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PETROGRAPHY OF THE YOMONSOY INTRUSIVE (SULTAN-UWEIS MOUNTAINS)

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ABSTRACT

The Yomonsoy syenite complex is mainly composed of sub-alkaline igneous rocks that form small intrusive bodies south of the Tebinbulak gabbro-pyroxenite intrusion and in the upper reaches of the Yomonoy. The material composition of syenites is very close to Tebinbulak gabbro-pyroxenites, so they should be considered a single gabbro-pyroxenite-monzonite-syenite complex.

Introduction. The primary data on the features of its geological structure as part of the Sultan-Uweis Mountain system were obtained during the geological surveys of 1964-1974, culminating in the creation of a geological map of the region on a scale of 1:50,000 (Kulesh et al., 1974). In the same years, the basis of modern ideas about the stratigraphy, lithology, petrography, tectonics, and metallogeny of the region was formed (Y.S.Wisnewski, P.P.Chuenko, G.Yu.Alferov, A.A.Kulesh, D.A.Rubanov, A.M.Vilensky, V.M.Zhelezovs). V. I. Surgutanov and many other geologists).

Yomonsoy complex - ξP1d. It was separated separately by S.S. Shults (1972) in Sultan-Uwais under the name "Yomonsoy granosyenites, syenodiorites, and gabbro-diorite complex". Other researchers (A.A. Kulesh, V.V. Baranov, A.F. Sviridenko, L.B. Kogan) previously looked at the scale of the Tebinbulok Early-Middle Carboniferous intrusive complex. The Yomonsoy intrusive is bounded by the northwest tilting zone of the Eastern Sultan-Uwais Ridge, 2.0 km along the long (latitudinal) axis, and 1.0 km along the short axis. It is found in the form of an oval-shaped intrusive body 2 km long.

It is located in the deposits of the Beshmozor suite of the Early Devonian period, and in the exocontact with a thickness of 150-350 m, contact cherts belonging to the amphibole-chert facies of metamorphism were formed. In the second stage of vein rocks: syenodiorites and syenodiorite porphyrites and quartz syenite-porphyries and sub-alkaline diorite porphyrites were formed. Since the composition of the rocks in the research area mainly belongs to sub-alkaline and alkaline basic and medium rocks, we will give a brief description of these rocks. The basic rocks of the sub-alkaline and alkaline series are distinguished by the occurrence of more than 5% modal feldspars and curvilinear-augite. There are four types of alkaline gabbroid: theralite, essexite, teschenite, and shonkinite. Among the formic minerals, pyroxene (titan augite) plays an important role in the mineral composition of alkaline

gabbroids. Along with pyroxene, olivine, amphibole (versatile, larvikite, hastingsite), and biotite types are known. Colorless minerals are represented by plagioclase, alkali feldspar, and feldspar, whose nature mainly determines whether the rock belongs to one or another type. Teralites consist of plagioclase, clinopyroxene, nepheline, olivine, and accessory minerals - apatite and titanomagnetite.

Essexite is representative of the potassium-sodium series of alkaline rocks. According to the composition, it has transitional types corresponding to the plagioclase melanocrate feldspar syenites on the one hand, and the sub-alkaline base rocks without feldspar on the other. Compared to sodium-alkaline gabbroid, shonkinites are distinguished by the dominance of potassic minerals - pseudoleucite, orthoclase, and sanidine, plagioclase is almost absent. The structure of the rocks is defined by the sharp idiomorphism of orthoclase and pyroxene compared to pseudoleucite and nepheline. Some shonkinites have a poikilitic structure.

Middle plutonic rocks in the sub-alkaline series Sub-alkaline diorite. Appearance - gray, pinkish-gray, crystalline, coarse, medium and fine-grained, uniform-grained, uneven-grained, sometimes porphyritic rock. The texture is massive, sometimes with installments. The main rock-forming minerals of sub-alkaline diorite are plagioclase, amphibole, biotite, pyroxenes (sometimes), and potassium-sodium feldspar. Secondary minerals - magnetite, ilmenite, apatite, titanite, zircon, sometimes, orthite, quartz; small amounts of xenotime, monazite, anatase, garnet, and tourmaline are found. Among the secondary minerals, chlorite, epidote, secondary magnetite, albite, sericite, and leucoxene are usually found. The structure of sub-alkaline diorites is mainly hypidiomorphic granular.

Syenite is a pink, pinkish-gray, sometimes gray or brown colored, monolithic, giant-large, medium, small and ultra-fine-grained, uniform-grained, uneven-grained, and porphyritic, monolithic plutonic rock, sometimes sectional, has a trachytoid texture. In giant granular syenites, potassium-sodium feldspar crystals reach 10 cm or more. The main minerals of syenites are plagioclase, potassium-sodium feldspar, pyroxene, amphibole, and biotite. Secondary minerals include quartz, titanomagnetite, magnetite, ilmenite, apatite, zircon, titanite, and in some cases olivine. Secondary minerals include iddingsite, chlorite, and calcite. Syenites usually have a hypidiomorphic granular, sometimes trachytoid or bostonite structure.

Alkaline feldspar syenite. the difference from syenite is that in alkaline feldspar syenite, plagioclase is almost absent in the form of independent grains. Its content does not exceed 10% of the amount of feldspars. The amount of dark minerals in the rock does not exceed 15%, usually 3-5%. Appearance - pink, pinkish-gray, coarse, medium, fine, very fine-grained, uniform-grained, cohesive, and in some cases uneven-grained porphyry rock with trachytoid texture. Appearance - pink, pinkish-gray, coarse, medium, fine, very fine-grained, uniform-grained, cohesive, and in some cases uneven-grained porphyry rock with trachytoid texture. The main minerals of alkaline-feldspar syenite are potassium-sodium feldspar, monoclinic pyroxene, and hornblende; secondary - plagioclase, quartz, magnetite, apatite, zircon, in some cases titanite, rhombic pyroxene, fluorite, granite. Secondary minerals: chlorite, secondary magnetite, albite, carbonate. Alkaline-feldspar syenites are distinguished by hypidiomorphic

granular, panidiomorphic granular, allotriomorphic granular, sometimes trachytoid, and bostonitic structures.

The most common type of rock is medium-grained syenites. They form a wide outer ring of the massive, "filled" with fine-grained syenites (body thickness up to 20 m, length - up to 500 m), as well as syenite-porphyries, as well as cyenodiorite-porphyries and other veined rocks. brought Along the southern half of the massif along the Yomonsoy Basin, this ring is cut by a central stochastic body of coarse-grained syenites, which is also cut by fine-grained syenites and vein facies. On the plan, the Yomonsoy massif was shown in the form of a ring pluton with an asymmetric structure due to its displacement to the south under the influence of the stocky body in the center. Shonkinites are found in syenites in the form of autoliths of various sizes (from 0.5-0.6 cm to blocks of several tens of meters). Along with shonkinites and syenites, the massif contains monsonites and melanocratic syenites, which form a gradational contact with the rocks and with each other.

Shonkinites consist of the following minerals: pertitized microcline (large prisms with poikilitic inclusions of plagioclase, hastingsite, and pyroxene), plagioclase (large rectangular crystals are strongly altered, and small tabular grains are albitized), amphibole (consisting of dark green actinolite found), diopside-augite (agrinized, often changed to actinolite, hastingsite, epidote), green-brown biotite (a secondary mineral developed at the expense of hastingsite).

Petrographically, the shonkinite-containing rocks of this complex are mainly found in the form of autoliths (from 0.5-0.6 cm to several tens of meters) among medium-grained syenites and vein rocks of the second stage.

Fragments of autolithic shonkinites in a dike of sub-alkali quartz diorite porphyrite.

Autoliths of shonkinite with a prismatic grain structure in a sub-alkaline diorite porphyrite dyke.

They mainly form poikilite, monzonitic, and sometimes prismatic granular structures. These rocks are composed of pelitic microcline, plagioclase, amphibole (hastingsite and actinolite), diopside-augite, and biotite. Since they are in the form of autoliths, they have undergone metasomatic changes.

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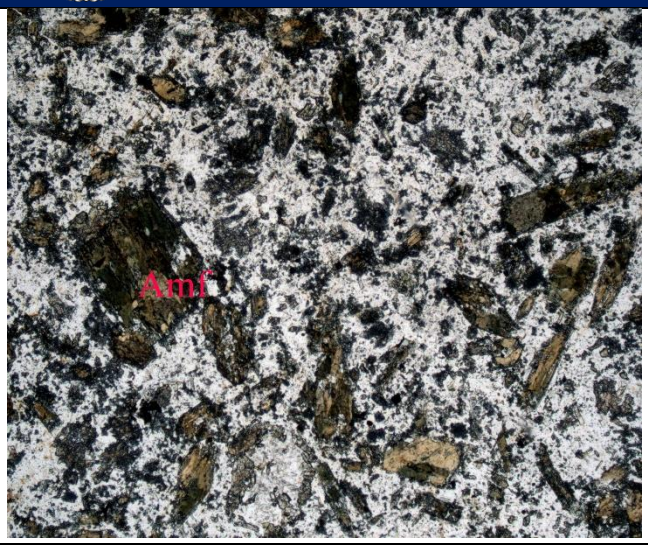

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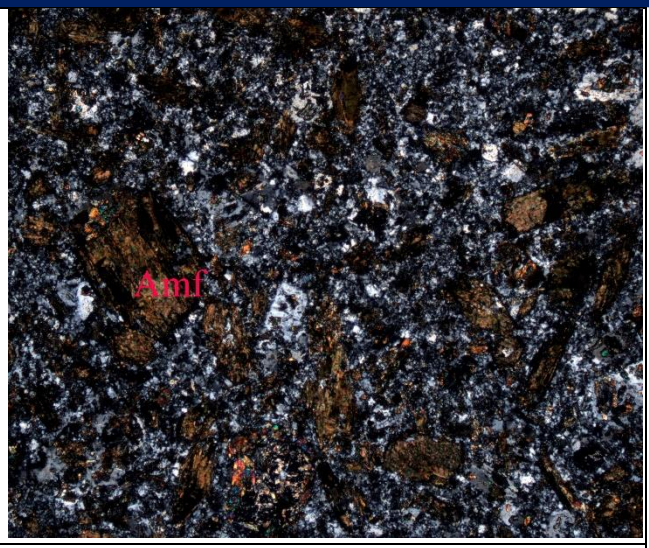
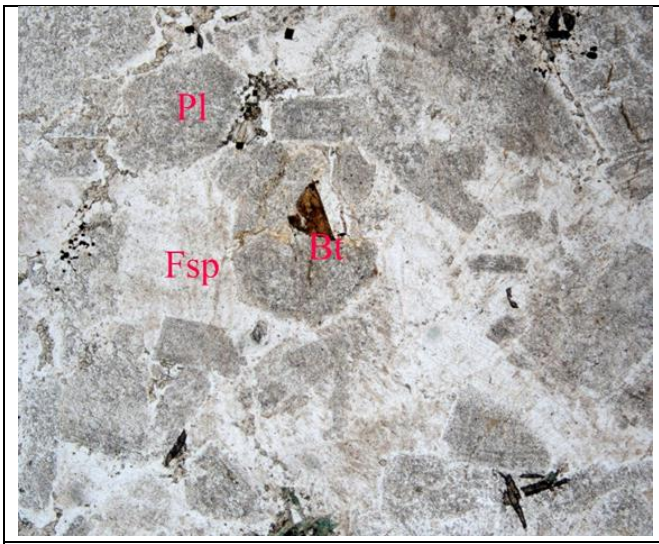


With the analyzer. The field of view is 3.0 mm

Syenites are a relatively common type of rock belonging to this complex in the area of the Yomonsoy intrusion, and they are distributed in the form of a thick ring in the outer parts of the massive. According to their appearance, they are divided into large, medium, and fine-grained types. According to the composition of the minerals that make up the rocks, medium-grained syenites are fine-grained green-gray trachytoid syenites and large- and coarse-grained, and their composition is very close to monsonite and melanosyenite. The rocks of this group are composed of plagioclase, microcline, hastingsite, and pyroxene; It consists of accessory minerals: sphene, magnetite, apatite, melanite, zircon, fluorite, secondary minerals - actinolite, biotite, epidote, chlorite, carbonate. Plagioclase consists of zonal crystal grains, the central part of which is saucuritized, and the outer part is surrounded by a thin shell of albite. Microcline forms large rectangular crystals that fill the spaces between other minerals, and there is partial pertitization. Amphibole, which usually strongly dominates pyroxene, is represented by the similarity of hastingsite and actinolite in the shonkinite minerals of the same name. Pyroxene belongs to diopside-augite and aegirine-augite and is often transformed into amphibole. Biotite is olive green in color. The structure is prismatic, sometimes monzonitic



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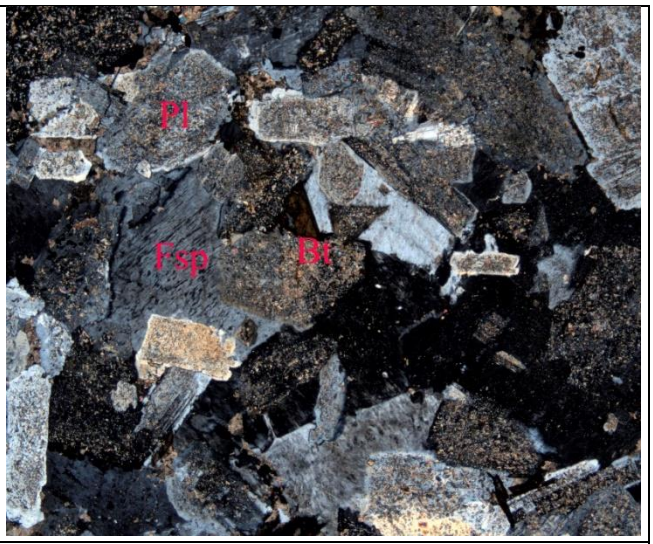

With the analyzer. The field of view is 6.0 mm

Microscopic photo of moderately metasomatically altered medium- to large-grained syenites

Macroscopically, the medium-large-grained syenites of the Yomonsoy intrusive are pink-gray in color. The structure of the rock is monzonitic. The mineral composition consists of plagioclase, potassium feldspar, biotite, and amphibole remnants. Plagioclase is idiomorphic to potassium feldspar, intensively sericitized and albitized.

Conclusion

Summary The internal structure of the Yomonsoy complex is as follows (from oldest to younger): 1) shonkinites and monsonites, 2) medium-grained syenites, 3) large- and coarse-grained syenites and quartz syenites, 4) fine-grained syenites. In the first stage of vein phase: aplite-pegmatites and syenite-pegmatites are found. In the second stage of vein rocks: syenodiorites and syenodiorite porphyrites and quartz syenite-porphyries and sub-alkaline diorite porphyrites were formed.

Shonkinites consist of the following minerals: pertitized microcline (large prisms with poikilitic inclusions of plagioclase, hastingsite, and pyroxene), plagioclase (large rectangular crystals strongly altered, and small tabular grains albitized), amphibole (dark green composed of actinolite), diopside-augite (augite, often changed to actinolite, hastingsite, epidote), green-brown biotite (a secondary mineral developed at the expense of hastingsite). Macroscopically, the medium-large-grained syenites of the Yomonsoy intrusive are pink-gray in color. The structure of the rock is monzonitic. The mineral composition consists of plagioclase, potassium feldspar, biotite, and amphibole remnants. The rock has been intensively metasomatically altered. Plagioclase crystals are strongly sericitized and albitized. Potassium feldspar fills the spaces between plagioclase. In the central part of the picture, there are veins of quartz+potassium feldspar composition. Dikes of sub-alkaline quartz diorite porphyrites consist of a macroscopic brown-gray, porphyritic, glassy connective mass. The structure of the rock has a porphyry, allotriomorphic granular (small granular) main mass. They are sericitized and albitized plagioclase crystals of porphyry form and sometimes opacified elongated remnants of femic minerals. The main mass is composed of plagioclase, potassium feldspar, quartz, and chlorite.

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