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EARTH SCIENCES

IMPROVING THE METHODOLOGY FOR CALCULATING HYDROCARBON RESERVES BASED ON ELECTRICAL LOGGING DATA

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Abstract

Purpose and object of research: the purpose of the study - development of a new interpretation method for determining petrophysical quantities used in calculating oil reserves based on mining geophysical data; the object of research - is oil fields that have been in development for a long time.

Methods and means of solving the problem: method - methods of interpretation of electrical logging data; tools - digitization program, interpretation formulas for calculating petrophysical quantities in Excel.

Method and methodology: method - conversion of electrical logging diagrams into digital files using Neuralog program, calculation of petrophysical quantities according to substantiated formulas using Excel program; methodology - development of a new method.

Research results: New methods for determining the porosity coefficient have been developed for recalculation of oil saturation using electrical logging (A2M0.5N) in the well stock of long-term developed oil fields and using the well potential curve. Using this information, various maps, sections, models were constructed and suggestions were made based on the analysis.

Keywords: well logging methods, electrical logging, deposits, layers, well, porosity, oil saturation, clayness, sandness, etc.

1. Introduction

Research data play a leading role in studying the geological section of oil and gas fields by geophysical methods. Therefore, geophysical research in each oil field is divided into three stages. Structure of the field is studied by seismic; for field structure by electrical, gravimetric survey methods and well cross-section by mining geophysics methods [1]. In order to assess the state of development of the long-operating Pirallahi field in the Apsheron archipelago, research materials measured in the geophysical section of 443 wells discovered by this object were surveyed using existing processing programs and the necessary database for analysis was created.

It should be noted that, like many oil and gas fields, the balance of oil reserves in the Pirallahi field has been calculated several times during operation. The last calculation was made in 2002 [2].

Taking into account technical and economic factors, the number of fully explored wells in the field is 5-10%. Oil reserves are calculated based on the results of these well surveys and laboratory analysis of a small number of rock samples.

The sequence of the newly proposed study is as follows: 1) new interpretation methods are being developed for the calculation of petrophysical quantities; 2) a list of wells on tectonic blocks is prepared; 3) converts SER (specific electric resistance) and spontaneous potential (SP) curves from analog to digital according to the Neuralog program for all wells; 4) SER, α_{SP} and new methods $\Delta\alpha_{SP}$, K_p , K_{os} , C_c , C_s , as well as h are determined by the application of the program on the basis of digital data with 1 m interval (on all wells, along the entire section); 5) including the

above-mentioned quantities on blocks, intervals exceeding K_{os} 52 % are selected and collected. In the end, along with the quantities h_o and h_{og} , the average value of the mentioned quantities is determined; 6) On the basis of the second part of 4, the average quantities required for the calculation of the reserve on the blocks is given in the form of a table on the suite, and the initial reserve is calculated; 7) the oil reserves produced by formation groups are deducted from the initial reserves and the current oil reserves are determined, and the oil recovery factor is determined by dividing; 8) field distribution maps and 3D model are constructed and analyzed;

2. Methods used and proposed

Methods used [7, 8, 9, 10, 13]:

The main parameters that characterize the filtration-capacity of the collector layers at the development site are porosity, effective thickness and hydrocarbon saturation, etc. These quantities are determined by the following known formulas:

- Determination of effective thickness

$$h_{ef} = H_{total} * (1 - C_c) \quad (1)$$

Here, H_{total} - total thickness of the layer; C_c - is the coefficient of clayness.

- Porosity is determined by both electrical logging and spontaneous potential (SP). The Archie-Hamblé formula is applied in electrical logging [14, 15, 18, 28]:

$$P_r = \frac{\alpha_{SP}}{K_p^m} = \frac{\rho_{w,rock}}{\rho_{laywater}} \quad (2)$$

$$K_p = K_p^{max} - K_{lay} C_c \quad (3)$$

Here, P_r - relative specific resistance; α - is a coefficient equal to 1; K_p - collector porosity coefficient; $\rho_{w,rock}$ - special resistance of water-bearing bed; $\rho_{laywater}$ - special resistance layer water; C_c - is the coefficient of clayiness; K_p^{max} - maximum coefficient of porosity on the cross-section; m - is a coefficient, reflecting the structure of the rock ($m=2$ was accepted in the investigation).

- The coefficient clayiness is determined on the basis of $\alpha_{SP} = f(C_c)$ dependence on SP:

$$\alpha_{SP} = \frac{U_{SP}}{U_{SP, max}} \quad (4)$$

Here, U_{SP} - the value of the SP in front of studied collector layers; $U_{SP, max}$ - is the value of the SP in front of "clean" sandstone.

- The following formulas are available to determine the saturation coefficient:

$$K_{o.g} = K_{o.g}^{max} (1 - C_c) \frac{K_p^{max}}{K_p^{lay}} \quad (5)$$

Here, $K_{o.g}^{max}$ - maximum saturation coefficient on cross-section; C_c - is the coefficient of clayiness; K_p^{max} - maximum coefficient of porosity on the cross-section; K_p^{lay} - porosity coefficient of the studied layer.

For clayly-sandstone according to Pupon [21, 22, 25, 26, 27]

$$K_{water} = \frac{0.9}{K_p} \sqrt{(1/\rho_{lay} - C_c/\rho_c)\rho_{water}(1 - C_c)};$$

$$K_{o.g} = 1 - \frac{0.9}{K_p} \sqrt{(1/\rho_{lay} - C_c/\rho_c)\rho_{water}(1 - C_c)} \quad (6)$$

For clean-sandstone according to De Uta

$$K_{water} = \frac{0.9}{K_p} \sqrt{(1/\rho_{lay} - C_c/\rho_c)C_c};$$

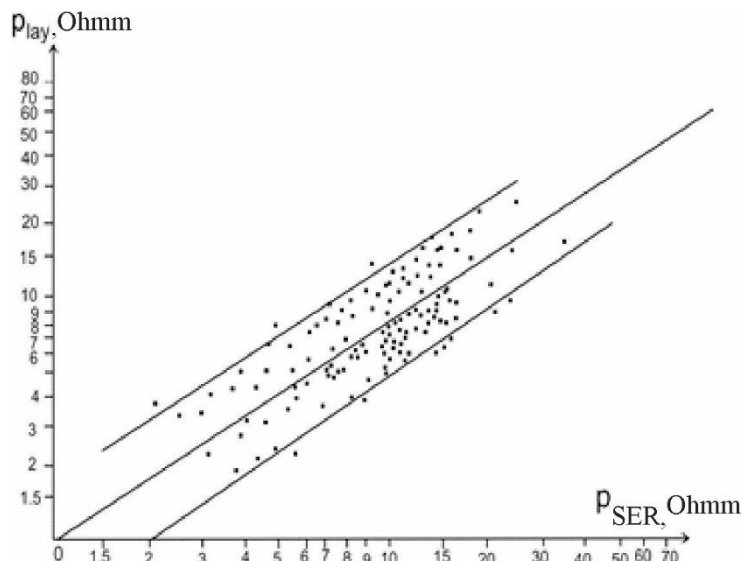


Figure 1. The transition curve from the assumed specific resistance value to the true resistance value

The mentioned methodology was applied between SER and true resistance value of formation PKS and

$$K_{o.g} = 1 - \frac{0.9}{K_p} \sqrt{(1/\rho_{lay} - C_c/\rho_c)C_c} \quad (7)$$

According to Simandoux

$$K_{water} = \left[C_c/\rho_c + \sqrt{(C_c/\rho_c)^2 + 5(K_p^2)} \right] \frac{0.4\rho_{water}}{K_p^2};$$

$$K_{o.g} = 1 - \left[C_c/\rho_c + \sqrt{(C_c/\rho_c)^2 + 5(K_p^2)} \right] \frac{0.4\rho_{water}}{K_p^2} \quad (8)$$

According to Dolly

$$K_{water} = \frac{1}{K_p} \left[(0.81\rho_{water}/\rho_c)^{1/n} - C_c(\rho_{water}/(0.4\rho_c))^{1/n} \right]$$

$$K_{o.g} = 1 - \frac{1}{K_p} \left[(0.81\rho_{water}/\rho_c)^{1/n} - C_c(\rho_{water}/(0.4\rho_c))^{1/n} \right] \text{ets.} \quad (9)$$

Here, K_p - porosity coefficient of collector; C_c - is the coefficient of clayiness; ρ_{lay} - special resistance of layer; ρ_{water} - special resistance of layer water; ρ_c - special resistance of clay layer; K_{water} - coefficient of water saturation; $K_{o.g}$ - coefficient of oil-gas saturation.

3. Suggested methods [3, 4, 5, 6, 11, 12, 16, 17, 19, 20, 23, 24].

New methods for determining the mentioned quantities have been developed in the following sequence:

a) Determination of true resistance. For this purpose, using well survey data measured with a complete geophysical complex, the value of the true resistance (ρ_{lay}) determined at the cross-section is based on a comparison of the assumed specific resistance (ρ_{SER}) with the standard zonde (N0.5M2A) transition to the true value (ρ_{lay}) using the dependence curve (fig.1), the following formula is determined:

$$\rho_{lay} = 0.995 \rho_{SER}^{0.843} \quad (R^2=0.998) \quad (10)$$

Here, ρ_{SER} - assumed specific electric resistance.

KS and, as can be seen, a linear relationship was obtained (fig. 2).

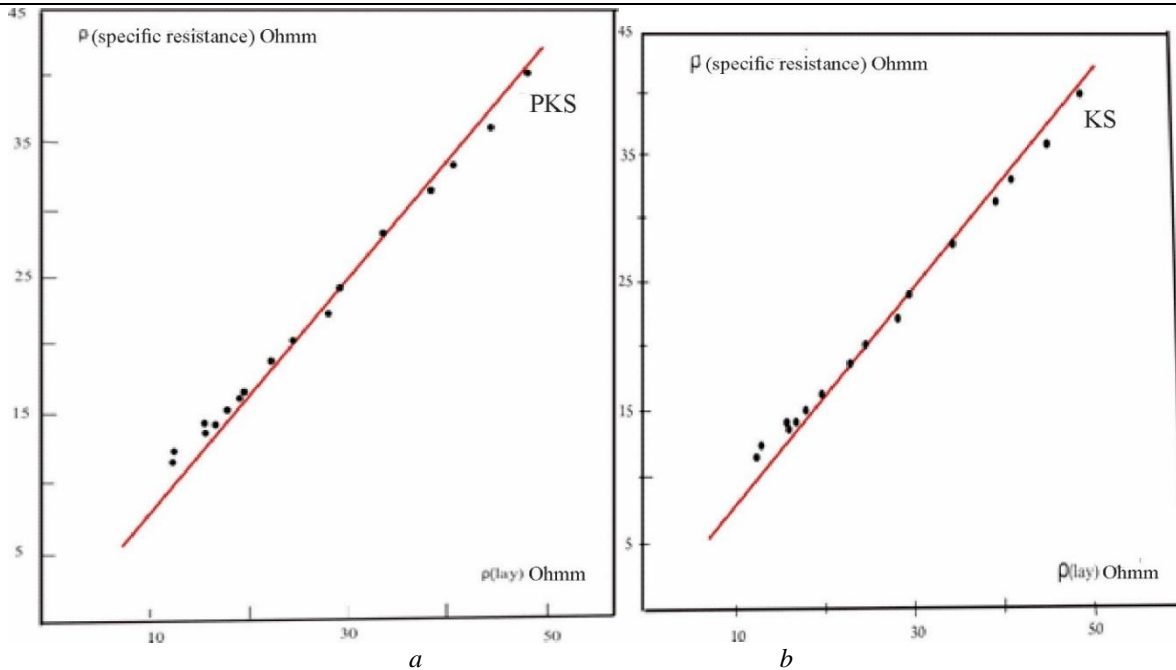


Figure 2. $\rho_{SER} = f(\rho_h)$ dependence for formation PKS and KS

b) Determination of porosity coefficient. Petrophysical and geophysical data collected on the field are analyzed in order to assess the collector parameters in the rocks at the cross-section of wells drilled at the development object. For this purpose, values of the determination porosity coefficient based on the analysis of rock samples taken during excavation from the cross-section of the object, by compiling the dependence

curve α_{SP} determined by electric logging from porosity at the same intervals (fig. 3) and the following formula was obtained.

$$K_p = 0,258\alpha_{SP}^{0,5} \quad (R^2=0,975) \quad (11)$$

α_{SP} - relative spontaneous potential.

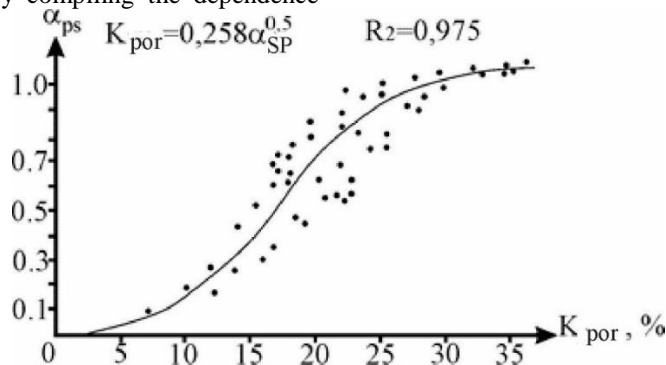


Figure 3. Dependence curve α_{SP} from value of rock samples porosity

c) Determination of oil saturation coefficient. Complete and limited complex researches are carried out at the cross-section of wells that open the object during drilling in the field, by the methods of mining geophysics. Taking into account technical and economic factors, the number of wells measured in the field with full geophysical complex is 5-10 %. Only after the investigation of these wells, an opinion characterizing the qualitative or quantitative parameters of the filtration-capacity characteristics of the section collectors is given, and these opinions are used as basic information in the calculation of the balance oil and gas reserves of the field. The time difference between the drilling period of these wells, the complex lithological composition of the cross-section, change in area along the vertical and horizontal directions, shielding with transverse and longitudinal disturbances, tectonic block

fraction in the calculation of reserves and the small number of wells measured in a complete geophysical complex in the analysis of development, adversely affects the results of inventory calculation and analysis, and most fields need to be reassessed. For this purpose, when assessing the development status of the object analyzed by the field research method, using research data on complete and limited geophysical complexes in wells, quantitative parameters of collectors are determined at the cross-section. For this purpose, using well survey data measured in a complete geophysical complex, the following formula was obtained for oil and gas saturation (fig. 4):

$$K_{o.g} = 0,454\rho_{lay}^{0,157} \quad (R^2=0,998) \quad (12)$$

ρ_{lay} - true value of the special resistance of layer;

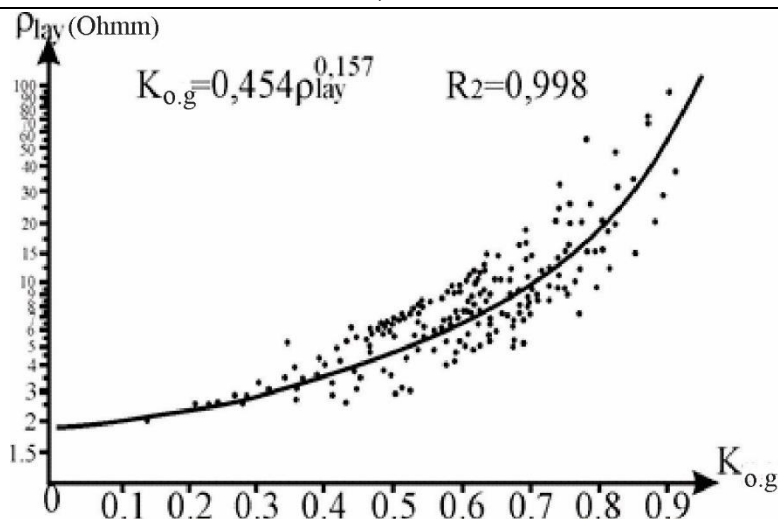


Figure 4. Dependence curve on the true resistance of the oil-bearing formation

d) Calculation of clayness coefficient. The following formula (anisotropic method) was used for this purpose:

$$C_g = \frac{(\rho_{cal}^{max} - \rho_{cal})\rho_c}{(\rho_{cal}^{max} - \rho_c)\rho_{cal}} * 100\% \quad (13)$$

Here, ρ_{cal} - is the true specific resistance obtained for the layers by calculation; ρ_c - special resistance of clay layer (this value is taken as 1.5 Ohmm); ρ_{cal}^{max} - is the maximum true specific resistance in the field - this value is determined on the basis of the dependencies $\rho_{SER} = f(\rho_{cal})$ established for KS and PKS (=50 Ohmm taken, fig. 2a and b).

e) Determination of sandness coefficient. The following formula was used for this purpose:

$$C_s = (1 - C_c) * 100\% \quad (14)$$

i) Determination of the true thickness of the layer. For this purpose, the following scheme characterizing

the angle of inclination of the layers on the blocks was developed using a structural map (fig. 5). The traditional formula used, taking into account the angle of inclination of both the layer and the well, is as follows:

$$h_h = h_f \cos(\alpha - \beta) \cos \varphi \quad (15)$$

Here, α - angle of inclination of the layer; β - inclination angle of the well; φ - azimuth of the well axis. However, since not all wells have inclinometer data, an abbreviated formula has been determined the true layer thickness using the above scheme:

$$h_{cal} = h_a \cos \eta \quad (16)$$

Here, h_a - is the assumed thickness of the layer taken from the diagram; η - is the angle taken according to the scheme, and in our case it is assumed to be 20° (fig. 5). In the Pirallahi field 377 wells are vertical and 170 are inclined.

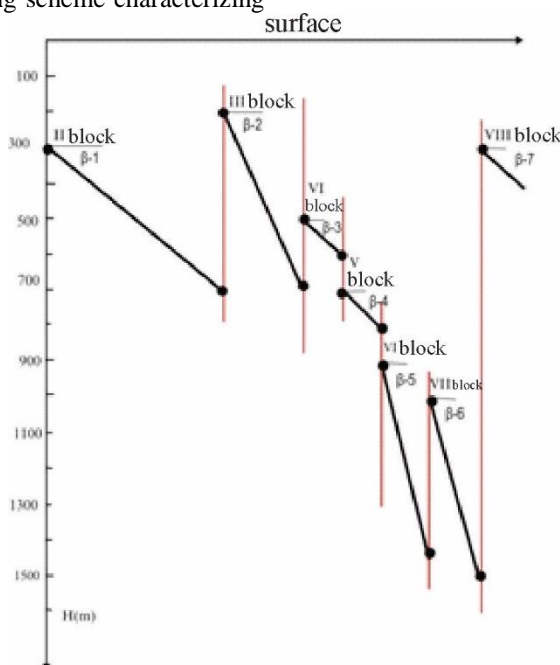


Figure 5. Scheme characterizing the angle of inclination of layers on blocks

f) Determination of the thickness of the oil-bearing layer. The following formula was used to determine this thickness:

$$h_{o.g} = h_r C_s \quad (17)$$

Here, h_r - the real thickness of the investigation layer; C_s - is the coefficient of sandness. Based on the obtained data, a model of the research horizon for different quantities is builded. At the same time, tables on wells, horizons, tectonic blocks and final results on the object are compiled on the basis of information obtained from the research object method of the oil and gas field.

4. Results

Layers with an oil and gas saturation coefficient greater than 0.52 were selected by formation groups and the average values of all quantities were determined. The above sequence was implemented for all suite from top to bottom on tectonic blocks (table 1).

Sufficient oil and gas-bearing layer have been identified in PKCS, PKSS, KS and PKS on tectonic blocks in well cross-sections. No such layer were recorded in the Balakhany, Surakhany and Sabunchi suite.

Oil and gas-bearing layer are present in tectonic blocks I (we have II), IIa (we have IV) of the "Pereriva" formation. The total thickness of these layers was 8 m in tectonic block I (II), 5 m in II (III) and 2 m in IIa (IV). The initial balance reserves of 3883.000 tons of oil have been determined in the "Pereriva" formation on the field. The "Pereriva" formation has not been developed in the field so far. Based on the results obtained, it is proposed to conduct sampling in this layer.

PKCS is observed in all tectonic blocks. The inirial balance reserves of oil in this formation are estimated at 4296 thousand tons. The PKCS formation has not been developed in the field so far. Based on the results obtained, it is proposed to conduct sampling in this layer.

PKSS is observed in all tectonic blocks. The inirial balance reserves of oil in this formation are estimated at 6019 thousand tons.

KS is observed in all tectonic blocks. The inirial balance reserves of oil in this formation are estimated at 57.196 thousand tons.

PKS is observed in all tectonic blocks. The inirial balance reserves of oil in this formation are estimated at 30.046 thousand tons.

PKSS, KS and PKS are the objects of development in the field. Therefore, according to 443 wells surveyed at the Pirallahi oil field, the initial balance reserves of oil for these suite were estimated at 93.261 thousand tons.

As a result of processing the logging diagrams, the following additional information was obtained.

Preliminary balance oil reserves for previously undeveloped tectonic blocks are distributed as follows: II (I) in "Pereriva"+PKCS+PKSS 8192 thousand tons; III (II) in "Pereriva"+PKCS+PKSS 639 thousand tons; IV (IIa) in "Pereriva"+PKCS+PKSS 231 thousand tons; V (IIb) in PKCS+PKSS 2138 thousand tons; VII (IIc) in PKCS+PKSS 1270 thousand tons; VIII (IVa) in PKCS+PKSS 1728 thousand tons; Total is 14.198 thousand tons.

Initial balance oil reserves in tectonic block I (III), which is not developed yet: 1792 thousand tons in PKCS; 276 thousand tons in PKSS; 2573 thousand tons in KS; 1192 thousand tons in PKS. Total is 5833 thousand tons.

Due to the lack of information on wells located in tectonic block VI (IIc), in this tectonic block was not included in the calculation.

1) A total of 87.242 thousand tons was estimated for the KS+PKS of the initial oil reserves in the field; 2) I (III) tectonic block recoverable oil reserves is 2174 thousand tons; 3) The recoverable oil reserves in tectonic blocks II (I), III (II), IV (IIa), V (IIb), VII (IIc), VIII (IVa) are 1.600 thousand tons at PKCS and 2.242 thousand tons at PKSS. 4) The recoverable oil reserves in tectonic blocks II (I), II (II), IV (IIa) are 1.447 thousand tons at "Pereriva". 5) The recoverable oil reserves of the field are 32.553 thousand tons.

5. Discussion

The results of the compiled model, cross-section and correlation schemes on suite.

According to the 2D model (the model is compiled on the whole suite - fig. 6)

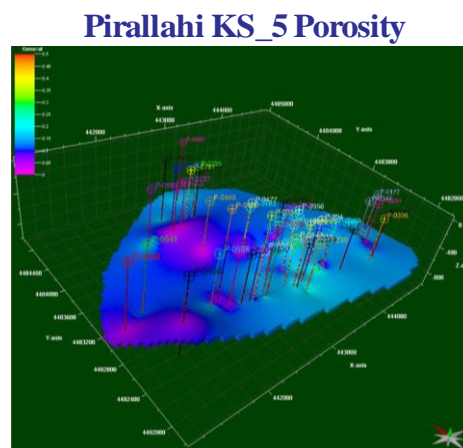


Figure 6. 2D model - for example

1. By coefficient of porosity: KS5 - high values in the southeast and north; KS4 - is characterized by low values in layers; KS3 - grows in the south-eastern; KS2 - slight increase in the south-east; KS1 - high values in the north and south; PKCS - high value in the layer; PKSS - slight increase in the western and south-eastern part, an increase is observed in the lower horizons of the south-eastern part of the structure.

2. Distribution of oil saturation coefficient: KS5 - high values in the center and south-east; KS4 - the highest value in the south-east and center; KS3 - high values in the south-east and center; KS2 - declining trend; KS1 - in the center and east is normal, deteriorating to the south-east; PKCS - high value in the

east and north of the structure; PKSS - saturation is practically not observed.

3. Distribution of facies: KS5 - high sandiness in the north-west and south-west; KS4 - clayiness in the center, high sand in the north and south-east; KS3 - sand-clay transition in the eastern and western parts of the center; KS2 - good sandiness is persistent in the south-western direction and in the northern part, in the other direction the sands and clays replace each other; KS1 - the layers consist mainly of clay fractions; PKCS - clays in the south-west and south-east; PKSS - small quantities of clay-sands are observed.

Porosity and facies in the 3D model (the model is compiled on the whole suite - fig. 7):

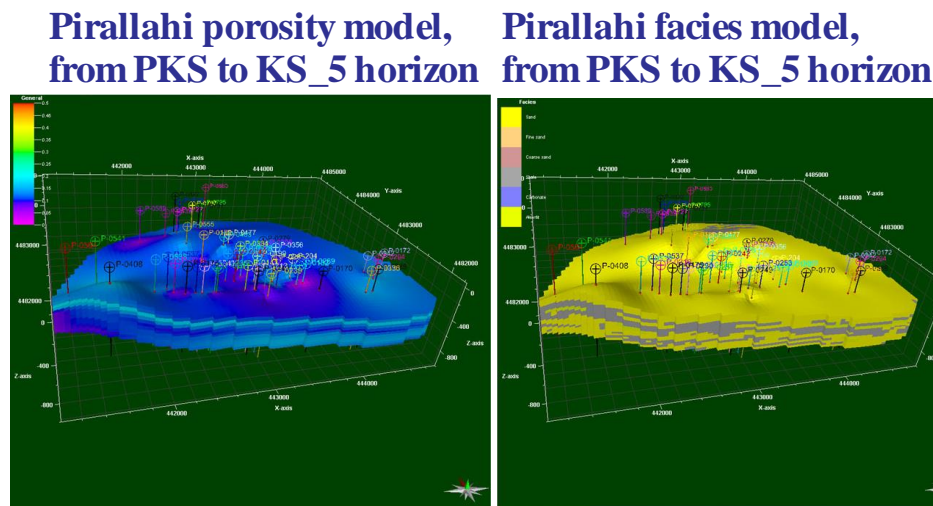


Figure 7. Porosity and facies in 3D model

Porosity - grows southeast of the structure from the PKSS to the KS5 horizon. Facies - from the PKSS to the KS5 horizon the clayiness of the sandy facies along the horizon increases, and then the percentage of sandiness increases.

According to the cross-section of the field (fig. 8): To west-east direction: The cross-sectional profile of the southern parts of the structure shows the absence of

oil in the PKSS. Low oil content in PKCS is in the western part. Relative oil content is in the lower parts of the KS. Good oil content is observed in the eastern parts of structure in the KS3, KS4, KS5 horizons; In the north-south direction: Good oil content is observed in the lower horizons of KS2, KS3, KS4 and KS5 with an increase to the south.

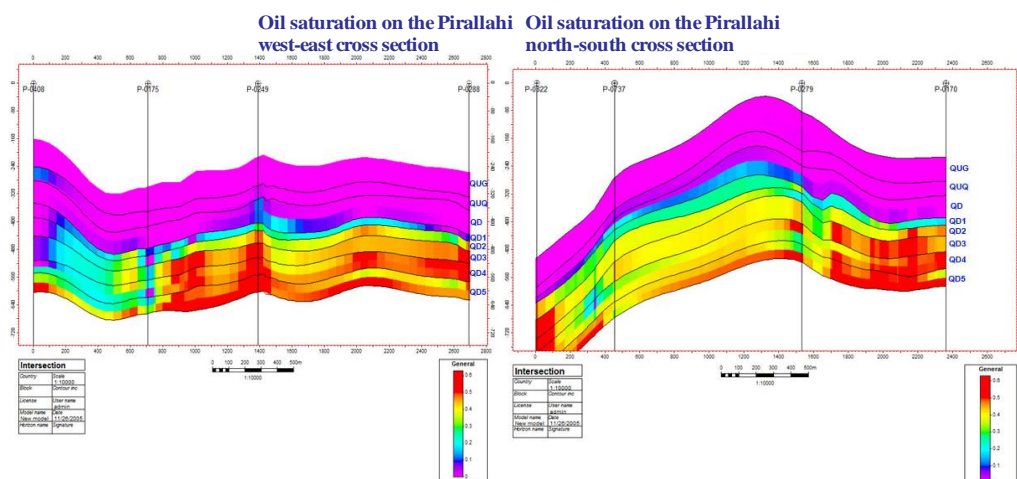


Figure 8. Geological section: QUG - Post-Kirmaky Clay Suite (PKCS); QUQ - Post-Kirmaky Sand Suite (PKSS); QD - Kirmaky Suite (KS); QD1 - Kirmaky Suite (KS1); QD2 - Kirmaky Suite (KS2); QD3 - Kirmaky Suite (KS3); QD4 - Kirmaky Suite (KS4); QD5 - Kirmaky Suite (KS5)

Distribution of petrophysical quantities in the 3D model (the model is compiled on the whole suite - fig. 9): Clayness - average value 40 %; Porosity - average value 15 %; Sandiness - about 80 %; Oil saturation -

average value 50-60 %; Fasie - sandstone predominates.

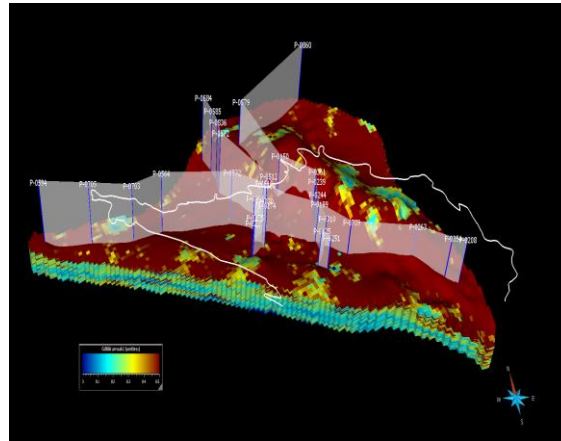


Figure 9. Distribution of petrophysical quantities - for example

Correlation result (fig. 10): All suite are involved in well section according to the correlated profile. There is no thinning-out and the thickness of

the layers does not change so sharply (approximate average value is 15-17 m).

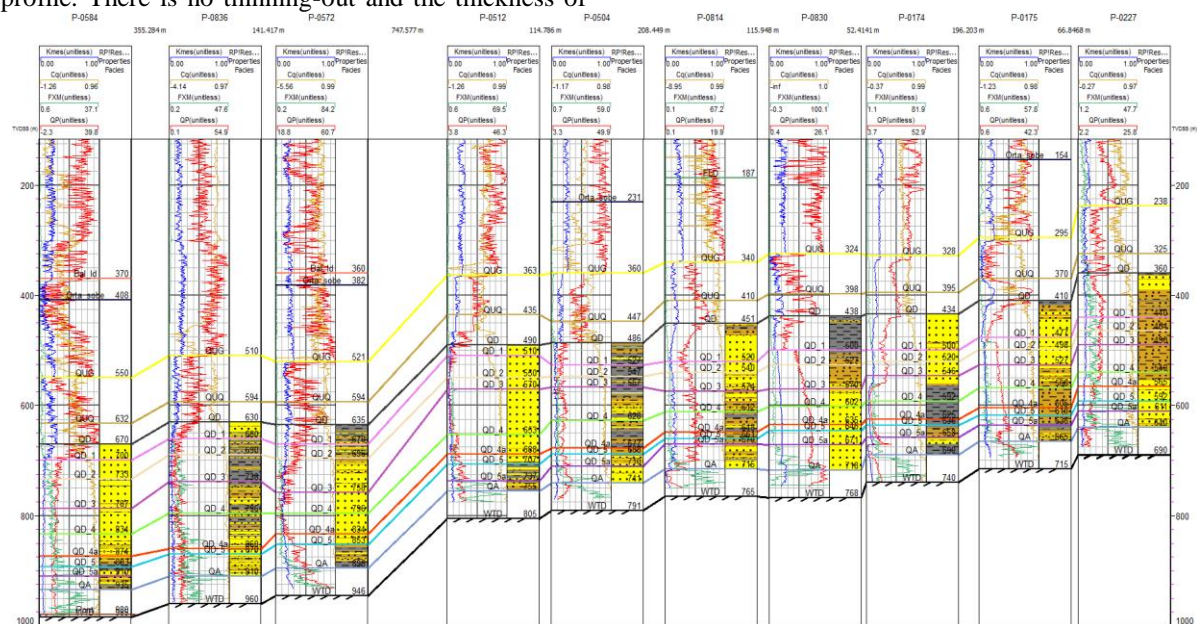


Figure 10. Correlation scheme: K_{mes} - porosity coefficient; C_q - percentage of sand FXM - assumed specific electric resistance; QP - spontaneous potential (SP); Bal_LD - Balakhany Suite (BS); orta sobe - middle productive series; QUG - Post-Kirmaky Clay Suite (PKCS); QUQ - Post-Kirmaky Sand Suite (PKSS); QD - Kirmaky Suite (KS); QD1 - Kirmaky Suite (KS1); QD2 - Kirmaky Suite (KS2); QD3 - Kirmaky Suite (KS3); QD4 - Kirmaky Suite (KS4); QD5 - Kirmaky Suite (KS5); QA - Pre-Kirmaky Suite (PKS)

6. Conclusions

1. The sandness coefficient of the collector layers of the Pirallahi field is about 80 %. This is also important in the operation of the layers.
2. As a result of the research, some oil-bearing layer with high oil content have been released.
3. Distribution graphs show that, good collectors are located in the south-eastern direction of the field.
4. In the south-eastern parts, an increase in porosity is observed in the lower horizons of the structure.
5. Clays predominate in the south-western and south-eastern parts of the structure.

Credit authorship contribution statement

Vagif Mirgamze Seyidov: Conceptualisation, Investigation, Formal analysis, Writing - original draft.
Khalid Faig Melikov: Conceptualisation, Investigation, Formal analysis, Writing - original draft.

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Conflict of interest

The authors declare no conflict of interest.

References

1. Ahmedov NN, Bagirzade FA, Salayev SM (1973) Geology of oil and gas regions of Azerbaijan. Baku, 262 p.
2. Kerimov KM, Huseynov AN, Nagiyev FM et al. (2002) Geological bases of assessment of hydrocarbon resources of the Azerbaijan Republic // Geophysics news in Azerbaijan. Baku, #3-4, p. 6-8.
3. Mammadov NV, Seyidov VM, Pashayev NV (1996) About determination of productive layers in piped wells by INNLL // Azerbaijan Oil Industry. Baku, #11, p. 11-14.
4. Pashayev NV, Seyidov VM, Sadyarov AD (2010) Estimation of field reserve parameters based on GIW data with mathematical statistical approach / Theses of the scientific conference dedicated to the 100th anniversary of Sh.Mehdiyev. BSU, Baku, p. 185-187.
5. Pashayev NV, Seyidov VM, Malikov KhF (2011) Assess the feasibility of methods for determining the permeability of rocks // Azerbaijan Oil Industry. Baku, #05, p. 3-7.
6. Seyidov VM (2009) Problems studied by geophysical control methods in field development and application of new methods // Proceedings of Azerbaijan High Technical Educational Institutions. Baku, #3(61), p. 14-17.
7. Basin YN, Qrunis EB (2004) Geophysical surveys of wells at the stage of operation of an oil and gas field // Karotajnik. Tver, #25, p. 11-15.
8. Hasanov AB, Melikov KhF, Seyidov VM (2008) Estimation of the distribution of collectors in space according to the complex of geophysical and petrophysical data // Karotajnik. Tver, #7(172), p. 50-57.
9. Konoplev YV, Kuznichov GS, Leontyev EI et al. (1986) Geophysical methods for monitoring the development of oil fields. Moscow, 221 p.
10. Vendelshteyn BY, Zoloyeva GM, Chareva NV et al. (1985) Geophysical methods for studying estimated parameters in determining oil and gas reserves. Moscow, 311 p.
11. Seyidov VM (2004) Improving control over the exploitation of deposits in Azerbaijan with the help of geophysical research methods // Azerbaijan Oil Industry. Moscow, #11, p. 108-110.
12. Seyidov VM (2005) To the question of studying some parameters during the exploitation of layers // Azerbaijan Oil Industry. Moscow, #11, p. 58-60.
13. Gutiérrez-Torres, Ludy-Amparo, Molina-Gomez, et al. (2019) Methodology to define hydrocarbon potential in a shale reservoir based on geochemical data and well logs. *Ciencia, Tecnologia y Futuro* Vol 9, Num 1: 5-14. <https://doi.org/10.29047/01225383.147>
14. Crain. (2015). Petrophysical Handbook. [Online] E.R (Ross) Crain. Shareware Petrophysics Training and Reference Manual. [Cited March 10, 2015]. Available at: URL <http://spec2000.net/01-index.htm>
15. Crain, E.R Ross. (2014) HOLGATE D. Step Program To Reduce Uncertainty In Kerogen-Rich Reservoirs: Part 1- Getting the right porosity. Reservoir Issue 03.
16. Passey QR; et al. (2010). From Oil-Prone Source Rock to Gas-Producing Shale Reservoir-Geologic and Petrophysical Characterization of Unconventional Shale-Gas Reservoir. Available at: Society of Petroleum Engineers, SPE 131350/SPE International, Copyright. 29p.
17. US. EIA. (2013). Technically Recoverable Shale Oil and Shale Gas Resources: An Assessment of 137 Shale Formations in Countries outside the United States. Available at: <https://www.eia.gov/analysis/studies/worldshalegas/pdf/overview.pdf>
18. Craddock PR, Mosse L, Bernhardt C, Ortiz AC, Tomassini FG, Pirie IC, Saldungaray P, Pomerantz AE (2018) Matrix-adjusted shale porosity measured in horizontal wells. *Petrophysics* 59(03):288-307. <https://doi.org/10.30632/PJV59N3-2018a1>
19. Hill DG (2017) Formation evaluation. In: Hsu CS, Robinson PR (eds) Springer handbook of petroleum technology. Springer, Cham, pp 433-500. https://doi.org/10.1007/978-3-319-49347-3_13
20. Tiab D, Donaldson EC (2016) Petrophysics: theory and practice of measuring reservoir rock and fluid transport properties, 4th edn. Gulf Professional Publishing, Oxford. <https://doi.org/10.1016/C2014-0-03707-0>
21. Oras Joseph Mkinga, Erik Skogen, Jon Kleppe (2020) Petrophysical interpretation in shaly sand formation of a gas field in Tanzania. *Journal of Petroleum Exploration and Production Technology*. 10:1201-1213 <https://doi.org/10.1007/s13202-019-00819-x>
22. Sihui Liu, Buzhou Huang, Baozhi Pan, et al. (2015) Research on the calculation method of shale and tuff content: taking tuffaceous reservoirs of X depression in the Hailar-Tamtsag Basin as an example. *J. Geophys. Eng.* 12. 810-819. <https://academic.oup.com/jge/article/12/5/810/5106779>
23. Yunsheng W, Ailin J, Yanmei X, Jianlong F (2021) Progress on the different methods of reserves calculation in the whole life cycle of gas reservoir development. *Journal of Natural Gas Geoscience*, Volume 6, Issue 1, February, Pages 55-63.
24. Chen YQ, Tang W (2016) Annual evaluation methods for remaining recoverable reserves, remaining recoverable reserves-production ratio and remaining recoverable degree of oil and gas fields. *Acta Pet. Sin.*, 37 (6), pp. 796-801.
25. Аль-Кебси, ААМА (2019) Improving the methodology for calculating oil reserves of the Bazhenov formation by taking into account the system of fractures. p. 119-122.
26. Eremina NV (2017) Calculation of reserves and assessment of oil and gas resources. Training manual (laboratory workshop). Stavropol, 181 p.
27. Makuxo OO, Xomik VM (2019) Improving the accuracy of estimating hydrocarbon reserves for

prospecting and exploration wells according to the prms Prooil classification. Professionally about oil. № 4(14). p. 26-31.

28. Dmitry Z (2019) Improving the Accuracy of Hydrocarbon Reserves Estimation Based on an Integrated Approach November DOI:10.30987/graphicon-2019-2-164-167.

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ECONOMIC SCIENCES

INCREASING THE ROLE OF INNOVATIONS IN INCREASING THE EXPORT POTENTIAL OF THE NON-OIL SECTOR

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Abstract

The article explains the development of the non-oil sector in modern times, export growth, favorable business environment, investment attraction, continuous improvement of infrastructure, expansion of integration relations. The role of innovations in increasing the export potential of the non-oil sector. sources of funding in the field of innovation, world experience, etc. investigated.

Keywords: national business, innovation potential, innovation economy, innovative development, innovation strategy.

Content of the case

The socio-economic policy pursued by President Ilham Aliyev and the diversification of the economy, which is one of the main directions of this policy, play an exceptional role in ensuring the sustainable development of Azerbaijan. President of the Republic of Azerbaijan Ilham Aliyev states that "The main goal of the new economic development program is to develop the non-oil sector in our country, diversify the economy and support the private sector."

One of the main goals of the Strategic Road Map, approved by the Presidential Decree dated December 6, 2016, is to ensure the development of the non-oil sector. As a result of multifaceted and fundamental reforms, the non-oil sector is developing in Azerbaijan, our export opportunities are expanding, and dependence on imports is decreasing. At the heart of all these successes is the unity of people and power and the principle of mutual trust.

The Strategic Roadmap for the National Economic Perspective covers three periods - short-term, medium-term and long-term - 2020, 2025 and 2025.

Successful implementation of strategic roadmaps under the leadership of President Ilham Aliyev contributes to macroeconomic stability, growth of the non-oil sector and exports, improvement of trade and fiscal balance, favorable business environment, investment attraction, sustainable infrastructure improvement, social welfare and integration of our country [1].

At present, it is planned to strengthen Azerbaijan's integration into the world economy and join the group of high-income countries.

Ensuring the development of the non-oil sector in order to increase the efficiency of the economy and increase competitiveness in our country is one of the main priorities of the national economy. To this end, as a result of successful economic policies pursued in the country, along with the achievement of economic diversification, the share of the non-oil sector in Gross Domestic Product has increased significantly. [2]

Economy Minister Mikayil Jabbarov said on Twitter that the export potential of the non-oil sector has been restored with confidence and

speed. He noted that in January-June this year, non-oil exports increased by 27.1% compared to the first half of last year and exceeded \$ 1.16 billion in monetary terms. At the same time, exports of non-oil products increased by 40.1% and its share in total non-oil exports exceeded 50%. In general, the total export volume for 6 months increased by 14.8% year on year. Further, the growth of exports has a positive impact on financial stability, creating new jobs and ensuring the stability of our foreign exchange reserves. Ensuring the competitiveness of development plays an exceptional role.

It is very important for our republic that the economic development of enterprises in accordance with the requirements of a market economy is formed on the basis of the principle of competitiveness. In the Global Competitiveness Index, Azerbaijan ranked 64th in 2006, behind Russia (62nd) and Kazakhstan (56th). As a result of economic development in the country over the past 10 years, according to the "Global Competitiveness Index 2013-2014", Azerbaijan ranked 39th in terms of competitiveness, ahead of countries such as Russia and Kazakhstan, and 1st in the CIS. It is ranked 51st in terms of innovation and 35th in terms of innovation potential. Azerbaijan ranks 71st in terms of real GDP per capita. These indicators show the development of the country's economy at the macro and micro levels, increasing its competitiveness. [3].

The strengthening of the modern process of globalization and its impact on national economies has made it necessary to make fundamental changes in scientific and practical views that serve to ensure the competitiveness of enterprises.

In the context of modern globalization and increasing openness of Azerbaijani markets to foreign business, the issue of increasing the competitiveness of the economy has become even more urgent.

At present, one of the most important directions of the state's economic policy in Azerbaijan is to increase the competitiveness and ensure the innovative development of existing enterprises in the country.

It should be noted that business structures in our country - newly created and modernized enterprises -

do not work to create new products, new technologies, but to produce competitive products that exist in the market. These companies already prefer to buy and apply technologies used in foreign markets, or to cooperate with foreign companies. One or two enterprises are engaged in the production of any specific product in the country at the same time, and the application of customs and tax duties on imports of these products, transport costs, artificial barriers in the import process allow producers to gain a certain competitive advantage. [4]

Research shows that most innovations implemented by enterprises are temporary. There are a limited number of innovations. This shows that the competition in the commodity markets is weak and many enterprises of the republic have a monopoly position.

It should be noted that Azerbaijan had a strong oil engineering industry until the 1990s. Due to the transition to a market economy from the first years of the transition period, the economic ties of the enterprises of this industry were broken, and as a result of the loss of traditional markets for their products, the industry fell into decline. In addition to losing supply and sales markets, oil companies have lost the opportunity to apply new equipment and technology, modernize existing production facilities, and thus produce quality products that meet international standards due to financial difficulties.

At present, mastering the production of products that meet the requirements of local and foreign markets, the application of investment policy, innovation strategies, modern management systems, marketing strategies, information and communication technologies is one of the important issues.

Production of competitive products in modern conditions is achieved, first of all, by achieving high profits by saving costs as a result of the application of innovation in the enterprise. To this end, any entrepreneur is interested in attracting innovation to the enterprise. The innovative form of entrepreneurship manifests itself in two directions: technological and product innovation. Technological innovation involves the further improvement of an existing product by applying innovation to the enterprise. Such entrepreneurship is based on the development of material and technical base. Product innovation involves the production of new products as consumer demand changes. In short, innovative entrepreneurship refers to economic entities that produce high quality products with advanced techniques and modern technological methods. Studies show that the winners in the world economy are the countries that have an effective innovation system, as well as the development of infrastructure that allows them to produce advanced products. The development of innovation-based entrepreneurship in our country is considered a key factor in economic diversification. Innovative innovations are usually made by large companies. This is due to the fact that this area requires large financial resources. However, small firms were able to bring this innovation to the enterprise faster, because these small firms are more flexible in adapting to changing needs.

According to the facts, the share of innovative products in the GDP of our country is about 5%, but in the developed countries of the world it is 8-9 times higher (40% -60%). According to research, the development of innovation in the country depends primarily on the development of human capital, ie, first of all, its level of education, knowledge and skills. From this point of view, the state program on "Education of youth abroad" for 2007-2015 has been developed for the development of human resources in our country. In many parts of the world, the private sector spends more on research (65% in the EU, 71% in Japan and 75% in the United States). However, this figure is low in our country (5%). Proper implementation of innovation activities of the enterprise depends, first of all, on the correct determination of the economic efficiency of innovation projects in the enterprise in advance and the choice of methods of implementation. The formation of innovative entrepreneurship, in turn, leads to the emergence of innovative employment. This is due to the fact that the workforce does not meet the requirements of high-tech production. Thus, the development of human potential is the basis for the formation of innovative employment.

Research shows that the socio-economic progress of any country depends on the development of science, human capital and innovation. The formation of an innovative national business determines the direction of the effective realization of the national economic power and interests of the country. For this purpose, formation of the country's technical and economic competitiveness for the implementation of the tasks envisaged in the socio-economic development strategy of the republic; improving the quality and competitiveness of national products; It is very important to increase state support for the innovative development of industries with comparative advantages. In addition, ensuring the access of innovative products to international markets; Encouraging the development of innovative industries in the regions by the state, the application of a number of concessions in the field of taxation and customs can be very effective. [5]

The results of reforms in the country show that new knowledge, technologies and their effective application to socio-economic development determine the country's place in the world community and ensuring national security. In this regard, given the limited resources of innovation, all economic systems must adhere to the norms of efficient use of their use. [6]

To achieve this goal, innovative technologies that meet modern requirements must be created in the country and their effective use must be ensured. Research shows that China, the United States, Germany, Italy, Japan, the Republic of South Korea, Malaysia, Singapore, Taiwan and other countries are currently leading in the production and introduction of modern innovative technologies on the world market. Providing a favorable business environment, Azerbaijan ranked 63rd out of 189 countries in the 2016 World Bank's R Business report. At the same time, Azerbaijan ranks 40th among the world's

countries on 5 out of 10 indicators reflected in the World Bank. At the same time, in order to stimulate private sector investment in the non-oil economy, it is proposed to further improve the favorable business environment and strengthen its institutional framework.

It should be noted that the policy of import substitution and expansion of export potential in our country should be taken into account in the customs policy of our country. Thus, the experience of other countries shows that financial and credit mechanisms should be widely used to ensure the rapid development of the non-oil sector during import substitution and expansion of export potential. In addition, additional investment should be attracted in this area, tax rates should be reduced and customs tariffs regulatory tools must be used effectively.

Result

In the future, in accordance with the requirements of Azerbaijan's economic development strategy, the development of innovative national business in all sectors of the economy must be provided in a proportional manner. The development of innovative national business in the country should serve the realization of national economic interests. As progressive progress has been made in the socio-economic development of Azerbaijan, important steps have been taken in the export of innovative products in a number of areas. These include the products of the country's non-oil sector, the petrochemical industry, construction, cotton, tobacco and other products. However, in the development of innovative national business, it is expedient to pay more attention to the development of import-substituting products. Such products include machinery, machine tools and equipment for the processing and oil industries, cost-effective replacement resources, etc. can be attributed. In particular, in the development of the non-oil sector and the diversification of the economy, more investment is planned in the production of innovative products. Opportunities for foreign and domestic investment as a strong source of funding should be used effectively in the implementation of innovative measures in the non-oil sector in our country. [7]

To this end, the rate of return on investment must be taken into account in order to increase innovation assets. In order to increase innovation activity in the country, we consider it expedient to give priority to the implementation of the following measures:

1. Foreign and domestic investment in the development of the non-oil sector should be encouraged.

2. A favorable competitive and business environment must be created for the activities of innovative firms and companies.

3. The volume of investments in the replacement of physically and morally worn-out fixed assets in the republic should be increased.

4. Investments in the application of innovative technologies in existing industries should be encouraged.

5. Opportunities to limit the flow of capital from the republic to foreign countries and direct it to innovation-oriented areas should be expanded.

6. Attention should be paid to the development of innovation-oriented priority areas in the country, taking into account comparative advantages.

7. In order to ensure the active participation of our country in the regional integration blocs, the production of innovation-oriented products in the international market should be stimulated.

The application of all these measures will lead to the rapid development of the non-oil sector in our country and the improvement of the material well-being of the population.

References

1. "Decree of the President of the Republic of Azerbaijan on the Strategic Road Map for the National Economic Prospects of the Republic of Azerbaijan. December 6, 2016.
2. Decree of the President of the Republic of Azerbaijan on the State Program of Socio-Economic Development of the Regions of the Republic of Azerbaijan for 2014-2018. February 27, 2014 11.
3. Azerbaijan's foreign economic relations: achievements and prospects. Institute of Economics of ANAS. Baku: "Europe" publishing house, 2015.
4. A.Musayev. Innovation economy and tax incentives.
5. Z.M.Najafov. Basics of national innovation systems. Baku: "Science", 2006.
6. A.D.Hüseynova. Analysis of innovation potential in Azerbaijan. Baku: "Science and education", 2013.
7. ZA Shakaraliyeva Improving the regulation of the export potential of the non-oil sector. News magazine of the ENECO-Center for Energy Economy Baku №1,2022, p. 13-14

PEDAGOGICAL SCIENCES

FORMATION OF LINGUOCULTURAL COMPETENCE USING AUTHENTIC VIDEO CONTENT

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Abstract

The article presents the features of the use of video materials in a foreign language lesson as part of a linguistic research undertaken as part of the professional training of an English teacher. This article reflects the methodological aspects of training teachers to work with video material in order to diversify the traditional form of work through the introduction of authentic materials. The article describes the use of video materials, which activates the attention and arouses the interest of students in a foreign language, touches upon the issue of choosing authentic video materials and the effectiveness of their use in the classroom. In this paper, an innovative method of teaching with the help of video will be studied, and methodological recommendations will be given for the use of video content. This article provides an example of working on English-language video material.

Keywords: Authentic video content, criteria for choosing an authentic video material, self-motivation, teaching foreign languages, video recordings, authentic video material, authentic documents, innovative technologies, video programs for studying

INTRODUCTION

The formation of linguocultural competence is the main and leading goal of foreign language education. This is especially true today.

At the same time, in the process of mastering foreign language communication, it is very important to focus on the development of the ability to perceive foreign speech by ear. In addition, it should be remembered that language is closely related to culture. Today, when special attention is paid to the use of innovative technologies in the learning process, the use of video materials in the classroom, which is one of the types of such technologies, is a natural and correct approach to teaching. Due to the fact that this method is still gaining popularity, it is unusual, non-trivial and interesting for students, as it helps to assimilate information through authentic video materials, immersing themselves in the socio-cultural and linguistic environment in the classroom.[1]

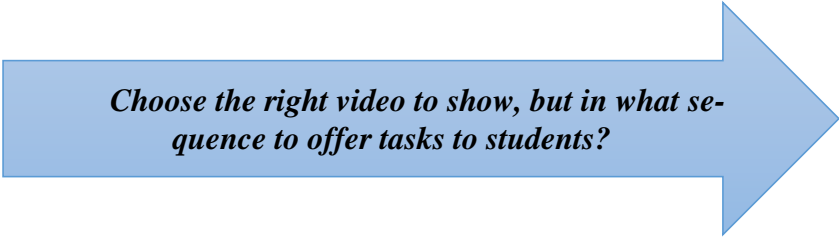
Some believe that the use of video in the classroom is unnecessary, it scatters the attention of students. However, in this work it is necessary to refute this fact and consider the importance of video materials as one of the means that increase the activity of students

in the classroom and give rise to their desire to speak out, to express their opinion about what they see.

I- THE USE OF AUTHENTIC VIDEO CONTENT

The use of video recordings in English lessons contributes to the individualization of learning and the development of motivation for the speech activity of students. The specificity of video materials as a means of teaching a foreign language provides communication with real objects that stimulate almost genuine communication: students seem to become participants in all situations played out with their help, play certain roles, solve "real", life problems. The resulting effect of participation in the daily life of the country of the language being studied not only contributes to learning a natural, living language, but also serves as a powerful incentive to increase students' motivation.

Currently, a lot of information, materials, adapted authentic films are offered with ready-made developments. The teacher has the opportunity to select material and show it in class. However, such lessons do not always bring results and are not effective.



Choose the right video to show, but in what sequence to offer tasks to students?

The use of video contributes to the development of various types of mental activity, primarily attention and memory. During viewing in the classroom, an atmosphere of joint cognitive activity arises. Under these conditions, even an inattentive student becomes attentive. In order to understand the content of the film,

students need to make some effort. So involuntary attention turns into arbitrary. And the intensity of attention affects the process of memorization. Use of various channels of information receipt (auditory, visual, motor perception) has a positive effect on the

strength of imprinting regional and linguistic material.[2]

The use of video in a foreign language lesson should always be more than a symbolic trip to the cinema or watching a TV show. While watching the video, the teacher comments on certain points, and then the students share their impressions of what they saw.

II - THE CHOICE OF AUTHENTIC VIDEO CONTENT

1. Main criteria for selecting authentic video materials

Video is an excellent supplementary material for learning English, as it is as close to language reality as possible. The video contains visual images and the necessary audio material, which makes the memorization process efficient and easy. Video can be used in the lesson to familiarize and study new material, as well as for repetition. [3]

In order to choose the right authentic video materials, we need to understand what categories are important when choosing, what factors affect effectiveness, and what teacher requirements should be demanded to prepare a lesson with this type of material.

First of all, the criteria for choosing an authentic video material are many and varied. It is necessary to take into account the elements that arouse motivation in the learning of any language in the learner. These

elements must be compatible with the needs of the learners.[4] Here it is up to the teacher to seek out, choose and finally offer the material used to teach the socio-cultural realities of the language studied. An authentic video material must be adapted to the public, it must interest and motivate it. A document must be found where the communication situation must appear clearly. That is to say, the nature of the document, speakers, place, time of the interaction, how the interaction takes place, cause, issue of the interaction. The video must be pedagogically usable. The communicative content must be relevant to the progression, so it must be in line with the targeted communicative objectives.

These elements are a few aspects that can promote the pleasure of learning for learners. Authentic video material is chosen to adapt it to the context, age and language level of the learners.

2. Audience

Focusing on his own audience, the teacher, in addition to the level, must of course take into account the age characteristics of the learners. It is necessary to take an interest in the various needs of the latter in order to succeed in teaching.

Students of different age groups have a number of psycho-physiological characteristics that must be taken into account in lessons of foreign languages. [5]

Age	Use of video content
5-10	In the classes, it is important to present the authentic video material, as well as the frequent change of activities. It is especially important to activate the main channels of perception and create positive motivation in children with the help of games.
11-17	In the classrooms, the role of analysis, generalization, systematization and repetition of video material is reinforced. The lessons create conditions in which each student has the opportunity to prove themselves.
18-25	In classes, it is effective to use role-playing, discussions, problematic orientation games, project methods, collaborative training using videos and cognitive materials. The classroom teacher becomes a communication partner, an Assistant, guiding the learning process.[6]
26+	The teacher should involve students at all stages of the educational process, use various games and techniques that improve and facilitate the memorization of material and allow you to immediately begin to apply the knowledge acquired in life.

CONCLUSION

Based on the data of the article, it can be concluded that at the moment there is no ideally developed methodology for teaching a foreign language using technical textbooks, and in particular video programs. Nevertheless, this method is being introduced into the educational process with great speed and contributes to the development of linguocultural competence within the framework of modern foreign language education.

References

1. Kamenetskaya N.P., Efremenko V.A. Application of information technologies in foreign language lessons / N.P. Kamenetskaya, V.A. Efremenko - M.: Foreign languages at school, - 2017. p. 18-20.
2. Useful English: Available at: <http://usefulenglish.ru/> (Accessed January 05, 2022).

3. Pencreach E.J. Dictionnaire de didactique du français, Langue étrangère et seconde, CLE International / E.J. Pencreach. – Paris : Methode et didactique, 2019. 11 p.

4. Rogova G.V., Sokolova E.N., Filatov V.M. Methods of teaching English at the initial stage in high school. / G.V. Rogova, E.N. Sokolova, V.M. Filatov - M.: English Publication, 1986. - 224 p.

5. Narymbetova Zh. S. Formation of linguocultural competence of a teacher of foreign languages in the context of his preparation for intercultural communication (English language): Kaz. University of International Relations and World Languages / J. S. Narymbetova - Almaty: Shamshyrak. 2021 - p. 21

6. Astapova N.O. Linguistic aspects of intercultural communication / N.O. Astapova - Barnaul, 2018. - p. 7

A REVIEW OF THE STUDIES ON VOCATIONAL GUIDANCE IN KYRGYZSTAN

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ОБЗОР ИССЛЕДОВАНИЙ ПО ПРОФЕССИОНАЛЬНОЙ ОРИЕНТАЦИИ В КЫРГЫЗСТАНЕ

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Abstract

This research was carried out to examine the studies on vocational guidance in Kyrgyzstan. In the research, a literature review model from the qualitative research method was used. Content analysis technique was used in order to examine the theses of the articles related to vocational guidance. According to the findings obtained in the research; It was concluded that the researchers working in terms of gender were mostly men, most of the studies consisted of articles, and the methods used in the research were mostly done with descriptive research method, and the data they used were mostly obtained through document analysis. Considering the results of the studies examined, it was concluded that students were more affected by their families in choosing a profession, and that vocational guidance was carried out by teachers during the lessons in schools. It was concluded that in most of the studies, suggestions were made based on the implementation of school and extracurricular activities related to vocational guidance in cooperation with families.

Аннотация

Данное исследование было проведено для изучения исследований по профориентации в Кыргызстане. В исследовании использовалась модель обзора литературы из качественного метода исследования. Для проверки диссертаций и статей, касающихся профориентации, применялся метод контент-анализа. Согласно выводам, полученным в ходе исследования; Был сделан вывод, что исследователи были в основном мужчинами, большая часть исследований состояла из статей, а методы, использованные в исследовании, в основном проводились описательным методом исследования, а данные, которые они использовали, в основном были получены путем анализа документов. По результатам рассмотренных исследований сделан вывод о том, что на учащихся в большей степени повлияла семья при выборе профессии, а профориентация осуществлялась учителями на уроках в школах. Сделан вывод, что в большинстве исследований вносились предложения, основанные на реализации внешкольных и внеклассных мероприятий, связанных с профориентацией, во взаимодействии с семьями.

Keywords: Profession, guidance, vocational guidance**Ключевые слова:** Профессия, ориентация, профориентация.

Работа – это связь человека с реальностью. Вот почему людям нужна работа. Профессия является важнейшим ресурсом человека и одним из важнейших факторов, благодаря которым он пользуется уважением окружающих, имеет место в обществе, зарабатывает на жизнь и реализует себя. Професси-

ональная ориентация, предпочтения, выбор и некоторые задачи профессионального развития человека, которые возникают в процессе развития карьеры, обычно происходят в процессе образования. Появились некоторые институты, которые берут на себя задачу подготовки молодых людей к выбору профессии. Одним из таких институтов является

институт «Консультации» [5]. Консультации — это работа по познанию человека, раскрытию себя, принятию собственных решений, управлению собственной жизнью и ответственному оказанию помощи человеку в достижении результатов. Профориентация — это помощь, оказываемая лицам в ознакомлении с различными профессиями, в выборе подходящих профессий, в подготовке к профессии и в профессиональном развитии. Профориентация как часть жизни человека вызвала интерес во многих аспектах и может стать темой исследования. В литературных исследованиях видно, что этой темой занимались ученые разных стран. Документальное изучение исследований, проводимых в Кыргызстане по профориентации, составило задачу настоящего исследования.

Основной целью исследования является изучение исследований по профориентации в Кыргызстане. В соответствии с этой общей целью были получены ответы на следующие вопросы: исследования по профориентации в Кыргызстане каково распределение исследований: по полу исследователей; по их типам; по использованным им методам исследования; в соответствии с используемыми методами сбора данных; по рабочей группе; по результатам и по рекомендациям исследований?

Метод

В этом исследовании, в котором использовался метод качественного исследования, техника «контент-анализа» использовалась для изучения в общей сложности 13 источников, состоящих из диссертаций и научных статей, полученных из 8 университетов и из сайта высшего аттестационного комиссии в Кыргызстане в зависимости от профориентации.

Результаты

При рассмотрении распределения исследований по профориентации в Кыргызстане, что является первой подцелью исследования, по полу исследователей, показало что, в исследовании приняли участие 7 (53,8%) мужчин-исследователей и 6 (46,1%) женщин-исследователей.

Согласно распределению исследований по типам, что является второй подцелью исследования, было выявлено 7 (53,8%) статей, 4 (30,7%) дипломных работ и 2 (15,4%) докторских диссертаций.

Третья подцель исследования, которая заключается в распределении исследований по профориентации в Кыргызстане по методам исследования, найденных исследованиях является описательный метод исследования (8) 61,5%, качественный метод исследования 4 (30,7%) и смешанный метод 1 (7,6%).

Учитывая распределение исследований по профориентации в Кыргызстане, что является четвертой подцелью исследования, в соответствии с используемыми методами сбора данных, инструменты сбора данных, использованные в исследованиях, включали анализ документов 6 (46,1%), анкетирование 2 (15,3%), шкала 2 (15,3%), и наблюдение 1 (7,6%).

При анализе распределения исследований по профориентации в Кыргызстане, которая является

пятой подцелью исследования, по учебным группам, наиболее изученной группой в исследованиях являются документы 8 (57,1%), за которым следует школьники среднего школа 3 (21,4%) и преподаватели 2 (14,2%), студенты вузов 1 (7,1%) и граждане 1 (7,1%).

При рассмотрении распределения результатов исследований по профориентации в Кыргызстане, которое является шестой подцелью исследования, по плотности, 9 (26%) исследований по профориентации в Кыргызстане пришли к выводу, что семейный фактор предшествует факторам, влияющим на выбор учащимися профессии. 4 (11,7%) пришли к выводу, что внедрение учебных программ в школах профориентации повысит осведомленность учащихся о профессиях. Опять же, 4 (11,7%) пришли к выводу, что, когда профориентационные занятия для учащихся проводятся в сотрудничестве с семьями, школами и различными учреждениями, они более эффективны и успешны.

Учитывая распределение исследований по профориентации в Кыргызстане, что является седьмой подцелью исследования, согласно рекомендациям исследователей изученных исследований, было отмечено, что профориентационные исследования проводились внешкольной и внеучебной деятельностью в 6 (19,3 %) исследованиях, а ориентация на профессию выявлена в 5 (16 %) исследованиях, в исследовании высказано предложение сделать это в сотрудничестве школы и семьи.

Обсуждени

Если рассмотреть распределение исследований, написанных в Кыргызстане по профориентации, по их типам, то видно, что основу составляют статьи (7). При сравнении статей с бакалаврской (4) и докторской (2) диссертациями был сделан вывод о неравноценности предмета профориентации. Это может быть связано с тем, что в высших учебных заведениях не уделяется должного внимания профориентации. Çarkit [4], изучая исследования, проведенные в Турции в области консультирования по вопросам карьеры и профессиональной ориентации, пришел к выводу, что большинство диссертационных исследований составили 58 магистерских и 15 докторских диссертаций, что показало сходство с результатами этого исследования.

При изучении распределения исследований, написанных по профессиональной ориентации, в соответствии с используемыми методами исследования в значительной степени использовались описательные исследования. Çarkit [4] обнаружил, что было проведено больше всего реляционных и описательных исследований, а исследований качественных и смешанных методов. Это подтверждает результат исследования.

Согласно другому выводу исследования, было замечено, что исследования по профессиональной ориентации в основном проводились с анализами документов и старшеклассниками, Çarkit [4] при рассмотрении кандидатских диссертаций в области карьерного консультирования и профессиональной

ориентации в Турции пришел к выводу, что исследовательская группа была сформирована в основном из старшеклассников, а затем из студентов университетов, что подтверждает результаты исследования.

При оценке тем, связанных с профориентацией, с точки зрения результатов исследований, было выявлено, что наиболее влиятельным фактором в процессе профессиональной ориентации учащихся является семья. Абдыракунова [8] и Мусарова [7], в своем исследовании профориентации как проблемы образования был сделан вывод о том, что поддержка профессий членами семьи и родителями, отношение к профессиональным решениям помогают им сделать более здоровый выбор. Относительно эффекта составления учебных планов по профориентации на уроке Сманбаев [9] пришел к выводу, что в учебном процессе начать ориентирование учащихся на профессию с младшего школьного возраста. Это формируют интереса к профессии у школьников.

Сманбаев [9] пришел к выводу, что в процессе профориентации сотрудничество школы, семьи и различных учреждений облегчает выбор профессии школьников.

Когда темы, связанные с профессиональной ориентацией, которая является следующей подцелью исследования, были оценены с точки зрения рекомендаций исследований, был сделан вывод, что большинство исследователей рекомендовали осуществлять профессиональную ориентацию в школьной и внеклассной деятельности на основе сотрудничества с семьями. Темирбекова [11] и Весек [12] предположили, что организация внешкольных мероприятий оказывает положительное влияние на учащихся и их семьи, поскольку они посещают различные учреждения для занятий, связанных с профессиями. Они предположили, что осуществление внеучебной профессиональной деятельности специалистами в школах дает возможность учащимся и родителям больше узнать о профессиях и принять правильное решение. Рекомендовано проведение профессиональной ориентации в сотрудничестве со школой-семьей [8]. Была подчеркнута важность проведения профориентации всем школьным сообществом вместе с семьями и высказано мнение, что профориентация, проводимая администрацией школы и семьями, даст более эффективные результаты.

References

1. Büyüköztürk Ş., Çakmak K., Akgün Ö., Karadeniz Ş. and Demirel F., (2012). Scientific Research Methods. Ankara: Pegem Academy [опубликована на турецком].
2. Belen Ö., (2019). Analysis of Postgraduate Theses on Domestic Violence in Turkey, Konya: Necmettin Erbakan University (Published Master's Thesis) [опубликована на турецком].
3. Berrios, R., & Lucca, N., (2006). Qualitative methodology in counseling research: Recent contributions and challenges for a new century. Journal of Counseling & Development, 84(2), 174-186.
4. Çarkıt, E., (2019). Research Tendencies of Postgraduate Theses in the Field of Career Counseling and Vocational Guidance in Turkey, Manas Journal of Social Research, 8 (2): 1503-1514 [опубликована на турецком].
5. Eryetiş M. V., (2016). Vocational Selection and Vocational Guidance (Published Master's Thesis) [опубликована на турецком].
6. Karasar N., (1984). Scientific Research Methods 23(1), 96-104. Nobel Akademik Yayıncılık Eğitim Danışmanlık Tic. LTD.ŞTİ [опубликована на турецком].
7. Musarova A., (2018), Factors affecting the career choice of Kyrgyzstan-Turkey Manas University students (undergraduate thesis).
8. Siyaev T.M., Abdırakunova C.S., (2017). Professional mentoring as a problem of education. National Certification Authority [опубликована на русском].
9. Smanbaev O.A., (2020). Developing aspects of vocational guidance offered to students in village schools. Vestnik Arabaeva I, 2020 [опубликована на русском].
10. Smanbaev O.A., (2013). Vocational guidance for students in the educational process. National Certification Authority, 2013 [опубликована на русском].
11. Temirbekova C. (2017). Investigation of professional maturity levels of high school senior students. Undergraduate thesis, Kyrgyzstan-Turkey Manas University, 2017.
12. Vesek N., (2018). Socio-cultural factors in career choice (Bishkek city secondary school 11th grade example). Undergraduate thesis Kyrgyzstan-Turkey Manas University, 2018.

CONTENT AND LANGUAGE INTEGRATED LEARNING IN THE PROCESS OF STUDYING FOREIGN LANGUAGE

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Abstract

This article discusses the subject-language integrated approach (CLIL), its features in teaching a foreign language. Currently, this approach is characterized in the world scientific and methodological literature as an innovative approach to the organization of bilingual education and has two goals: the implementation of education in two subject areas - language and subject; various interpretations of its essence are presented, its varieties, possibilities and features of implementation in bilingual education are distinguished through the application of its basic principles and strategies.

Keywords: Content and language integrated learning, CLIL principles, stages of CLIL implementation, foreign language teaching.

Modern complex and constantly changing living conditions dictate higher demands on human capabilities, both physical and social. The comprehensive development of the individual is the paramount task of education today. That is why the most important learning objectives are the development and formation of a strong and reliable system of knowledge, skills and abilities that are necessary for the future independent activity of students.

Knowledge of a foreign language, especially English, is becoming a basic skill in modern conditions; it is an absolute necessity for a successful career and personal growth. One of the reasons for this global trend is clearly reflected in the extremely important observation of the British linguist D. Greddall, who claims that these educational and social changes are caused by the development of the Internet and the parallel growth of globalization [7].

Thus, the popularity of bilingual education is increasing every day, and this situation, of course, requires changes in the teaching of a foreign language, that is, it is necessary to develop new effective approaches and methods, forms and ways of organizing the process of language acquisition. To this end, in 2004, the European Commission recommended a subject-language integrated approach (CLIL - content and language integrated learning) for implementation on the scale of universal education. The principle of operation of this approach is bilingual, namely: the subject is studied through a foreign language, and at the same time a foreign language is studied through the subject. It is important to note that this approach does not require the addition of additional academic hours to the curriculum [9].

Moreover, within the framework of Kazakh education, the subject-language integrated approach could be considered as one of the ways to solve the problems of small rural schools, in which the academic workload of the teacher often exceeds the norm. To date, there are quite a large number of definitions of the subject-language integrated approach (CLIL), each of which, to

one degree or another, characterizes its multifaceted essence.

For example, F. Ball, who works within the framework of this approach in Spain, gives five definitions in his article [4]. The first and most simplified is interpreted by the European Commission as follows: "Subject-language integrated is education in which students learn a subject through a foreign language and vice versa" [9, p. 8-9]. The most detailed, detailed and generally accepted is the definition of the founder of this approach D. Marsh, who in 1994. first used the term "content and language integrated learning" (whose acronym "CLIL" is currently used in the scientific and methodological literature in different languages). Later, this concept became the official name of the subject-language integrated approach. D. Marsh and then D. Coyle give a more detailed explanation of this concept, defining it as an educational approach in which disciplines or their individual sections are taught in a foreign language, thus, a dual goal is pursued: studying the content of the discipline and simultaneously learning a foreign language [8].

D. Coyle, to characterize the essence of CLIL, developed the 4"C" scheme, which is presented in the form of a triangular pyramid with four vertices:

1. "content"
2. "communication"
3. "cognition"
4. "culture"

Each component of the design proposed by D. Coyle has indicators.

"Content" is designed to answer the questions: "What are the goals of learning?", "What to teach?", "What new learners learn?", "What is the result of this training?"

"Communication" defines the working language of teaching, the creation of a special dictionary, language correction in the learning process, the choice of types of communication, while pointing out the need to use debatable forms of interaction in the educational process.

"Cognition" highlights the mental skills that determine the concentration of attention on the subject and the language being studied, the types of questions leading to the correct answers, the tasks necessary for reasoning.

"Culture" involves the choice of the socio-cultural meaning of the topic and the integration of all the material of the lesson, and also involves taking into account the individual qualities of students.

The main methodological principles of CLIL were determined by K.S. Grigorieva[2]:

1. Multiculturalism;
2. Sustainable learning;
3. Development of thinking skills of a higher order;
4. Intensive and productive knowledge of the teacher in a foreign language;
5. A variety of methodological techniques;
6. Use of authentic teaching material.

According to the classification of F. Ball, who notes in one of his works the relatively recent emergence of a domain-language integrated approach (CLIL), as well as the difficulty of recognizing this approach in practice, two versions of the implementation of a domain-language integrated approach are distinguished: based on learning content (content-driven) and based on language learning (language-driven)[5]. Also in foreign scientific and methodological literature, such concepts as "hard" and "soft" CLIL are often found.

When implementing the "soft" (soft) version of CLIL, the educational process focuses on a foreign language, its study becomes one of the main tasks. This model assumes that teachers of language subjects present the material through some scientific or professional context.

Based on the analysis of the specific features of the "soft" version of the subject-language integrated approach, the following stages of introducing this CLIL model into the process of teaching a foreign language were identified:

1. Review and selection of the necessary educational and methodological material;
2. Distribution of means and techniques of pedagogical communication;
3. Direct implementation of CLIL in the learning process.

Based on the principles of a subject-language integrated approach, the following pedagogical conditions are required at the first stage of implementation[1]:

1. Correct definition of the object of study;
2. Correct selection of material, taking into account the psychological aspects of cognitive activity;
3. Obligatory consideration of age characteristics.

Thus, at the first stage, the teacher needs to analyze and select the necessary educational and methodological material corresponding to the level of knowledge of a foreign language, in particular English, and the profile subject of students.

This standard, which is necessary for the successful conduct of foreign language classes within the

framework of a subject-language integrated approach, must also follow the 4 "C" scheme [8]:

1. The content of the educational material is aimed at improving the skills and abilities in the core subject;
2. Communication defines the communicative goal of discussing the topic of a specialized subject through a foreign language;
3. Knowledge focuses on the combination of acquired knowledge with the expression of one's own thoughts in a foreign language;
4. Culture involves the selection of material aimed at understanding and defining oneself, the people around and the world as a whole. The use of a subject-language integrated approach requires a thorough, time-consuming preparation from the teacher.

Moreover, this process dictates the need for constant creative search. However, as mentioned earlier, this approach does not require an increase in academic hours for mastering a foreign language and a decrease in the hourly load on specialized subjects.

Thus, when planning and conducting a lesson using CLIL, a certain algorithm of actions is observed at the initial stage: the material is analyzed and selected, means of pedagogical communications are planned for further practical application. Choosing a version of CLIL or varying it (soft-hard) can become an extremely effective learning model at all stages of introducing this approach into the educational process.

I would also like to note about the basic principles of CLIL.

CLIL principles

- CLIL is, first of all, teaching general knowledge, not multilingualism, so the latter is only an additional feature;
- Training is based on the main 4 "C": content, communication, cognition and culture. All these components are in continuous connection with each other;
- Requires building a safe psychological climate in the classroom;
- Implies the use of only one (foreign) language, the same teacher and audience;
- for a better understanding of the material, the teacher can use facial expressions, gestures, pictures, presentation sound, etc.

References

1. Andreev V.I. Pedagogy of the higher school. / V.I. Andreev // Kazan: Center for Innovative Technologies. - 2013. - 500s.
2. Grigorieva K.S. Content and Language Integrated Learning as the basis for the formation of professional foreign language competence of students of technical universities / K.S. Grigoriev // Kazan: KFU. - 2013. - S. 89-94.
3. Filipovich I.I. Subject-language integrated learning. A new step in the development of competencies / I.I. Filipovich // Scientific Bulletin of YIM. - 2015. - URL: <https://cyberleninka.ru/article/n/predmetno-yazykovoe-integrirovannoe-obucheniye-novyy-shag-v-razvitiy-kompetentsiy/viewer>
4. Ball Ph. What is CLIL? / Ph. Ball // One Stop English: English Language Resources - 2013

URL:<http://www.onestopenglish.com/clil/methodology/articles/article-what-is-clil/500453.article>

5. Ball Ph. How do you know if you're practising CLIL? / Ph. Ball // One Stop English: English Language Resources.—2013.

URL:<http://www.onestopenglish.com/clil/methodology/articles/article-how-do-you-know-if-youre-practising-clil/500614.article>

6. Coyle D. CLIL: Learning Through a Foreign Language: Models, Methods and Outcomes / D. Coyle. — London: CILT, 1999. — 64 p.

7. Graddol D. English Next / D. Graddol. — British Council, 2006. — 132p.

8. Marsh D. CLIL: Content and Language Integrated Learning / D. Marsh, P. Hood, D. Coyle D. — Cambridge: CUP, 2010. — 184 p.

9. Promoting Language Learning and Linguistic Diversity: An Action Plan 2004-2006. — Brussels, 2004.

10. Zaripova R.R. Pedagogical experiment of implementing the Russian English CLIL (content and language integrated learning) model in higher education / R.R. Zaripova // Modern problems of science and education. — 2014. — URL:<https://science-education.ru/en/article/view?id=15854>

TECHNICAL SCIENCES

RESEARCH OF IRON-CONTAINING SORBENTS ON THE BASIS OF ORGANOMONTMORILLONITE FOR THE EXTRACTION OF Cr(VI)

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Abstract

The article is devoted to the study of the structure and sorption properties of composites based on clay minerals. The materials are designed to clean aquatic environments from contamination by heavy metals and radionuclides. Physicochemical and technological features of obtaining sorbents on the basis of organomodified montmorillonite with a layer of nanosized zero-valent iron are considered. Their structure was studied using X-ray diffraction, microscopic studies, as well as their sorption capacity with respect to Cr (VI).

Keywords: nanosized zero-valent iron, montmorillonite, organo montmorillonite, sorption, chromium (VI).

Introduction. Sorption methods are the most promising for the extraction of heavy metal ions from aqueous solutions, especially their low concentrations. Recently, research aimed at the synthesis of highly selective sorption materials based on clay minerals has developed significantly. In order to increase the sorption capacity of clay minerals, it is promising to modify their surface with nanosized zero-valent iron (Fe^0). This material is widely used for purification of aqueous solutions from inorganic pollutants due to its physicochemical properties. Fe^0 nanoparticles have a large surface area, which provides high sorption properties. However, one of the most important properties of nanosized iron is its ability to exhibit reducing properties. Thus, by converting pollutants into less harmful ones, for example, the reduction of Cr (VI) to Cr (III).

A significant disadvantage is that Fe^0 tends to aggregate and is easily oxidized. These factors reduce the activity and efficiency of nanosized zero-valent iron. However, Fe^0 synthesized on the surface of clay minerals remains virtually unchanged in the environment.

Research methods: Montmorillonite is a layered silicate with the general formula $(\text{Ca}, \text{Na})(\text{Al}, \text{Mg}, \text{Fe})_2(\text{OH})_2 [(\text{Si}, \text{Al})_4\text{O}_{10}] \times n\text{H}_2\text{O}$. Purification of montmorillonite was performed according to the method described in the article [1]. In this work, pre-prepared clay, converted into Na-form, was treated with cationic surfactants - salts of four-substituted ammonium with different alkyl chain lengths from the manufacturer Merck: hexadecyltrimethylammonium bromide (HDTMA) [2]. In this work, the synthesis of nanosized zero-valent iron (Fe^0) was performed by the sulfate method without the use of an inert atmosphere according to the methods [3,4]. Then the obtained nanomaterial (Fe^0 , Fe^0 -MMT, Fe^0 -OMMT) was separated from the liquid phase by centrifugation and washed three times with alcohol. The obtained materials were dried under vacuum at a temperature of 90°C and ground to obtain a fraction ≤ 0.1 mm. Chemically pure reagents $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$, NaBH_4 and HDTMA manufactured by Merck were used in the experiments.

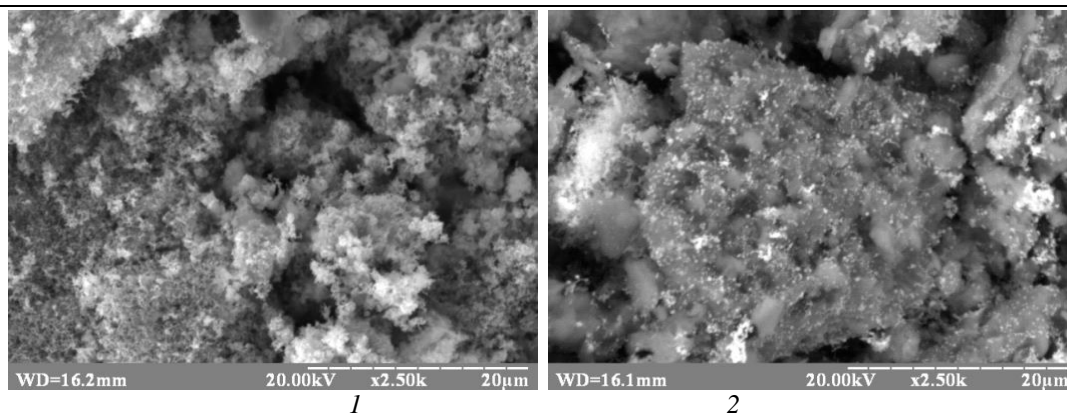
The structure of sorbents was investigated by X-ray diffraction and microscopic studies, as well as the sorption capacity of Cr (VI) ions.

X-ray diffraction studies of the original and modified samples were performed using a DRON-4-07 diffractometer with two Soller slits using filtered $\text{CuK}\alpha$ radiation in the range of $3-60^\circ$ (2 θ). Electron microscopic studies. TEM studies were performed on a PEM-U transmission electron microscope with a digital image output system SAI-01A using Lacey formvar / carb 400M CU PK25 grids manufactured by Ted pella, Inc. SEM study was performed on a scanning electron microscope REM-106L.

Sorption extraction of Cr (VI) with clay minerals, nano-iron and composite silicate materials was performed under static conditions at room temperature, determined ionic strength and continuous shaking of samples for 1 hour (volume of aqueous phase was 50 cm^3 , sorbent weight - 0.1 g for determination of Cr(VI) sorption. After adsorption equilibrium was established, the aqueous phase was separated by centrifugation and the equilibrium concentration of the metal ion was determined spectrophotometrically on a UNICO 2100UV instrument using the nitroso-R-salt reagent diphenylcarbazide ($\text{C}_{13}\text{H}_{14}\text{NO}$).

Results. On the diffraction pattern of nanosized iron we observe clear reflexes at 44.9° and 35.8° (0.202 and 0.252 nm, respectively) belonging to the crystalline phases of zero-valent iron (α -Fe) and iron oxide (FeO). The diffractograms of MMT and OMMT samples after application of a layer of nanosized iron also recorded reflexes at 44.9° and 35.8° , indicating the presence in the composition of composite sorbents of crystalline phases of zero-ferrous iron, iron oxide, as well as, at lower values of 2 θ , goethite (FeOOH) [2].

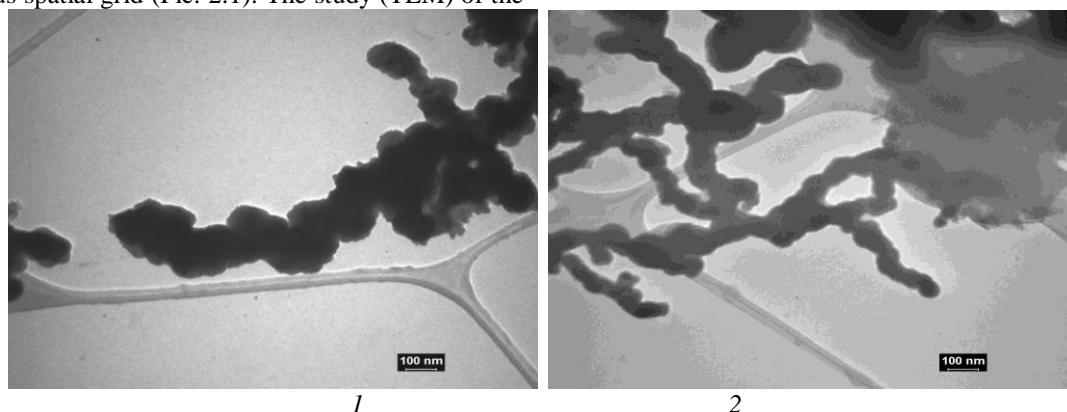
Studies (SEM) were also performed for Fe^0 and Fe^0 -OMMT samples. The Fe^0 sample is characterized by the formation of branch-like structures (Pic. 1.1). Iron particles form nanospheres that connect to each other in chains. This linear orientation is related to the magnetic properties of iron. For the Fe^0 -MMT sample (Pic. 1.2) there is a uniform distribution of Fe^0 particles on the surface of mineral, as well as the characteristic distribution of nanosized iron as individual aggregates and chain clusters.



Pic. 1 – SEM image of the surface of the sample Fe^0 and Fe^0 -OMMT

Comparison of the results of TEM studies of synthesized nanosized Fe^0 and iron-containing composites Fe^0 -OMMT indicates a significant difference in the dispersed structure. The particle size of iron obtained from $FeSO_4$ salt solutions is in the range from tens to several hundred nanometers, which are combined into a continuous spatial grid (Pic. 2.1). The study (TEM) of the

Fe^0 -OMMT sample confirms that nanodispersed iron deposited in OMMT dispersions has a size of 20-80 nm, which is much less than when precipitating iron from $FeSO_4$ solution.

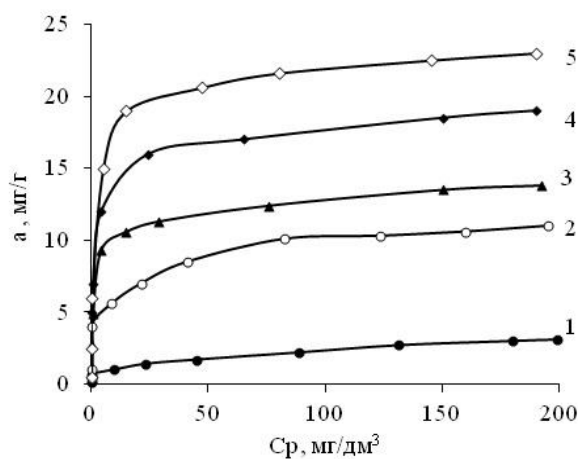


Pic. 2 – TEM image of the surface of the sample Fe^0 and Fe^0 -OMMT

Investigation of sorption removal of Cr (VI) by modified clays based on montmorillonite. The efficiency of extraction of chromium (VI) ions of iron-containing composite based on organomontmorillonite (Fe^0 -OMMT) was compared with the sorption capacity of MMT, OMMT, synthesized nanosized Fe^0 , and Fe^0 -MMT. Sorption experiments were performed on five samples at pH = 6. The obtained isotherms are shown in Pic. 3. The maximum value of Cr (VI) sorption was obtained for the Fe^0 -OMMT composite (22,5 mg/g), which is significantly higher than for Fe^0 -MMT (18,7

mg/g) and nanosized iron Fe^0 (13,2 mg/g). Sorption on the original montmorillonite of anionic forms of Cr(VI) is 2,3 mg/g, and on its organomodified form – 10,8 mg/g.

The increase in the activity of Fe^0 -OMMT composite samples compared to other iron-containing samples is explained by the greater dispersion of nano-iron particles formed on the hydrophobic surface of organomontmorillonite compared to those on the hydrophilic surface of the original montmorillonite particles or simply in solution [5].



Pic. – 3. Isotherms of sorption of Cr (VI) source montmorillonite and synthesized sorbents at pH = 6 (1 - MMT, 2 - OMMT, 3 - Fe⁰, 4 - Fe⁰-MMT, 5 - Fe⁰-OMMT)

Thus, it is confirmed that organomontmorillonite modified with nanosized iron effectively removes chromium(VI) from the aqueous medium at pH close to natural waters, which indicates the possibility of its use in their purification from heavy metal anions and radionuclides.

Conclusions. Composite sorbents based on organomodified montmorillonite with a layer of nanosized Fe⁰ were obtained. It was found that the treatment of organomontmorillonite with nanodispersed iron improves the sorption properties of natural silicates in relation to Cr(VI) compounds, 22,5 mg/g for chromium(VI), which significantly exceeds the value for the original montmorillonite and montmorillonite with Fe⁰ layer.

References

1. Zhdanyuk N. Research of chromium (VI) ion adsorption by montmorillonite modified by cationic

surfactants. *Technological audit and production reserves*. 2016. №5. C. 11–15.

2. Bergaya F., Theng B. K.G., Lagaly G. Developments in clay science. V. 1. Handbook of clay science. Amsterdam: Elsevier Ltd, 2006. 1224 p.

3. Pang Z., Yan M., Jia X., Wang Z. Chen J. Debromination of decabromodiphenyl ether by organomontmorillonite supported nanoscale zero-valent iron: Preparation, characterization and influence factors. *J. Environ. Sci.* 2014. № 26. P. 483–491.

4. Prus V., Zhdanyuk N. Investigation of removal of hexavalent chromium and divalent cobalt from aqueous solutions by organo-montmorillonite supported iron nanoparticles. *Eureka: Physics and Engineering*. 2016. №5. C. 81–88.

5. Shi Li-na, Zhang Xin, Chen Zuliang. Removal of Chromium (VI) from wastewater using bentonite-supported nanoscale zero-valent iron. *Water research*. 2011. № 45. P. 886–892.

VETERINARY SCIENCES

MONITORING OF FISH HELMINTHIASIS OF WATER SOURCES IN AKMOLA REGION

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Abstract

Based on the data obtained, it should be noted that the epidemiological situation in the water sources of Akmola region is poor for zoonotic helminthiasis, such as opisthorchiasis, diplostomosis. The worst situation with opisthorchs turned out to be the Sholak reservoir in the Korgalzhyn district, where it turned out that all the studied fish were infested.

Keywords: opisthorchiasis, diplostomiasis.

Introduction. The parasitological situation in a reservoir is an integral part of its environmental situation. Due to the duality of the habitat (external environment and host organism), parasites are a natural component of the biocenosis of the reservoir and its species diversity, forming a special structural level of ecosystems.

The most common are helminth diseases caused by various parasitic worms (monogenes, flukes, tapeworms and roundworms). These parasites are found in fish both in natural reservoirs and when they are bred in ponds and spawning farms. Some helminths live in various organs and tissues of fish at the juvenile stage, improving their development in humans and carnivores, causing their very dangerous diseases.

Helminthiasis of carnivores, waterfowl and fish with two and three owners is widespread in the natural conditions of the Akmola region, on the territory of which there are the main foci of natural diseases (opisthocosis, metorchosis, diphyllobotriosis). Some of the helminthiasis we have considered are zooanthroponoses and pose a great danger to humans.

In Kazakhstan, helminthiasis has its own epizootological characteristics, depending on specific natural and climatic and socio – economic conditions. Almost the entire territory is favorable for the mass spread of helminths, including those confined to natural foci. Data on the nature of the natural foci of a particular helminthiasis, in particular opisthorchiasis, its components are an important parameter for assessing, explaining the manifestation of the epizootic process, the epidemiological situation, and planning veterinary and sanitary measures.

In Akmola region, which is not affected by opisthorchiasis, studies have been conducted on the degree of infection with metacercaria of fish opisthorchiasis, which is a source of infection of animals and humans.

Pathogens of helminthiasis of various fish are mature helminths that parasitize the body of owners (wild and domestic animals, humans, fish – eating birds), contributing to the further spread of diseases that pollute the aquatic environment.

The purpose of the work is to monitor fish helminthiasis of water sources in Akmola region.

To achieve this goal, the following tasks were set:

- Description of the epidemiological situation of zoonotic helminthiasis in water sources of Akmola region.

- Research and its results in the detection of helminthiasis of fish.

- Study of helminthofauna of pond farms of Akmola region.

Materials and methods. The study was conducted on the basis of the procedure for conducting special works.

In the period from 2021 to 2022, this work was carried out in the Veterinary Laboratory of the Republican Veterinary Laboratory of the Ministry of Agriculture of the Republic of Kazakhstan in Nur-Sultan, as well as at the Department of Veterinary sanitation of the Veterinary Faculty of the Kazakh agrotechnical university named after S. Seifullin.

Fish samples were taken from certain reservoirs of Akmola region: lakes Zharlykol, Koyanda reservoir (tselinograd region); Lakes Balytkol, Maly Sary - Oba and Zhaltyrkol (Arshaly district); Lakes Shortandy, Burabay, Shabakty, Maybalyk, Katarkol (Burabay District), Lake Zerenda (Zerendinsky district); Lakes Shalkar, Birtaban, Yesey, Sultankeldy (Korgalzhyn district), Zerendinsky fish plant LLP, Maybalyk fish the nursery.

The study of the quality and safety of fish was carried out by determining total quality indicators, studying helminthiasis infection. Total Quality indicators were carried out according to GOST 7631 - 2008 by methods of organoleptic and biochemical studies of fish. According to GOST 7631-85, fish sampling was carried out directly. Damage to fish by helminthiasis was determined by the method of a complete helminthological study on Scriabin, which includes the study of scales, fins, eyes, internal organs and muscles by visual and compressive methods.

Since 3 hosts are involved in the cycle of development of opisthorchiasis and the epizootic chain of this disease: determinant (predators and humans),

intermediate (aquatic mollusks) and Additional, the degree of infection of all three hosts was high. Monitoring of carnivorous infestations, which are the main sources of infestation, was carried out on the basis of analysis of statistical data of the Parasitology Department of the Republican Veterinary Laboratory in Astana for 2016-2018.[9]

Since the main source of infection of humans and carnivores is fish, we believe that the identification of fish damage by opisthorchiasis larvae makes a certain contribution to the clarification of the epizootological and epidemiological situation in the region. The study of infection of fish with opisthorchiasis larvae was carried out in the unfavorable region – Akmola region.

When conducting monitoring studies of fishery reservoirs and fish farms in Akmola region, it was found that the total number of reservoirs of local significance in the region is 583 (337 of them are permanent and 246 are reserve). Of the 337 approved reservoirs, 291 are in operation, which is 86.3%. The Nura river belongs to a reservoir of international and national significance. There are two fish plants in Akmola region (Zerenda fish plant LLP, Altyn invest Corporation LLP).

During the sensory examination of the fish, I began to examine the appearance: the skin, fins, mouth area, fins were examined very carefully.

For an accurate diagnosis of diplostomosis, we examined the fish's eyes: I looked at them by the compressor method (squeezing between two glasses of the compressor), removed the eye crystal from the eye sockets and placed it in the compressor. Then I examined the material under a microscope.[10]

The muscles were also examined by the compressor method: along the spine of the fish, the fins were removed from both sides, and then the skin was removed in both directions.

The first incision was made on the lateral line perpendicular to the longitudinal axis of the body from the front of the back wing, the second - from the end of the first incision along the lateral line to the tail wing. The edge of the skin was raised with tweezers, and the subcutaneous tissue was cut so that the muscles remained on the surface. After that, the surface layer of muscles with a thickness of 0.2 - 0.5 cm is cut off, cut into small pieces and placed over the entire surface of the lower part of the compresorium, covered with glass and compressed with screws. At low magnification under the microscope, all the parts obtained from one fish were examined.

After an external examination, the internal organs were examined: the liver, gallbladder, urinary and swim bladder were divided into parts and examined by the compressor method. I straightened the esophagus, stomach, intestines freed from fat, liver, opened the esophagus with scissors and conducted a study for the presence of large helminths.

Results obtained.

Results of organoleptic studies of fish. Organoleptic parameters of fish obtained from reservoirs of Akmola region were within normal limits. The scales are shiny, the eyes are domed, the mucus is clean, with a characteristic smell. The fins of the gills

are densely arranged, and from red to dark red. When determining the specific gravity, all samples sink. Internal organs are not damaged, clearly visible, the abdomen is not swollen. Individual fish specimens from Lake zharlykol (Tselinograd District), Lake Balyktykol (Arshaly district) were distinguished, where red spots were found on the body of fish, characteristic mainly of carp aeromonosis. In the fish selected at the Nur-Sultan market – fish with a high content of mucus, turbidity, with a weak consistency of elasticity, the freshness of which is questionable, was characteristic.

Physico - chemical indicators of fish in the lakes were normal – smears were poorly colored, microbial bodies were not detected in microscopy, with the exception of fish samples taken from markets, smears were well colored and 30 - 40 microbial bodies were found in microscopy, in all fish samples the PH was normal and ranged from 6.3 to 6.6, in fish taken from markets the PH was 6.9, The peroxidase reaction is positive in samples taken from reservoirs and weakly positive in seven samples taken from markets. In all samples, reactions to ammonia and hydrogen sulfide gave negative results.[11]

Thus, it was found that the quality indicators of fish from reservoirs of Akmola region correspond to the norm (6.6%), with the exception of fish from certain reservoirs of tselinograd and Arshaly regions, where clinical signs of aeromonosis are observed. In seven cases, the organoleptic and biochemical parameters of fish taken from the shelves of food markets in Nur-Sultan are questionable (9.1%).

When detecting fish damage by helminthiasis in reservoirs, a low degree of fish infestation in reservoirs of Akmola region was revealed.[12]

When determining the quality indicators of fish extracted from reservoirs of Akmola region, clinical signs characteristic of aeromonosis were found, which correspond to the norm (6.6%). Organoleptic and biochemical parameters of fish taken from the shelves of food markets in Nur-Sultan are questionable (9.1%), mainly due to non - compliance with sanitary and hygienic standards for the sale, transportation and storage of fish.

When examining perch on Lake zharlykol (Tselinograd region), *Dirlostomum cercariae* was found in the source. Helminthiasis is the most common disease of pond fish in Kazakhstan. Most natural reservoirs are mainly foci of helminth infestations. The main transmitters of diplostomosis pathogens are birds that feed on fish, introducing an invasive start to the reservoirs of Fisheries.

Fish from some water sources of the region were studied by compression method with the help of a trichinelloscope for infestation of opisthorchs with an invasive metacercarium.[13]

Studies of the presence of opisthorchiasis larvae in fish caught from reservoirs have shown a poor situation with opisthorchiasis.

In total, 879 different fish were tested for the presence of metacercariae of opisthorchiasis in the back muscles by compressor method, including 79 units or 8.99% of positive samples. Of all the fish species

studied, and with a significant range of up to 61.1%, Whitefish is affected.

The worst situation with opisthorchs turned out to be the Sholak reservoir in the Korgalzhyn district, where it turned out that all the studied fish were infested.

In particular, the IE of akkayran was 61.1%; in tortillas - 14.5%; in fish – 4.8%. It was found that only akkayran is infested in the yesey, Shalkar and Sholak reservoirs, the share of which ranges from 2.6% to 20.0%. When conducting a compressor study of fish in all other reservoirs, no larvae (metacercariae) of opisthorchs were found.

Helminthofauna of the main commercial fish species in the water sources of Akmola region

Questions about the ecological state of the environment and their impact on fish quality are becoming very relevant. There are such issues in the Republic of Kazakhstan and insufficient research is not carried out. On the basis of this, the most pressing problem is the contamination of fish with toxic substances of man-made and biogenic nature in fish reservoirs and fish farms of Akmola region. The purpose of our research work was to monitor the quality indicators of fish, their infection with helminthiasis in reservoirs of Fisheries importance in Akmola region.

A lot of work was devoted to the ichthyofauna of the lakes of the modern Korgalzhyn Reserve. The most famous of them in the article by N. P. Serov describes 9 species of fish that inhabit the Korgalzhyn lakes and catch fish in them.

There is no complete list of ichthyofauna of Akmola region. The 30 species listed in the collection cause serious doubts in some cases. The fish population of the studied Lakes is formed mainly at the expense of populations living in the reservoirs of the Nura Basin in this territory.

In the studied Lakes, the ichthyofauna is based on a somewhat modified Aboriginal complex. Other invasive forms (carp, sole) do not play an important role in the fish community. The main factor affecting the ichthyofauna is the abundance of bird species that feed on fish. Another important factor is the risk of freezing in both winter and summer. The studied lakes are shallow in hydromorphology. And if for the Sultankeldy and Kokay lakes such a danger is partially equated with the flow of the Nura river, then for Lake Yesey it is the most significant. It is necessary to strictly monitor the number of massive species (roe deer, perch) and predatory fish (Pike).

When determining the overall quality indicators, it was determined that fish from water sources meet the requirements.

But the fish sold in the markets were studied and did not meet the requirements.

As a result of sensory research, a Red Spot was found in a sample of carp in Lake Shnet. [14]

In case of doubt, we tried 2 methods to determine the freshness of the fish as soon as possible. These methods were developed at the Kazakh Agrotechnical university named after S. Seifullin and made it possible to conduct research quickly.

There was a good situation when the residual content of toxic elements in fish meat obtained from water sources in Akmola region did not exceed the requirements.

Carp and crucian carp were the most susceptible to contamination, and Pike was the purest fish.

Spread of pathogens of helminthiasis of commercial fish

Diplostomic diseases of pond fish are common in Kazakhstan. This is facilitated, first of all, by the creation of ponds and spawning farms in the immediate vicinity of natural reservoirs with permanent foci of diplostomosis. Most natural reservoirs are mainly hotbeds of diplostomic invasion.[15]

The main transmitters of diplostomosis pathogens are fish-feeding birds that bring an invasive initiative to fisheries ponds. In the presence of a high density of shellfish-pond snails, a high voltage of the epizootic state of farm ponds is generated by diplostomoses, which has a very negative impact on the productivity of fish stocks and commercial fish production. In fish of Kazakhstan, 14 species of flukes of the genus *Dirlostomum* have been registered, each of which causes an independent form of the disease in them. They are widely used in pond farms located in different regions of Kazakhstan. Fish are infected with the pathogens of diplostomosis from the second half of May to the end of October. In autumn, the damage to fish is somewhat weakened, but it continues in October, when the water temperature is 12 - 14°C. Consequently, the presence of favorable environmental conditions of the aquatic environment contributes to the intensive functioning of pond foci of fish diplostomosis in the conditions of Fisheries.

Diplostomosis is widespread everywhere, in various reservoirs. This disease affects carp, perch, perch, walleye, crucian carp, etc. An important role in the spread of the pathogen is played by birds that feed on fish, which are able to carry the pathogen over long distances, making daily and seasonal migrations. Fish infection and the manifestation of diplostomosis are most often observed in the spring and summer period.

The most sick fish in the reservoirs of Akmola region is the carp family. Of the industrial fish, to a lesser extent, carp and carp are susceptible to diseases. The dominant species of helminthofauna of the reservoir are flukes *Dirlostomum sathaceum* in the eye, *Rosthodirlostomum cuticola* in the skin and subcutaneous tissues, *Arorhallus muehlingi*.

It was found that fish pseudomphistomy is much more common and more common than opisthorchiasis (the absence of esophageal pseudodamphistomy in excited metacercaria is differentiated according to morphological characteristics). The intensity of infection of fish with the opisthorchid family is low, because in spring and summer, when the water temperature in the reservoir increases, the life span of fluke eggs and cercariae is significantly reduced.

Harm to fisheries of the main helminthiasis of pond fish, preventive measures

Preventive measures:

- treatment of fish from helminth pathogens;

- conducting research in accordance with the requirements, etc.

- it is necessary to carry out conservation measures for water exchange between the lands of the reservoir. It is necessary to deepen shallow areas of water sources, reduce the accumulation of silt, improve the network of water sources, clean Springs and channels. It is mandatory to conduct a hydrochemical study and take conservation measures. Mandatory implementation of measures to reduce and prevent water pollution.

- it is necessary to prevent excessive growth of plants, in which there is a lot of reproduction of helminthiasis pathogens of birds and aquatic arthropods that feed on fish. In overgrown areas of water sources, it is necessary to regularly mow. Overgrowth of the reservoir also increases in intensity due to the release of larvae of highly herbivorous fish.

- it is necessary to reduce the population density of unfavorable reservoirs by biological methods, intermediate hosts of crustaceans. Grown in ponds and puddles in certain regions, water purification from invasive origin.

For the fight against carp, the number of catfish, pike, walleye and perch fish increases in the unfavorable area of the reservoir (fish barriers are installed to prevent them from swimming). After that, predatory fish should be caught, and the introduction of new fish into the reservoir is allowed no earlier than one year.

- when transporting fish from one reservoir to another, it is necessary to observe veterinary and sanitary rules. Transportation of fish is carried out mainly in autumn or winter, when their damage by parasites is sharply reduced.

- before each shipment of fish, it is necessary to carefully check the presence or absence of larvae of dangerous helminths. If an infected person is found, it is not allowed to transport fish to safe reservoirs.

In order to prevent the settlement and animals from opisthorchiasis, it is allowed to purchase fish products only from water flows of Fisheries and fish production that have a veterinary and sanitary passport.[16]

The veterinary and sanitary passport is an accounting document that reflects the epidemiological situation of the water flow and all fish species living in it, as well as hydrochemical and toxicological analyses of water.

The sale of fish to the locality is allowed after conducting laboratory and ichthyopotologic studies.

Prevention of diseases in unfavorable territories.

Preventive measures should be carried out mainly by veterinary services. In the study of fish by laboratory tests, water sources in unfavorable territories are determined.

In case of detection of pathogens of opisthorchiasis in laboratory tests, it is not allowed to sell fish and fish products.

Fish containing pathogens that are dangerous to the animal are divided into suitable or unsuitable for sale.

Suitable fish are sent for use in food, for sale with mandatory sterilization and use.

Compensates for unsuitable fish.

The easiest way to disinfect fish products is to treat it at high temperatures.

Hot and cold smoking, smoking, canning, which is carried out in accordance with the technological instructions, disinfect fish from opisthorchiasis larvae, with the exception of akkairan. Chilled akkairan fish is not used for the production of smoked and cold-smoked fish products, as such processing does not disinfect the larvae of opisthorchiasis.[17]

Fish products intended for animal feeding are decontaminated in accordance with the technological processes specified in paragraphs of this Veterinary regulation.

Waste obtained during the processing of conditionally suitable fish products, as well as fish products that have been declared unfit, is sent for the production of fish flour for animal husbandry. Fish flour is boiled for thirty minutes in the absence of industrial premises. Burial in BioThermal pits is allowed. It is strictly forbidden to dispose of fish processing waste in reservoirs and landfills without prior decontamination, as well as feed animals with them.

Measures are taken to prevent the accumulation of waterfowl and cut down aquatic vegetation in reservoirs that are not suitable for them, scare away birds and periodically deworming them. Domestic and wild animals should not be allowed to go fishing and slaughterhouses, they should not be given raw fish without prior sterilization (freezing, boiling). It is forbidden to discharge conditionally dead, abandoned and destroyed fish, their internal organs, raw waste from processing into reservoirs and landfills.

Special places should be allocated for waste in fishing areas. They must be regularly collected and recycled in accordance with the current regulations. The place, procedure and conditions for the disposal of fish with live helminths that are dangerous to human health are determined by the owner of fish products in agreement with the territorial institutions of the state sanitary and veterinary service.

Conclusion.

Based on the obtained data, it should be noted that the epidemiological situation in the water sources of Akmola region is poor for zoonotic helminthiasis, such as opisthorchiasis, diplostomosis. The worst situation with opisthorchs turned out to be the Sholak reservoir in the Korgalzhyn district, where it turned out that all the studied fish were infested.

Most natural water sources are mainly foci of diplostomial infestations. When determining the damage of fish to water sources by helminthiasis and bacteriosis, a low degree of fish infestation in reservoirs of Akmola region was revealed.

When determining the overall quality indicators, scientists determined that fish in the reservoirs of Akmola region meet regulatory requirements. However, during the study of selected fish in the markets of Nur-Sultan, deviations from the norm were

observed in some cases. One of the reasons is violations of sanitary rules during transportation, storage and sale.

References

1. Akbayev M. Sh. Veterinary helminthology. M. Kolos, 1998. 82-106c.
2. Shabdarbayeva G. S., Abdybekova a.m., Shalmenov M. Sh., Tokban S. T., Shapieva zh. zh., Khusainov D. M., Balgimbayeva A. I., Ibazhanova A. S., Turganbayeva G. E. - Epizootological and epidemiological monitoring of zoonotic helminthiasis//Ranel/ Recent Interests in Parasitology and Nutrition of veterinary field 2016. P.33-44.
3. general Parasitology and helminthology : a textbook. A. N. Tazayan, Donskoy gau. - Persionovsky 2019. - 159 P.
4. Akshalova P., Shabdarbayeva G. S. Results of research on opisthorchiasis. Material of the student scientific and practical conference Kaznu, April 1-2, 2016, Almaty. P. 109-115.
5. Ivanov I. K., the impact of industrial wastewater pollution of reservoirs of Kazakhstan on fisheries. Ivanov I. K., Amirgaliev N. A. [electronic resource].
6. Berdenov zh. G.sources of water pollution as one of the main problems of rational use of Natural Resources in Kazakhstan. Earth Sciences: yesterday, today, tomorrow: Proceedings of the I International Scientific Conference. 2015. - P. 78-84.
7. Sidorov E. G. foci of opisthorchiasis and disease prevention in Kazakhstan: monograph. E. G. Sidorov-Almaty, 2011. - 63b.
8. Baimukanov. M. practical problems of preserving fish biodiversity in reservoirs of Specially Protected Natural Areas. 2012. 16-20B.
9. Abdybekova a.m., Tokpan S. S., Abildaeva R. A., Abdibaeva A. A. methodological recommendations for the diagnosis of opisthorchiasis of Fish and shellfish. Almaty, 2011. - 21 P.
10. Sembayeva zh. P.Epidemiology and biology of the causative agent of fish diplostomosis in reservoirs of Akmola region. "I Don't Know," He Said. Eurasian Union of scientists.2015. 88-92B.
11. Muk 3.2.988-00. Methods of sanitary and parasitological expertise of fish, shellfish, crustaceans, earthworms, cruciferous and products of their processing. "Antiepidemic events": - 2001. collection of official documents of Russia. 2006. - 27s.
12. Eleupova A. A., Zhantelieva L. O., Shabdarbayeva G. S. - epizootic situation on opisthorchiasis in Akmola region of Kazakhstan. Materials of the International Scientific Forum, Russia, 2019.
13. Akshalova P., Shabdarbayeva G. S.-The incidence of metacercaria opisthorchiasis of fish Rec Akmola region of Kazakhstan. "Material of the IV International Conference ""conceptual and applied aspects of scientific research and education in the field of Zoology of the free""." Russia, Tomsk. 2015. 156-160s.
14. Malovasty, K. S. diagnostics of early and veterinary sanitary expertise of fish: educational and methodological recommendations. St. Petersburg. 2013. - 512c.
15. the scale of pollution of rivers and lakes in Kazakhstan. https://www.inform.kz/ru/iz-69-rek-kazahstana-tol-ko-devyat-priznanychistymi-obzor-respublikanskoy-pressy-za-26-maya_a2467056.
16. patent of the Republic of Kazakhstan No. 32737 - Sposob diagnostics of opisthorchiasis. published in the official bulletin of the Republic of Kazakhstan" industrial property " No. 14 of 09.04.2018 (Shabdarbayeva G. S., Khusainov D. M., Turganbayeva G. E., Ibazhanova A. S., Kenzhebekova zh. zh.).
17. Akshalova P., infection with metacercaria opisthorchiasis in fish of rivers of Akmola region of Kazakhstan. "Conceptual and applied aspects of scientific research and education in the field of Invertebrate Zoology": materials of the IV International Conference. Tomsk, 2015. - Pp. 156-160.

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