triassic- Jurassic carbonaceous basement and is tectonically covered by the ultrabasic massifs of the ophiolitic complex.

ÖZ: Volkano-sedimanter seri "Mirdita" kuşağındaki ofiyolitlerin kabuğunda yer almaktadır. Bu, düzenli biçimde organik Trias-Jura üstünde yer almakta olup ofiyolitik kompleksin ultrabazik masifleri ile tektonik olarak örtülmüşlerdir.

INTRODUCTION

The following two main structural units are distinguished in the geological structure o Albanides: Outer Albanides and Inner Albanides. Mirdita, Gashi and Korabi tectonic'zones belong to inner Albanides. The Mirdita zone, with wide extention of ophiolites, is the main ore-bearing zone of Albania (Geology of Albania, 1982).

This paper treates the problems of the age, spatial position and the consturction of Jurassic volcano-sedimentary serie, which is encountered in the peripheral parts of ophiolites of the Mirdita zone (figue. 1.)

The Jurassic volcano-sedimentary serie is almost everywhere limited by the rocks of the Triassic-Jurassic corbonaceous serie on one flank (its basement) and by the ultrabasic rocks of the ophiolitic complex on the other (its cover).

Basement of Volcano-Sedîmentory Serie

Complete section which build up the basement of Jurassic volcano-sedimentary serie are developed in the eastern flank of the Mirdita zone (Kodra, A. etc. 1980; Gjata Th., etc., 1987 franbotton to top wedistin guish (Fig.2).

-Paleozoic schists.

-Conglomerates-Sandstones of Permian -Verfenian.

- Volcano-sedimentary rocks of Verfenian. The volcanics consist of oliainic diabases, porphyr diabases, andesites, dacites up to liparites. Petrochemically, the rocks belong to basic-acid serie and are highly alcalinic.

-Sandstone, sandy limestones and dolomites of Verfenian- Anisian.

- Radiolarites and limestones with cherts of Anisian and Ladinian. The phenomena of the Anisian volcanism and the Ladinian tuffs exist also at some sectors.

- Stromatolitic limestones with megalodonts and Lithiotis (shallow sea facies) and the limestones with cherats (deep sea facies) of the Upper Triassic-Lower Liassic.

- Condensed Jurassic reddish limestones (2-20 m thick) with manganese nodules. The microfacies with Involutina liassica, embryonic ammonites, Protoglobigerina, Cadosina etc. is characteristic (Kodra, A., Gjata, K., Pirdeni, A., 1979; Shallo, M. etc., 1980; Shallo, M. etc., 1986).

Volcano-Sedimentary Serie

The sequences of volcano-sedimentary serie are most complicated, with facial variations both, in extention and verticallity. In spite of that, several lithological packs, well correlated in the field can be distinfuished

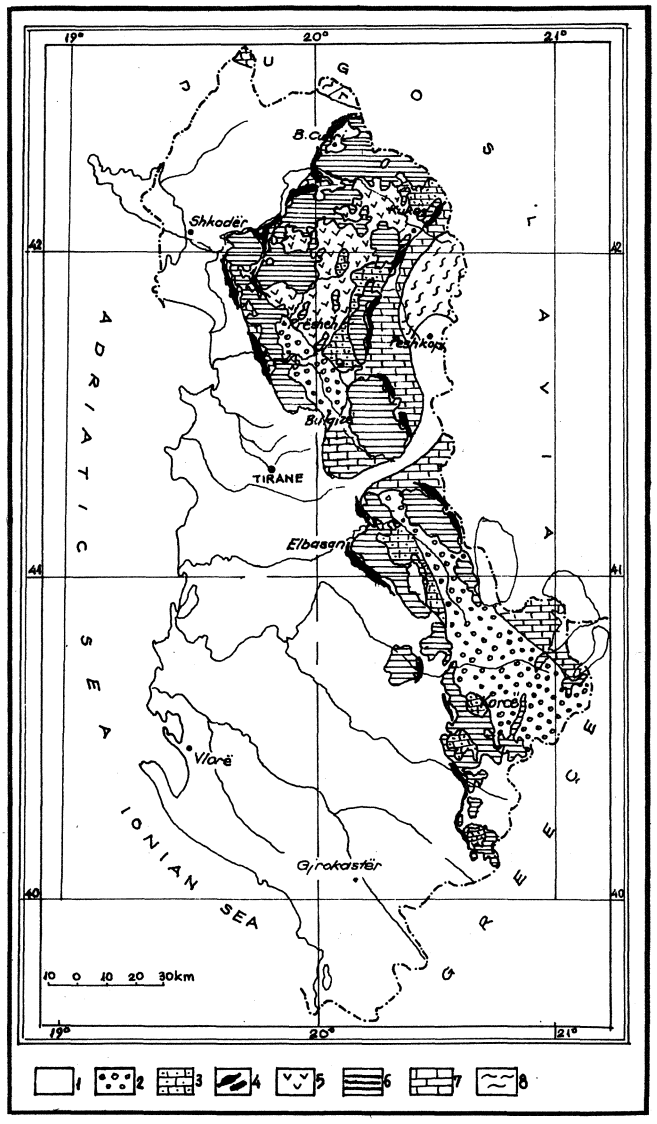

Figure 1. The Distribution of Jurassic Volcano-Sedimertary Serie in Inner Albanides.
1. Outer Albanides, 2-8. Inner Albanides; 2. Tertiary molasses; 3. Cretaceous limestones; 4. Volcano-Sedimentary serie; 5. Ophiolitic gabbro-plagiograint-volkanic rocks. 6. Serpentinised utramafics; 7. Triassic-Jurassic limestones; 8. Paleozoic schists.

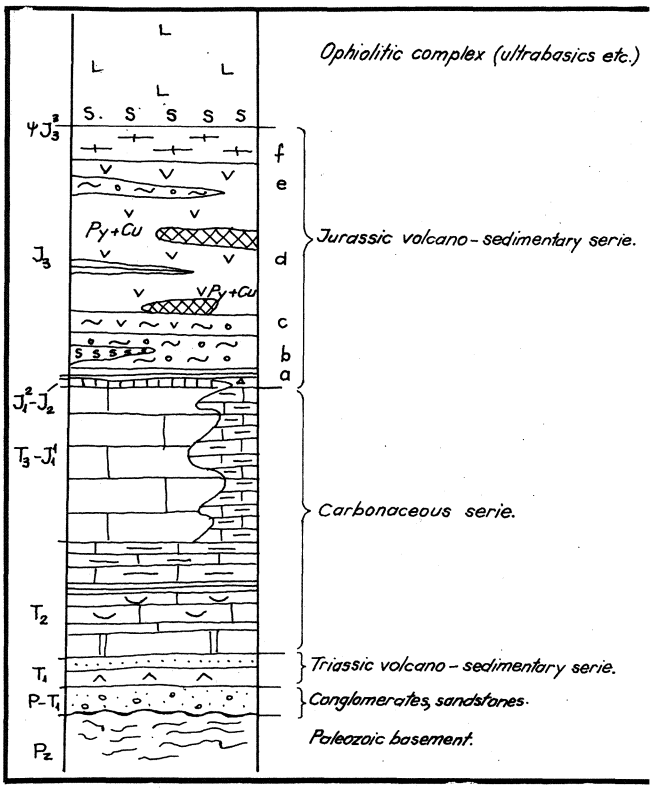

Figure 2. A generalized column of the volcano-sedimentary serie.

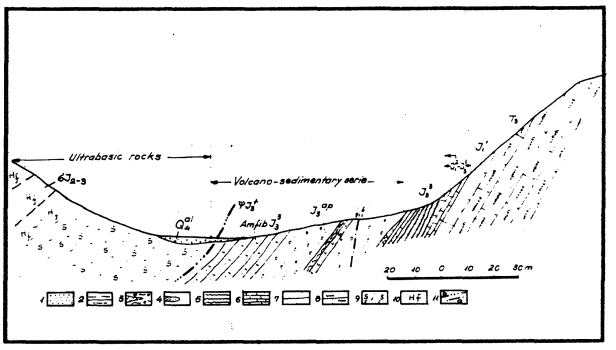

Figure 3, The Fushelura Section
1. Alluvial deposits; 2. Amphibolites, granate-quartz-micaceous shales; 3. The argillite-detritus pack with volcanic bodries (the effusive-sedimentary serie); 4. Radiolaritic maris; 5. The tuffaceus radiolarites; 6. The reddish marly limestones. (The Fushëlura suite); 7. The massive limestones; 8. The thickbedded limestones; 9. The tectonical serpentinites; 10. The pseudostratified fresh harzburgites; 11a. The oversetting plane (of the obduction); 11b. The fault.

among this serie. The good sections of volcano-sedimentary serie, with well preserved relations regarding limestone rocks of the basement as well as the ultrabasic ones, which cover them tectonically occur in several sectors such as Fushë Lurë (figure 3) (Kodra, Al, 1981; Kodra, Al, Peza, L. H., etc., 1986), Poravë (figure 4) (Kodra, A., Delaj, E., 1976; Bezhani, V., etc., 1986; Çakalli, P., etc. 1983).

Most foreign students have investigated Dinarides and Hellenides (Cadet, J.P., etc., 1980, etc.) are of the same opinion as regards such a setting of volcano-sedimentary serie. It is supported also by the geophysical data (Langora, LI., etc., 1983).

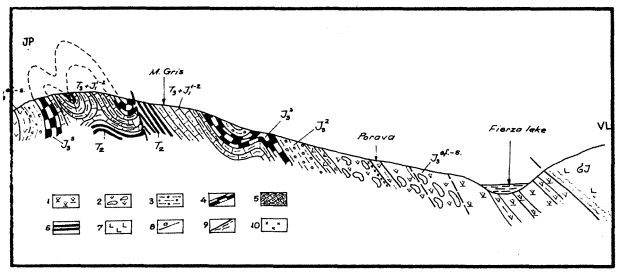

Figure 4. Coupe Geologique de Porav
1-4. Volcano-sedimentaires serie du Jurassique superieur: 1. Diabases et schistes metamorphisees. 2. Diabases a pillow lava et schistes siliceux; 3. Schistes detritiques; 4. Bane de silex du Trias superieur-Lias; 6. Schistes silliceux du Trias moyenne; 7. Harzburgites; 8. Disjunction tectonique; 9. Plan d obduction; 10. Picrite.

Five different packs can be distinguished within volcanosedimentary serie:

a. Radiolaritic-tuffaceous pack (10-25 m). It is most characteristic and situated almost on top of Triassic-Jurassic carbonaceous serie (successively or with hard grounds) (Kodra, A., 1976,1986).

b. Schistous pack with debris (20.150 m). It is represented by a chaotic formation (melange). The sandstone, chert, limestone tirassic volcanics and ophicalcites are found in the argillic matrix. The radiolaritic intercallations or the lenses of arkosic sandstone have been encountered in most cases as well.

In some sections occur also the intercalations of the basic and intermediaie-alcaline (hialotrachyliparites, trachytes etc.) volcanics.

c. Diabase schistous pack (10-30 m). It consist of diabasic intercalations within schists.

d. Diabase-chert pack (50-500 m). It has a wide extendion and occupies the largest volume of volcano-sedimentary serie.

The volcanics consist of diabases, albitic diabases, diabase porphyres, diabasic agglomeratic lavas etc. Of the most intereset is the persence of the olivinic gabbro-diabases and picrites in the chert- diabase sequence of Poravë etc.

e. Diabasic pack with chert intercalations and schists with clasts (20-50 m). The packs c, d, e may be included in an invidual pack -the diabase- chert one.

f. Metamorphic pack (20-100 m). This pack occur everywhere at the uppermort part of volcano-sedimentary serie. The study of this pack has been conducted by Shallo, M. (1970), who distinguishes the mcttamorphic rocks of green schist facies as well as the metamorphic rocks of stavrolite -almandine subfacies and quartz- albite epidote almandine. The formation of metamorphic rocks is linked with the paleomovement of ophiolites on the volcano-sedimentary basement in the end of Upper Jurassic.

In different levels (mainly in the lower ones) of volcano-sedimentary serie are located the ultrabasic ((picritic) lavas, ultrabasic bodies, gabbros and gabbro-monsonites etc., penetrated by underscrust (Kodra, Al, Gjata, K., 1982; Gjata, K., etc. 1985 etc.).

The volcanics of volcano -sedimentary serie show a differentiated pertochemical evolution: from subalculine basalts to basalt anuesites and up to dacites- rhyoluo» (Ndojaj, L, 1982).

The Cover of the Volcano - Sedimentary Serie

The ultrabasic rocks of the ophiolitic complex of the Mirdita zone lie on the metamorphic pack of the top of volcano-sedimentary serie. Their contact represents a major tectonic and is expressed by the formation of amphibolites and foliated serpentinites (of tens metres thickness). The lowermost levels of ultrabasic tectonites composed of lherzolites and fresh harzburgites occur, in general, at the contact with the volcano-sedimentary serie (Kodra, A., 1976; Gjata, K., Kodra, A., 1982 etc.).

The emplacement of the rocks of the ophiolitic complex on the volcano- sedimentary serie occur during the Tithonian and is linked with the immersion of the continental crust under the oceanic one during the period of compression which closes the marginal ocean basin during the Jurassic.

The Upper Tithonian-Berriasian flyschoidal formations are set with break on the Triassic- Jurassic carbonaceous rocks, Jurassic volcano- sedimentary ones and on the other rocks of ophiolitic complex (Figure 5).

Age. The rocks of the volcano- sedimentary serie lie

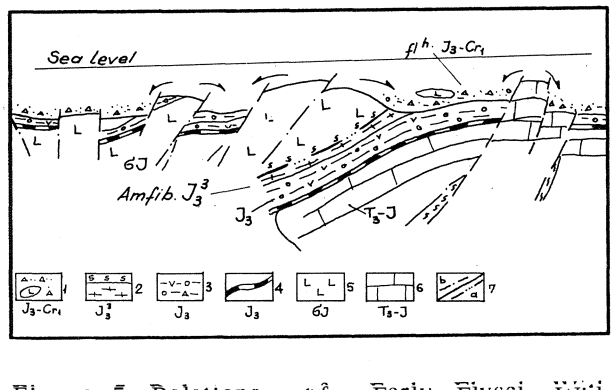

Figure 5. Relations of Early Flysch With Triassic-Jurasic Formations and Ophiolites
1. Early conglo-breccia-marlaceous flysch with Tintinnides; 2. Amphibolites, serpentinites; 3. Argillite-detritus pack with volcanites; 4. Radiolarites-tufogene rocks; 5. ophiolite; 6. Jurasic limestones; 7. Plain of obduction (a) and fault (b).

stratigraphically on top of the Lower-Middle Jurassic limestones and are covered by the Upper Tithonian flysch. Thus, the age of the volcano-sedimentary serie is of Upper Jurassic.

Copper mineralization. As regards Py-Cu massive mineralizations, the volcano- sedimentary serie is of the most interest. Recently, in the diabese- chert pack (fig. 2) are known two main mineralization levels. In various sectors of the spreading of volcano- sedimentary serie occur also two other levels of less important sulfide mineralization (Behzani, V., etc., 1986; Delaj, E., 1985; Hoxha, L. etc; 1983; Çakalli, P., etc., 1983; Avxhiu, R., etc., 1984)

CONCLUSIONS

The Jurassic volcano -sedimentary serie lies on the Trianssic– Jurassic carbonaceous basement and is tectonically covered by the ultrabasic rocks of the ophiolotic complex.

In the lower part, volcano –sedimentary serie is composed of tuffaceous cherts and schists with debris (melange); in the middle part by diabase- cherts and in the upper one by amphibolites and metamorphic schiste.

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