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«Қазақстан Республикасы Ұлттық ғылым академиясының Хабарлары. Геология және техникалық ғылымдар сериясы» ғылыми журналы 2016 жылдан бастап халықаралық реферативтік және ғылыметриялық Scopus дерекқорында индекстеледі және тұрақты библиометриялық көрсеткіштерді көрсетіп келеді.

Сонымен қатар журнал Web of Science платформасының (Clarivate Analytics, 2018) халықаралық реферативтік және наукометриялық дерекқоры Emerging Sources Citation Index (ESCI) тізіміне енгізілген.

ESCI дерекқорында индекстелуі журналдың халықаралық ғылыми рецензиялау талаптары мен редакциялық этика стандарттарына сәйкестігін растайды, сондай-ақ Clarivate Analytics компаниясы тарапынан басылымды Science Citation Index Expanded (SCIE), Social Sciences Citation Index (SSCI) және Arts & Humanities Citation Index (AHCI) дерекқорларына енгізу қарастырылуда.

Scopus және Web of Science дерекқорларында индекстелуі жарияланымдардың халықаралық деңгейде жоғары сұранысқа ие болуын қамтамасыз етеді, олардың дәйексөз алу көрсеткіштерінің артуына ықпал етеді және редакциялық алқаның геология мен техникалық ғылымдар саласындағы өзекті, бірегей және ғылыми тұрғыдан маңызды зерттеулерді жариялауға ұмтылысын айқындайды.

Научный журнал «News of the National Academy of Sciences of the Republic of Kazakhstan, Series of Geology and Technical Sciences» с 2016 года индексируется в международной реферативной и наукометрической базе данных Scopus и демонстрирует стабильные библиометрические показатели.

Журнал также включён в международную реферативную и наукометрическую базу данных Emerging Sources Citation Index (ESCI) платформы Web of Science (Clarivate Analytics, 2018).

Индексирование в ESCI подтверждает соответствие журнала международным стандартам научного рецензирования и редакционной этики, а также рассматривается компанией Clarivate Analytics в рамках дальнейшего включения издания в Science Citation Index Expanded (SCIE), Social Sciences Citation Index (SSCI) и Arts & Humanities Citation Index (AHCI).

Индексирование в Scopus и Web of Science обеспечивает высокую международную востребованность публикаций, способствует росту цитируемости и подтверждает стремление редакционной коллегии публиковать актуальные, оригинальные и научно значимые исследования в области геологии и технических наук.

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CONTENTS

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FORMATION AND DEVELOPMENT PROSPECTS OF PLACER GOLD DEPOSITS IN SOUTHERN JUNGGAR

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Abstract. The article examines the formation processes and prospects for further development of placer gold deposits within Southern Junggar. Particular attention is given to the geological–structural and gold-bearing characteristics of unconsolidated sediments formed during different geological epochs, ranging from the Late Cretaceous to the Late Quaternary. The study is based on an integrated analysis of geological, geomorphological, lithostratigraphic, and mineralogical data, as well as the results of field observations, sampling, and sample processing.

Based on the combined dataset, several age stages of placer formation are identified, including the Late Cretaceous, Neogene, and the Early, Middle, Late Quaternary stages. It is shown that placer formation was controlled by the tectonic evolution of the region, the intensity of denudational processes, and the conditions

of sediment accumulation and reworking. Among the identified stages, Late Quaternary alluvial deposits are of the greatest interest for future exploration and evaluation activities, as they provide the most favorable conditions for placer gold concentration and are characterized by a relatively high degree of preservation of the valuable component.

The bedrock gold sources of the region are characterized by a complex internal structure and have undergone significant supergene alteration, which has resulted in the predominance of fine and very fine gold fractions in placer deposits. This feature substantially affects the efficiency of traditional exploration, sampling, and sample-processing methods and necessitates adjustments to existing methodological approaches for resource assessment of such deposits.

Based on the study of gold mineralization in the Mesozoic–Cenozoic unconsolidated deposits of Southern Junggar, the region is considered highly prospective for the discovery and development of new industrial placer gold deposits. The obtained results substantiate the relevance of further geological exploration activities, taking into account the identified geological and mineragenetic features, and may be applied in the forecasting and assessment of gold-bearing areas within the region.

Keywords: Southern Junggar, placer gold deposits, alluvial sediments, Late Quaternary stage, supergene processes, unconsolidated sediments, gold-bearing potential, primary sources, fine-grained gold

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ОҢТҮСТІК ЖОҢҒАРИЯДАҒЫ ШАШЫРАНДЫ АЛТЫН КЕН ОРЫНДАРЫНЫҢ ҚАЛЫПТАСУЫ МЕН ДАМУ ПЕРСПЕКТИВАЛАРЫ

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Аннотация. Мақалада Оңтүстік Жоңғар шегінде шашыраңқы алтын кен орындарының қалыптасуы және одан әрі игеру перспективалары қарастырылады. Ерекше назар бордың соңғы кезеңінен бастап төрттіктің соңғы кезеңіне дейінгі әртүрлі геологиялық кезеңдерде пайда болған борпылдақ шөгінділердің геологиялық, құрылымдық және алтынқұрамды сипаттамаларына аударылады. Зерттеу геологиялық, геоморфологиялық, литологиялық-стратиграфиялық және минералогиялық деректерді, сондай-ақ далалық бақылаулардың, сынама алудың және сынамаларды өңдеудің нәтижелерін кешенді талдауға негізделген.

Жиналған деректер негізінде шашыраңқы алтынның пайда болуының бірнеше кезеңдері бөлінеді: бордың соңғы кезеңі, неоген және ерте, орта және төрттіктің соңғы кезеңі. Шашыраңқы алтынның пайда болуы аумақтың тектоникалық дамуымен, денудация процестерінің қарқындылығымен және борпылдақ материалдың жиналуы мен өңделуі жағдайларымен бақыланғаны көрсетілген. Анықталған кезеңдердің ішінде төрттіктің соңғы кезеңіндегі аллювиалды кен орындары кейінгі барлау және бағалау жұмыстары үшін ең маңызды болып табылады, олар шашыраңқы алтынның шоғырлануы үшін ең қолайлы жағдайларды ұсынады және құнды компоненттің сақталуының жоғарылауымен сипатталады.

Аймақтың бастапқы алтын көздері күрделі құрылыммен сипатталады және айтарлықтай супергендік трансформацияға ұшыраған, нәтижесінде шашыраңқы кен орындарында ұсақ және ұсақ дисперсті алтын фракциялары басым болады. Бұл ерекшелік дәстүрлі іздеу, сынама алу және сынамаларды өңдеу әдістерінің тиімділігіне айтарлықтай әсер етеді және мұндай нысандар үшін ресурстарды бағалаудың қолданыстағы әдіснамалық тәсілдеріне түзетулер енгізуді талап етеді.

Оңтүстік Жоңғардағы мезозой-кайнозой бос кен орындарының алтын әлеуетін зерттеу негізінде аймақтың жаңа коммерциялық алтын шашыраңқы кен орындарын анықтау және игеру үшін жоғары әлеуеті бар деген қорытынды жасалды. Алынған нәтижелер анықталған геологиялық және минерагенетикалық ерекшеліктерді ескере отырып, геологиялық барлауды одан әрі жүргізу қажеттілігін негіздейді және аймақтағы алтын бар аумақтарды болжау және бағалау үшін пайдаланылуы мүмкін.

Түйін сөздер: Оңтүстік Жоңғар, алтын шөгінділері, аллювий шөгінділері, төрттік кезеңнің соңғы сатысы, гипергенез, борпылдақ кен орындары, алтын құрамы, бастапқы көздері, ұсақ дисперсті алтын

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ФОРМИРОВАНИЕ И ПЕРСПЕКТИВЫ РАЗВИТИЯ РОССЫПНЫХ МЕСТОРОЖДЕНИЙ ЗОЛОТА ЮЖНОЙ ЖОНГАРИИ

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Аннотация. В статье рассматриваются вопросы формирования и перспектив дальнейшего освоения россыпных месторождений золота в пределах Южной Жонгарии. Особое внимание уделяется геолого-

структурным и золотоносным характеристикам рыхлых отложений, сформировавшихся в различные геологические эпохи — от позднего мела до позднего четвертичного времени. Исследование базируется на комплексном анализе геологических, геоморфологических, литолого-стратиграфических и минералогических данных, а также результатов полевых наблюдений, опробования и лабораторной обработки проб. На основании совокупности полученных материалов выделяются несколько возрастных этапов россыпеобразования: позднемеловой, неогеновый, а также ранне-, средне- и позднечетвертичный. Показано, что формирование россыпей контролировалось особенностями тектонического развития территории, интенсивностью денудационных процессов, условиями аккумуляции и переработки рыхлого материала. Среди выделенных этапов наибольший интерес для последующих поисково-оценочных работ представляют позднечетвертичные аллювиальные отложения, обладающие наиболее благоприятными условиями для концентрации рассыпного золота и характеризующиеся повышенной сохранностью полезного компонента. Коренные источники золота региона отличаются сложным строением и претерпели значительное гипергенное преобразование, что обусловило доминирование в россыпях мелких и тонкодисперсных фракций золота. Данная особенность существенно влияет на эффективность традиционных методов поисков, опробования и пробообработки и требует корректировки существующих методических подходов к оценке ресурсов объектов данного типа. На основе проведённых исследований золотоносности мезозойско-кайнозойских рыхлых отложений Южной Жонгарии делается вывод о высокой перспективности региона с точки зрения выявления и освоения новых промышленных россыпей золота. Полученные результаты обосновывают актуальность проведения дальнейших геологоразведочных работ с учётом выявленных геологических и минерагенетических особенностей и могут быть использованы при прогнозировании и оценке золотоносных площадей региона.

Ключевые слова: Южная Жонгария, россыпные месторождения золота, аллювиальные отложения, позднечетвертичный этап, гипергенез, рыхлые отложения, золотоносность, коренные источники, мелкодисперсное золото

Introduction. In the Junggar region, the presence of placer gold has been known since ancient times. Numerous traces of ancient workings, dating back to the 5th century BCE and later, have been identified in river valleys. The Arab geographer Al-Idrisi reported gold mining activities in Junggar during the 12th century CE. From the 17th to the 19th centuries, mining was initially carried out by "Chinese" miners and later by Russian industrialists. According to mining engineer Tatarnov (1867), extremely rich placers with coarse gold were exploited here. Nuggets measuring 6.35–12.7 mm and weighing 5–10 grams were frequently found, and

the largest nugget discovered at that time weighed 250 grams (Klitin et al., 1984; Roslyakov, 1981; Rassadkin, 2008; Firsov, 1957).

In modern times, the study of placer gold potential in Southern Kazakhstan has been addressed through geological mapping, prospecting, and exploration works of various scales by a number of researchers: I.I. Mashkara (1938), A.N. Kostenko (1947–1954), G.A. Yarmak (1951–1956), V.V. Berezovikov (1955–1968), I.L. Radchenko (1957), Kh.Ts. Medoev (1959), M.Ya. Filimonov (1961), V.D. Barkan, M.N. Grinvald (1965), A.G. Novikov, A.V. Lyadzhin et al. (1966), A.F. Novoskoltsev, E.G. Malyshev, N.F. Nikolenko (1968–1969), among others. The compilation and registration of placer occurrences were carried out during the preparation of a gold potential forecast map for Southern Kazakhstan at a scale of 1:500,000 (Bulygo et al., 1961). The most comprehensive data on the study area can be found in the works of V.B. Klitin and co-authors (1976–1980), as well as in the summary work by E.G. Malyshev et al., "Assessment of Placer Gold Prospects in the Dzhungarian and Zailiysky Alatau" for 1988–1990.

The main placer gold deposits of the region-such as Tentek, Kyzyltogai, Rgaity, Zhamanty, Kensuat, and others-are located in Northern Junggar. As correctly noted by B.S. Uzhkenov, A.V. Tretyakov, and others (Uzhkenov and Tretyakov, 2007; Tretyakov, 2004; Tretyakov, 2009; Sher, 1968), the largest placer deposits in terms of reserves may be discovered in the fan-shaped alluvial cones and inherited depressions of this region.

The territory of Southern Junggar remains less studied, and the known placers are associated with alluvial sediments in the valleys of the Koksu, Bizhe, Tyshkan, Shizhin, Borokhudzira, and Usek rivers, which currently have no industrial significance. In proposing Southern Junggar as one of the promising regions for placer gold exploration (Zhautikov, 1998; Rassadkin, 2007; Umarbekova et al., 2018; Skrinnik et al., 2020), the following objectives were pursued:

1. Since the primary gold deposits in this area are associated with near-surface gold-silver mineralization, it is necessary to assess the potential of this type of mineralization as a source of placer gold.

2. Due to the specific composition of the primary gold sources, it is important to identify, in addition to native gold, other mineral forms of gold within the "sands," as well as to evaluate the role of absorbed gold in weathered minerals from the regolith in the overall gold balance.

3. To classify the industrial-genetic types of gold-bearing placers in the region.

The Junggar mountain system, which includes the area under study, represents a relatively young domal uplift that originated in the Paleogene and was formed during the Neogene and Quaternary periods. Deposits from the Early Alpine stage are absent here, those of the Middle Alpine (Paleogene) stage are limited in extent, while the Late Alpine deposits form the cover of numerous intermountain depressions. The main watershed ridges of Northern and Southern Junggar are separated by the Koksu-Borotaly Depression.

A key element in the formation of placer deposits is the development of a pre-

Paleogene peneplain on the epigeosynclinal platform, along with a thick weathering crust. These features played a crucial role in the release and re-deposition of gold and were of primary importance in the accumulation of supergene gold—the main source of placer deposits. The surface of the peneplain, overlain by fossil-bearing Upper Cretaceous deposits, represents a distinct stratigraphic level. The peneplain is well preserved on the Karoy Plateau, the extent of which I.P. Gerasimov and Yu.A. Meshcheryakov (1967) describe as a semi-buried basement plain with preserved patches of Cretaceous, Miocene, and Quaternary sediments (Geology of the USSR, 1971; Zhautikov, 2008; Umarbekova et al., 2025).

Relics of the peneplain have been mapped in areas of high mountain development, where they have been uplifted to absolute elevations of 4000–4500 meters, indicating the upward evolution of the mountain system.

Materials and methods. In Southern Junggar, the primary sources of gold are predominantly represented by deposits and occurrences of near-surface gold-silver formation. Typical examples include the Arkharly, Dalabay, Betbastau, Iglik, and Bizhe deposits, as well as numerous mineral occurrences that form well-defined ore nodes associated with specific late Paleozoic volcano-plutonic structures (Arkharly, Degeres, Katutau, Malaisary, and others). These are typically hydrothermal quartz-vein type deposits with fine-dispersed gold and high silver content. In recent years, vein-disseminated brecciated ores have been identified at some of these deposits.

The role of gold-silver formation deposits and occurrences in placer formation is well studied at the Arkharly deposit. Here, within the weathering crust, numerous redeposited forms of supergene gold have been identified: thin wire-like filaments, various dendritic structures, tiny crystalline forms, as well as a broad association of fine particulate gold with iron and copper oxides. For the first time, forms resembling Liesegang rings and dendrites with characteristic polymeric growth patterns were observed (Figure 1). Despite significant erosion of the weathering crust—essentially resulting in outcrops of oxidized rocks—some areas of the deposit (e.g., Vein No. 10 and others) exhibit extreme enrichment from supergene processes, with gold grades reaching up to 1500 g/t and silver up to 4800 g/t.

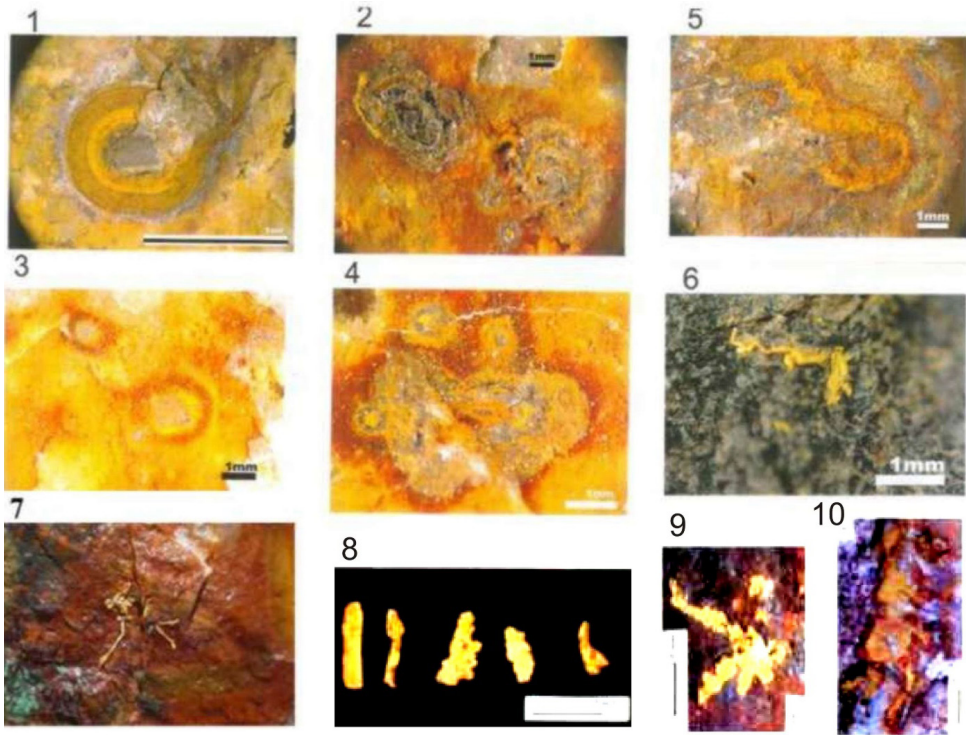

Figure 1 – Fine-dispersed, dendritic, and dust-like gold in the oxidation zone of the Arkharly gold-silver deposit (From the collection of T.M. Zhautykov.)
1–5 – Fine- and colloidal-dispersed supergene gold formed in the oxidation zone as "Liesegang rings"; 6–9 – Dendritic supergene gold; 10 – Dust-like gold particles associated with limonite in the supergene zone.

Such deep reworking of mineralization within mature weathering crusts, below the peneplain surface, served as an excellent source for the subsequent formation of placer deposits. A good example of how weathering processes led to placer formation is the valley placer of the Koksu River (Figures 2, 3).

Figure 2 – Valley of the Koksu River

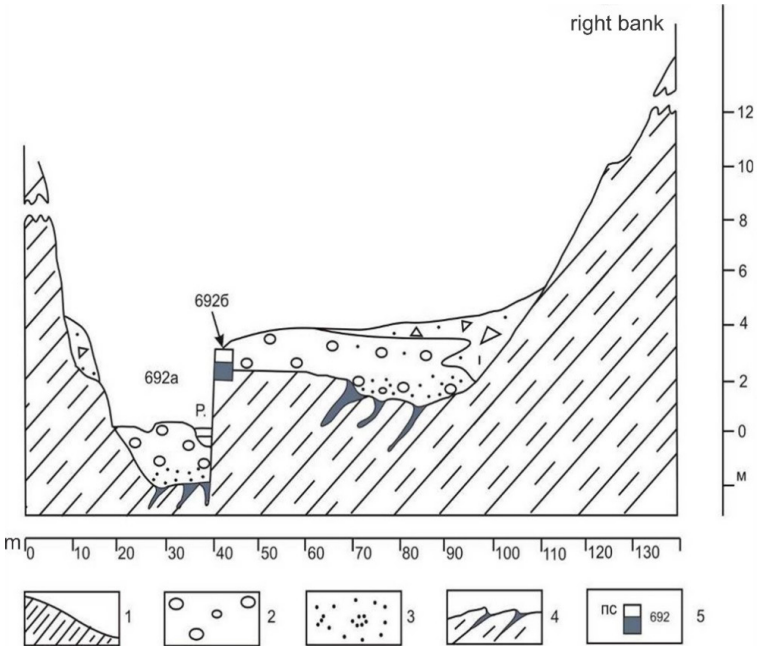

Figure 3 – Cross-section of the Koksu River valley. According to E.G. Malyshev and S.D. Danilova. 1 – bedrock; 2 – alluvium; 3 – presumed near-clay placer; 4 – presumed clay placer; 5 – sample number and location (shaded – weight, unshaded – particle size).

Within the spatial influence of the Koksu River drainage basin, occurrences of primary (bedrock) gold are practically absent. Nevertheless, according to sluice concentrate data, gold has been detected along almost the entire length of the Koksu River.

Among the sites recommended for detailed study, the most accessible is the

Lower Koksu section. Here, on the basal terraces, a gold concentration of 300–390 mg/m³ by weight has been established, and indicator gold (4–7 particles) is found in the lateral and floodplain deposits (Figure 4). Gold particles of various sizes, from fine to medium, are commonly encountered, including weakly rounded gold indicators.

Representative data for further prospecting are provided for the Bijie River. Here, gold concentration is noted in the lower parts of the alluvial sequence and on the upper fractured surface of the clay bedrock. The concentrates mainly consist of a barite–pyrite–marcasite–martite association containing gold particles of various forms: grains, granules, rounded and weakly polished flakes, scales, plate-like and nugget-shaped grains, and rarely wire-like gold. All these forms are characteristic of the supergene enrichment zone of deposits.

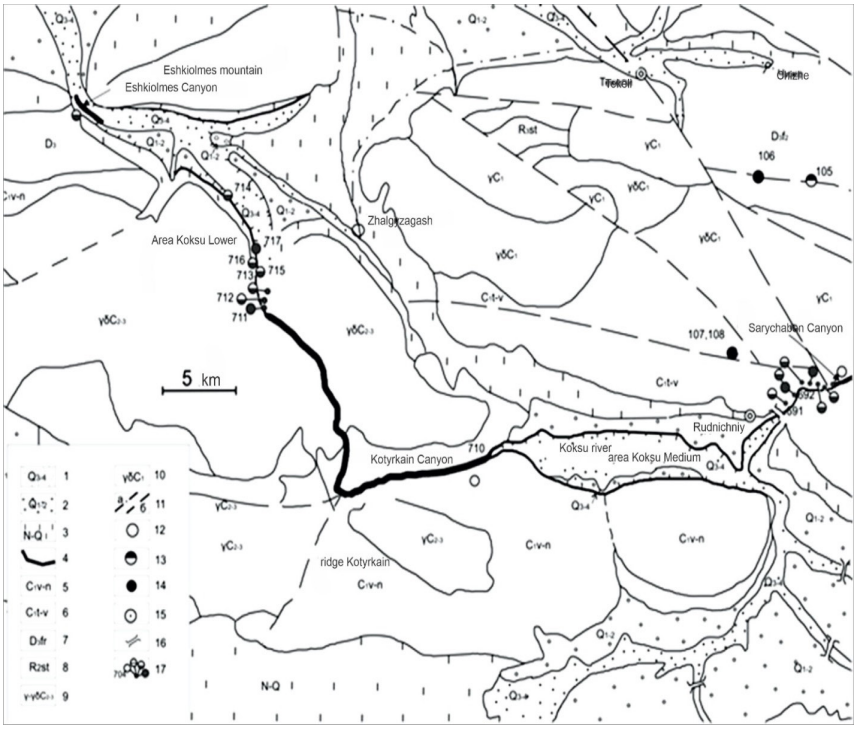

Figure 4 – Geological-geomorphological scheme of placer gold-bearing sites Lower and Middle Koksu. After E.G. Malyshev, S.D. Danilova with author's additions.

1 – modern floodplain with the complex of first and second terraces above the floodplain; 2 – alluvial-proluvial intermountain plains; 3 – layered-denudational foothill elevated plains composed of a complex of Neogene–Quaternary deposits; 4 – through canyons; 5 – lavas, acidic and intermediate composition tuffs; 6 – acidic tuffs;

7 – siltstones, silty sandstones; 8 – Middle Riphean, Suuktube suite, limestones, marbles; 9 – Junggar complex: granites, granodiorites, diorites; 10 – leucocratic granites; 11 – a) faults of buried basement, b) major tectonic faults; 12 – gold-ore formation; 13 – gold–lead–zinc formation; 14 – lead–zinc formation; 15 – settlements; 16 – bridges; 17 – sluice samples, their numbers (empty, minor, indicator gold, gold by weight).

The placer deposit of the Ykylas stream (left tributary of the Bije River) is notable for the peculiar morphology of its gold grains (Figure 5).

Figure 5 – Valley of the Ykylas stream

The gold particles here have a platy shape, show poor roundness, and range in size from 0.1 to 1 mm, occasionally reaching 3–4 mm. Some particles are partially or completely coated with a limonitized crust, within which a dense sprinkling of very fine gold grains up to 0.01 mm in size can sometimes be observed. On the right bank of the Ykhylas stream, spoon-shaped placers up to 1000 meters in length have been identified, composed of alluvial–deluvial deposits (Figures 6, 7). Gold is primarily found in the sub-bottom parts of the modern alluvial section. For these placers, a possible source of gold is considered to be the Lower Quaternary alluvial–proluvial deposits, which extend down to the Paleogene sandy–clayey bedrock (Zhautikov, 1995).

Figure 6 – Spoon-shaped depression on the right side of the Ykhylas River valley

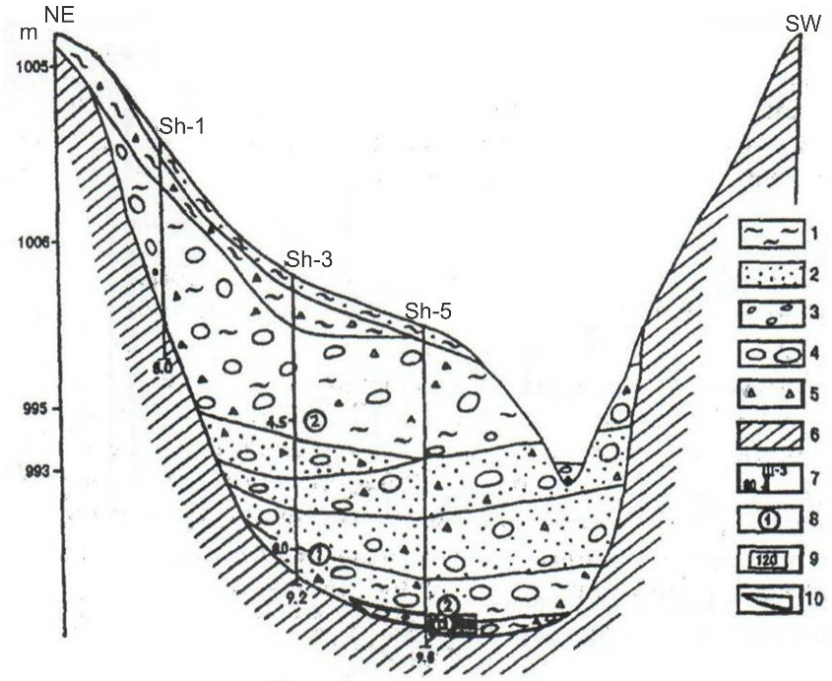

Figure 7 - Occurrence No. 8 (Ykhylas). After A.I. Kovalenko.
1 – clay; 2 – sand; 3 – pebbles; 4 – boulders; 5 – gravel; 6 – bedrock (clays of the Aktau suite); 7 – test pit, its number; 8 – amount of gold (in signs); 9 – gold content (mg/m³); 10 – placer outline.

In the eastern part of the South Zhetisu (South Junggar) region, placers have been identified along the Usek, Shizhin, Tyshkan, and Borokhudzira rivers, as well as the Naryn stream (Figure 8).

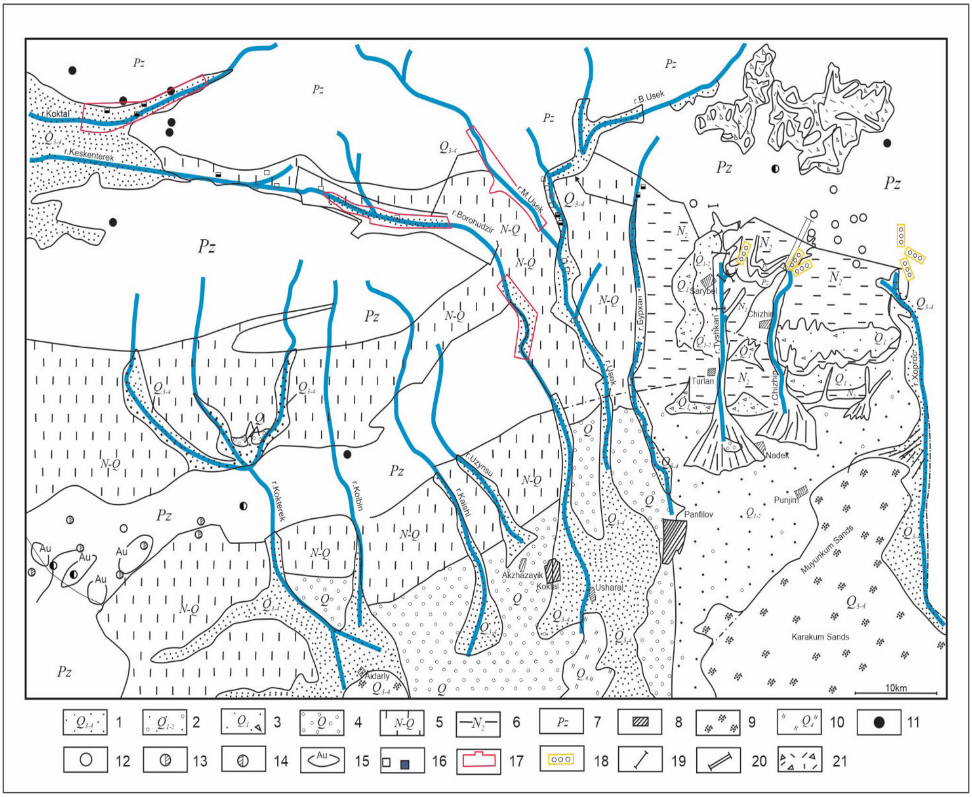

Figure 8 - Geological and geomorphological map of the Khorgos and Katutau placer gold-bearing districts in South Junggar. Based on S.D. Danilova and E.G. Malyshev with author's additions. 1 – modern floodplain with a complex of first and second floodplain terraces; 2 – deluvial-proluvial sands and loams with gravel and debris; 3 – fragments of alluvial-proluvial sands, boulder-pebble deposits with gravel and grit; 4 – deluvial-proluvial sands and loams with gravel and debris; 5 – undivided deposits: sands, pebbles, siltstones, and conglomerates; 6 – clays, gravelites, siltstones, sands, boulder-pebble deposits, conglomerates; 7 – bedrock complex of Paleozoic deposits; 8 – settlements; 9 – aeolian sands; 10 – meadows; 11 – gold ore formation; 12 – silver formation; 13 – polymetallic formation with gold; 14 – copper formation with gold; 15 – gold halos, metallometric survey; 16 – heavy mineral concentrate samples (a – barren, b – gold present); 17 – boundaries of areas recommended for further geomorphological investigations; 18 – manifestations of valley and channel gold placers; 19 – exploratory drilling lines; 20 – boundary of the Shizhin valley placer deposit; 21 – mountain glaciers with adjacent zones of intense nivation disintegration of bedrock.

Result and discussion. Gold has been identified in trace and non-commercial concentrations almost everywhere. Commercial placers have been confirmed only in the areas of the Shizhin and Tyshkan rivers, with reserves suitable for small-scale (artisanal) mining (Figures 9, 10).

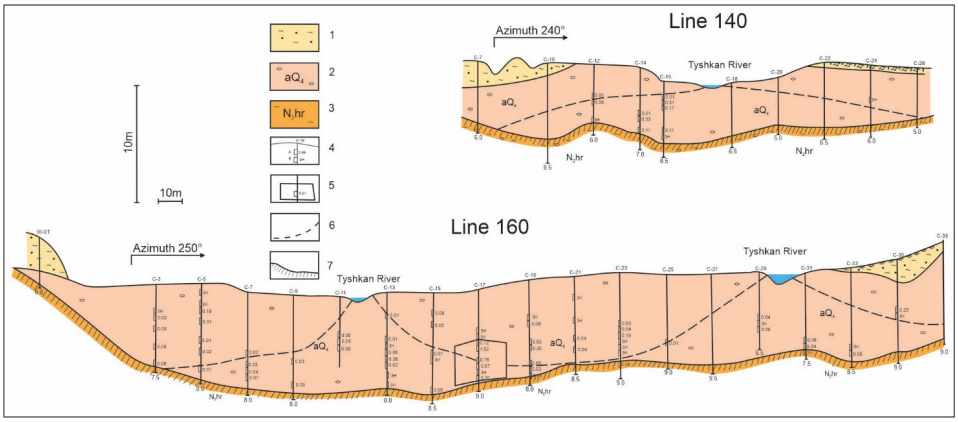

Figure 9 - Section of the Tyshkan River area. Geological cross-sections along lines 140 and 160
1 – Late Quaternary alluvial deposits: boulders, pebbles, gravel; 2 – Khorgos suite: boulder-pebble deposits, clays; 3 – Boreholes with reported gold contents: a) by weight (g/m³), b) by gold flakes (signs); 4 – Boundaries of blocks with industrial gold content; 5 – Groundwater level; 6 – Bedrock.

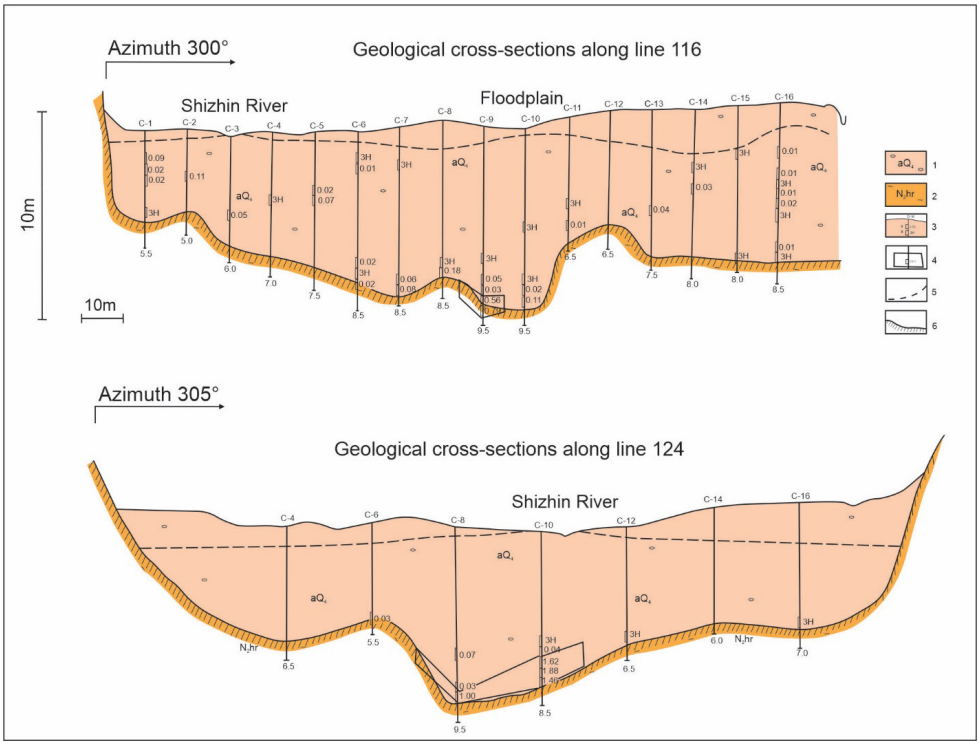

Figure 10 – Section of the Shizhin area. Geological cross-sections along lines 116 and 124
1 – Late Quaternary alluvial deposits: boulders, pebbles, gravel; 2 – Khorgos suite: boulder-pebble deposits, clays; 3 – Boreholes with reported gold contents: a) by weight (g/m³), b) by gold flakes (signs); 4 – Boundaries of blocks with industrial gold content; 5 – Groundwater level; 6 – Bedrock.

Gold characteristics: The morphology of the gold grains includes plate-like, nugget-like, scaly, and very rarely isometric shapes. The color of the grains is bright yellow, though occasionally dull due to surface roughness. Pale-yellow and whitish gold grains are rare. Gold fineness ranges from 600 to 998, with most values exceeding 900. Sieve analysis results are shown in the table below:

Table 1. Sieve analysis results as a percentage of weight – Shizhin area

№ line	Fractions, mm					Average diameter, mm
	-0,25	+0,25 -0,5	+0,5 -1,0	+1,0 -2,0	+2,0 -4,0	
100	3,6	24,1	41,5	30,8	-	0,72
116	5,6	16,0	37,5	40,9	-	0,80
124	3,4	7,3	17,1	25,5	46,7	1,69
132	2,9	8,2	17,6	45,7	25,6	1,36
140	2,6	14,6	28,7	54,1	-	0,95
148	0,7	4,4	9,5	18,5	66,9	2,72

As seen from the table, the majority of the gold particles range in size from 0.5 to 2.0 mm, with a decrease in gold particle weight observed downstream along the placer deposit.

The heavy mineral concentrates are primarily composed of iron minerals. The magnetic fraction consists entirely of magnetite, martite, and hematite. In addition to these, the electromagnetic fraction contains iron hydroxides (derived from pyrite) and the epidote–zoisite group. Other minerals—such as sphene, ilmenite, scheelite, zircon, apatite, and others—are present in trace amounts in both the magnetic and electromagnetic fractions.

Despite the modest data on placer gold mineralization in the loose sediments of Southern Junggar obtained by previous researchers, the prospects of this region cannot be considered fully assessed.

First, experience shows that during manual washing of material (sluicing was only done manually), at least 30–50% of fine and very fine gold is lost, which reduces the measured metal content in the concentrates.

Second, as noted by A.I. Kovalenko, who studied the Bizhe River area, in many cases, visual gold was not detected during washing of concentrate samples; its extraction was only possible through mineralogical analysis under a binocular microscope. The visual absence of gold in concentrates often served as a basis for negative evaluation of the placer.

Third, until now, no one has accounted for the gold contained in minerals of the oxidation zone - that is, invisible gold in the heavy concentrate fraction.

Our studies in the valleys of the Kokterek, Keskenterik, and Konurolen rivers, as well as earlier work on placers in the West Kalba region and on the Irtysh River, show that the content of invisible gold in sands often reaches 0.1–0.3 g/m³.

To study such placers, we applied a new method involving mechanical separation (screening) of the fraction smaller than 2 mm from the placers, its further

concentration by processing equipment, and extraction of gold from the enriched sands by various leaching methods (Rassadkin, 2008: 3).

Conclusion.

1. On the territory of Southern Junggar, several age levels of placer formation are distinguished: Late Cretaceous, Neogene, Early, Middle, and Late Quaternary, among which the most promising are the Late Quaternary alluvial placers.

2. The specifics of the region's primary gold sources, as well as the deep supergene transformation processes that have occurred here, result in most of the industrial gold in placers being concentrated in fine and very fine fractions. This necessitates a revision of sampling methods, sample processing, and evaluation techniques for such placers.

3. The results of studying the gold-bearing loose sediments of the Mesozoic–Cenozoic of Southern Junggar allow the region to be classified as prospective for the exploration of industrial placer gold deposits.

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