UDC 552.4.051.6(477.63)

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THE INTERRELATION BETWEEN THE NOVOKRYVORIZKA AND SKELIUVATSKA SUITES OF THE KRYVYI RIH SERIES

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ДО ПИТАННЯ ПРО ВЗАЄМОВІДНОШЕННЯ НОВОКРИВОРІЗЬКОЇ ТА СКЕЛЮВАТСЬКОЇ СВІТ КРИВОРІЗЬКОЇ СЕРІЇ

Purpose. Explore features of the structure and the relationship between the nature of occurrence of Novokryvorizka and Skeliuvatska Suites.

Methodology. The authors used analysis of suite sections and field research. The results of geochemical analyses were used to determine the ratio of the contents of indicator elements and facial conditions of sedimentation of rocks, quantitative assessments of weathering intensity and the extent of sedimentary differentiation of metasedimentary deposits of various paleotectonic modes for the purpose of paleotectonic reconstruction.

Findings. The results of geological investigations of conglomerate bearing strata of Kryvbas indicate that the lower part of the section of Kryvyi Rih series there are two different of formation types of metaconglomerate – schistic and oligomictic ones – according to composition and conditions. The former are part of the metaconglomerate- schist formation, which corresponds to the volume of Novokryvorizka suite in its modern interpretation, and the latter are part of the metaconglomerate-sandstone-schist, which combines metaterrigene part of Skeliuvatska suite section. The section of the upper part of Novokryvorizka suite is represented by the association of different chlorite schists and quartz metasandstone with subordinate spread of slate metaconglomerates according to the composition. The number of layers of metasandstones and their capacity increase upsection. The lower part of the Skeliuvatska suite section is presented by rhythms, composed by paragenesis metasandstone + metagritstone. Moreover, metasandstones are deposited at the base of rhythms and are similar to the metasandstones of the upper part of the section of Novokryvorizka suite according to the mineral composition and structural-textural features. This indicates a gradual transition between these suites and refutes the assumption regarding the basal character of quartz metaconglomerates of Skeliuvatska suite, as they are inherent to its central section, where they are involved in forming rhythms made of metasandstone ± metagritstone + metaconglomerate association. That is, the section of Skeliuvatska suite bottom has regressive character rather than transgressive character, as it is believed to be.

Originality. The nature of the contact between Novokryvorizka and Skeliuvatska suites was studied, the peculiarities of their material composition that paleotectonic features of their formation were compared.

Practical value. The research results can be used for stratigraphic subdivision of the sections; techniques used in the article can be used for paleotectonic reconstructions.

Keywords: *suite Novokryvorizka, Skeliuvatska, Kryvyi Rih series*

Introduction. It is considered that Skeliuvatska suite with its angular unconformity and stratigraphic break is deposited on Novokryvorizka suite rocks [1]. The reason for such understanding of interrelation between these stratigraphic units of Kryvyi Rih series is based on an assumption that the metamorphosed weathering zones are developed in the metabasites of the Novokryvorizka suite [2], transgressive character of the Skeliuvatska suite profile and occurrence of quartz metaconglomerates, which are the main diagnostic features for the Skeliuvatska suite. However, the results of the geological formation analysis of the conglomerate-bearing beds of the Kryvbass reveals that in the lower part of the section of Kryvyi Rih series there are two types of metaconglomerates which differ in compositions and the formation conditions: schistic and oligomictic. The former belong to the metaconglomerate-schist formation, which corresponds to the volume of the Novokryvorizka suite according to a new interpretation [3], and the latter – to metaconglomerate-sandstone-schist formation, which is the metaterrigeneous part of the Skeliuvatska suite [4, 5].

Objectives of the article. Based on the analysis of suite sections and application of methods for paleotectonic reconstructions, the work aims at researching structural features and the relationship of the bedding character of Novokryvorizka and Skeliuvatska suites.

Presentation of the main research and results. Novokryvorizka suite is well exposed in the eastern part of the Kryvyi Rih structure, to the south of the Devladivska fault zone, as well as in the region of the Main Synclinorium closure, in the Tarapakovskyi-Lykhmanivskyi section and in the area of the Tarapakovskyi-Lykhmanivskyi structure closure (Fig. 1). This Suite is generally composed of chlorite-bearing (quartz-chlorite, quartz-sericite-chlorite, chlorite-biotite, amphi-

bole-chlorite), biotite-amphibole and biotite-quartz schists. Quartz-amphibole-biotite, garnet-amphibole-biotite schists, metasandstones cemented with chloritic matrix and schist metaconglomerates are subordinate. The characteristic feature of the Novokryvorizka suite is lateral compositional variability and a constant presence of chlorite-bearing schists in its section.

In the western part of the Main structure closure the section of the suite is composed of alternating biotite-amphibole, quartz-biotite and chlorite-biotite schists with minor quartz-sericite and quartz-sericite-chlorite varities (Fig. 2). Amphibole-bearing schists constitute up to 40–50 % of the suite volume, forming the beds of thickness between 4 and 7 m with a gradual decrease

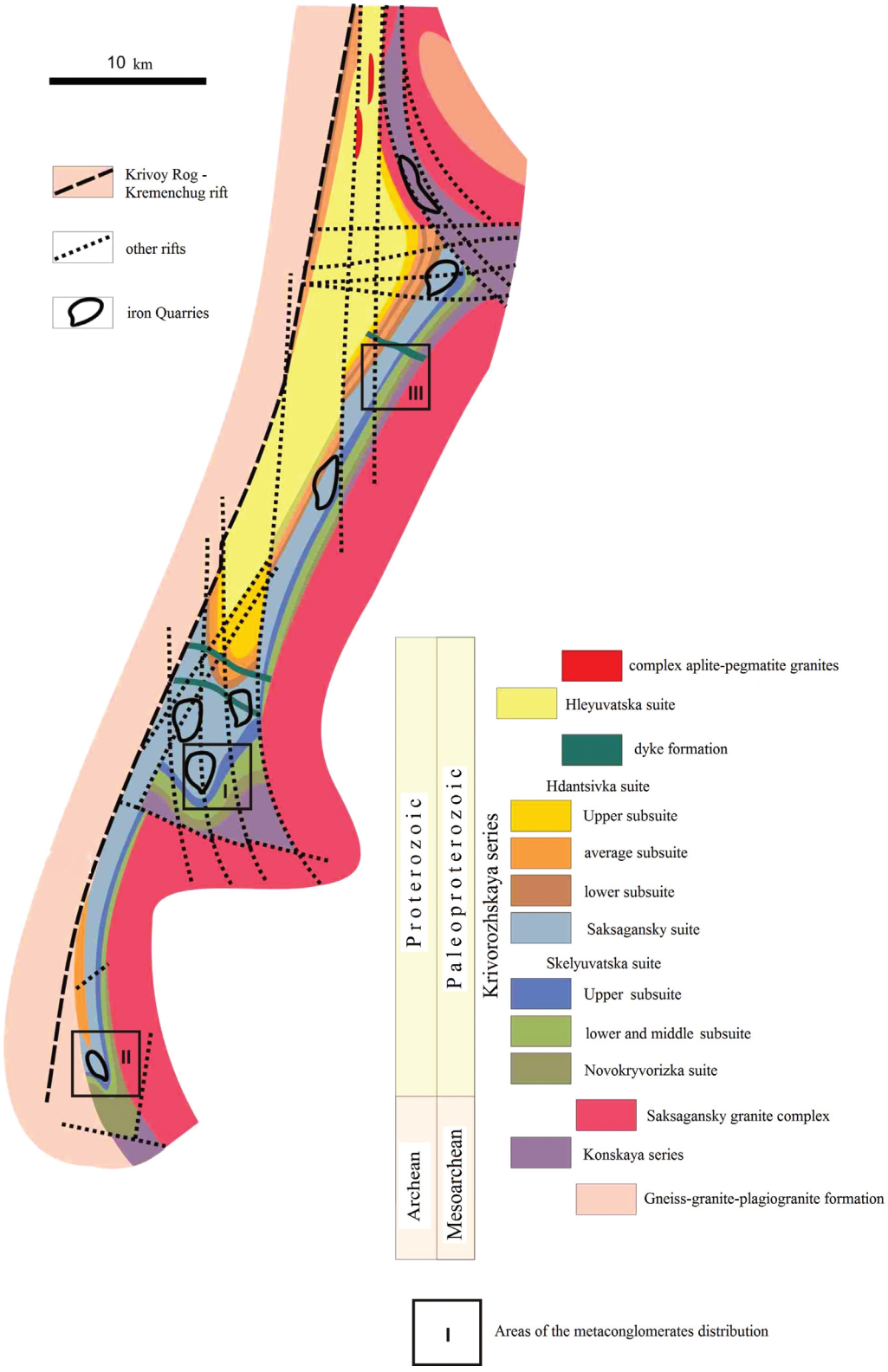

Fig. 1. Dissemination of metaconglomerate on the territory of Kryvyi Rih structure

towards the upper part of the section. These are fine-grained rocks composed of 70 % of bluish-green hornblende with many inclusions of quartz, plagioclase and biotite. The rock texture is banded, whereas the structure is poikiloblastic. Quartz-biotite varities forming beds of thickness between 2 and 5 m are strictly associated with these rocks. They are represented by fine-grained dark grey and black rocks of lepidogranoblastic structure. In general, biotite undergoes chloritization and occupies 40–50 % of the rock volume. Quartz and plagioclase occur in the same quantities: 25–30 %. Plagioclase is sericitised and contains small quartz inclusions which are of spherical or sometimes needle-like shapes. Quartz is anhedral and sometimes shows rounded grain edges. There also occur single crystals of hornblende, which are petrographically similar to the hornblende form of the above mentioned schists.

Biotite-chlorite schists are distributed in all levels of the suite section in form of 1–4 m beds; however, they are more characteristic of the upper part, where they occur in association with quartz-sericite schists and quartz metasandstones. Their main rock-forming minerals are quartz and biotite, which occupy up to 75–80 % of the rock volume; however, chlorite prevails quantitatively.

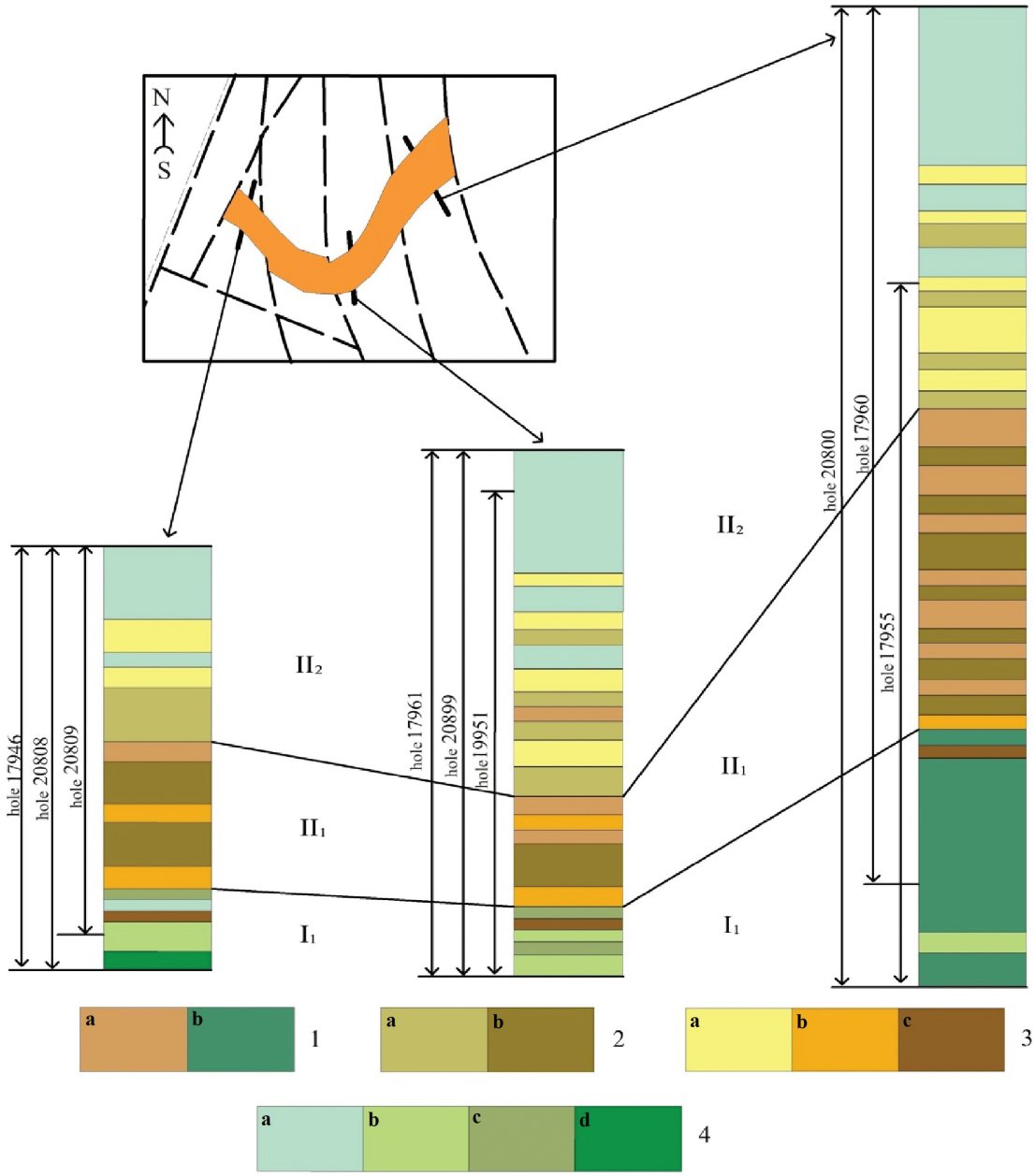

Fig. 2. Correlation of the sections of the western part of the Main closure of the Kryvyi Rih structure:

1 – metaconglomerates: a – oligomictic, b – schistic; 2 – metagravelites: a – quartz, b – feldspar-quartz; 3 – metasandstones: a – feldspar-quartz, b – quartz c – polymictic cemented with chlorite; 4 – schists: a – quartz-sericite, b – quartz-biotite-chlorite, c – garnet-chlorite-biotite, d – quartz-hornblende-biotite; Geological formations: I – metaconglomerate-schist (Novokryvorizka suite); II – metaconglomerate-sandstone-schist (Skeliuvatska suite): II_1 – metaconglomerate-gravelite-sandstone subformation, II_2 – metagravelite-sandstone-schist subformation

Quartz-sericite schists, which occupy up to 5–7 % of the section volume, occur in minority within the Suite.

In the upper part of the Suite section, 10–20 cm thick beds of fine-grained metasandstones are found in the association with schists. Their quantity and thickness increase towards the top of the Suite section.

Depending on the spatial distribution of the above mentioned rock varieties, the Suite section in the western limb of the Main Synclinorium, where its thickness does not exceed 50 m, is divided into three parts: lower, middle and upper. The lower part is characterized by amphibole-bearing, quartz-biotite and chlorite biotite schists association. The middle part is composed of paragenesis: chlorite-biotite and quartz-biotie schists. The latter, upper part comprises alternating quartz-sericite-biotite, chlorite-biotite sometimes with garnet, schists and oligomictic metasandstones.

The section in the central region of the Main Structure closure is composed mostly of biotite-amphibole schists, which unlike the schists of the western region, contain actinolite. However, regarding other mineralogical and petrographical features, they are similar to the schists from the western region. These schists in the suite section form beds of thickness ranging between 5 and 10 m and are separated by layers of quartz-biotite and biotite-chlorite varieties. Their thickness increases towards the top of the section from 0.5 up to 1.5–2.0 m. This association is overlain by a 30 m bed composed of biotite-quartz schists with intercalations of chlorite-biotite and chlorite-biotite-quartz varieties 0.1–1.5 m thick. The association of chlorite-biotite, chlorite-biotite-quartz schists and oligomictic metasandstones terminates the suite section. These mentioned rocks are similar to those mentioned above in terms of mineralogical and petrographical features. The thickness of the Suite in the given part of the Main Structure closure reaches 130–150 m.

Similar compositional features are typical of the Suite section in the Saksahanskyi interval (eastern limb of the Kryvyi Rih Structure) and Tarapakovskyi-Likhmanovskiy interval, and also in the region of Inguletskiy iron quartzite deposit (Lykhmanivskiy Synclinorium). The exception is the section of the eastern part of the Main Structure closure, due to presence of schistic metaconglomerates, which form 130–140 m thick bed in the lower part of the Suite section. The clastic material of the metaconglomerates comprises, in 80–90 %, poorly or medium sorted fragments of chlorite-quartz, chlorite-amphibole, chlorite-sericite-quartz, sericite-quartz schists, which are similar to those from the above described profiles in terms of mineralogical and petrographical features. In the composition of the metaconglomerates there also occur single clasts of vein quartz, quartzites, mafic effusive rocks and amphibole schists. The matrix cementing these clasts is sandstone of variably-sized grains, which are composed of quartz, feldspar, garnet and carbonates. These clasts are cemented with chlorite-sericite material. Regular change in the proportion of chlorite to sericite content is typical for the section. In the lower part of the bed, chlorite prevails within the matrix, whereas in the upper part sericite dominates. This trend is also reflected in the composition in the metaconglomerates. The metaconglomerate beds from the lower part of the section are medium and coarse-grained with clasts of diameters from 2–3 to 5 cm. Towards the top of the section the diameter of the clasts decreases, simultaneously the quantity of the vein quartz and quartzite clasts increases and the amount of clastic material in the rock volume decreases from 80–85 % in the lower part of the bed to 60–70 % in the upper part.

The metaconglomerates are underlain by fine-grained, weakly banded chlorite-quartz, chlorite-amphibole and amphibole-chlorite schists. Similar schists with scarce inclusions of coarse clastic material are also found in the middle of the lower part of the metaconglomerate series, in which they form layers of thickness varying between 0.5 to 1.0 m. This indicates rhythmic internal composition of the profile. According to mineralogical and petrographical features, the schists are similar to those which contain clastic material and, as mentioned before, to the schists which were described above.

The suite section at Lenin mine (Saksahanskyi interval) features a similar composition; it also contains schist conglomerates. The only difference is that here the suite thickness reaches a few dozens of meters, whereas in the eastern part of the closure it ranges between 300 and 350 m.

Rocks of the suite have been metamorphosed in greenschists facies (Saksahanskyi region of the Kryvyi Rih structure) and epidote-amphibolite facies (Southern region) [4, 6].

Skeliuvatska suite outcrops in the eastern part of the Kryvyi Rih structure, to the south of the Devladivska fault zone. It includes oligomictic metaconglomerates, quartz and felspar-quartz metasandstones, quartz-biotite, quartz-sericite-biotite, sericite-biotite schists, which are conventionally known as phyllites [6].

Depending on the relative proportions of the major and minor rock types, the profile of the metaterrigeneous suite is divided into two subsuites: the lower and the upper.

The lower subsuite is represented by rocks showing the regressive transition within the profile. They are quartz metasandstones, metagravelites and metaconglomerates, which reflect two- or three-component rhythms of higher orders. The former include metasandstones and metagravelites typical of the lower part of the subsuite, whereas the rhythms composed dominantly of metasandstones, metagravelites and metaconglomerates are typical of its middle and upper parts. The most complete section of the subsuite has been opened up in many boreholes in the Main Structure closure in the Kryvbass, and also in many outcrops along the banks of the Inhulets River in the region of workers' settlement of the Pivdennyi Ore-Dressing Integrated Plant.

In the region of the Main Structure closure, two types of subsuite profiles are observed. They differ in the quantitative, relative proportions of the rock types. The sections of the western and central parts of the closure include metagravelites, which form 1–40 m thick bed and are separated by layers of metasandstones and

metaconglomerates. The metagravelit + metasandstone association is more characteristic of the lower part of the subsuite section, in which metasandstones are present in form of layers of thickness increasing towards the top from 1 to 3 m. In the same direction the thickness of the metagravelite layers increases; they are quantitatively enriched in gravel-sized clastic material from its base (50 % of the rock volume) to the top (70–80 %). At the same time, inclusions of pebbles are observed in metagravelites and their amount also increases towards the top of the section. The metagravelites are gradually replaced by metaconglomerates.

The metaconglomerates form beds and lenses of thickness ranging from 1 to 7 m in the upper part of the subsuite section. The contacts between them and the metagravelites, as already mentioned, are gradual. In most cases the metaconglomerates are interbedded with thin layers (from 0.1–0.2 to 1 m) of fine- to medium-grained metasandstones. Contacts between them are sharp and clear.

The gradual transition from the base to the top of the section of the metagravelite-metasandstone association reflected in metaconglomerat+metagraelit±m etasandstone paragenesis is indicative of the regressive character of the deposition.

The subsuite thickness in the western and central parts of the Main Structure closure is alternating from 25 up to 50 m.

The characteristic feature of the eastern part of the closure is increase in the thickness up to 120–140 m and the quantity of metaconglomerates, which here comprise around 50–70 % of the section volume, compared to 10–15 % in the central and western parts of the structure. The subsuite includes association of metagravelites and metaconglomerates, which form a bed of thickness from 2–10 (metaconglomerates) up to 20 m (metagravelites). Metasandstones occur as minority and form thin (tens of cm) layers and lenses. In the lower part of the section, the metagravelites prevail quantitatively over the metaconglomerates, whereas in the upper part conversely the metaconglomerates prevail. This fact emphasizes the regressive character of the deposition.

The similar compositional features are typical of the subsuite sections in other regions. However, the metaconglomerates are present only in the sections of the Lykhmanivska Structure closure (Inhuletske iron quartzite deposit) and in the region of the deposits mined by Lenin and R. Liuksemburg mines. Within the Tarapakivsko-Lykhmanivskyi region and in the Saksahanskyi region (between the Ilich and Libknekhta mines and to the south of Lenin mine) the subsuite is composed of metagravelite-sandstone association and this suggests local distribution of metaconglomerates and their facial replacement along the strike by metagravelites and metasandstones.

The upper subsuite differs from the lower subsuite and is characterized by the transgressive type of the section. Its base consists of paragenesis of metagravelites + metasandstones ± metaconglomerates, whereas its top includes metasandstone + phyllite schist + metagravelite association. The lower part of its profile is composed of alternating beds of metagravelites and metasandstones with minor fine-grained metaconglomerates, which form thin (from tens of cm to 2 m) layers and lenses.

Upwards the section, the quantity of metasandstones increases, the thickness of metagravelites decreases and they are gradually replaced by phyllitic schists, whereas the metasandstone + metagravelite association is replaced by metasandstone + phyllite schist paragenesis. Moreover, the quantity of metasandtones gradually decreases upwards the section and its upper part is represented by a bed of phyllitic schists.

The subsuites differ not only regarding their profile types (regressive or transgressive) but also in respect of the mineralogical and petrographical features of the rocks.

The upper subsuite is composed of fine-grained feldspar-quartz metasandstones. They contain 80 % quartz clasts, 10–15 % microcline and albite clasts and around 5–10 % clasts are microquartzites and mica quartzites. The clasts are cemented with quartz-sericite matrix.

The major part of the profile of the upper subsuite consists of dark grey phyllitic schists. The major rock-forming minerals are sericite, quartz and biotite. Depending on proportions of the constituents, their compositional varieties are divided into: quartz-sericite, quartz-biotite, quartz-sericite-biotite, biotite, and biotite-quartzite. These rocks also contain chlorite, tourmaline, opaque minerals (pyrite and pyrrhotite). According to the petrochemical analyses, the schists correspond to metamorphosed aleurite-argillite and clay rocks [6].

One of the diagnostic features of the suite is metaconglomerates. They are classified as fine-, medium-, coarse-grained depending on the size of the clasts. Fine- and medium-grained metaconglomerates are characteristic of the lower part of the sections of the lower and upper subsuites. The clast size varies between 0.5 and 2.0 cm. Their shapes are isometric, elongated and they are medium or well rounded. The content of the clastic material does not exceed 40–60 % of the rock volume. Generally, the fine-grained varieties are gradually replaced by medium-grained of sizes 2.0–3.5 cm. In these varieties clasts are very well rounded and of elongated and spindle-shaped forms. In the coarse-grained metaconglomerates medium size of the clasts along the elongated axis varies between 5 and 7 cm, but also boulders of 10–20 cm are encountered. Shape of these clasts is exclusively fusiform. Within medium- and coarse-grained varieties quantity of the clastic material reaches 70–80 % of the rock volume. The elongated axes of these clasts are oriented in the dipping direction of the rocks with sharp ending oriented towards one direction, which looks like a tile in a planar view.

The metaconglomerates are very similar in composition and contain quartz, quartzites, metasandstone, metagravelite and schist clasts. Clasts of quartz and quartzite dominate and occupy up to 70–80 % of the clast volume. It is worth mentioning that the quantitative ratios in fine- and medium-grained metaconglomerates are roughly the same with minor (10 %) deviations in one direction or another, whereas in the

coarse-grained metaconglomerates the quartzite clasts prevail and occupy up to 50–80 % of the clasts volume.

Quartz from the clasts comes mostly from veins. Light grey, grey, white and dark grey quartz clasts occur. All these color quartz clast varieties are rather randomly scattered; however, poor regularity is observed in the distribution of the dark grey quartz clasts. Lower parts of medium- and fine-grained metaconglomerate beds are enriched in the dark grey quartz clasts.

Clasts of quartz-sericite and sericite-quartz schists occupy around 10–25 % of the clastic material volume.

The metaconglomerates contain rounded clasts of metagravelites in minor quantities (2–3 % of the clasts volume). The grit within them consists of monomineral quartz cemented with a quartz-sericite matrix.

The least abundant in the metaconglomerates are clasts of metamorphosed mafic effusive rocks, which were observed only in a few cases.

The matrix of the metaconglomerates is metasandstone, which is similar to metasandstones forming beds and lenses within the Suite according to mineralogical, petrographical and petrochemical features. The major rock-forming minerals of the matrix are quartz and sericite with subordinate biotite and chlorite. The exceptions are these areas where the metaconglomerates overlie directly the schist conglomerates of Novokryvorizka suite (eastern part of the Main Structure closure and region of the deposit mined by Lenin mine).

Conventionally, the chlorite-bearing schists are known as the weathering products of the metabasites [1]. However, the above analysis of Novokryvorizka suite profile shows an alteration of the several chlorite-bearing schist varieties and metasadstones to be an integral unit, in which the chlorite is dominating in the matrix. This fact is not in an agreement with the hypothesis that these rocks are the weathering products but it favors the marine deposition environment. Analysis of the elements, which are indicative for the depositional environments [6, 7], shows that the sedimentation took place in a marine basin (Table 1). The source of the psammite-pelitic material for the formation of schists and metasandstone suite were weathered metabasites of Kryvyi Rih region. The process of re-deposition of the metabasite weathering products was triggered by the initiation of tectonic activity of the Kryvyi Rih stage, which took place after the formation of the metavolcanic-sedimentary greenstone Middle Dniprean Complex [4] and it was manifested within Kryvyi Rih region by sharp and short subsidence of the paleobasins seafloor. This point of view is supported by low thicknesses of the sections of Novokryvorizka suite and a very low maturity of the primary sedimentary material comprising the chlorite-bearing schists. The latter is favored by the ratios $Al_2O_3 : Na_2O$ and $K_2O : Na_2O$, which are, respectively, 22.04 and 2.96, and are related to areas with relatively active tectonic regimes [6].

Schist metaconglomerates, which are strictly associated with the chlorite-bearing schists and metasandstones cemented with the chloritic matrix, were formed in similar graben-like structures due to disintegration of the schsits by density currents and gravitational processes, which are indicated by angular and poorly rounded shapes of the schist clasts.

Table 1

Ratios of element-indicators and facial conditions for deposition environments of rocks of Novokryvorizka suite

Rock and the element indicators	The value of the ratio of contents of elements	Conditions of deposition
Quartz-biotite-chlorite, quartz-sericite-chlorite schists		
Al : Ti	12.8	marine
Zr : Cu	2.76	marine
V : Cu	4.00	marine
V : Zr	1.81	marine
Chlorite-amphibole, amphibole-chlorite schists		
Zr : Cu	1.65	marine
V : Cu	4.29	marine
V : Zr	2.60	marine

The dominance of high maturity quartzite metasandstones in the upper part of the suite and gradual increase in their thickness upwards the profile with simultaneous decrease of the chlorite content within their matrix, suggest relative tectonic stabilization of the region at the end of the suite deposition. Mineralogical and petrographical investigation of the mentioned metasandstones showed that they are similar in composition and structure to the metasandstones of the lower part of Skeliuvatska suite profile. This fact is evidence of continuous deposition of metaterrigeneous sediments of two stratigraphical units. In areas where schist metaconglomerates are developed the content of the schist clasts gradually decreases upwards the section, whereas the content of the quartz vein clasts increases. Simultaneously, the content of chlorite within the matrix decreases in the same direction. The chlorite is displaced by quartz, which together with sericite is the major rock-forming component of the matrix of the metaconglomerates from the lower part of the subsuite, which belongs to Skeliuvatska suite [8]; this fact also infers a gradual replacement of rock associations of Novokryvorizka Suite by parageneses of Skeliuvatska suite.

The stage of regional tectonic stabilization, which began during the finalization of deposition of Novokryvorizka suite continued during sedimentation of the lower subsuite of Skeliuvatska suite. It is proved by the oligomictic composition of terrigenic material of the latter and supported by the coefficients of weathering intensity (W) and sedimentary differentiation (d) of different types of zones of tectonic regimes (Table 2) developed by O. A. Predovskyi. The analysis of these factors shows that the stabilization regime was moderately changeably activated during the deposition of the rock parageneses of the upper subsuite of Skeliuvatska suite, i. e. at the transition between the regression of the Skelevatskyi paleobasin, which took place during the forma-

Table 2

Comparison of the approximate quantitative estimates of weathering intensity and degree of sedimentary differentiation of metasedimentary deposits of various paleotectonic regimes within the Skeliuvatska suite

Types of zones of tectonic regimes	Standard indicators		Indicator of Skeliuvatska suite formation	
	W	d	W	d
Stabilized subsidence	80	17	96*	–
Moderately active subsidence	58	2.4	79**	2.55
Average and strongly active subsidence	40	1.6	–	–
Moderately active uplifting	48	1.6	–	–

Footnote: W – weathering intensity; d – degree of sedimentary differentiation; * the lower subsuite; ** the upper subsuite

tion of rock associations of Novokryvorizka suite and the lower subsuite of Skeliuvatska suite, and transgressive conditions, during which there was accumulation of rocks of the upper subsuite. Increased significance of the tectonic activity at the time of deposition of the rock parageneses of the latter is also proved by a low degree of maturity of pelitic material of the phyllite-like schists (Al_2O_3 : Na_2O = 23.3; K_2O : Na_2O = 6.85) and by an increase in the Al-Si module from 0.07 (metasandstones of the lower subformation) up to 0.09 for psammites and 0.32 for pelites of the upper subsuite. This fact indicates a relatively high degree of differentiation of psammites from the lower subsuite. The degree of maturity of sedimentary material gradually increased from Novokryvorizka suite towards the upper subsuite of Skeliuvatska Suite. This fact may also support the conformable boundary between these stratigraphic units.

The metaconglomerates of Skeliuvatska suite refer to the inter-formational conditions rather than basal as it is traditionally considered.

This assumption is not only indicated by their position within the profile, confined to the border of two micro-cycles of the transgressive-regressive macrocycle, but also by their paragenetic relation with other rocks of the suite [6], which is also a confirmation of the continuous accumulation of rock associations of Novokryvorizka and Skeliuvatska suites.

Conclusions. The composition of the profiles of the Novokryvorizka and Skeliuvatska suites combined with paleotectonic and paleoenvironmental features of the rock association deposition shows the conformable character of their contact and excludes the assumption that the metaconglomerates refer to the basal formations.

References / Список літератури

1. Yesypchuk, Yu. K., Bobrov, O. B. and Stepaniuk, L. M., 2004. *Koreliatsiina khronostratyhrafichna skhema rannioho dokembriiu Ukrainskoho shchuta* [Correlative chrono-stratigraphic scheme of Early Precambrian Ukrainian Shield]. Kyiv: UkrDGRI.

Кореляційна хроностратиграфічна схема раннього докембрію Українського щита / [Єсипчук Ю. К., Бобров О. Б., Степанюк Л. М. та ін.] – К.: УкрДГРІ, 2004. – 30 с.

2. Paranko, I. S. and Matishchuk, O. A., 2014. To the question of stratigraphic dismemberment of Skeliuvatska Suite of Kryvyi Rih series. *Zbirnyk naukovykh prats of UkrDHRI,* No. 1, pp. 140–150.

Паранько І. С. До питання про стратиграфічне розчленування скелюватської світи Криворізької серії / І. С. Паранько, О. А. Матіщук // Збірник наукових праць УкрДГРІ. – 2014. – № 1. – С. 140–150.

3. Paranko, I. S., Butyrin, V. K. and Kozar, M. A., 2005. To the question of stratigraphic dismemberment of meta-volcanic sediments of Kryvyi Rih structure. *Mineralni resursy Ukrayiny*, No. 3, pp. 35–40.

Паранько І. С. До питання про стратиграфічне розчленування метавулканогенно-осадових відкладів Криворізької структури / І. С. Паранько, В. К. Бутирін, М. А. Козар // Мінерал. ресурси України. – 2005. – № 3. – С. 35–40.

4. Paranko, I. S., 2005. Formational types of Proterozoic stratigraphic complexes of the Ukrainian shield. *Visnyk L'vivs'koho universytetu. Seriya heolohichna*. Vol. 19, pp. 100–110.

Паранько І. С. Формаційні типи стратигенних комплексів протерозою Українського щита / І. С. Паранько // Вісник Львівського університету. Серія геологічна. – 2005. – Вип. 19. – С. 100–110.

5. Deriabin, N. I., 2008. About the Skelevatska suite (complex) of Kryvbas. *Heolohichnyy zhurnal*, No. 2, pp. 100–107.

Дерябин Н. И. О скелеватской свите (комплексе) Кривбасса / Н. И. Дерябин // Геологічний журнал. – 2008. – № 2. – С. 100–107.

6. Matishchuk, O. A., 2016. Paleogeographic peculiarities of the formation of a conglomerate enclosing strata of Kryvyi Rih structure. *Zbirnyk naukovykh prats of UkrDHRI,* No. 1, pp. 48–64.

Матіщук О. А. Палеогеографічні особливості формування конгломератовміщуючих товщ криворізької структури / О. А. Матіщук // Збірник наукових праць УкрДГРІ. – 2016. – № 1. – С. 48–64.

7. Deriabin, N. I., 2008. Once again about the formation of the rock of Kryvyi Rih structure. *Heolohichnyy zhurnal*, No. 1, pp. 102–110.

Дерябин Н. И. Еще раз о формировании пород Криворожской структуры / Н. И. Дерябин // Геологічний журнал. – 2008. – № 1. – С. 102–110.

8. Pokaliuk, V. V. and Sukach, V. V., 2014. Sedimentation in the Early Precambrian kryvbas: lithogeochemical types and MINLITH-normative composition of metasediments. *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu*, No. 6, pp. 5–14.

Покалюк В. В. Седиментогенез в раннем докембрии Криворожского железорудного бассейна: литохимические типы и MINLITH-нормативный состав метаосадков / В. В. Покалюк, В. В. Сукач // Науковий вісник НГУ. – 2014. – № 6. – С. 5–14.

Мета. Дослідити особливості будови та взаємовідношення характеру залягання новокриворізької та скелюватської світ.

Методика. Авторами використовувався аналіз розрізів світ, польові дослідження. Результати геохімічних аналізів були використані для визначення величини відношення вмісту елементів-індикаторів та фаціальних умов осадконакопичення порід, кількісних оцінок інтенсивності вивітрювання та ступеня осадової диференціації метаосадових відкладів різних палеотектонічних режимів з метою палеотектонічної реконструкції.

Результати. Результати геолого-формаційних досліджень конгломератовмісних товщ Кривбасу вказують на те, що в нижній частині розрізу Криворізької серії присутні два різних за складом та умовами утворення типи метаконгломератів – сланцеві та олігоміктові. Перші є складовою метаконгломерат-сланцевої формації, котра відповідає обсягу новокриворізької світи в сучасному її трактуванні, а другі – метаконгломерат-пісковиково-сланцевої, що об'єднує метатеригенну частину розрізу скелюватської світи. Розріз верхньої частини новокриворізької світи репрезентований асоціацією різноманітних за складом хлоритових сланців і кварцових метапісковиків з підпорядкованим поширенням сланцевих метаконгломератів. При цьому кількість прошарків метапісковиків і їх потужності збільшуються вгору за розрізом. Нижня частина розрізу скелюватської світи представлена ритмами, складеними парагенезисом метапісковик + метагравеліт. При цьому метапісковики залягають в основі ритмів і за мінеральним складом та структурно-текстурними особливостями аналогічні метапісковикам верхньої частини розрізу новокриворізької світи. Це вказує на поступовий перехід між зазначеними світами та спростовує припущення щодо базального характеру кварцових метаконгломератів скелюватської світи, так як вони властиві для її центральної частини розрізу, де беруть участь у будові ритмів, складених асоціацією метапісковик ± метагрівеліт + метаконгломерат. Тобто, розріз низів скелюватської світи має не трансгресивний, як вважається, а регресивний характер.

Наукова новизна. Був досліджений характер контакту новокриворізької та скелюватської світ, порівняні особливості їх речовинного складу та палеотектонічні особливості їх формування

Практична значимість. Результати дослідження можна використовувати для стратиграфічного розчленування розрізів; методики, використанні у статті, можна використовувати для палеотектонічних реконструкцій

Ключові слова: *світа новокриворізька, скелюватська, Криворізька серія*

Цель. Исследовать особенности строения и взаимоотношения характера залегания новокриворожской и скелеватской свит.

Методика. Авторами использовался анализ разрезов свит, полевые исследования. Результаты геохимических анализов были использованы для определения величины отношения содержания элементов-индикаторов и фациальных условий осадконакопления пород, количественных оценок интенсивности выветривания и степени осадочной дифференциации метаосадочных отложений различных палеотектонических режимов с целью палеотектонической реконструкции.

Результаты. Результаты геолого-формационных исследований конгломератсодержащих толщ Кривбасса указывают на то, что в нижней части разреза Криворожской серии присутствуют два различных по составу и условиям образования типа метаконгломератов – сланцевые и олигомиктовые. Первые являются составляющей метаконгломерат-сланцевой формации, которая соответствует объему новокриворожской свиты в современной ее трактовке, а вторые – метаконгломерат-песчаник-сланцевой, которая объединяет метатеригенную часть разреза скелеватской свиты. Разрез верхней части новокриворожской свиты представлен ассоциацией различных по составу хлоритовых сланцев и кварцевых метапесчаников с подчиненным распространением сланцевых метаконгломератов. При этом количество слоев метапесчаников и их мощность увеличиваются вверх по разрезу. Нижняя часть разреза скелеватской свиты представлена ритмами, сложенными парагенезисом метапесчаник + метагравелит. Метапесчаники залегают в основе ритмов и по минеральному составу и структурно-текстурным особенностям аналогичны метапесчаникам верхней части разреза новокриворожской свиты. Это указывает на постепенный переход между указанными свитами и опровергает предположение о базальном характере кварцевых метаконгломератов скелеватской свиты, так как они характерны для ее центральной части разреза, где участвуют в строительстве ритмов, сложенных ассоциацией метапесчаник ± метагравелит + метаконгломерат. То есть, разрез низов скелеватской свиты имеет не трансгрессивный, как считается, а регрессивный характер.

Научная новизна. Исследован характер контакта новокриворожской и скелеватской свит, сравнены особенности их вещественного состава и палеотектонические особенности их формирования.

Практическая значимость. Результаты исследований можно использовать для стратиграфического расчленения разрезов; методики, данные в статье, можно использовать для палеотектонических реконструкций.

Ключевые слова: *свита новокриворожская, скелеватская, Криворожская серия*

Рекомендовано до публікації докт. геол. наук А. А. Березовським. Дата надходження рукопису 01.12.15.