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LATE LOWER CAMBRIAN AND MIDDLE CAMBRIAN SEDIMENTARY SECTIONS OF THE MAYAZHON AND ATHEY SUITS OF THE SHYNGYZ RANGE (EAST KAZAKHSTAN)

Abstract. There are descriptions of the Late Lower Cambrian and Early Middle Cambrian sedimentary sections of the Mayazhon (Arkalyk zone) and the Athenian (Kanshyngyz zone) suites, that located within the Shyngyz Range (East Kazakhstan). Each section is accompanied by a layer-by-layer investigation with an illustration of schematic geological maps and lithologic-stratigraphic columns with found location of fauna and vertical expansion with reference to production rate, which allows us to trace the change of fauna complexes within the researched aqueous part of the section. The annexes authors of the trilobite fauna lists have significantly expanded compared to the previous ones, which allows more accurate dating of the age of the host rock within stated age interval. In the time following the research data will allow to take correlation with abutting regions.

Keywords: stratigraphy, Mayazhon suite, Athey suite, late lower and lower middle Cambrian.

Introduction. According to the grant program "Compilation and publication of the Atlas of key geological sections and the Phanerozoic stratotypes of Kazakhstan", it was necessary to find the Cambrian key sections in the Shyngyz range territory (East Kazakhstan), because the region is considered to be a widely developed paleontologically characterized sediment of all three Cambrian systems (Decisions of the I, II and III Kazakhstan stratigraphic meetings) [1-3]. In this regard, from 1997 to 2005, in the entire territory of the Shyngyz range, including the closed area of the Semipalatinsk Nuclear Test Site, the regional geology group of the IGN n.a. K. I. Satpaev conducted review works for the establishment of areas covering all departments of the Cambrian system. As a result, the sections of the Balkybek suite of the lower Cambrian, the Mayazhaon (Koksengir) suite of the late lower Camberian - lower middle Cambrian age, the Athey suite of the middle Cambrian and the Chingiztau suite of the middle Cambrian upper part were confirmed. Materials of the Chingiztau suite (Ergaliev, Pirogova, 2017 [4]) were published earlier. In this article, we present the Mayazhon and Athey suites sections, because the previous fauna characteristics were neither sufficient nor reliable (especially, single points lacked accurately located reference).

The Mayazhon suite. In 1960, S.S. Kuzmin [5] attributed the volcanogenic-terrigenous-sedimentary deposits of this age in the Arkalyk zone near Mayazhon Mountains, located in the Semipalatinsk test site, to the Koksengir suite, analogous to deposits of the Akshatau zone in the Koksengir tract. Based on results of 1998-2002 work, the layered description of the Cambrian section at the southwestern foot of Mayazhon (figure 1), revealed that sedimentary deposits with interbeds of andesite-containing tuffs predominate in the formation, and tuffs of andesite porphyrites with subordinate layers of terrigenous rocks predominate in the Akshatau zone. At the International Stratigraphic Conference in 2002, G.K. Ergaliev [6] proposed to rename the sediments of the Koksengir suite in the Arkalyk zone to the Mayazhonian (carbonate-terrigenous) suite with a stratotype near the south-western the Mayazhon Mountains foothill.

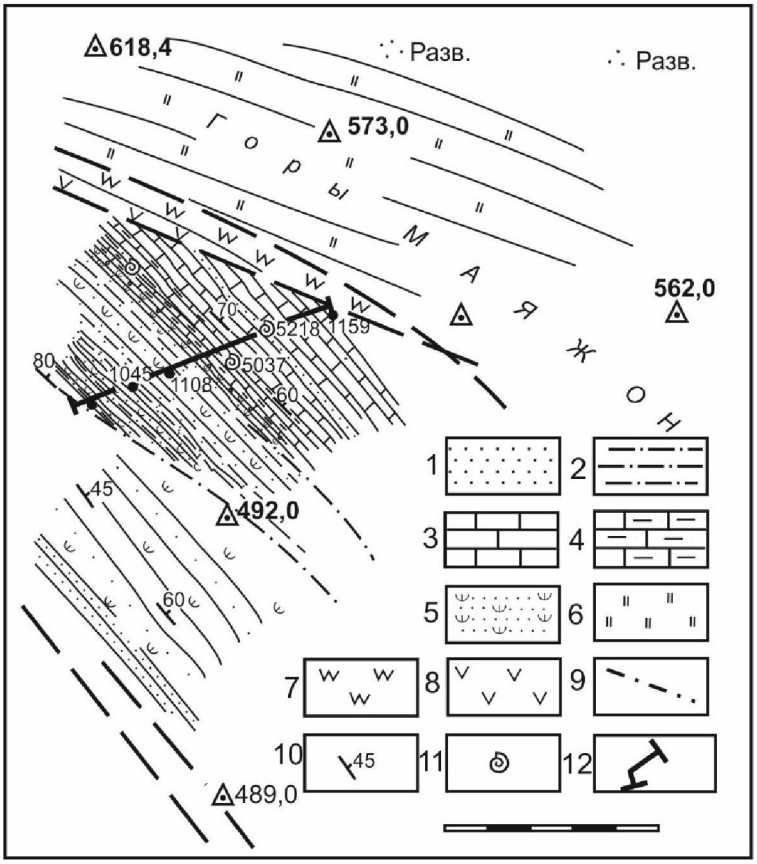

Figure 1 – Schematic geological map of the location of the section of the Mayzhon series at the base of the Mayajon mountains (created by G.K. Ergaliev, T.E. Pirogova):
1 – sandstone, 2 – siltstone, 3 – limestone, 4 – marlstone, 5 – tuff sandstone, 6 – flake jasper, 7 – silicified rock, 8 – andesine, 9 – faulting, 10 – angle of layers slope, 11 – fauna point location, 12 – key section line

The suite section is located 46 km north of the Degelen mountains about 800 m to the south-west of the Mayazhon mountains and 1.3 km to the south-west from the 492.0 peak. The section was described along the north-eastern slope of the dry dell.

As shown in figure 2, the suite is composed of argillitic siltstones, silt-sandstones, volcanomictic greywacke sands, medium-composition tuffs. In the upper part fine-grained limestones are exposed. The trilobites and brachiopods complex are characterized by rock pertaining to the upper part of the Toyonian lower reaches of the Amginian stage. The suite boundaries have indistinct character.

1. Green dense siltstones, sometimes turning into argillitic siltstones, with layers of compact-grained greywacke sandstones. Siltstones make up layers from 2 cm to 10-15 cm, sandstones make up 1-1.5 cm layers. Siltstones are usually an integral thin and shallow horizontal layering, rare intervals of massive rocks. D.a. 53°, degree of dip 85 ° ……..15.9 m

2. The alternation of very thin layers of green tuff siltstone and basaltic psammite tuffs and less often tuff-sand (tephroids). The thickness of the layers of tuff siltstone is up to 1.5-2 cm. The simple uniform horizontal layering predominates. Low angle wavy and asymmetric wavy layering and landslide texture are occurred rarely. The upper boundary is gradual. D.a. 10 °, degree of dip 85-90°.....25 m

3. Psammitic basaltic lithic-crystal tuff, that rusty-brown and greenish-gray on the weathered surface and green in a fresh fault, with inclusions of gravel crystal clastic and lithic-crystal debris. Among them, rare thin layers of tuff siltstone with a thickness of up to 1 cm. In 19.8 m and 20.7 m from the base of the bed among the psammitic rocks, laminated and irregular elongated fragments of tuff siltstone were encountered. Thin horizontal layering is often in combination with landslide textures. The upper boundary is gradual. D.a. 30°, degree of dip 48-50 ° .....25.7-27 m

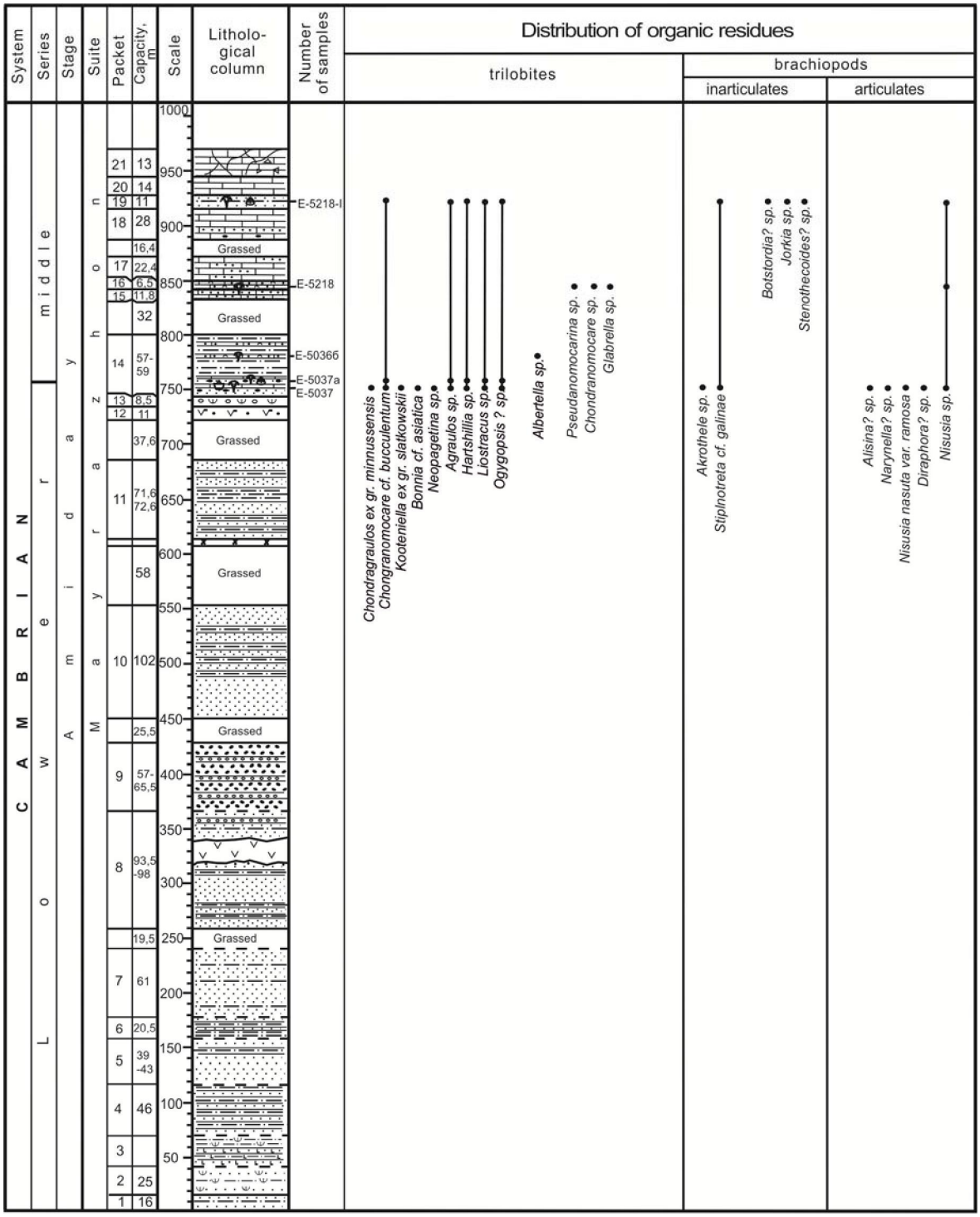

Figure 2 – Lithostratigraphic column of the Mayzhon suite of the lower part of the Middle Cambrian with vertical distribution of organic remains (legend to column is described in figure 1)

4. Uneven alternation of green layers of more often fine-grained sandstones and dense siltstones. Potassium feldspar are present in the fragmental components of the sandstones. The thickness of the sand layers is 0.5-18 cm, siltstones is 0.1-12 cm. The thin horizontal layering is combined with landslide and rarely brecciated, sometimes cross-bedded textures. Lamellar fragments of siltstones of 0.4-3 cm are rarely encountered among sandstones. The dyke-shaped body of altered porphyry basalts was encountered at 20-24.5 m range of exploratory lines.

Rocks d.a.30°, degree of dip 45-70 ° .....46 m

5. Medium-grained greywacke sandstones, that rusty-brownish and green in the weathered surface and green in fresh fault. Potassium feldspar are present in the fragmental components. The lower part is dominated by a massive texture, cross-bedding are rare in occurrence. Rare or single layers of siltstone are up to 1.5 cm thick. Sandstones contain inclusions of irregularly shaped layers typical of gravitational flows. There are rare layers of siltstones above 27 m.

D.a. 35°, degree of dip 60 ° ..... .39-43 m

6. Uneven alternation of layers of green siltstones, fine-grained, medium- and coarse-grained volcanomictic greywacke sandstones. Potassium feldspar are present in the fragmental components of the sandstones. Layering is thin horizontal and gradation. Landslide texture is frequent. Incorrect inclusions of siltstones in sandstones and sedimentary breccias have been encountered at several levels. The upper and lower boundaries are gradual.

D.a. 20 °, degree of dip 70-75 ° .....20.5 m

7. Gray laminated fine-medium-grained quartz-feldspathic greywacke sandstones with rare unevenly distributed layers of siltstones and silty sandstone. Fragmental component of potassium feldspar are present in a sandstones. Layers of sandstones are 10-25 cm thick, siltstones are 0.5-2 cm thick. Thin horizontal layering, massive and landslide texture are present.

D.a. 20 °, degree of dip 75 ° .....61 m

Grassed - 19.5 m.

8. Uneven alternation of a prevailing layers of gray quartz-feldspathic greywacke, the actual volcanomictic greywacke sandstones and siltstones. The thickness of a sandstone layers is 1-15 cm. The thin horizontal layering prevails in combination with the landslide texture. D.a. 20, degree of dip 80°. A small intrusion of euporphyrite andesites is exposed at 61-80.8 m range of exploratory lines, elongated along the strike of the rocks. At 80.8-98.4 m range of exploratory lines among the sandstones small layers of small-scale volcanomictic conglomerates with a thickness of 8-10 cm were encountered .....93.5-98.2 m

9. Greenish-gray and dark-gray volcanomictic gravelites and fine-pebble conglomerates with rounded and subrounded pebbles of altered basalts of 2-8 cm size ..... 57-65.5 m

Grassed – 25.5 m.

10. Uneven alternation of prevailing feldspar greywacke sandstones and siltstones, that greenish-gray and gray-green in a weathered surface and gray in a fresh fault, similar to pl. 8, but they differ in greater thickness. D.a. 345°, degree of dip 45-50° .....102 m

Grassed 58 m.

Dykes debris of greenish-gray metamorphosed amphibole-augite diorites are 5.6 m.

11. Alternation of a predominant siltstones and aleuritic argillites layers (0.3-1.5 cm layers). Among them, rare, but more powerful layers of gray-green heterogeneous volcanomictic and arkose greywacke sandstones in a fresh fault. D.a. 30°, degree of dip 50°. Alternating layers of cleavage siltstones with rare layers of sandstones are in the upper part of a section.

D.a. 70° , degree of dip 75° .....71.6-72.60 m

Grassed – 37.6 m.

12. Greenish-gray psammite and fine-piece lithocrystalloclastic tuffs of andesite basalts. The rocks are in various degrees brecciated and carbonatized ..... 11 m

13. Fine-pebbled tuff-conglomerate with tuff-gravel aggregate. Pebbles of pyroxene basalts are up to 10 cm isometric and elongated, semi-angular and angular form ..... 8.5 m

14. Layers uneven alternation of dark gray siltstones and gray, lilac fine-grained clastic and heterogeneous-grained organogenous-detritus limestones, a number and thickness of the latter increases upwards along the section. The thickness of the limestone layers is 0.6 to 15 cm. Silt-ellipsoidal early diagenetic carbonate concretions with a length of 1-15 cm and a thickness of 0.5-4 cm are present in siltstones. The trilobites and brachiopods fauna found at two levels in siltstones and limestones (E-5037, E-5037a in 10,3 – 11 m from assise foundation): *Neopagetina* sp., *Chondranomocare* cf. *bucculentum* Laz., *Agraulos* sp., *Hartshillia* sp., *Liostracus* sp., *Ogygopsis* ? sp.; brachiopods: *Alisina* ? sp., *Nisusia nasuta* var. *ramosa* Nik., *Narynella* sp., *Diraphora* ? sp.; (E-5036 b in 36.2 m from assise foundation): trilobites *Albertella* sp.

D.a. 50 - 68°, degree of dip 65 - 70° .....57-59 m

Probably, in aleurosandstones of the 14 layer, SS. Kuzmin had previously collected remains of trilobites *Condragráulos minusuensis* Lerm, *Kootenia* sp., *Olenoides* sp. and brachiopod *Nisusia?* sp. and *Billingsella* sp., which were attributed to downmost of the Amginian stage of the middle Cambrian, according to the conclusion of N.K. Ivshin Concerning brachiopods, I.F. Nikitin, O.I. Nikitina identified *Nisusia* cf. *ramosa* Nik., typical for the lower middle Cambrian. Stratigraphically higher, in lilac-gray limestones, trilobites and brachiopods of the lower Cambrian lower basins were also found in poor condition. They allow us to classify the enclosing sediments to the upper part of the early - the lower part of middle Cambrian.

Grassed - 32 m.

15. Light gray, highly laminated fine-grained clastic massive limestones. They contain dark gray isometric and elongated fragments of 0.5-3 cm in size often visible on the weathered surface and in fresh fault, are found in the basal fine-grained matrix.

D.a. 35°, degree of dip 65° .....11.8 m

16. Grayish-greenish organogenic-detrital limestones. At 3 m from the base (E- 5218-I): trilobites: *Pseudanomocarina* sp., *Chongranomocare* sp., *Glabrella* sp.; inarticulate: *Stilphotreta* cf. *galinae* Popov, Holms and Gorjansky, *Botsfordia*? sp., *Yorkia* sp., *Stenothecoides* ? sp. were found .....6.5 m

17. Gray laminated fine-grained limestones, similar to 14 layer, but inclusions of debris are less common. In them, nonlayered homogeneous texture types are present along with detrital, non-homogeneous types. Fault cracks are filled with cream-colored carbonate up to 1-1.5 mm thick ..... 22.4 m

Grassed – 16.4 m.

18. Gray fine-grained limestones, sometimes with clastic structure, with pinkish-red secondary formations, often filling cleavage cracks and forming irregular layers. D.a. 35°, degree of dip 65°. At 5.5 m from the base, creamy silicified concretions of 2-2.5 cm in length are encountered. Sometimes an irregular horizontal and similar layered bedding is seen ..... 28 m

19. Gray-green greywacke sandstones with layers of siltstones and polymictic gravels are up to 9-14 cm thick. The fauna (E-5218) *Chondranomocare* cf. *bucculentum* Laz., *Agraulos* sp., *Hartshillia* sp., *Liostracus* sp., *Ogygopsis*? sp. was collected at 5.1 m from the base. In the layers of siltstones, fragments of isometric and angular shape are visible, and sedimentary breccias are also present .....11 m

20. Gray fine-grained limestones analogous to the 17 layer .....14 m

21. Modified, mostly fine-grained brecciated limestones. Probably they are brecciated along the fault, bounding from the northeast the Mayazhon suite section .....13 m

The suite power is 883 – 904 m.

The trilobite complex of the *Chondrograulos, Kootenia, Neopagetina, Chondranomocare, Agraulos, Hartshillia, Liostracus* and the *Alisina, Nisusia, Narynella, Diraphora* brachiopods indicate that these are typical representatives of the fauna of the upper part of the lower and lower part of the middle Cambrian and they are found everywhere on the Siberian platform and in the Altai-Sayan region in the Toyon and Amginian stages. Probably, the deposits of the terrigenous-tuffaceous part of the section up to 14layer, as shown in Pic. 2, are of lower Cambrian age, from 14 to 21 layers are to the lower part of the Middle Cambrian. As regards the belonging of the trilobite complex to a certain zone, the question remains open until the monographic description of trilobites and the receipt of additional material.

Atheyan suite. Within the Shyngyz range the Athey suit deposits are observed only in the Kan-shyngyz zone [7,8] to the northwest of Athey Mountain at the southern foot of the Zerbkyzyl Mountains, where its parastratotype is established [3, p. 59]. The finds of the trilobite fauna in the Athey tract are known from the late 50s of the last century [1, p. 125]. Earlier N.K. Ivshin [7, p. 133] only listed trilobites from the Athey suite for three isolated points not precisely allocated to the site.

In 2004, K.A. Lisogor published the monograph [8] on collections of geologists L.N. Rakova, V.V. Abramicheva and others, which contain monographic descriptions of polymer trilobites from the deposits of the Middle Cambrian of the Shynghyz range, including north-west of the Athey town. However, there is no precise geological linkage of the fauna location, although the map sheet nomenclature and outcrop numbers were given without reference to sections and levels.

In 2003, 56 km to the north-east of the Karaul t. (East Kazakhstan region), in the area of Athey Mountain, at 100 m to the south-east from the Askar winter camp, along the line where the sedimentary rocks of the formation are most exposed, as shown in figure 3, the authors for the first time compiled a complete lithological description of the atheic section with selection of a good collection of trilobites on 8 levels. Trilobites are *in situ*, among the finds there are many whole dorsal shields, which indicate their lifelong burial, and scattered shields, most likely, have posthumous displacement by bottom currents and are buried in the same sediments. Layers with fauna were traced along the spread, and thin outcrops of the suite with small number of trilobites were found at the northwestern foot of Athey Mountain. As noted by N.K. Ivshin [3], the suite has agreeing contacts with the Carribian suite of the Lower Cambrian and the overlying Zerbkyzyl suite of the Middle Cambrian.

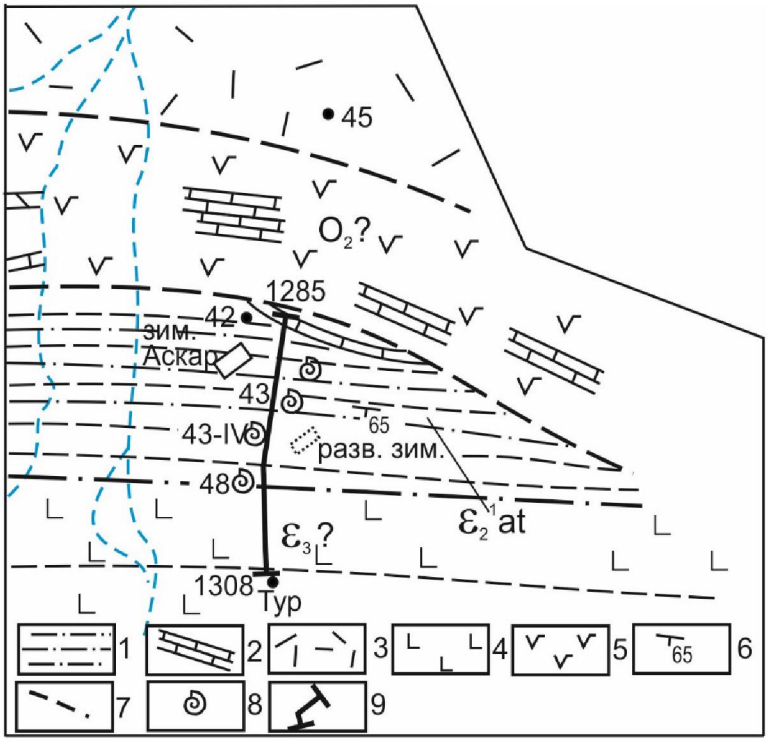

Figure 3 – Schematic geological plan of the Athey suite section in Askar wintering ground, Athey natural boundary (created by G.K. Ergaliev, T.E. Pirogova): 1 – siltstones, 2 – limestones, 3 – medium Ordovician lavas of acid composition, 4 – pyroxene basaltic lavas, 5 – medium Ordovician andesibasalts, 6 – slope angles of layers, 7 – faulting, 8 – of fauna collection points, 9 – line section

The lower boundary of the cut passes along a tectonic disturbance. In the lower part the suite is composed of uneven alternating aleuritic clastic limestones and siltstones, above which lie calcareous siltstones and sandstones, large-scale conglomerates, and sandstones. In the sandstones, a fauna of articulate and inarticulate brachiopods, as well as whole and disjoint dorsal shields of trilobites, was found. Sedimentary deposits of the Athey suite overlap with a thickness of diopside-containing basalts with thin intercalations of basaltic lithocrystalloclastic gravel tuffs of the Middle Cambrian as shown in figure 4.

1. Alternating layers of gray modified fine-grained aleuritic clastic limestones and siltstones. The thickness of the layers in the lower part is 0.2-1 cm, limestones predominate. In the middle, layers 3-4 mm thick. The topmost part of the pack (~ 1.3 m) consists of detrital limestones. Layering thin horizontal, sometimes broken horizontal.

D.a. 174°, degree of dip 65° ..... 11.8 m

2. Uneven alternation of green and lilac-gray coarse calcareous siltstones with indistinct thin horizontal stratification. In siltstones, numerous small crystals and intergrowth of pyrite up to 0.5 cm thick. The rocks are intensively cleaved.

D.a. 175°, degree of dip 63-65° .....19 m

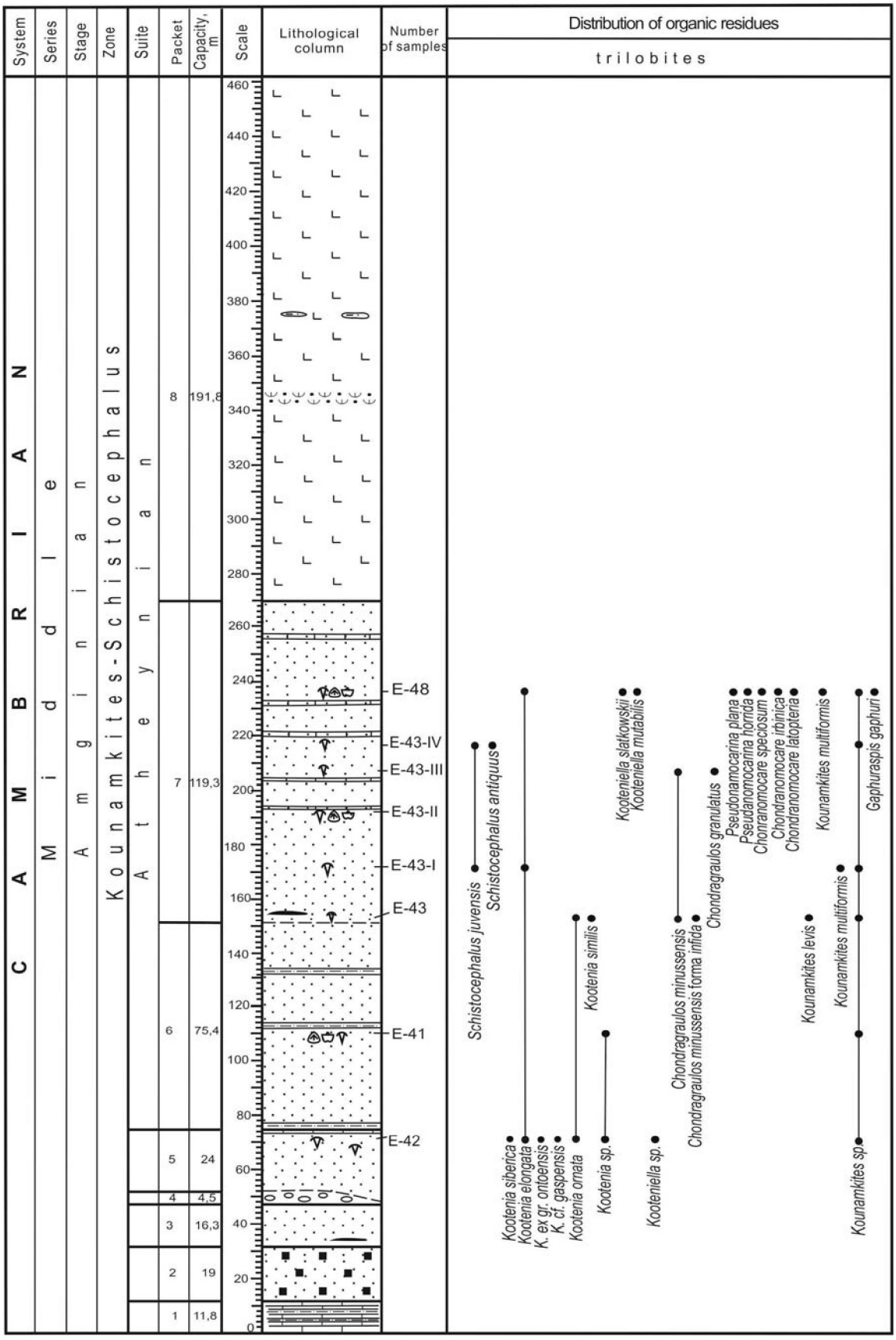

Figure 4 – Lithostratigraphic column with vertical range of the trilobite in the Athey suite of the Middle Cambrian (legend to column is described in figure 3)

3. Purple fine-grained calcareous sandstones with authigenic pyrite. Among them are the undeveloped gray layered and concretionary diagenetic formations of sandy limestone. Their boundaries with sandstones are uneven ..... 16.3 m

4. Greenish-gray large-scale volcanic-terrigenous conglomerate. Pebbles of andzite basalts, jasper-like silicas and limestones of slightly loamy and rounded form up to 10 cm in size are located in the sand-gravel matrix, they are irregular and irregular. Gradually, the amount of fragments decreases to 3 cm. The upper limit is gradual ..... 4.5 m

5. Lilac-gray and green fine-grained greywacke sandstones with indistinct thin horizontal stratification. Trilobites *Kootenia siberica, K.* ex gr *onensis, K.* cf. *gaspensis, Kootenia* sp., *Kounamkites* sp., *Kooteniella* sp. (points E-42) were found in green sandstones at 18 and 21.6 m in the ground. In the upper part, gray organogenous-detrital fine-grained limestone 0.5 m thick with irregular horizontal layering .....24 m

6. Greenish-gray and lilac-cherry modified fine-grained calcareous and properly greywacke sandstones with thin layers (thickness of layers is 0.3-1.5 cm) of siltstones with irregular horizontal stratification. Trilobites *Kootenia* sp., *Acrothele* sp. inarticulate brachiopods and *Narynella* sp., Orthoidea gen. et sp. indet., Protorthoidea gen. et sp. indet. articulate brachiopods, (point E-41) were found in lilac-cherry sandstones at 27.8 m in the ground. The upper boundary is gradual.

D.a. 130°, degree of dip 55° .....75.4 m

7. Green and gray-green fine-grained greywacke sandstones, sometimes cleared, with layers of silty fine-grained limestones. There is a thin or shallow alternation of sandstones and aleuritic limestones. Stratification is indistinct, thin horizontal. In the lowest part, rare concretionate carbonate formations of an irregular, elongated form (on average 8x2.5 cm) were encountered. At 6 levels, a fauna was found (E-43 in 1 m, E-43-I at 19.9 m, E-43-II, E-43-III, E-43-IV, E-48 at 84.5 m). Trilobites are represented by: *Schistocephalus juvensis* N. Tchern., *Sch. antiquus* N. Tchern., *Kounamkites levis* Las., *K. multiformis* Jeg., *K.* ex gr. *rotundatus* N. Tchern., *Kootenia elongata* Rasetti, *K. ornata* Ivsh., *K. similis* Ivsh., *Kooteniella slatkowskii* (Schmidt), *K. mutabilis* N. Tchern., *Chondragraulos minussensis* Lerm., *Ch. minussensis* forma *infida* N. Tchern., *Ch. granulatus* N. Tchern., *Pseudonamocarina plana* N. Tchern., *Ps. horrida* N. Tchern., *Chonranomocare speciosum* M. Rom., *Chond. irbinica* Rep., *Chond. latopteria* Lis., *Gaphuraspis gaphuri* Ivsh., *Kounamkites* sp., inarticulate brachiopods Botsfordiidae gen. et sp. indet., articulate brachiopods *Narynella* sp., Protorthoidea gen. et sp. indet.

D.a.175, degree of dip 65° .....119.3 m

8. Dark gray with a gray-cherry shade of diopside-containing basalts. The rocks are intensively epidotized. In 73.6-76.5 m range of exploratory lines gravelly lithocrystalloclastic tuffs of basic composition were found. The boundary with the underlying sedimentary rocks is uneven. At the base of the layer (up to 30-40 cm upward in the layer) fragments of the irregular shape of the underlying greywacke sandstones were encountered.....191.8 m

The visible thickness of the suite is 462 meters.

Further along the section in the northwesterly direction, outcrops mainly of the lavas of pyroxene basalts and their tuffs continue, without interbedding with the underlying sedimentary rocks. Probably, these effusives don't belong to the Athey suite, which requires further elaboration.

For the cutting of the Athey suite are numerous remnants of trilobites of the genera *Kootenia, Kooteniella, Chondragraulos, Kounamkites* and a few *Pseudanomocarina* and *Schistocephalus*. In the upper part of the incision, the only cranidium *Gaphuraspis gaphuri* Ivsh. was encountered. It's a form typically found in the volcanic-sedimentary deposits of Central Kazakhstan. It was noted that the remains of the genus *Kounamkites* are constantly present in the sediments, spread from the upper part of the lower to the lower part of the Middle Cambrian on the Siberian platform. The trilobite complex, cited in describing the Athey suite, refers to the Koonamkites-Schistocephalus zone by analogy with the Siberian platform, the Altai-Sayan region and Central Kazakhstan. The presence of the listed trilobite genera in the composition of the suite is common to the lower part of the Middle Cambrian and allows correlating Shynghyz forms with trilobites of Southern and Central Kazakhstan, as well as the Sayan-Altai region and the Siberian platform. By N.K. Ivshin sediments of generic composition are attributed to the Pacific paleozoogeographic province, covering North America, China, Korea, Western and Eastern Siberia.

Conclusions. After analyzing the distribution of trilobite taxa from the Mayzhon and Athey suits sediments, the following conclusions can be drawn: in the paleoecological plan, because of the presence of the above trilobite genera in the sedimentary deposits of the Mayazhon and Athey suits, the Shynghyz Range makes it possible to correlate with known sections of Kazakhstan, Sayan-Altai and Siberian platform and we can confidently state the existence of a connection between the marine basins of these regions in the Cambrian time.

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ШЫҢҒЫС ҮСТІРТІНІҢ (ШЫҒЫС ҚАЗАҚСТАН) МАЯЖОН ЖӘНЕ ӘТЕЙ СВИТАЛАРЫНЫҢ КЕШ-ТӨМЕНГІ КЕМБРИЙ ЖӘНЕ ОРТА КЕМБРИЙЛІК ШӨГІНДІ ҚИМАЛАРЫ

Аннотация. Шыңғыс үстірті аумағында орналасқан (Шығыс Қазақстан) маяжон (Арқалық аймағы) және әтей (Қаншыңғыс аймағы) шөгінді қималарының кеш-төменгі кембрий және ерте-орта кембрий сипаттамалары қарастырылған. Әр қима алынған деңгейіне тіркелген фаунаның тікелей таралу және орналасу нүктелері белгіленген литологиялық-стратиграфиялық бағаны және схемалық геологиялық карталары тіркелген қабаттық сипаттамасымен ұсынылған, бұл қиманың зерттелінетін шөгінді бөлігінің аумағында фауна кешендерінің алмасуын қадағалауға мүмкіндік береді. Қималарды сипаттау барысында автордың келтірген трилобиттер фаунасының тізімі бұрыннан белгілілермен салыстырғанда көбейген, бұл өз ретінде көрсетілген жас интервалы аумағында сыйыстырушы таужыныстардың жасын дәл анықтауға көмектеседі. Зерттеу мәліметтері болашақта шектес аудандармен корреляция жасауға мүмкіндік береді.

Түйін сөздер: стратиграфия, маяжон свитасы, әтей свитасы, кеш-төменгі және ерте-орта кембрий.

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ПОЗДНЕ-НИЖНЕКЕМБРИЙСКИЕ И СРЕДНЕКЕМБРИЙСКИЕ ОСАДОЧНЫЕ РАЗРЕЗЫ МАЯЖОНСКОЙ И АТЕЙСКОЙ СВИТ ХРЕБТА ШЫНГЫЗ (ВОСТОЧНЫЙ КАЗАХСТАН)

Аннотация. Приводятся описания поздне-нижнекембрийского и ранне-среднекембрийского осадочных разрезов маяжонской (Аркалыкская зона) и атейской (Каншынгызская зона) свит, расположенных в пределах хребта Шынгыз (Восточный Казахстан). Каждый разрез сопровождается послойным описанием с иллюстрацией схематических геологических карт и литолого-стратиграфических колонок с точками нахождения фауны и вертикальным их распространением с привязкой к уровням отбора, что позволяет проследить смену комплексов фауны в пределах исследуемой осадочной части разреза. Приведенные авторами при описании разрезов списки фауны трилобитов, значительно расширены по сравнению с ранее известными, что позволяет более точно проводить датировку возраста вмещающих пород в пределах указанного возрастного интервала. Данные исследований позволят в дальнейшем провести корреляцию со смежными регионами.

Ключевые слова: стратиграфия, маяжонская свита, атейская свита, поздне-нижний и нижне-средний кембрий.

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