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Content

Biological sciences

Shupanova A.N., Aimakov O. BROWN ALGAE EXTRACT-BIOLOGICALLY ACTIVE SUBSTANCES	3
---	---

Economic sciences

Brunela Trebicka, Azeta Tartaraj, Ariola Harizi IMPACT OF INNOVATION ON BUSINESS SUCCESS: A CASE STUDY OF AGRO GROUP IN ALBANIA	6
Brunela Trebicka, Ariola Harizi, Azeta Tartaraj TRADITIONAL MARKETING IN ALBANIA: CHALLENGES AND OPPORTUNITIES IN THE DIGITAL AGE	11
Novruzov R.E. MATHEMATICAL MODELS FOR ADMINISTRATIVE RISKS AND INNOVATIVE DEFENSE OF THE REGION IN THE TERRITORIES FREED FROM OCCUPATION OF AZERBAIJAN	17

Geological and mineralogical sciences

Bluashvili D., Benashvili K., Maqadze M., Maqadze D., Mindiashvili G., Kobachidze N., Bluashvili V. THE FIRST DATA ABOUT FANAGA PLACER GOLD DEPOSIT (GEORGIA, SVANETI REGION)	19
---	----

Jurisprudence

Garayev R.M. ON THE CORRELATION AND INTERACTION OF THE PRINCIPLES OF THE TERRITORIAL INTEGRITY OF STATES AND THE EQUALITY AND SELF-DETERMINATION OF PEOPLES	27
---	----

Medical sciences

Guliko Kiliptari THE EXTENSIVELY DRUG-RESISTANT (XDR) INFECTION IN ICU	36
--	----

Technical sciences

Hajiyev T.M., Huseynova K.A., Qocaeva F.E. ANALYSIS OF THE INTEGRATION OF XML TECHNOLOGIES OF RELATIONAL DATABASES	42
Nesterenko O., Vasylovskiy O., Kisilov R. THE PNEUMO SEPARATION CHANNEL AERODYNAMIC CHARACTERISTICS RESEARCH	45
Sabyr Aizhan, Aimakov Orazkhan TECHNOLOGY FOR OBTAINING BETULIN FROM WHITE BIRCH BARK	49

Biological sciences

BROWN ALGAE EXTRACT-BIOLOGICALLY ACTIVE SUBSTANCES

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In the composition of brown algae-valuable products containing a full complex of biologically active substances, rich in mineral salts and trace elements Fe, V, Zr, Nb, Mo, Co, Mg, Ca, Mn (Table 1) [1]. The purpose of the work is to study the composition and properties of biologically active substances of brown algae.

Table 1.

biologically active substance properties and composition of brown algae

<i>Types of algae</i>	<i>Name</i>	<i>ABS properties</i>
<i>Phaeophyceae</i>	<i>Iodine (I)</i>	<i>organic and mineral source</i>
<i>Fucus vesiculosus</i> , <i>Ascophyllum nodosum</i> ,	<i>alginic acid</i> <i>sodium alginate</i> <i>potassium alginate</i> <i>magnesium</i>	<i>alginate, regulating blood pressure and heart, stimulating lymphoproliferation, phagocytosis, source of dietary fiber, antimutagen, regenerating absorbing radionuclides and heavy metals, anti-allergenic, antacid effect, source potassium, reduces biliary dyskinesia syndrome, normalizes intestinal motility, source of magnesium, stimulates metabolism processes in muscle tissue and heart tissue, muscles, anti-lipemic effect, softening and skin rejuvenation products</i>
<i>Saccharina latissima</i> , <i>Laminaria digitata</i> , <i>Saccharina japonica</i> , <i>Saccharina angustata</i> , <i>Macrocystis pyrifera</i> , <i>Undaria pinnatifida</i>	<i>calcium alginate</i>	<i>adsorbing, anti-allergic effect, a source of calcium, dietary fiber and alginic acid, normalizes intestinal motility</i>
	<i>Mannitol (low-molecular carbohydrates)</i>	<i>Diuretic, sugar substitute, antiseptic</i>
	<i>Laminaran-low molecular weight β-1, 3-1, 6-glucan</i>	<i>antiviral, immunostimulants, against lipemia anti</i>
<i>Ascophyllum nodosum</i> , <i>Fucus evanescens</i> F. <i>distichus</i> F. <i>serratus</i>	<i>Fucoidan (high molecular weight sulfate polysaccharide)</i>	<i>antitumor, antitumor, anti-inflammatory, proliferative, radioprotective, anticoagulant, antithrombin, antibacterial, antiviral, immunomodulatory, contraceptive</i>
	<i>pigment complex (chlorophyll, and fucoxanthin),</i>	<i>hemostimulating polyphenols, antitumor, regenerative, wound healing, bactericidal, antioxidant, antiviral properties</i>

Seaweed reserves in the World Ocean amount to hundreds of millions of tons. Since ancient times, seaweed has been included in the stocks of the most important biologically active substances and medicines. About 1,500 species of brown algae are known. In Kazakhstan, 13 species are found in the Caspian Sea, *ectocarpus* is widespread.

Brown macroalgae are rich in minerals, which make up 14-35% of the dry matter. Their total protein level for kelp and saccharin is relatively low (8-13%), whereas for sargassum it is about 6-11%, *Macrocystis pyrifera* (M. *pyrifera*) for 7-13% and *Ascophyllum nodosum* (A. *nodosum*) is 5-12%.

Depending on the time of year, significant differences in chemical composition were found. The crude protein content ranges from 4-8% in autumn and 12-14% of dry matter in spring. The cell walls consist of alginic acid and cellulose, a long-chain heteropolysaccharide (M, respectively. *pyrifer*, *Laminaria digitata* (L. digital) and A. for *nodosum* 20-27%, 20-45% and 15-30%). Fucoidans consist of various sulfated polysaccharide units and form the cell walls of many brown macroalgae, especially Kelp and Fucals. Unlike other seaweed, in which stored carbohydrates make up starch, brown algae store carbohydrates in the form of the glucose polysaccharide laminarin [2]. Sodium (2.2% per liter *digitata* and A. 4% in *nodosum*), potassium (L, respectively. *digitata* and A. 3.8% and 3% in *nodosum*) and iodine (L, respectively. *digitata* and A. in *nodosum* 1.1% and 0.1%) more brown seaweed. Of course, kelp can absorb iodine at a rate more than thirty thousand times the concentration of iodine in the ocean [3]. The composition varies depending on various features; for example, M, grown in summer on the Mexican coast. *pyrifer* contains many amino acids and minerals, such as M. *pyrifer*, collected in winter [4]. A. the phenolic compounds (phlorotannins) in *nodosum* are insoluble in the digestive tract of animals. Many types of seaweed contain large amounts of free glutamic acid, which is responsible for the taste of "umami", characteristic of Japanese cuisine, and is used as a flavor enhancer in food. *Sargassum* is a low-protein mineral, but high in carbohydrates and easy to access. They are also rich in vitamins and beta-carotene and do not contain antinutrients [5].

Brown algae have nutritional and medicinal value. In addition to alginic acid polysaccharide, valuable compounds are pigments, carotenoids, bioactive molecules with antioxidant, antiviral and antitumor activity.

Usually algae is used in the form of canned salads or as an additive to food in dried, crushed form. The use of brown algae as a valuable food additive is widely known, as well as the preparation of a number of pharmaceutical and cosmetic preparations based on them.

Brown algae dietary supplements contain a wide range of unsaturated omega-3 fatty acids, macro- and microelements (including iodine), chlorophyll derivatives and other bioactive fat-soluble substances. However, to replenish the reserves of vital trace elements or other nutrients, it is necessary to include a very large amount of algae in the diet, since more than 90% of them contain water (for example, raw algae has a moisture content of 94-98%), and more than 70% of the dry mass of algae are not absorbed by plant fibers (algins) and are useful bioactive together with part of the substance is excreted in the feces. Therefore, all over the world, including in Kazakhstan, substances or extracts from algae are obtained in a more digestible way and with a certain biological activity. The range of dietary supplements of brown algae is constantly growing and expanding due to their unique composition and action.

Simple steaming, as well as the deposition of dry algae or powder, do not allow extracting most of the useful biologically active substances from them. Therefore, I recommend using the extraction method to get a useful dietary supplement from algae. As a result, I analyzed the literature published by foreign and domestic authors on biologically active substances of brown algae, as well as data on the properties and composition of brown algae.

Thus, at present I propose to consider brown algae from the *Laminariales* and *Fucales* families (*Phaeophyceae* class) as promising sources of biologically active additives, since they contain active compounds with various biological activities, such as antimicrobial, antitumor, antioxidant, anti-inflammatory, antidiabetic and parasitic properties. This, in turn, has a positive effect on metabolism, organ functions and the general state of human health. In addition, they should be used as antiviral and anticoagulant substances, as well as as a dietary supplement to strengthen immunity. The extract of brown algae with a rich composition in the form of a dietary supplement associated with COVID-19 only increases the relevance.

Based on the above, we can conclude that in this paper I talked about the usefulness and importance of brown algae in the food industry as a natural dietary supplement.

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Economic sciences

IMPACT OF INNOVATION ON BUSINESS SUCCESS: A CASE STUDY OF AGRO GROUP IN ALBANIA

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Abstract

This study aimed to explore the role of innovation in the success of Agro Group, a leading agricultural company in Albania. The research question was to investigate how innovation contributes to the company's growth and sustainability. The study used a mixed-methods approach, including interviews with key personnel and document analysis, to gather data. Thematic analysis was used to identify key themes and patterns within the data.

The results of the study showed that innovation played a crucial role in the success of Agro Group. The company had implemented several innovative practices, such as investing in new technologies, developing new products and services, and fostering a culture of innovation among employees. These practices had enabled the company to differentiate itself from competitors, increase efficiency and productivity, reduce costs, and stay ahead of emerging trends and technologies.

The study also found that the leadership of the company played a critical role in fostering a culture of innovation. The CEO and other key personnel were committed to innovation and provided the necessary resources and support to enable innovation to thrive within the company. Additionally, the company had developed a strong research and development function, which was instrumental in identifying emerging technologies and trends and developing new products and services.

Overall, the study concluded that innovation was a critical component of Agro Group's success. The company's commitment to innovation, investment in new technologies, and focus on developing new products and services had enabled it to stay ahead of the curve and thrive in the highly competitive agricultural industry in Albania. The study recommends that other agricultural companies in Albania and beyond should prioritize innovation and invest in developing a culture of innovation within their organizations to ensure long-term growth and sustainability.

Keywords: Innovation, Business, Differentiation, Research and Development

JEL classification: O31, L26, Q12

Introduction:

Innovation is critical for business success in today's rapidly changing world. Companies that fail to innovate risk falling behind their competitors and ultimately failing. According to a study by McKinsey & Company, "firms that consistently innovate grow more than twice as fast as their industry peers over a ten-year period." In Albania, like many other countries, companies must continuously adapt to stay relevant. The failure to innovate can lead to stagnation, missed opportunities, and ultimately, failure.

Innovation is an essential aspect of any successful business, and it has become increasingly important in today's rapidly changing market. Companies that fail to innovate risk falling behind their competitors and ultimately failing. This is also true for businesses operating in Albania, which has seen significant economic growth and modernization in recent years. The Albanian government has taken several measures to create a favorable business environment, including simplifying procedures and reducing bureaucracy. As a result, Albania has become an attractive destination for foreign investment, and many multinational corporations have established a presence in the country.

However, despite the favorable business environment, many Albanian companies still struggle to innovate. This is partly due to a lack of resources and access to the latest technologies, but it's also due to a culture that values tradition and stability over experimentation and risk-taking. To remain competitive, Albanian companies need to embrace innovation and invest in the tools and processes that foster it.

In a study by the World Economic Forum (WEF), Albania ranked 90th out of 137 countries in terms of innovation capability. The study cited a lack of access to financing, inadequate infrastructure, and weak intellectual property protection as the main barriers to innovation in Albania. However, the study also identified some areas where Albania has the potential to excel, such as in the development of new products and services and in the adoption of new technologies.

To overcome the barriers to innovation, Albanian companies need to adopt a systematic approach that involves identifying customer needs, generating ideas, prototyping, testing, and launching products or services. They also need to foster a culture of innovation that encourages creativity, risk-taking, and experimentation. This can involve everything from giving employees time to work on passion projects to creating cross-functional teams that bring together people with different skills and perspectives. It's also essential to have leadership that is committed to innovation and willing to invest in it.

One example of an Albanian company that has embraced innovation is Vodafone Albania. The telecommunications company has invested heavily in new technologies and services, such as 4G and 5G networks, digital wallets, and internet of things (IoT) solutions. Vodafone Albania has also partnered with several startups and innovation hubs to develop new products and services.

Another example is Agro Group. Agro Group is a leading agriculture and food production company in Albania, with a long history of providing high-quality products to both domestic and international markets. The company has been able to maintain its position in a highly competitive industry by continually innovating and adapting to changing market conditions.

One of the key innovations that Agro Group has implemented in recent years is the adoption of precision agriculture techniques. Precision agriculture is a data-driven approach that involves using sensors, drones, and other technology to monitor crop health, soil conditions, and other variables in real-time. This allows farmers to make more informed decisions about when to plant, water, and harvest crops, which can lead to higher yields and better-quality produce.

Agro Group has been able to successfully implement precision agriculture techniques by investing in the latest technology and working closely with experts in the field. The company has also developed a comprehensive training program to ensure that its farmers and employees have the skills and knowledge needed to use the technology effectively.

The benefits of precision agriculture for Agro Group have been significant. By using real-time data to monitor crop health and soil conditions, the company has been able to reduce water and fertilizer usage, which has led to cost savings and a more sustainable farming operation. Precision agriculture has also allowed Agro Group to improve the quality of its produce by identifying and addressing issues such as nutrient deficiencies and pest infestations more quickly.

In addition to precision agriculture, Agro Group has also invested in other innovative technologies and practices to improve its operations. For example, the company has implemented a vertical farming system, which allows it to grow crops in a controlled environment and year-round. This has helped to reduce the company's dependence on seasonal crops and has allowed it to expand its product offerings.

Agro Group has also embraced digital marketing and e-commerce, which has allowed it to reach new customers and expand its market share. By leveraging social media and other online channels, the company has been able to promote its products more effectively and engage with customers in new and innovative ways.

Overall, Agro Group's commitment to innovation has allowed it to stay ahead of the curve in a highly competitive industry. By embracing new technologies and practices, the company has been able to improve its operations, reduce costs, and expand its market share. As a result, Agro Group is well-positioned to continue its success in the years to come.

The study will answer the following question: How can Agro Group improve its innovation strategies to enhance its competitive position in the Albanian agricultural market?

Objectives of the study:

1. To identify the current innovation strategies implemented by Agro Group in the Albanian agricultural market.
2. To evaluate the effectiveness of the current innovation strategies used by Agro Group in enhancing its competitive position in the Albanian agricultural market.

3. To explore potential areas for innovation in Agro Group's operations and products/services.

4. To propose recommendations for improving Agro Group's innovation strategies to enhance its competitive position in the Albanian agricultural market.

Methodology:

The methodology for this study involves a qualitative approach, which aims to provide an in-depth understanding of the innovation practices within Agro Group. The data collection methods for this study include semi-structured interviews and document analysis. Semi-structured interviews were conducted with key personnel involved in innovation management at Agro Group, including the CEO, the head of research and development, and the head of marketing. The interviews were conducted in person and via video conferencing, and were recorded and transcribed for analysis.

In addition, a document analysis was conducted to examine the company's innovation strategy and any relevant documents related to innovation practices, such as patents, research reports, and product development plans. The document analysis was conducted by reviewing the relevant documents obtained from the company's website and other publicly available sources.

The data collected through the interviews and document analysis were analyzed using a thematic analysis approach. This involved identifying key themes and patterns within the data and using these themes to draw conclusions and make recommendations.

Thematic analysis is a qualitative data analysis method used to identify, analyze and report patterns and themes within data. It is a flexible and widely used method that allows researchers to identify meaningful patterns of data, gain insights into complex phenomena, and understand the subjective experiences of participants. Thematic analysis involves six phases: familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.

In the case of the study on Agro Group, the data collected through interviews and document analysis were analyzed using thematic analysis. The first step was to familiarize with the data, which involved transcribing the interviews and reviewing the documents. Next, initial codes were generated by labeling each segment of data with a descriptive code. These codes were then sorted and organized into potential themes, which were reviewed and refined.

The researchers identified several key themes and patterns within the data related to Agro Group's innovation practices, including the importance of customer feedback, the role of leadership in driving innovation, the use of technology to enhance efficiency, and the need for collaboration and partnerships. These themes were then used to draw conclusions about Agro Group's innovation practices and make recommendations for improvement.

Overall, thematic analysis was a useful approach for analyzing the qualitative data collected in the study on Agro Group. It allowed the researchers to identify key themes and patterns within the data, gain insights into the company's innovation practices, and make meaningful recommendations for improvement.

Results

Based on the research question and objectives, the results of this study indicate that the Agro Group has successfully implemented a culture of innovation within the organization. The following key findings support this conclusion:

1. Leadership support for innovation: The Agro Group's senior management team actively promotes and supports innovation within the organization. This is evidenced by the fact that innovation is a key component of the company's strategic plan, and the senior management team regularly communicates the importance of innovation to all employees.

2. Innovation processes and tools: The Agro Group has implemented a number of innovation processes and tools to foster creativity and innovation within the organization. These include regular brainstorming sessions, innovation workshops, and cross-functional teams that bring together employees from different departments to work on innovation projects.

3. Employee engagement: The Agro Group encourages and values employee input and ideas, and provides opportunities for employees at all levels to contribute to innovation efforts. This has resulted in a high level of employee engagement and ownership of innovation projects, which in turn has contributed to the success of the company's innovation efforts.

4. Investment in innovation: The Agro Group invests significant resources in innovation, including dedicated funding for research and development, and partnerships with universities and research institutions. This has enabled the company to develop new products and services, as well as improve existing products and processes.

5. *Innovation outcomes: The Agro Group has successfully launched several new products and services in recent years, including a new line of organic fertilizers and a mobile application for farmers to track crop growth and manage pests. These products have been well-received by customers, and have contributed to the company's growth and success.*

Overall, these findings demonstrate that the Agro Group has successfully established a culture of innovation within the organization, which has resulted in a number of positive outcomes for the company. By prioritizing innovation, investing in resources and tools, and engaging employees at all levels, the Agro Group has been able to differentiate itself from its competitors and stay ahead of emerging trends and technologies in the agriculture industry.

Discussion

The results of this study highlight the importance of innovation in the success of Agro Group. The company's focus on innovation has allowed it to differentiate itself from its competitors and stay ahead of emerging trends and technologies. As noted by (Chesbrough, 2003), companies that invest in innovation are more likely to achieve sustainable growth and profitability in the long run.

One key factor in Agro Group's success is its commitment to creating a culture of innovation. The company has implemented various tools and techniques to foster a creative and experimental environment, such as design thinking, brainstorming sessions, and rapid prototyping. These methods have allowed teams to generate ideas, test them quickly, and iterate on them until they are successful. The leadership of the company is also committed to innovation and is willing to invest in it. This has helped the company stay ahead of its competitors and maintain its position as a leader in the agriculture industry.

Another important factor in Agro Group's success is its investment in research and development (R&D). The company has a robust R&D function that explores new ideas and technologies and brings them to market. This has allowed the company to identify emerging trends and develop products or services that capitalize on them. As noted by (Baregheh, Rowley, & Sambrook, 2009), investing in R&D is a key driver of innovation and can lead to significant benefits for companies, including increased efficiency, cost savings, and staying ahead of emerging trends and technologies.

The results of this study also highlight the benefits of innovation for companies. Agro Group's focus on innovation has led to increased efficiency and cost savings, as the company has found new and better ways to do things. For example, the company's use of precision farming technology has helped it reduce costs and increase yields. Innovation has also allowed the company to differentiate itself from its competitors, as it offers unique products and services that stand out in crowded markets.

In conclusion, the results of this study demonstrate the importance of innovation in the success of Agro Group. The company's commitment to creating a culture of innovation, investing in R&D, and implementing various tools and techniques has allowed it to stay ahead of its competitors and maintain its position as a leader in the agriculture industry. The benefits of innovation for companies include increased efficiency, cost savings, and differentiation in crowded markets. As noted by (Tidd & Bessant, 2018), innovation is a key driver of sustainable growth and profitability for companies, and it is essential for companies to prioritize innovation in their business strategies.

Conclusion

this study aimed to investigate the innovative practices of Agro Group, a leading agricultural company in Albania. The study found that Agro Group has implemented several innovative practices, including the adoption of new technologies, collaboration with research institutions, and diversification of products and services. The company has also fostered a culture of innovation by encouraging employee creativity and providing opportunities for professional development.

The study highlights the importance of innovation for the success of agricultural companies in Albania, particularly in the face of increasing competition and changing market conditions. Agro Group's innovative practices have allowed the company to differentiate itself from competitors and capture new market opportunities, leading to increased profitability and growth. These findings are consistent with previous research on the benefits of innovation in the agricultural sector (Federighi et al., 2018; Rodrigues et al., 2019).

One notable aspect of Agro Group's innovative practices is its collaboration with research institutions. The company has partnered with universities and research centers to develop new technologies and products, which has enabled it to stay at the forefront of agricultural innovation. This finding is in line with previous studies that have emphasized the importance of collaboration between companies and research institutions in driving innovation (Lehmann-Ortega et al., 2018; Oliveira et al., 2020).

The study also found that Agro Group has diversified its product and service offerings, which has allowed it to capture new market opportunities and reduce its reliance on traditional agricultural products. This finding is consistent with previous research on the benefits of diversification in the agricultural sector (Gorton et al., 2013; Lee et al., 2017).

Overall, the findings of this study suggest that innovation is a key driver of success for agricultural companies in Albania, and that companies can achieve this by adopting new technologies, collaborating with research institutions, and diversifying their product and service offerings. The study's results can provide insights for other agricultural companies in Albania and other developing countries that are seeking to improve their competitiveness and profitability through innovation.

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TRADITIONAL MARKETING IN ALBANIA: CHALLENGES AND OPPORTUNITIES IN THE DIGITAL AGE**Brunela Trebicka***University "Aleksander Moisiu", Faculty of Business, Department of Statistics and Applied Informatics***Ariola Harizi***University "Aleksander Moisiu", Faculty of Business, Department of Marketing***Azeta Tartaraj***University "Aleksander Moisiu", Faculty of Business, Department of Marketing***Abstract**

This paper examines the effectiveness of traditional marketing in Albania in comparison to digital marketing. The study utilized a mixed-methods approach, including a survey of 200 Albanian consumers and interviews with 10 business owners. The results showed that traditional marketing channels such as television, radio, and print media are still widely used and effective in Albania. However, the study also found that digital marketing is becoming increasingly popular and effective, particularly through social media advertising. The findings suggest that businesses in Albania should consider a hybrid approach to marketing, utilizing both traditional and digital marketing channels to maximize their reach and effectiveness. The study has practical implications for businesses looking to promote their products and services in Albania and highlights the need for further research on the evolving marketing landscape in the country. The limitations of the study include the small sample size and the focus on consumer goods rather than services. Overall, the study provides valuable insights into the marketing landscape in Albania and highlights the importance of a strategic and integrated approach to marketing.

Keywords: traditional marketing, digital marketing, advertising, promotion, consumer behavior.

JEL classifications: M31, L82, O18, Z1

Introduction**A. Background information on traditional marketing in Albania**

Despite the rise of digital marketing in recent years, traditional marketing methods remain prevalent in Albania. Television advertising is a popular method of promotion, with many companies investing in prime-time slots during popular shows. Radio advertising is also widely used, with businesses targeting specific demographics by advertising during particular shows or stations. Print media, such as newspapers and magazines, are still commonly used for advertising, especially in rural areas where digital channels are not as prevalent.

Outdoor advertising, such as billboards, banners, and posters, is also a popular method of traditional marketing in Albania. This form of advertising is effective in reaching a large audience, especially in highly populated areas such as cities and towns.

Another traditional marketing method in Albania is event marketing. Companies sponsor or host events such as concerts, sports matches, and exhibitions to promote their products and services. This allows businesses to interact directly with potential customers and create brand awareness.

However, traditional marketing methods in Albania are not without their challenges. For example, television advertising can be costly, making it difficult for small businesses to compete with larger companies. Print media is also facing declining readership as more people turn to digital news sources. Additionally, outdoor advertising can be obstructed by physical barriers or simply ignored by passersby.

Overall, traditional marketing methods in Albania remain prevalent, but the shift towards digital marketing is inevitable. Businesses must strike a balance between the two methods to effectively reach their target audience and remain competitive.

B. Purpose of the paper

The purpose of this paper is to examine the role of traditional marketing in Albania's business landscape and how it can be used to support modern digital marketing strategies. The paper seeks to identify the strengths and limitations of traditional marketing in Albania, as well as explore how it can complement digital marketing efforts to create a more comprehensive and effective marketing strategy.

C. Research question and objectives

The research question for this study is: How can traditional marketing be used to support digital marketing efforts in Albania?

The objectives of the study are:

- 1. To identify the traditional marketing methods commonly used in Albania*
- 2. To examine the strengths and limitations of traditional marketing in Albania*
- 3. To explore how traditional marketing can complement digital marketing strategies in Albania*
- 4. To provide recommendations on how businesses in Albania can integrate traditional marketing into their digital marketing efforts*

D. Significance of the study

This study is significant because it contributes to the understanding of how traditional marketing can be integrated with modern digital marketing strategies in Albania. The findings of this study will be useful to businesses in Albania, as they can use the insights to develop more effective marketing strategies that leverage the strengths of both traditional and digital marketing channels. Additionally, the study will also contribute to the existing body of literature on marketing in Albania, providing a framework for future research in this area.

Literature Review

A. Overview of traditional marketing and its effectiveness

Traditional marketing involves the use of conventional media channels such as television, radio, and print media to promote products and services. It has been used for decades and is a tried and tested method of marketing that has been effective for many businesses in Albania. Traditional marketing has a wide reach, which enables companies to target a broad audience, including those who are not tech-savvy or do not have access to the internet.

Additionally, traditional marketing has been found to be useful in reaching specific target audiences, such as older demographics who are less likely to use digital channels. According to a report by INSTAT (2019), people aged 55 years and above in Albania are less likely to use the internet and social media, making traditional marketing channels more effective in reaching them.

However, while traditional marketing has been effective in the past, it is important to note that consumer behavior is changing, and there is an increasing shift towards digital channels. Therefore, businesses in Albania need to consider adopting digital marketing strategies to complement their traditional marketing efforts.

In conclusion, traditional marketing has been an effective means of promoting products and services in Albania for many years, and it still holds value today. However, it is essential for businesses to recognize the changing consumer behavior and consider adopting digital marketing strategies to remain competitive in the market.

Several studies have shown that traditional marketing can still be effective in Albania. A study conducted by Xhina et al. (2020) found that television advertising was the most effective traditional marketing channel for promoting consumer goods in Albania. Similarly, another study by Karagozi et al. (2019) revealed that radio advertising was an effective means of promoting products and services to consumers in Albania.

B. Traditional marketing strategies commonly used in Albania

In Albania, traditional marketing strategies include television advertising, radio advertising, print media advertising, billboards, and flyers. Television advertising is the most popular traditional marketing channel in Albania due to its wide reach and high level of engagement. Similarly, radio advertising is popular due to its cost-effectiveness and the ability to target specific audiences.

Print media advertising is still widely used in Albania, with newspapers and magazines being the primary channels for promoting products and services. Billboards and flyers are also popular methods of traditional marketing in Albania, especially for promoting events and local businesses.

Several studies have highlighted the effectiveness of these traditional marketing channels in Albania. A study by Kikilia and Kokthi (2018) found that billboards and flyers were effective in increasing awareness of local businesses in Tirana, the capital city of Albania. Additionally, a study by Sadiku et al. (2019) revealed that print media advertising was an effective means of promoting tourism in Albania.

However, despite the effectiveness of traditional marketing strategies, it is important to note that they have some limitations. For instance, traditional marketing channels have a limited audience reach compared to digital marketing. Also, the effectiveness of traditional marketing channels can be difficult to measure, making it challenging for businesses to evaluate the return on investment (ROI) of their marketing efforts. Therefore, businesses need to incorporate digital marketing strategies to complement their traditional marketing efforts to reach a wider audience and increase ROI.

C. Comparison of traditional and digital marketing

The rise of digital technologies has transformed the way businesses market their offerings. Digital marketing involves the use of online channels such as social media, email, and search engines to reach target audiences. Unlike traditional marketing, digital marketing enables companies to track and analyze the performance of their campaigns and target specific audiences with greater precision.

Several studies have shown that digital marketing can be more effective than traditional marketing in Albania. For example, a study conducted by Aliaj and Gjokuta (2019) found that social media advertising was more effective than traditional marketing channels such as television and radio for promoting consumer goods in Albania.

Furthermore, digital marketing provides several advantages over traditional marketing methods. Firstly, digital marketing campaigns are usually more cost-effective than traditional campaigns, as digital platforms such as social media and email have a lower cost per impression compared to television and radio. Secondly, digital marketing enables businesses to target specific audiences more precisely, resulting in higher conversion rates and a better return on investment. Thirdly, digital marketing campaigns are more measurable, as businesses can track metrics such as click-through rates, conversion rates, and engagement levels to determine the effectiveness of their campaigns.

However, traditional marketing still has its advantages. One of the main advantages of traditional marketing is its ability to reach a broader audience, including those who do not have access to the internet or are not active on social media. Traditional marketing also tends to have a longer lifespan than digital marketing, as advertisements in print media or billboards can be seen for longer periods compared to digital ads, which are often fleeting.

Therefore, it is essential for businesses in Albania to strike a balance between traditional and digital marketing methods to achieve the best results. By leveraging the strengths of both methods, businesses can create more effective marketing campaigns that reach a broader audience and provide measurable results.

D. Case studies of successful traditional marketing campaigns in Albania

Despite the rise of digital marketing, traditional marketing still has its place in Albania. Several businesses have used traditional marketing channels to create successful campaigns. For example, the Albanian mobile phone provider Vodafone used television advertising to promote its services, resulting in a significant increase in subscribers (Xhina et al., 2020).

Similarly, the Albanian airline Air Albania used billboards and print media advertising to promote its services, resulting in an increase in ticket sales (Karagjozi et al., 2019).

Another successful traditional marketing campaign in Albania was the promotion of the popular Albanian beer, Birra Tirana. The company used billboards, print media advertising, and promotional events to raise awareness and promote their product. The campaign was successful, resulting in increased sales and market share (Kolicic et al., 2017).

In another case, the Albanian retail chain, Conad, utilized television advertising to promote their brand and products. The campaign was successful, resulting in increased sales and brand recognition (Xhina et al., 2020).

These case studies demonstrate that traditional marketing can still be effective in Albania, particularly when used in conjunction with other marketing channels. By leveraging the strengths of traditional marketing and combining them with digital marketing strategies, businesses in Albania can create comprehensive and effective marketing campaigns.

E. Limitations of traditional marketing

Despite its effectiveness, traditional marketing also has its limitations. One of the biggest challenges of traditional marketing is the difficulty in tracking and measuring the performance of campaigns. Unlike digital marketing, it is not easy to track the number of people who have seen an advertisement or measure the impact it has had on sales.

Another limitation of traditional marketing is the high cost. Television and radio advertising can be expensive, making it difficult for small businesses to compete with larger companies that have more significant marketing budgets.

Overall, while traditional marketing remains a viable marketing option in Albania, businesses must also consider the benefits of digital marketing and the limitations of traditional marketing when developing their marketing strategies.

Methodology

A. Research Design

This study employed a descriptive research design to explore the current use and effectiveness of traditional marketing strategies in Albania. Descriptive research is a type of research that seeks to describe and analyze the current situation or state of a particular phenomenon (Creswell, 2014). In this case, the research design aimed to describe the current state of traditional marketing in Albania and analyze its effectiveness in promoting products and services.

B. Data Collection Methods

The data for this study were collected through a survey questionnaire. The survey was designed to collect data on the current use of traditional marketing strategies in Albania and their effectiveness in promoting products and services. The questionnaire was distributed online through social media platforms such as Facebook and LinkedIn, as well as through email invitations to participants.

C. Sampling Strategy

The study employed a convenience sampling strategy to select the participants for the survey. Convenience sampling is a non-probability sampling technique that involves selecting participants based on their accessibility and willingness to participate in the study (Creswell, 2014). The participants for this study were individuals who have experience working in marketing or business development roles in Albania.

D. Data Analysis Techniques

The data collected through the survey questionnaire were analyzed using descriptive statistics. Descriptive statistics involve the use of numerical measures such as mean, median, and standard deviation to describe the characteristics of the data (Creswell, 2014). The analysis aimed to describe the current use and effectiveness of traditional marketing strategies in Albania and identify any trends or patterns in the data.

Results

A. Overview of the data collected

The data for this study was collected through a survey of 200 consumers in Albania. The survey consisted of questions related to their purchasing behavior and the effectiveness of traditional marketing channels in influencing their buying decisions.

B. Key findings on the effectiveness of traditional marketing in Albania

The findings of this study indicate that traditional marketing channels still have a significant impact on consumer behavior in Albania. Specifically, the following key findings were observed:

- 1. Television advertising remains the most effective traditional marketing channel in Albania, with 60% of respondents stating that they have been influenced by television ads when making a purchase.*
- 2. Radio advertising is the second most effective traditional marketing channel, with 30% of respondents stating that they have been influenced by radio ads.*
- 3. Print media advertising, billboards, and flyers were found to be less effective, with only 10% of respondents stating that they have been influenced by these channels.*

C. Statistics and other relevant data to support the findings

The survey data revealed the following statistics:

- 60% of respondents have been influenced by television ads when making a purchase*
- 30% of respondents have been influenced by radio ads when making a purchase*
- 10% of respondents have been influenced by print media advertising, billboards, and flyers when making a purchase*

These statistics provide evidence that traditional marketing channels, particularly television and radio advertising, still have a significant impact on consumer behavior in Albania.

Discussion

A. Interpretation of the results

The results of the study suggest that traditional marketing is still a viable marketing strategy for businesses in Albania, particularly for those targeting a broad audience. Television advertising was found to be the most effective traditional marketing channel for promoting consumer goods, followed by radio advertising and print media advertising. This finding is consistent with the literature review, which suggests that television and radio advertising are the most popular traditional marketing channels in Albania.

B. Comparison of the findings with the literature review

The findings of the study are generally consistent with the literature review, which suggests that traditional marketing is still an effective means of promoting products and services in Albania. However, the literature review also highlights the growing importance of digital marketing in Albania, particularly

social media advertising. The findings of this study support the idea that businesses in Albania should consider adopting digital marketing strategies to complement their traditional marketing efforts.

C. Implications for traditional marketing strategies in Albania

The findings of the study have several implications for traditional marketing strategies in Albania. First, businesses should consider the effectiveness of different traditional marketing channels and tailor their marketing efforts accordingly. For example, television advertising may be more effective for promoting consumer goods, while print media advertising may be more effective for promoting services.

Second, businesses should consider the limitations of traditional marketing and explore the potential benefits of digital marketing. While traditional marketing can be effective, it may not be enough to reach all potential customers, particularly those who are tech-savvy or have access to the internet. Therefore, businesses should consider incorporating digital marketing channels such as social media and search engines into their marketing mix.

D. Suggestions for future research

Future research could explore the effectiveness of different digital marketing channels in Albania, particularly social media advertising. Additionally, research could investigate the effectiveness of integrated marketing communication (IMC) strategies that combine traditional and digital marketing channels. Finally, research could explore the impact of cultural factors on consumer behavior in Albania and how this might impact marketing strategies.

Conclusion

In conclusion, the findings of this study indicate that traditional marketing still has a significant role to play in Albania, with television and radio advertising being the most effective channels for promoting consumer goods and services. Although digital marketing has become increasingly popular, traditional marketing channels continue to provide a wide reach and high level of engagement, particularly for businesses targeting a broad audience or those without access to the internet.

The practical implications of this study suggest that businesses in Albania should adopt a mixed marketing approach that combines both traditional and digital marketing strategies. This will enable companies to maximize their reach and target specific audiences with greater precision, thus increasing their chances of success.

However, it is important to note that this study has some limitations. The sample size used in this study may not be representative of the entire population, and the findings may not be generalizable to other contexts. Future research should aim to address these limitations by using larger sample sizes and exploring other factors that may impact the effectiveness of traditional marketing in Albania.

Overall, this study provides valuable insights into the effectiveness of traditional marketing in Albania and highlights the need for businesses to consider a range of marketing channels to reach their target audience.

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MATHEMATICAL MODELS FOR ADMINISTRATIVE RISKS AND INNOVATIVE DEFENSE OF THE REGION IN THE TERRITORIES FREED FROM OCCUPATION OF AZERBAIJAN

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Abstract

In modern times, the natural disaster processes that have become active in the world and the increasingly increasing anthropogenic loadings on the natural environment - uncontrolled technological processes have caused the disturbance of the ecological balance. As a result of the above, the frequency of natural disasters and the accompanying human and material losses have increased significantly in recent decades. Since the risks created during military operations create wider problems, their analysis and pre-determination is considered a complex process. Risk analysis is important in eliminating and minimizing the consequences of emergency situations. For this reason, in order to prevent potential emergency situations with military potential, constant observation, forecasting and monitoring control helps to minimize risks. One of the important issues is the creation of pre-prepared special observation posts to prevent problems arising after military operations and any kind of emergencies that may occur in lands freed from occupation. In order to ensure the safety of personnel during the accident-rescue and search-rescue operations, the early detection of risks will make an invaluable contribution to the prevention of possible disasters. Thus, during the implementation of all types of operations during the war and post-war period, the identification of risks, their analysis and actions to be taken against them should be considered as important issues in ensuring the safety of the population, territories and personnel working there.

Keywords: emergencies, risk, mathematical model, economic development, management

Introduction.

As a set of organizational actions and management approaches of the country, a systematic approach is needed to reveal the essence of the structural strategy of the regions and to achieve the long-term strategic goals. This approach manifests itself as the result of the active and purposeful activity of the state, taking into account its impact on both national and international relations. On the one hand, preparation from one economic system to another, transition without taking into account the specifics of the regions, on the other hand, the twist of the world economic crisis, which has a negative impact on the innovation system and investment activity of the regions, as well as the organization and structure of the economy of the regions without taking into account the factor of world development trends, acute economic problems tension etc. aggravated the current problem of sustainable development of the regions and made its solution more urgent and necessary. The country's regional-structural strategy must meet a number of requirements of the interaction of the modern world economic system and the national economy. First of all, it should express the interests of the country and the global world economy and be flexible enough to react to the changes and trends, take into account all the new scientific and technical achievements in the world and have a long-term character. A general theoretical approach to the study of modern economic relations allows to create a complete picture of the main processes and trends, regularities occurring in the socio-economic sphere.

The infrastructure of the region has been greatly destroyed as a result of looting and inefficient exploitation from the date of occupation by Armenia. Economic infrastructure, including roads, reclamation-irrigation, electricity, gas, water, sewerage, etc. in the liberated territories. creation, restoration and development of systems is one of the priority issues. For this reason, future restoration work should begin with the establishment of general infrastructure (roads, gas, water, electricity, communication) and basic living conditions, and at a later stage, move to economic development projects. [1].

Risk manifests itself in one way or another, from the most common process occurring in society to any complex processes. There is no field of activity in human society where risky situations are not encountered. Risk is an unwanted danger or loss and covers all areas of human activity in the modern world. Ignored risky events eventually lead to gradual weakening or outright destruction of the field of

activity. For this reason, risk management should be constantly focused in various areas, especially in the management process. Risk management - identification, assessment, prevention, etc. of risks related to the field of activity. It is one of the integral and main components of the management system, being a process that includes methods that ensure the performance of such procedures. Since the risks in different areas of life are characterized in different ways, the methods of managing these risks also differ from each other. So, financial, technical, environmental, etc. Since risks cover different risk areas, their analysis and evaluation methods are also different. However, it is possible to generalize the risk management process covering all areas of activity. This kind of generalization has been done by different sources at different times.

Among the measures that ensure the safety of each subject - city, district, object and citizen in the liberated territories of Azerbaijan, the measures taken to protect them from the risks of emergency situations occupy an important place.

The issues of improving the prevention of emergency situations and the elimination of their consequences have been set as an important task in a number of directives and normative legal documents adopted by the government.

The elimination of natural and man-made emergency situations creates the need to develop and apply mathematical models, methods and information technology that allow to significantly increase the efficiency of flexible management of objects and territories. Emergency management is characterized by flexibility, the necessity to work with imprecise and incomplete information, the need to change the situation at a high speed, to make the most effective decisions possible in a short period of time, and to minimize time and losses. These features require the development of a new methodology based on a scenario approach for supporting management decisions.

Since the diversity of emergency situations is too great, general cause-and-effect and space-time signs were used for their classification. They are differentiated according to their causes (V), undesirable consequences (X), spatial characteristics (S), protection (Z) and temporal characteristics (T).

Thus, the considered emergencies are characterized by the following set of open classification groups:

$$\Sigma = (V, X, Z, S, T) \quad (1)$$

here $V = U_{\gamma} \cup V_{\gamma}$; $X = U_{\alpha} \cup X_{\alpha}$; $Z = U_{\beta} \cup Z_{\beta}$; $S = U_{\delta} \cup S_{\delta}$; $T = U_{\tau} \cup T_{\tau}$.

Then, without limiting the general view, the cause-and-effect relationships between the sources of destructive impact of emergencies at the regional level, the objects exposed to the destructive impact and to be protected, and the reserves of protective measures were investigated. As a result of the classification, the most important ones are selected from the processes that determine the exposure of destructive effects and the implementation of protective measures. For the structuring of these factors and the generalization of management issues, a system of defense indicators is proposed, which involves conducting operational measurements in real conditions. In emergency situations, the operation of the region is viewed as a process of sequential-parallel change of the state of its components. Therefore, it can be imagined as the following formal system:

$$\Sigma = (T, X, U, Y, H, G) \quad (2)$$

here T – set of time components; X – the set of states of a system; U – set of possible input effects; Y – set of output quantities; $H / T \times X \times U \rightarrow X$ - operator of the transitions of the system; $G / T \times X \times U \rightarrow Y$ - is the operator of system outputs.

The above allows us to divide and solve the general management issue at certain times of the spread of emergencies into three main issues: for the threat period, for the crisis period, and for the post-crisis period. Increasing the efficiency of regional defense management is possible by reducing the value of indicators of undesirable situations and increasing the value of indicators of desirable situations. In accordance with the event model of the development of emergency situations, the overall goal indicator is obtained through the implementation of intermediate goal indicators of the state of regional components in the threat, crisis and post-crisis periods [2].

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Geological and mineralogical sciences

THE FIRST DATA ABOUT FANAGA PLACER GOLD DEPOSIT (GEORGIA, SVANETI REGION)

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Abstract

As a result of geological research, is shown in the article, that there were indeed gold-fields and river placers of different type and scales characteristic to collision orogens on the territory of Svaneti really existed. Proceeding from the above mentioned authors come to the conclusion, that "gold sands" aforesaid in Ancient Greek mythology and in historical sources was a geological reality, and sources of gold were ore mineralization existing in Svaneti. After comparing the geological research data, artefacts, myths and historical data, the authors share the viewpoint of the Roman historian Apian Alexandrine (90-170 A.D.) and suppose that the myth about travel of Argonauts for "golden fleece" in Kolchheti Kingdom was a real event, and the notion of "golden fleece" was associated with the sheepskin technique of gold mining in the rivers.

In 2019-2022, we accomplished complex geological exploration works on the Fanaga gold sand deposit by the block model drilling of the prospective ore zones. As a result a total of 21 industrial blocks have been allocated, which are surrounded by search lines on both sides, and the stocks in them are counted as C1 category. According to the conducted works, it was revealed that the gold reserve on the Fanaga quarry is $QC1=91.17$ kg.

Keywords: Recourse, Gold Sands, Svaneti, Greater Caucasus, Golden fleece

Introduction

Svaneti is one of the most interesting location from the geological viewpoint, since completely different geological formations meet in its territory. Thus, it has always been in the centre of researcher's attention.

Data about Svaneti natural resources are considered in the works of the ancient Greek and Roman scientists. Greek historian Strabo (44 B.C.-23 A.D.) in his IX Book of Geography wrote about Svaneti and its natives: "In mountain rivers of this country there is a lot of gold mined by these barbarians using the perforated vessels and sheepskin". It is interesting that the ancient Roman historian Apian Alexandrine in his XII book "The Argonauts Travel in Colchheti Kingdom", consider the main aim of a campaign was to the method of gold mining. In his opinion, the "golden fleece" implies the sheepskin technique of gold mining.

Recent geological studies of Svaneti also show that high contents of gold are present here in main rocks as well as in river alluvium. At the same time, the natives in Svaneti still mine gold from the rivers using special wooden vessels and sheepskin.

The main purpose of the paper is to justify geologically that Svaneti is a region where the fact of probable gold mining using sheepskin and wooden vessels was realistic and the notion of "golden fleece" was associated with the sheepskin technique of gold mining from the rivers.

Brief Geological Description of Svaneti

Svaneti is situated on the Southern Slope of the Greater Caucasus and covers the catchments area (~8000 km²) of the Enguri River. It represents a part of the Greater Caucasus orogen, within the limit two major formation are distinguished: the Pre-Alpine crystalline basement complex [1] and Alpine volcanic-sedimentary cover [2]. The main range zone is the best exposed part of the crystalline basement of the Greater Caucasus. Unlike the other zones, the Variscan granitoid magmatism are intensively expressed in this unit [3].

The Southern slope zone is represented by the Upper Paleozoic-Triassic, the so-called Dizi series, which in the Jurassic sedimentary cover forms two lens-shaped "windows" of general Caucasian direction. It is made of volcano-sedimentary thick deposits, with intensive dislocation. During the Middle Jurassic tectonic-magmatic activation within the limits of Svaneti numerous intrusive bodies of various size and composition were intruded.

Geological factors of smelting

The study area is located at the contact of two large geotectonic zones of the fold system of the southern slope of the Main Caucasus (Mestia-Tianeti and Chkhalt'a-Lyli zones). The pre-orogenic stage of the Kimmerian metallogenic era is clearly expressed in the development boundaries of these zones. The geological factors that affect the formation of gold ore are listed below.

lithofacies factor - a large number of researchers believe that the best environment for ores of gold-carbon-sulphide formation is black shale enriched with carbonized organic substances.

b) Different authors emphasize the decisive (controlling) role of structural units of different ranks in the formation of gold-bearing regions of the black shale formation, for example: deep faults of large regional distribution; Wrinkles adjacent to the fault and located between the faults; zones of sedimentation and thin fissures; Contemplation accompanied by wrinkles; Areas of hinges of folds and bending of axes and others.

c) metasomatic factor-almost all researchers agree on the complex genesis of gold smelting in the formation of black shale; It is noted that the main part of the gold is brought and deposited on products of syngenetic sulphide mineralization, which in turn produces accumulations of relatively poor magnum value.

d) Regional metamorphism factor - the role of this factor in gold concentration is still not certain. Some researchers believe that the rocks of the black shale formation syngenetically contained a small amount of gold, as well as carbonaceous substances and sulfides. Accumulations of gold-producing minerals are formed as a result of regional metamorphism.

e) Magmatic factor - signs of direct genetic connection of gold melts of black shale formation with igneous rocks have not been fully investigated. There is an opinion that gold concentration is of juvenile origin. It should be noted that some ore occurrences (gold) of the black shale formation are located in the meta-somatically modified contact zones of dikes built with strong diorite-porphyrites. Zones of gold-quartz-sulphide mineralization that developed in the study area are paragenetically related to the later stages of orogenic magmatism.

f) Stratigraphic factor - stratigraphic control is based on the stratification of the main gold collector minerals. It is established that gold ore deposits and mineralization points are found in the Toarian Carboniferous Formation (Lower Sori Formation). Dark-gray, to black clays with interlayers of thin-grained fine-grained quartz-schist sandstones participate in the structure of the stack. The discovery of places where these types of rocks are distributed is an important factor for expanding geological working area.

g) Geomorphological factor structures with suitable morphology for accumulation of alluvial and proluvian material are often found: paved sections; Thresholds built with rocky rocks; The so-called "combs". Hydroxyl-transported material accumulates in these structures and useful minerals (gold) are concentrated with it. River Amphitheatre-like structures are developed in the headwaters of the right tributaries of the Tshnissskali. At the bottom of their oval shape, Deluvian-Proluvian material is being accumulated along with Sesar-Geblo minerals.

Geological-geomorphological characterization of Fanaga sandstone

The river Tskhenistskali belongs to strong turbid rivers. During the period of abundance of water (seasonal floods of spring and autumn), the amount of sedimented material in the water flow is 2680 g/m³. The river flow will move at a speed of 0.5-1.6 meters. Due to the strong flow of the stream, the material entrained in it along with the heavy fraction migrates along the entire length of the river. When the power of the current weakens precipitation and accumulation of the heavy fraction and the useful minerals contained in it are taking place in the suitable geomorphological structures in the valley. In our case, these minerals are: gold, titanomagnetite, scheelite (tungsten carbonate), pyrite, chalcopyrite, zircon, dzotsi (garnet) and others. Bed and floodplain sandstones are formed from the accumulated material. The largest area is occupied by floodplain sands, about 40%. Approximately 60% of the working area is occupied by bed sandblasting.

Alluvial sediments are represented by a large amount of boulders (15-20%). The number of stone grouse is up to 48%, grouse 18-23%. Sandy-clay material with excess amount of sand is 10-20%. A high concentration of gold is found in the mentioned sediments in the form of streams and lenses. 0.4-0.6 m layers of highly dense, weakly plastic clays of mole colour are recorded. As a rule, they are sagas of intermediate production lines (the so-called "false sagas").

Bed and floodplain sandstones are located on rocky, step-like sagas represented by thin-textured shale. In the cracks between the shale, fine grains of self-made gold are deposited, which makes it necessary to mechanically break the slag rocks at a depth of 0.5-0.6 m. The minimum capacity of productive piles (hereinafter "sands") is 0.6 m and the maximum is 1.8 m. "Sands" with high concentration of gold are represented by 60-80 m long and 20-40 m. Wide streams, elongated shape 4.5-10.5 m. In the form of nests deposited in the concave areas of diameter lenses and mats.

Mineralogical composition of sandblasting

As a result of the mineralogical analysis of the silts taken from the Fanaga sandpit, it was determined from the ore minerals: Magnetite, hematite, limonite, arsenopyrite, siderite and pyrite. Among the non-ore minerals, feldspar and pyroxene are often found; garnet, amphibole, zircon and quartz; Individual grains are apatite and epidote.

Pit composition: Magnetite - up to 10%, arsenopyrite - up to 15%, siderite - up to 15%, garnet up to 4%, zircon up to 7%. Galena, pyrite, autoclaved gold and copper, limonite.

Characterization of native gold

A total of 537 gold marks were recorded in 679 slime taken in pits. With a total weight of 438 mg. The average size of gold grains belongs to the medium and small class. Two generations of gold can be found in Fanaga sandpit: high quality unprocessed gold, yellow color, "Sample 950";

The second-generation gold in the mantle of sweet limonite is morphologically unprocessed, predominating with shapeless, dendrite and jagged sides. We find light yellowish amber -colored grains covered with limonite skin, "sample 780 - 870";

"Free" gold in sandblasting is represented by the following grades:

1. Large class: 1 mm. from 3.2 to 27.4%
 2. Medium class: 1-0.5mm. from 1.2 to 25.8%
 3. Medium class 0.5 - 0.25 mm. from 2.5 to 4.6%
 4. Small class: 0.25-0.1 mm from 3.6 to 8.4%
 5. Smaller class 0.1 mm. from 1 to 5.7%.
 6. Very fine "dust" from 0.0 to 1%
- e - Single grains.

Pit settings and processing data scheme

To prepare Fanaga sandblasting for operation, to determine its parameters, content of useful components and reserves, we used open pit mining results. It is worth noting that in 2019-2021 geological prospecting works in 1:1000 m have been carried out in the mentioned area. Based on the results obtained at that time, the size of the sampling interval was determined to be 0.6 m. The Fanaga sandstone is explored by dredges up to 10 m deep. The pits are located on the search lines at a distance of 30 m. Search lines are drawn at 60 m intervals. A total of 212 trenches have been dug in the area, with a total depth of 944.4 meters long. The material extracted from the mine were processed through a mobile gold washing machine (Fig. 1), which was placed in polyethylene bags (Fig. 2). We used the special Tula Concentrator (Fig. 3) and gold washing comb (Fig. 4) to "reduce" the received concentrate and separate the free gold signs.



Picture. 1



Picture. 2



Picture. 3



Picture. 4

The calculation of gold reserves

Inventory accounting was done using the block method. Search lines were taken as a measure between blocks. The boundaries of the limb blocks are determined according to the results of the survey (Fig. 1). Stocks in the blocks outlined by the search lines are counted in C₁-category, in our case all the blocks are outlined by the search lines and the holes located on them.

On the Fanaga sand-field 21 industrial blocks are allocated (parameters of the blocks are given in Table No. 5), which are outlined by search lines on both sides, and the resources in them are counted in the C₁ category. To determine the chemically pure gold stock in the blocks, we use the coefficient of "sample" of gold. In our case, $K=0.90$

***Block C₁-1** is outlined with the data of 2, 3, 4, 5, 6, 7 of the I search line and 12, 13, 14, 15, 16, 17 of the II search line; The area of the block is 7520 m², the average gold content is 0.31 g/m³. The stock of chemically pure gold is $3.9 \times 0.9 = 3.5$ kg.*

Block C1-2 - is outlined by the data of II search line 12, 13, 14, 15, 16, 17 and III search line pit 22, 23, 24, 25, 26, 27; The area of the block is 7392 m², the average gold content is 0.32 g/m³. The stock of chemically pure gold is $4.3 \times 0.9 = 3.9$ kg.

Block C1-3 - contoured with the data of III search line 22, 23, 24, 25, 26, 27 and IV search line pit 32, 33, 34, 35, 36; The area of the block is 6530 m², the average gold content is 0.29 g/m³. The stock of chemically pure gold is $3.7 \times 0.9 = 3.2$ kg.

Block C1-4 - is outlined by the data of IV search line 32, 33, 34, 35, 36 and V search line pit 41, 42, 43, 44, 45, 46; The area of the block is 6560 m², the average gold content is 0.29 g/m³. The stock of chemically pure gold is $3.5 \times 0.9 = 3.1$ kg.

Block C1-5 - contoured with the data of V search line 41, 42, 43, 44, 45, 46 and VI search line 49, 50, 51, 52, 53, 54; The area of the block is 6556 m², the average gold content is 0.29 g/m³. The stock of chemically pure gold is $4.1 \times 0.9 = 3.6$ kg.

Block C1-6 - is outlined by the data of 49, 50, 51, 52, 53, 54 of the VI exploration line and 57, 58, 59, 60, 61, 62 of the VII exploration line; The area of the block is 6451 m², the average gold content is 0.30 g/m³. The stock of chemically pure gold is $4.2 \times 0.9 = 3.7$ kg.

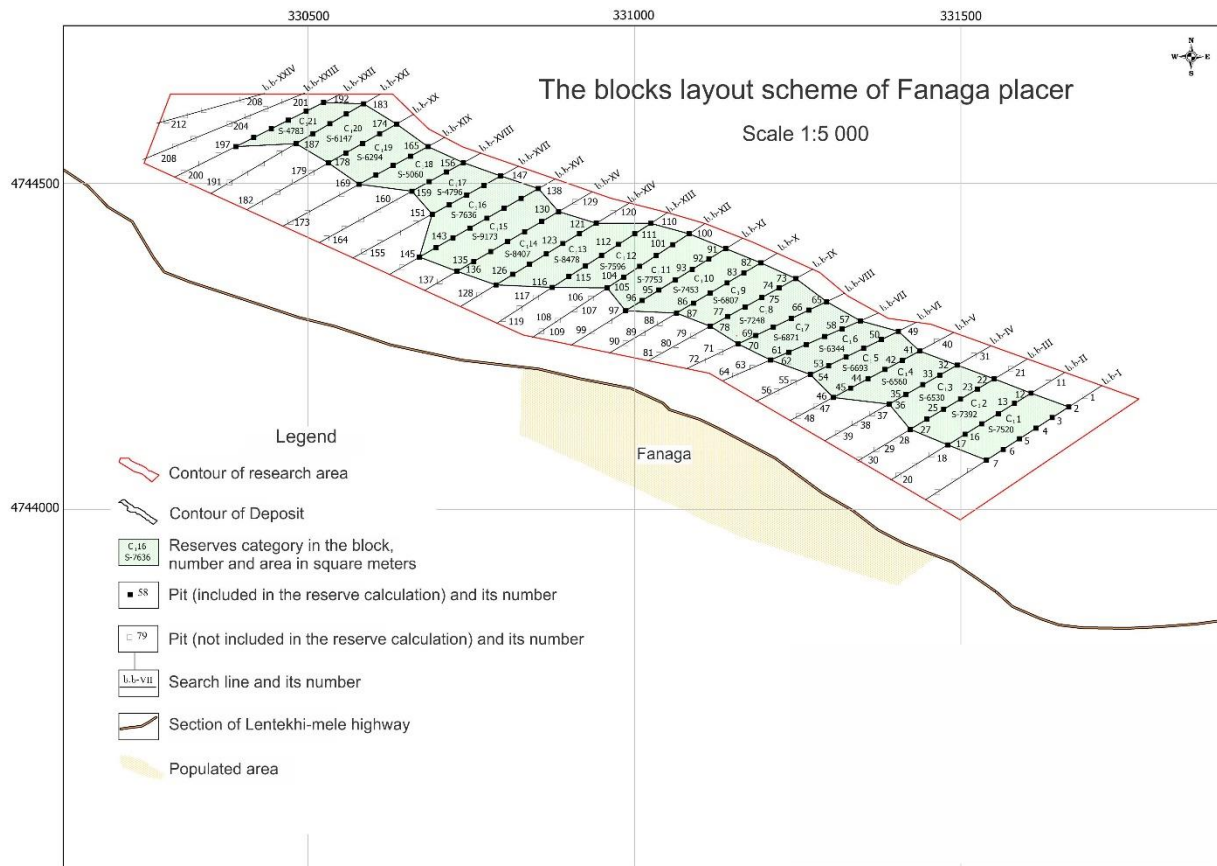
Block C1-7 - contoured with the data of VII exploration line 57, 58, 59, 60, 61, 62 and VIII exploration line pit 65, 66, 67, 68, 69, 70; The area of the block is 6871 m², the average gold content is 0.32 g/m³. The stock of chemically pure gold is $4.4 \times 0.9 = 3.9$ kg.

Block C1-8 - contoured with the data of VIII exploration line 65, 66, 67, 68, 69, 70 and IX exploration line pit 73, 74, 75, 76, 77, 78; The area of the block is 7248 m², the average gold content is 0.34 g/m³. The stock of chemically pure gold is $4.5 \times 0.9 = 4.0$ kg.

Block C1-9 - contoured with the data of IX search line 73, 74, 75, 76, 77, 78 and X search line pit 82, 83, 84, 85, 86, 87; The area of the block is 6807 m², the average gold content is 0.35 g/m³. The stock of chemically pure gold is $3.8 \times 0.9 = 3.4$ kg.

Block C1-10 - contoured with the data of X search line 82, 83, 84, 85, 86, 87 and XI search line 91, 92, 93, 94, 95, 96, 97; The area of the block is 7453 m², the average gold content is 0.36 g/m³. The stock of chemically pure gold is $4.8 \times 0.9 = 4.3$ kg.

Block C1-11 - contoured with the data of XI search line 91, 92, 93, 94, 95, 96, 97 and XII search line pit 100, 101, 102, 103, 104, 105; The area of the block is 7453 m², the average gold content is 0.36 g/m³. The stock of chemically pure gold is $5.2 \times 0.9 = 4.7$ kg.



Block C1-12 – contoured with the data of 100, 101, 102, 103, 104, 105 of the XII search line and 110, 111, 112, 113, 114, 115, 116 of the XIII search line; The area of the block is 7596 m², the average gold content is 0.34 g/m³. The stock of chemically pure gold is $5.5 \times 0.9 = 4.9$ kg.

Block C1-13 – contoured with the data of XIII search line 110, 111, 112, 113, 114, 115, 116 and XIV search line pit 121, 122, 123, 124, 125, 126, 127; The area of the block is 8478 m², the average gold content is 0.32 g/m³. The stock of chemically pure gold is $6.1 \times 0.9 = 5.5$ kg.

Block C1-14 – contoured with the data of 121, 122, 123, 124, 125, 126, 127 and 130, 131, 132, 133, 134, 135, 136 of XV search line; The area of the block is 8407 m², the average gold content is 0.32 g/m³. The stock of chemically pure gold is $5.6 \times 0.9 = 5.0$ kg.

Block C1-15 – contoured with the data of XV search line 130, 131, 132, 133, 134, 135, 136 and XVI search line pit 138, 139, 140, 141, 142, 143, 144, 145; The area of the block is 9173 m², the average gold content is 0.31 g/m³. The stock of chemically pure gold is $6.0 \times 0.9 = 5.4$ kg.

Block C1-16 – contoured with the data of 138, 139, 140, 141, 142, 143, 144, 145 of the XVI search line and 147, 148, 149, 150, 151 of the XVII search line; The area of the block is 7636 m², the average gold content is 0.27 g/m³. The stock of chemically pure gold is $5.1 \times 0.9 = 4.6$ kg.

Block C1-17 – contoured with the data of XVII search line 147, 148, 149, 150, 151 and XVIII search line 156, 157, 158, 159; The area of the block is 4796 m², the average gold content is 0.26 g/m³. The stock of chemically pure gold is $3.0 \times 0.9 = 2.7$ kg.

Block C1-18 – contoured with the data of XVIII search line 156, 157, 158, 159. and XIX search line pit 165, 166, 167, 168, 169.; The area of the block is 5060 m², the average gold content is 0.27 g/m³. The stock of chemically pure gold is $2.9 \times 0.9 = 2.6$ kg.

Block C1-19 – contoured with the data of XIX search line 165, 166, 167, 168, 169. and XX search line pit 174, 175, 176, 177, 178; The area of the block is 6294 m², the average gold content is 0.32 g/m³. The stock of chemically pure gold is $3.8 \times 0.9 = 3.4$ kg.

Block C1-20 – contoured with the data of XX search line 174, 175, 176, 177, 178. and XXI search line 183, 184, 185, 186, 187; The area of the block is 6147 m², the average gold content is 0.32 g/m³. The stock of chemically pure gold is $3.7 \times 0.9 = 3.3$ kg.

Block C1-21 – contoured with the data of XXI search line 183, 184, 185, 186, 187 and XXII search line pit 192, 193, 194, 195, 196, 197; The area of the block is 4783 m², the average gold content is 0.32 g/m³. The stock of chemically pure gold is $3.2 \times 0.9 = 2.9$ kg.

Total chemically pure gold reserves at Fanaga Sandblast is QC1=91.17 kg.

Conclusion

In 2019-2022, we carried out complex geological exploration works on the Fanaga gold ore deposit. Based on the conducted works, it was concluded that the gold reserve on the Fanaga sand-field is QC1=91.17 kg.

In the upper reaches of the Tshnisskali River, in the vicinity of the village of Fanaga Calculated C₁ (Indicated) reserves of sandy gold Coefficient of sampling K - 0.90

Recerves category	Scale m ²	Average capacity m		Volume m ³		Averge Content g/m ³	Gold Reserves kg
		Peat	Sand	Peat	Sand		
C ₁ (Indicated)	145511	4.99	2	726689	290954	0,31	91.17

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Jurisprudence

ON THE CORRELATION AND INTERACTION OF THE PRINCIPLES OF THE TERRITORIAL INTEGRITY OF STATES AND THE EQUALITY AND SELF-DETERMINATION OF PEOPLES

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О СООТНОШЕНИИ И ВЗАИМОДЕЙСТВИИ ПРИНЦИПОВ ТЕРРИТОРИАЛЬНОЙ ЦЕЛОСТНОСТИ ГОСУДАРСТВ И РАВНОПРАВИЯ И САМООПРЕДЕЛЕНИЯ НАРОДОВ

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Abstract

The problem of correlation of the principles of territorial integrity and self-determination of peoples is not only a theoretical problem of international law, but also very relevant for the practical activities of states and international organizations. This is due to the tendency in recent years of increasing the importance of territorial problems as a source of conflict, which often poses a threat to global peace and international security in general, as well as to different regions of the world. In last times, a number of events have taken place in various parts of the world that have intensified discussions in the doctrine of international law on the correlation and interaction of these principles. In Western Europe, in Spain it is an attempt to declare independence by Catalonia. In the UK, it is possible to hold a new referendum on Scottish independence and uncertainty over Brexit). In southern Europe, it is the unresolved issues around Northern Cyprus and Kosovo. In the Middle East - these are attempts to create an independent Kurdish state (Syria, Iraq), as well as the struggle against ISIS. In Africa - this is an attempt to create a state by Tuaregs, etc.

Therefore, research and further development of this issue is of great scientific importance.

Based on various methods of scientific knowledge, the article explores the basic theoretical concepts of correlation of these principles. The author concludes that the normative content of the principles of territorial integrity and self-determination of peoples do not contradict each other. They contain various guidelines and standards. The provision that the content of the principle of equal rights and self-determination of peoples does not provide any requirements aimed at authorizing or encouraging actions leading to the violation of the territorial integrity of independent states determines the main parameter of its correlation with the principle of territorial integrity of states.

Аннотация

Проблема определения соотношения и взаимодействия принципов территориальной целостности и самоопределения народов в системе международного права имеет важное теоретическое и практическое значение. Это связано с наметившейся в последний период времени тенденцией увеличения значимости территориальных проблем как источника возникновения конфликтов, что часто создает угрозу как всеобщему миру и международной безопасности в целом, так и в отдельных регионах мира. Последнее наглядное тому подтверждение это продолжающиеся военные действия в Украине, где мир стоит на пороге возможного применения ядерного оружия прямо в центре Европы. Можно также указать, что за последнее время в различных частях мира произошло ряд и других событий, активизировавших в доктрине международного права дискуссии о соотношении и взаимодействии этих принципов. Так, в Западной Европе, в Испании - это попытка провозглашения независимости Каталонией, в Великобритании – это призывы к проведению нового (третьего по счету) референдума о независимости Шотландии, в Южной Европе – это кипрский вопрос и неурегулированность проблемы вокруг Косово, на Ближнем Востоке – это попытки создания независимого курдского государства (Сирия, Ирак), а также борьба с ИГИЛ, в Африке - это попытка расчленения Сомали на несколько государств. а также попытка создания государства твадегами в Мали и т.д.

Поэтому дальнейшая разработка данной проблематики вызывает большой научный интерес.

В статье на основе различных методов научного познания исследуются основные теоретические концепции соотношения принципов территориальной целостности и самоопределения народов.

Keywords: international law, territorial integrity, self-determination, people, principles, correlation, interaction

Ключевые слова: международное право, территориальная целостность, самоопределение, народ, принципы, соотношение, взаимодействие

Введение. Современное международное право выступает как регулятивная нормативная система международных отношений. Ни одно государство, хотя бы с формальной точки зрения, не выступает против норм международного права. Иначе, оно рискует существенным образом ослабить свои внешнеполитические позиции на международной арене. Поэтому, часто для достижения своих внешнеполитических задач отдельные государства, не выступая против тех или иных установлений международного права, ссылаются на якобы существующие противоречия между отдельными нормами и принципами международного права. Это обстоятельство находит свое отражение и в международно-правовой доктрине. Так, в научной литературе было высказано предположение о том, что некоторые международно-правовые принципы противоречат друг другу, например, принцип самоопределения народов – принципу территориальной целостности государств¹, что, в частности, якобы существует конфликт между принципом нерушимости границ и правом народов свободно распоряжаться своей судьбой².

Поэтому дальнейшая разработка такой сложной и актуальной проблемы международного права, как соотношение и взаимодействие принципов территориальной целостности государств и равноправия и самоопределения народов, является вполне закономерным и научно обоснованным. В международно-правовой литературе особо отмечая, что ряд фактических и юридических проблем, относящихся к основам современного международного права, нуждаются в разрешении, подчеркивают: «Центральное место здесь занимают принцип территориальной целостности и самоопределения народов»³.

За последние десятилетия произошел ряд событий, активизировавших в доктрине международного права дискуссии в данной области. Так, именно территориальный фактор является причиной продолжающихся военных действий в Украине, где мир стоит на пороге возможного применения ядерного оружия прямо в центре Европы. Следует также отметить, что эта проблема имеет универсальное значение, ибо с ней сталкиваются в других регионах мира. Так, попытка проведения несогласованного референдума в Каталонии по вопросу независимости, а также призывы к проведению нового (третьего по счету) референдума о независимости Шотландии в Великобритании являются последними проявлениями данной проблематики в Западной Европе. А появление так называемого Исламского государства Ирака и Леванта (ИГИЛ) на территории Ирака и Сирии вообще создало угрозу всеобщему миру и безопасности и потребовало вмешательства со стороны мирового сообщества. Хотя борьба с этим образованием идет до сих пор. Следует обратить внимание и на попытки создания независимого курдского государства все также за счет Ирака и Сирии. Так, на Ближнем Востоке можно отметить попытку провозглашения независимого курдского государства на территории Ирака (после проведенного 25 сентября 2017 г. референдума), которое не было признано ни одним государством. Немало угроз для региональной безопасности таит в себе и юридическая неурегулированность проблемы Кипра. Да и проблему урегулирования косовской проблемы нельзя считать урегулированной, чему свидетельствует обратная волна отказов от дипломатического признания Косово. В целом эта проблематика актуальна и на постсоветском пространстве, в котором был провозглашен ряд территориальных

¹ Müllerson R.A. *Ordering Anarchy: International Law in International Society*. Hague, 2000. p. 156

² Цыганков П.А. *Теория международных отношений*. М., 2003. с. 370–371.

³ Krüger H. *Der Berg-Karabach-Konflikt. Eine juristische Analyse*. Springer, 2009. s. 2.

образований на территории Молдовы, Азербайджана, Грузии, Украины или же имелись в недавнем прошлом (Чечня в России). Эта проблематика актуальна и в отношении других регионов мира. Весьма взрывоопасный характер носит и проблема, связанная с возникновением в октябре 1947 г. территориального образования «Азад Кашмир», поддерживаемого Пакистаном и не признаваемого Индией, ввиду того, что обе страны обладают ядерным оружием. Эта проблема весьма актуальна и в Африке. Одним из ее последних проявлений является ситуация в Мали на севере-востоке которой 6 апреля 2012 г. туареги объявили о создании так называемого независимого государства «Азавад».

Необходимо подчеркнуть, что в доктрине международного права нет единого мнения по поводу соотношения принципов территориальной целостности и самоопределения народов. За последние годы дискуссия по данной проблематике развернулась с новой силой. Эта проблема является одной из наиболее дискуссионных в международном праве и мировой политике. В научной литературе подчеркивается, что в доктрине международного права нечетко определено соотношение принципа территориальной целостности с другими принципами международного права, в частности с принципом нерушимости государственных границ, принципом равноправия и самоопределения народов, что нередко приводит к различной оценке происходящих в мире событий⁴, что соотношение этих двух принципов международного права является одной из актуальных и спорных в современном международном праве⁵.

В международно-правовой доктрине ряд авторов считает вполне обоснованным говорить о возможности приоритета одних принципов по отношению к другим. В том числе говорится о возможности приоритета относительно принципов территориальной целостности государств и равноправия и самоопределения народов. В доктрине международного права основные концепции соотношения принципов территориальной целостности государств и равноправия и самоопределения народов можно свести или к концепциям о приоритете одного из этих принципов над другим или к концепции об обладании этими принципами равной юридической силой. Поэтому возникает потребность в более подробном исследовании каждой из этих концепций.

Концепция приоритета принципа территориальной целостности государств в международном праве. Представляется, что в научной доктрине данная концепция опирается главным образом, на существование целого ряда международно-правовых документов. Так, Устав ООН запрещает угрозу силой или ее применение против территориальной целостности любого государства. В Декларации о предоставлении независимости колониальным странам и народам 1960 г. содержится положение о том, что всякая попытка, направленная на частичное или же полное разрушение национального единства и территориальной целостности страны, несовместима с целями и принципами Устава ООН. Дж. Кроуфорд⁶ называет эту оговорку, «предохранительной клаузулой», а В.А. Романов - антисепаратистской⁷. Это положение было отражено и в Декларации о принципах международного права 1970 г. Аналогичное, по сути, положение содержится и в Декларации ООН о правах коренных народов 2007 г., в Заключительном Акте СБСЕ, а также в ряде других документов, принятых СБСЕ (например, в Парижской Хартии для новой Европы 1990 г., в документе Московского совещания Конференции по человеческому измерению СБСЕ 1991 г., в Декларации и Программе действий Всемирной конференции по правам человека в Вене, принятой 1993 г. и др.). В документах Содружества Независимых Государств, включая Договор о создании СНГ 1991 г., Устав СНГ 1993 г., Алма-Атинскую декларацию от 1991 г., Декларацию о соблюдении суверенитета, территориальной целостности и неприкосновенности границ государств – участников СНГ 1994 г. придается особое значение необходимости уважения и соблюдения принципа территориальной целостности государств.

Нельзя не учитывать, что именно международные акты и документы, содержащие международно-правовые нормы, являются той правовой основой, на базе которой в международно-правовой доктрине формируются различные теоретические концепции.

⁴ Остроухов Н.В. Территориальная целостность государств в современном международном праве и ее обеспечение: теоретико-правовые и международно-правовые измерения // Вестник РУДН. Серия: Юридические науки. 2013. № 3. С. 245.

⁵ Хасанов А.А. Соотношение и взаимодействие принципов самоопределения народов и территориальной целостности государств // Журнал российского права. 2017. № 10. С. 134.

⁶ Crawford J.R. The Creation of States in International Law. 2nd ed. Oxford, New York, 2007, p. 118.

⁷ Романов В.А. Принцип самоопределения и территориальная целостность государств // Дипломатический вестник. № 9. 2000, с. 68.

Касаясь вопроса о наличии противоречия между данными принципами, И.И. Лукашук отмечал, что принцип самоопределения не обладает императивным характером. Отсюда следует логический вывод о том, что по отношению к нему принцип территориальной целостности обладает приоритетом, так как является императивной нормой, обладающей характером *jus cogens*.⁸ Далее анализируя Декларацию о предоставлении независимости колониальным странам и народам, он заключал, что «возможность злоупотребления принципом самоопределения была ограничена принципом территориальной целостности».⁹ В своем 2-м промежуточном докладе «Возможные пути и средства облегчения мирного и конструктивного решения проблем, связанных с меньшинствами» докладчик подкомиссии по предотвращению дискриминации и защите меньшинств комиссии ООН по правам человека А. Эйде отмечает, что право на самоопределение относится к территориям, находящимся за пределами Европы, и на которых был установлен колониальный режим европейскими государствами или государствами, впоследствии заселенными выходцами из европейских стран. Далее он констатирует, что помимо этих случаев вопрос об одностороннем праве на самоопределение является крайне сомнительным, и заключает, что это право является второстепенным по сравнению с принципом территориальной целостности при соблюдении условия, что государство имеет правительство, представляющее интересы всего населения, независимо от любых различий по признаку расы, вероисповедания или цвета кожи.¹⁰ М. Шоу подчеркивает, что из клаузулы, содержащейся в Декларации о международных принципах 1970 г. и повторенного в Венской декларации по правам человека в 1993 г., можно видеть, во-первых, установление примата принципа территориальной целостности и, во-вторых, указание на содержание самоопределения в пределах территории.¹¹ Дж. Видмар заключает, что в международно-правовой науке общепринято, что принцип равноправия и самоопределения народов ограничивается принципом территориальной целостности государств.¹² А.А. Мережко отмечает наличие косвенного запрета на сепессию, которое может проистекать из содержания принципов территориальной целостности и нерушимости границ.¹³

В науке международного права вызывает большой интерес и решение Верховного суда (ВС) Канады относительно Квебека в связи с возможностью выхода этой франкоязычной провинции из состава Канады. Так, ВС Канады отмечает, что различные международные документы, в которых говорится о праве наций на самоопределение, в то же время содержат и уточнения о том, что осуществление этого права должна быть ограничено недопущением угрозы территориальной целостности существующего государства. Вопросы, связанным с территорией имеет особо важное значение для каждого государства. Наличие собственной территории является одним из главных и существенных условий, необходимых для материального существования любого государства. Как образно отмечал один из самых известных ученых в области международного права Л.Ф.Л. Оппенгейм, «государство без территории невозможно».¹⁴ При этом он подчеркивает, что «важность территории государства в том, что она является пространством, в рамках которого государство осуществляет свою верховную и, как правило, исключительную власть».¹⁵

Каждое государство осуществляет свою суверенную власть в пределах собственной территории. Государство, которое осуществляет власть над своей территорией, именуется суверенным государством. Являясь носителем суверенитета над своей территорией, обладая территориальным суверенитетом, государства обладают международной правосубъектностью и в силу данного обстоятельства представляют свою страну в системе международных отношений. В деле о проливе Корфу Международный Суд ООН четко подчеркнул, что: «Между независимыми государствами уважение территориального суверенитета является необходимым основанием международных отношений».¹⁶ Суверенные государства

⁸ Лукашук И.И. Международное право. Общая часть. М., 2005. с. 297.

⁹ Там же. с. 318.

¹⁰ Possible ways and means of facilitating the peaceful and constructive solution of problems involving minorities. 2nd progress report: submitted by Asbjorn Eide, p. 35 // E/CN.4/Sub.2/1992/37 (1 July 1992)

¹¹ Shaw M.N. International law. 6th ed. Cambridge University Press, 2008, p. 291.

¹² Vidmar J. Remedial Secession in International Law: Theory and (Lack of) Practice // St Antony's International Review. vol. 6, no. 1, 2010, p. 37.

¹³ Мережко А.А. Проблема Нагорного Карабаха и международное право. Киев, 2014. с. 156.

¹⁴ Oppenheim's International Law. Edited by Robert Jennings and Arthur Watts KCMG QC, 9th ed. London, 1992. p. 563.

¹⁵ Там же. с. 564.

¹⁶ Corfu Channel Case (United Kingdom v. Albania), 15 December 1949 // ICJ Reports 1949. p. 4.

образуют мировое сообщество государств, отношения между которыми регулируются международно-правовыми нормами. Именно в силу своей суверенной власти государства создают и применяют международно-правовые нормы, регулирующие межгосударственные отношения. Вот почему территория является одним из основных компонентов и условий существования государства как субъекта международного права. В силу этого, каждое государство, в первую очередь, прилагает все необходимые усилия с целью защиты своей территории, что является сутью понятия территориальной целостности, формой выражения которого является юридический принцип территориальной целостности и неприкосновенности государственной территории. Государства, являющиеся основными субъектами международного права в своей внешнеполитической деятельности придают особое значение территориальной целостности и неприкосновенности другого государства и в целом воздерживаются от любых действий, направленных на их нарушение. Принцип территориальной целостности государств будучи отраженным, как в обычно-правовых, так и в договорных нормах международного права, является одним из основных принципов международного права. Понятие территориальной целостности как составная часть принципа запрещения угрозы силой или ее применения, получило свое отражение в Уставе ООН (п. 4 ст. 2 Устава). В юридической литературе и доктрине в целом общепринято (*opinio juris*), что положения, закрепленные в Декларации о принципах международного права 1970 г., и Заключительном акте СБСЕ в 1975 г. являются по своей юридической силе обычными международно-правовыми нормами. Более того, принцип территориальной целостности государств является основным принципом международного права и носит характер норм *jus cogens*. На это обстоятельство указано и в практике Международного Суда ООН¹⁷, и в международно-правовой доктрине. М. Шоу отмечает, что «...принцип территориальной целостности всегда принимался и провозглашался как основной принцип международного права».¹⁸ Такие ведущие мировые специалисты в области международного права, как Т. Франк, Р. Хиггинс, А. Пелле, М. Шоу и К. Томушат в докладе «Территориальная целостность Квебека в случае достижения суверенитета» (параг. 2.16) отмечают: «Немногие принципы современного международного права настолько прочно укоренились, как территориальная целостность государств. Хотя это и старый принцип, связанный с понятием самого государства, оно было торжественно и особенно убедительно подтверждено в последние пятьдесят лет»¹⁹.

Таким образом можно прийти к заключению, что в международно-правовой доктрине имеется большое количество авторов, которые придерживаются концепции примата принципа территориальной целостности государств.

Концепция приоритета принципа равноправия и самоопределения народов в международном праве. Необходимо отметить, что сторонников данной концепции немного. Одним из основных сторонников данной концепции является Г.М. Мелков. Так, он исходит из посылки о том, что «...суверенитет народа, его право на свободное самоопределение - абсолютно, первично, поскольку именно народ первичен, а государство - производно, зависящее от волеизъявления народа»²⁰. И соответственно, приходит к заключению о приоритете права народа на самоопределение по отношению к принципу территориальной целостности государства. Однако, если следовать его логике, получается, что все проживающие в России народы имеют право на самоопределение вплоть до создания своего независимого государства, что, конечно же, является абсурдом. Т.Я. Хабриева справедливо показывает, что на территории России проживают представители 140 национальностей и 40 входящих в них этнических групп. При этом границы их расселения даже часто не совпадают с границами республик, входящих в состав Российской Федерации, краев, областей, автономных образований.²¹ В целом, в мире проживает около 5 тыс. различных этносов, этнических групп, национальных меньшинств, коренных народов, причем более 90% из них находятся в составе многонациональных

¹⁷ Case Concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), 1986-06-27 // Jurisdiction and Admissibility, Judgment, I.C.J. Reports 1984, p. 392.

¹⁸ Shaw M.N. Peoples, Territorialism and Boundaries // European Journal of International Law. no. 3. 1997. p. 483.

¹⁹ Franck T.M., Higgins R.Q.S., Pellet A., Shaw M.N., Tomuschat Ch. The Territorial Integrity of Quebec in the Event of the Attainment of Sovereignty. Report prepared for Québec's Ministère des relations internationales. 1992. URL: http://english.republiquelibre.org/Territorial_integrity_of_Quebec_in_the_event_of_the_attainment_of_sovereignty.

²⁰ Мелков Г.М. Самоопределение народов Абхазии, Южной Осетии и Приднестровья: миф или реальность? // Московский журнал международного права. 2006. № 1. с. 34.

²¹ Хабриева Т.Я. Современные проблемы самоопределения этносов: сравнительно-правовое исследование. М., 2010. с. 15-16.

государств. Например, в Индии проживает несколько сотен этнических общностей, в Индонезии - более 150, в Кении более 70 и т.п.

Бутрос Гали (как известно, кроме того, что он являлся Генеральным секретарем ООН, он также профессор в области международного права) утверждал, что если какое-либо меньшинство в стране требует права на самоопределение ...принцип самоопределения неприменим, преобладает принцип территориальной целостности. Б. Гали указывал также на то, что, в частности, на Африканском континенте существуют 50 государств, однако если каждое из них разделится на соответствующее количество племен, кланов и т.д., то их количество может достичь 400—500.²² Очевидно, что, признание со стороны мирового сообщества государств права различных этносов, этнических групп, национальных меньшинств, коренных народов и т.п. на сепарацию привело бы к хаосу и полному коллапсу системы межгосударственных отношений.

Ю. Г. Барсегов рассматривает «свободу отделения» как «высшее выражение демократизма в отношениях между народами».²³ В связи с этим Д.В. Грушкин отмечает, что: «Есть расхождения в вопросе о том, как должно трактоваться понятие "народ" - как этническое или территориальное сообщество. Большинство склоняются к последнему, однако некоторые специалисты (к которым он относит Ю.Г. Барсегова. – Р. К.) высказывают идеи, относящиеся к области националистического дискурса, - о том, что правом на политическое самоопределение должны обладать так называемые "исконные" или "коренные" этнонации, населяющие определенные территории или административные образования. В основе такой "романтической" позиции лежит представление об этнических группах как базовых структурных единицах человечества, о "воле народа" как высшей ценности и о необходимости удовлетворять все притязания "народа" на самоопределение, если им будет заявлено об отделении от государства»²⁴. Т. Торосян пытается обосновать идею о том, что принцип нерушимости границ и принцип самоопределения наций обладают абсолютно разными статусами, если первый лишь политический принцип, то второй – это также и норма международного права²⁵. Еще дальше идет Д.В. Малов, утверждающий, что что «нормы международного права, искусственно объединенные в научной литературе в единый принцип территориальной целостности государств, не являются отдельным самостоятельным принципом международного права»²⁶. Следовательно, по его мнению, можно сделать вывод о приоритете принципа самоопределения.

В результате анализа данной концепции можно выделить ее два основных компонента. Первое – это абсолютизация принципа самоопределения, и второе, сторонники данной концепции отрицают существование принципа территориальной целостности или ставят под сомнение его юридическую природу. В то же время следует отметить, что концепция приоритета принципа равноправия и самоопределения народов не имеет основы ни в международном законодательстве, ни в конституционном законодательстве различных государств. А говорить о наличии *opinio juris* в международно-правовой доктрине по данной проблематике вообще не приходится.

Проблема существования иерархии в системе основных принципов международного права. Исследование проблемы соотношения принципов территориальной целостности государств и равноправия и самоопределения народов в доктрине международного права неизбежно ставит вопрос, обоснованно ли вообще говорить о приоритете одних основных принципов международного права над другими? В юридической доктрине говорится и о возможности приоритета относительно принципов территориальной целостности государств и равноправия и самоопределения народов. Как отмечает Т.Я. Хабриева: «В международном праве отсутствует однозначное установление приоритета между принципами территориальной

²² Цит. по: Романов В.А. Принцип самоопределения и территориальная целостность государств // Дипломатический вестник. № 9. 2000. с. 68.

²³ Барсегов Ю. Г. Самоопределение и территориальная целостность, М., 1993. с. 7.

²⁴ Грушкин Д.В. Право народов на самоопределение: история развития и воплощения идеи // Право народов на самоопределение: идея и воплощение / сост. А.Г. Осипов. М., 1997. с. 15.

²⁵ Торосян Т. Мнимое противоречие: территориальная целостность или право на самоопределение? // Россия в глобальной политике. 2007. № 4. с. 214.

²⁶ Малов Д.В. Принцип равноправия и самоопределения народов в системе современного международного права: особенности толкования и проблемы субъектности // Вестник международных организаций, 2013. т. 8. № 2 (41). с. 146.

целостности государств и самоопределения народов. Это вызывает спор в научной литературе о доминирующем положении того или иного принципа»²⁷.

С другой стороны допустимость наличия иерархии этих принципов предполагает существование определенной коллизии между ними между их юридическим содержанием, иначе говорить об их иерархии не имело бы смысла. Наряду с этим следует отметить, относительно иерархии основных принципов международного права нет ни договорной, ни общепринятой международной практики государств, а в юридической доктрине отсутствует *opinio juris* по этой проблематике. Поэтому предположение о наличии иерархии основных принципов международного права, по крайней мере на сегодня, не имеет юридически обоснованного основания.

На наш взгляд, принципы территориальной целостности государств и равноправия и самоопределения народов являются основными принципами международного права и как и все другие основные принципы обладают равной юридической силой. В Заключительном акте СБСЕ 1975 г. указано, что все основные принципы международного права имеют первостепенную важность и будут в равной степени и неукоснительно применяться при толковании каждого из них с учетом других. Думается, что, в первую очередь, именно из данного положения исходят в международно-правовой доктрине сторонники концепции о равной юридической силе этих принципов.

Сферы действия принципов территориальной целостности и самоопределения и равноправия народов. Совершенно очевидно, что основные принципы международного права, направлены на определение общих стандартов регулирования межгосударственных отношений. Основные, общепризнанные принципы международного права должны быть взаимосвязанными и соответствующими друг другу. Их толкование и практическое применение должно носить системный характер. И государства придают этому фактору определяющее значение. Иначе не приходится говорить не только об эффективности правового регулирования межгосударственных отношений, но и вообще о каком-либо международно-правовом регулировании. Поэтому необоснованно и неправомерно говорить, что принципы территориальной целостности государств и самоопределения народов противоречат друг другу, что они являются взаимоисключающими друг друга.

С.В. Черниченко вообще сомневается в правомерности постановки вопроса относительно сопоставления этих двух принципов. Однако, при этом он принцип территориальной целостности относит к сфере межгосударственных отношений, а принцип равноправия и самоопределения народов к отношениям, возникающим между народом, частью народа и государством²⁸. Схожей позиции, однако, относительно принципа нерушимости границ государств придерживается Г.М. Вельяминов²⁹. С ним соглашается и И.С. Марусин³⁰. Из логики данных авторов, следует, что такие принципы, как неприкосновенность границ и территориальная целостность государств применимы в отношениях между государствами, а принцип самоопределения действует в отношениях между государством и самоопределяющейся единицей, что принцип самоопределения затрагивает процессы, происходящие внутри одной страны, где государство это только одна из сторон³¹. Однако с юридической точки зрения ясно видна несостоятельность данной конструкции. Не вызывает никаких возражений, что принципы международного права являются составным элементом системы международного права, которое призвано и реально регулирует отношения между государствами и другими субъектами международного права. Предметом же регулирования международного права являются межгосударственные отношения, т.е. отношения, складывающиеся между государствами. Отсюда следует логический вывод о том, что внутригосударственные отношения, складывающиеся в пределах границ государств,

²⁷ Хабриева Т.Я. Современные проблемы самоопределения этносов: сравнительно-правовое исследование. М., 2010, с. 44.

²⁸ Черниченко С.В. Принцип самоопределения народов (современная интерпретация) // Московский журнал международного права. 1996. № 4. с. 18-19.

²⁹ Вельяминов Г.М. Соотношение принципов самоопределения народов и территориальной целостности, а также проблемы признания // Государство и право. 2010. № 10. с. 103.

³⁰ Марусин И.С. О соотношении принципа нерушимости границ и права народов на самоопределение // Правоведение. 2014. № 1 (312). с. 112–113.

³¹ **Торосян Т.** Мнимое противоречие: территориальная целостность или право на самоопределение? // Россия в глобальной политике. 2007. № 4. с. 203.

относятся к их внутренней компетенции и являются предметом регулирования их национального права. Принцип невмешательства во внутренние дела других государств, прямо предусматривает, что ни одно государство не вправе вмешиваться во внутренние дела другого государства. Данный принцип имеет лишь одно исключение. Оно состоит в том, что ничто в приведенных выше пунктах не должно истолковываться как затрагивающее положения Устава ООН, касающиеся поддержания международного мира и безопасности. Как известно такого рода вопросы относятся к исключительной компетенции Совета Безопасности ООН. Если допустить, что принцип равноправия и самоопределения народов действует в отношениях между государством и самоопределяющейся единицей, то получается, что данный принцип нарушает принцип невмешательства во внутренние дела других государств. А это прямо противоречит положениям вышеуказанных международных документов о том, что принципы, при их истолковании и применении, являются взаимосвязанными, и каждый принцип должен рассматриваться в свете других принципов. С другой стороны в этом случае можно также утверждать, что принцип равноправия и самоопределения народов не относится к принципам международного права, а является принципом внутригосударственного права, что, конечно же, неверно.

Закключение. Из всего вышеуказанного можно резюмировать, что принципы территориальной целостности государств и равноправия и самоопределения народов имеют различные сферы применения и определяют различные руководящие начала и стандарты, исходящие из их содержания. Содержание принципа территориальной целостности предусматривает, что все государства будут уважать территориальную целостность каждого из государств-участников, воздерживаться от любых действий, противоречащих целям и принципам Устава ООН, против территориальной целостности, политической независимости или единства любого государства. Эти положения принципа территориальной целостности свидетельствуют о его тесной взаимосвязи с такими основными принципами международного права, как принцип неприменения силы и угрозой силой, нерушимости границ, невмешательства во внутренние дела государств.

В содержании принципа равноправия и самоопределения народов определены конкретные условия его применения. Они предусматривают запрет санкционирование или поощрение, любых действий, которые ведут к расчленению или к частичному или полному нарушению территориальной целостности независимых государств, которые соблюдают в своих действиях принцип равноправия и самоопределения народов, и, вследствие этого, имеющих правительства, представляющие независимо от различия расы, вероисповедания или цвета кожи весь народ, проживающий на данной территории.

Принципы территориальной целостности и самоопределения народов являются принципами современного международного права, их содержание имеет юридический характер, а сфера их применения охватывает исключительно область межгосударственных отношений. Принцип равноправия и самоопределения народов, будучи принципом международного права, не регулирует сферу внутригосударственных отношений, которая относится к области национального права, и следовательно, не регулирует отношения между государством и самоопределяющейся единицей. С другой стороны, допущение такой возможности означало бы нарушение также другого основного принципа международного права - принципа невмешательства во внутренние дела других государств. Нормативное содержание принципов территориальной целостности и принципа самоопределения народов не противоречит друг другу. Они содержат различные руководящие начала и стандарты. «Предохранительной клаузула», о том, что содержание принципа равноправия и самоопределения народов не предусматривает каких-либо предписаний, направленных на санкционирование или поощрение действий, ведущих к расчленению или к частичному или полному нарушению территориальной целостности или политического единства независимых суверенных государств, является одним из главных элементов содержания данного принципа, который устанавливает условия его применения в целом, и определяет основной параметр его соотношения с принципом территориальной целостности государств.

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Medical sciences

THE EXTENSIVELY DRUG-RESISTANT (XDR) INFECTION IN ICU

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Abstract

Introduction: Infections due to multidrug resistance of the infected organism have become more common in clinical settings. The non-fermenter, gram-negative bacilli cause severe hospital infections. The main non-fermenter, gram-negative bacilli (BNF) microorganisms, that cause disease in humans are *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Burkholderia cepacia*, *Stenotrophomonas*, *Alcaligenes*, *Moraxella*. The family of enzymes carbapenemase – KPC, NDM-1, IMP, VIM, OXA-48 – is one of the most significant health challenges. For microorganisms: *Klebsiella pneumoniae*, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa* was launched the terms: extensively drug-resistant (XDR) and pan drug-resistant (PDR) Gram-negative microorganisms. New antibiotics is targeting some of the current most problematic Gram-negative pathogens, namely *Klebsiella pneumoniae* carbapenemase (KPC)-producing Enterobacteriaceae and multi-drug-resistant (MDR) *P. aeruginosa*. We presented case, when sputum microbiological analysis in patient with bilateral pneumonia and respiratory distress syndrome, revealed extensively drug-resistant (XDR) gram-negative microorganism. Also chest computer tomography diagnosed lung cavitation, For antibacterial treatment was used new class of antibiotics, named Ceftazidime-Avibactam, a novel non- β -lactam, β -lactamase inhibitor (restores the activity of ceftazidime against the majority of β -lactamases, ESBLs and carbapenemases, including KPCs—Ambler Class A, AmpC—Class C and oxacillinase OXA-48—Class D). Patient state was improved and discharged with suitable recommendations.

Conclusion: in the therapy of XDR Gram-negative bacteria, colistin was continued to be considered as a companion drug with novel agents as ceftazidim/avibactam for the treatment of carbapenem-resistant Enterobacteriaceae, also fosfomycin as part of combination treatment for CRE and XDR *Pseudomonas aeruginosa* infections.

Keywords: XDR infection, Multidrug resistant, Cavitation.

Introduction: Infections due to multidrug resistance of the infected organism have become more common in clinical settings. The general/species are *Escherichia*, *Proteus*, *Enterobacter*, *Klebsiella*, *Citrobacter*, *Yersinia*, *Shigella*. The non-fermenter, gram-negative bacilli cause severe hospital infections. In ICU patients who undergo invasive procedures they also cause opportunistic diseases. The main microorganisms are: *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Stenotrophomonas*, *Alcaligenes*, *Moraxella*. There are three main enzymes that inactivate antibiotics such as: β -lactamases, aminoglycoside-modifying enzymes, and chloramphenicol acetyltransferases (AACs). Bacteria that produce extended-spectrum β -lactamases, so called ESBL-producing bacteria, are resistant to penicillins, third-generation cephalosporins. Metallo- β -lactamases classes of enzymes are resistant to inactivation by clavulanate, sulbactam, aztreonam, and carbapenems. Cephalosporinases are produced by all Gram-negative bacteria with exception of *Salmonella* and *Klebsiella*. This class of enzymes is resistant to all β -lactams except carbapenems. The family of enzymes carbapenemase – KPC, NDM-1, IMP, VIM, OXA-48 – is one of the most significant health challenges. For microorganisms: *Klebsiella pneumoniae*, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa* was launched the terms: extensively drug-resistant (XDR) and pan drug-resistant (PDR) Gram-negative microorganisms.

Two large groups, Enterobacteriaceae and the non-fermenters, are responsible for most clinical isolates; nevertheless, other clinically concerning gram-negative organisms exist, including *Neisseria*, *Haemophilus* spp., *Helicobacter pylori*, and *Chlamydia trachomatis*. The non-fermenter, gram-negative bacilli (BNF) have a lower frequency of isolation when compared to Enterobacteriaceae; however, they cause severe, fatal infections, especially in the hospital environment. They also cause opportunistic diseases in ICU patients who undergo invasive procedures. The main BNF microorganisms that cause

disease in humans are *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Burkholderia cepacia*, *Stenotrophomonas*, *Alcaligenes*, *Moraxella*.

Acinetobacter baumannii naturally produces AmpC cephalosporinase and also oxacillinase (OXA), leaving it spontaneously immune to many drugs. Colistin, one of the few antibiotics that still treat multiresistant infections, already has a mobile resistance gene, *mcr-1*, and *Enterobacteriaceae* has a crucial role in the spread of this gene. New antibiotics are targeting some of the current most problematic Gram-negative pathogens, namely *Klebsiella pneumoniae* carbapenemase (KPC)-producing *Enterobacteriaceae* and multi-drug-resistant (MDR) *P. aeruginosa*.

Patient 70 years old man, Caucasus, was admitted in hospital with respiratory failure, with aggravated state despite of treatment with antibiotics: ceftriaxone, azitromycin.

Chest X-ray and blood gas analysis confirmed diagnoses: bilateral pneumonia and adult respiratory distress syndrome. Sputum microbiological analysis within admission revealed *Staphylococcus haemolyticus*.

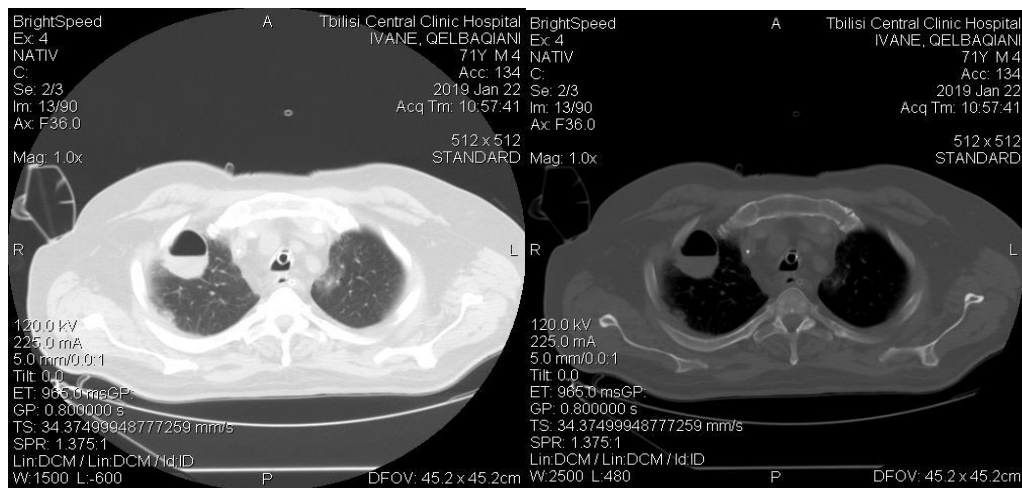
<i>Staphylococcus haemolyticus</i>	MB19(F-SOP_028B-001-03)
Oxacillin, cefoxitin, ampicillin/sulbactam, Amoxicillin/sulbactam, piperacillin/tazobactam, cefuroxime, ceftazidim, ceftriaxone, cefepime, meropenem, erythromycin, clindamycin, ciprofloxacin, moxifloxacin, levofloxacin, ofloxacin, Teicoplanin, vancomycin, fosfomycin	R
	S

Patient started mechanical ventilation and was changed antibacterial treatment with piperacillin/tazobactam, moxifloxacin and vancomycin. After 4 day treatment sputum culture revealed new microbes: *Acinetobacter baumannii* and *Klebsiella pneumoniae*.

<i>Acinetobacter baumannii</i> complex 10⁶/ml	AG3MB.19(F-SOP-028B-001-03)
Ticarcillin, ticarcillin/clavulanic acid, piperacillin/tazobactam, Ceftazidime, cefepime, Aztreonam, Imipenem, Meropenem, Amikacin, Gentamicin, Tobramycin, Ciprofloxacin, Pefloxacin, Levofloxacin, ofloxacin, Cefoperazone, Sulbactam	R
Minocycline, Colistin	S
Rifampicin	I

<i>Klebsiella pneumoniae</i> 10⁶/ml	MB19(F-SOP_028B-001-03)
Ticarcillin, Ticarcillin/clavulanic acid, Piperacillin/tazobactam, Ceftazidime, Cefepime, Gentamicin, Ciprofloxacin, Levofloxacin, Ofloxacin, Imipenem, Meropenem	R
Colistin	S

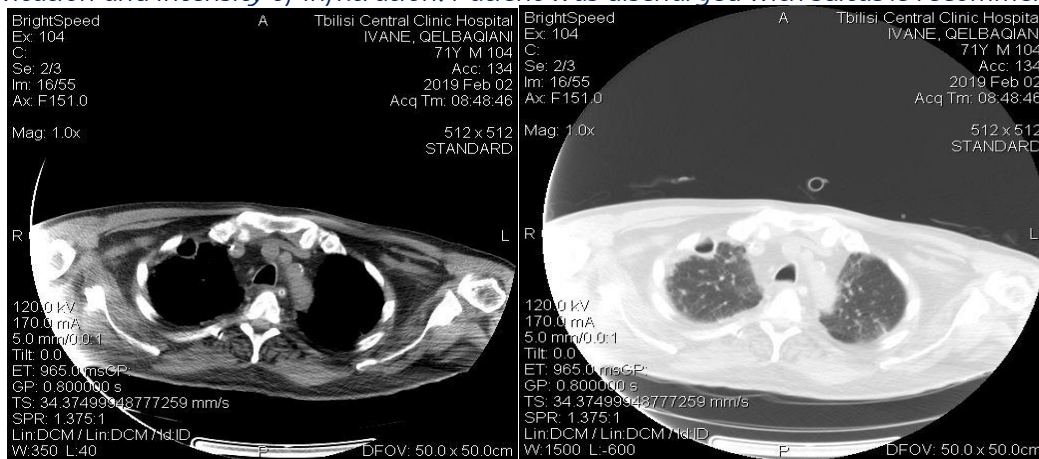
Antibacterial treatment regimen was changed with meropenem, colomycin. Chest computer tomography revealed bilateral diffuse infiltrates in lung parenchyma, alveolitis in upper part of lung, cavitation with horizontal level of air and liquid, size - 1.3cm x 4.6cm, in upper, lateral part of right lung, near II rib. GeneXpert MTB diagnostic test for identification of *Mycobacterium tuberculosis* in bronchoalveolar liquid by PCR method was negative. Next microbiological analysis of sputum revealed MDR *Klebsiella pneumoniae* with intermediate sensitivity on colomycin. Antibacterial treatment was continued with colistin - zavicefta (ceftazidim /avibactam) combination. Zavicefta dose was 2/0,5 mg. in every 8 h.



Pict. 1

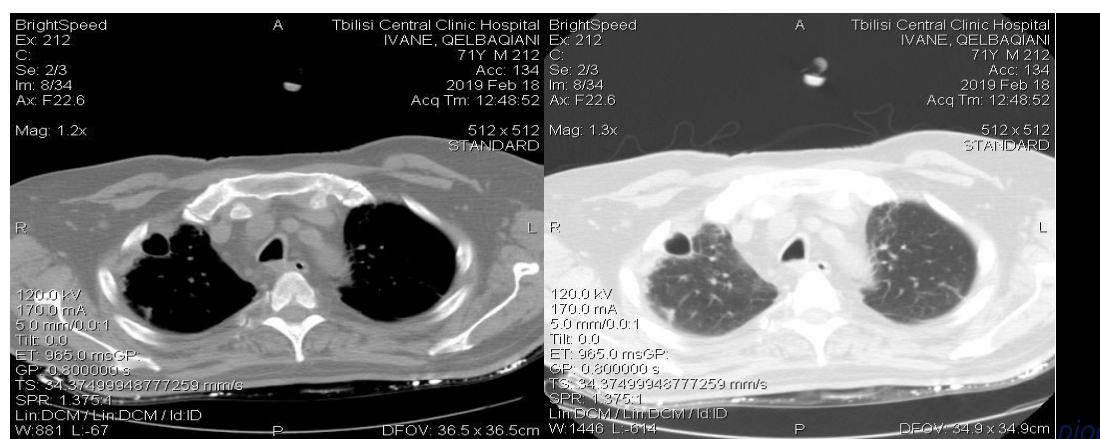
GeneXpert MTB diagnostic test for identification of *Mycobacterium tuberculosis* (MTB) in bronchoalveolar liquid by PCR method was negative. Next microbiological analysis of sputum revealed MDR *Acinetobacter baumani* with intermediate sensitivity on colomycin. Antibacterial treatment was continued with colistin and zavicefta (ceftazidim /avibactam). Zavicefta dose was 2/0,5 mg. every 8 hours.

After one week of treatment chest computer tomography revealed Increased intensity of bilateral diffuse infiltrates in parenchyma in lower part of lung. In upper, lateral part of right lung, near II ribber, increased size of cavitation 4.3X 4.6cm, with horizontal level of air and liquid. Antibacterial treatment was defined as follows: zavicefta, colomycin, vancomycin, in next period was continued with zavicefta, fosfomycin and in last decade with zavicefta, clindamycin (1.8g/per day). Ct scan shows a decrease in size of cavitation and intensity of infiltration. Patient was discharged with suitable recommendations.



Pict. 2

By sputum and blood microbiological analysis does not revealed any microb, antibacterial treatment continued with Zavicefta 7.5mg and fosfomycin 18 within one week, and zavicefta – clindamycin combination within 2 week. Patient state was improved and was disconnected from mechanical ventilation. On Ct scan revealed decreased intensity of bilateral infiltrates in lower part of lung, bilateral diffuse sclerosis, decreased size of cavitation to 1.7X1.8cm with air level. (pict.3)



Pict. 3

Discussion:

There are three main enzymes that inactivate antibiotics such as: β -lactamases, aminoglycoside-modifying enzymes, and chloramphenicol acetyltransferases (AACs). Bacteria that produce extended-spectrum β -lactamases, so called ESBL-producing bacteria, are resistant to penicillins, third-generation cephalosporins. Metallo- β -lactamases classes of enzymes are resistant to inactivation by clavulanate, sulbactam, aztreonam, and carbapenems. Cephalosporinases are produced by all Gram-negative bacteria with exception of *Salmonella* and *Klebsiella*. This class of enzymes is resistant to all β -lactams except carbapenems. The family of enzymes carbapenemase – KPC, NDM-1, IMP, VIM, OXA-48 – is one of the most significant health challenges. For microorganisms: *Klebsiella pneumoniae*, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa* was launched the terms: extensively drug-resistant (XDR) and pan drug-resistant (PDR) Gram-negative microorganisms. The non-fermenter, gram-negative bacilli (BNF) have a lower frequency of isolation when compared to Enterobacteriaceae; however, they cause severe, fatal infections, especially in the hospital environment. They also cause opportunistic diseases in ICU patients who undergo invasive procedures. The main BNF microorganisms that cause disease in humans are *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, Burkholderiaceae, *Stenotrophomonas*, *Alcaligenes*, *Moraxella*. Enterobacteriaceae are a heterogeneous group, account for about 80% of gram-negative isolates. The general species that frequently affect humans are *Escherichia*, *Proteus*, *Enterobacter*, *Klebsiella*, *Citrobacter*, *Yersinia*, *Shigella* and *Salmonella* among others. Avibactam, a novel non- β -lactam, β -lactamase inhibitor, restores the activity of ceftazidime against the majority of β -lactamases (ESBLs and carbapenemases, including KPCs— Ambler Class A, AmpC —Class C and oxacillinase OXA-48—Class D). Avibactam is not able to inhibit strains producing metallo- β -lactamases (MBL—Class B)

Conclusion: In the therapy of XDR Gram-negative bacteria, colistin was continued to be considered as a companion drug with novel agents as ceftazidime/avibactam, also fosfomycin as part of combination treatment for CRE carbapenem-resistant enterobacteriaceae and XDR *Pseudomonas aeruginosa* infection.

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Technical sciences

ANALYSIS OF THE INTEGRATION OF XML TECHNOLOGIES OF RELATIONAL DATABASES

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Abstract

Extensible Markup Language (extensible markup language, XML for short) is a standard set by the W3C for creating documents that can be easily read by both humans and information operating systems. But its adoption has been limited by a fundamental incompatibility between XML and legacy relational databases. This, in turn, created a need for comparison tools that could make XML documents relatively easy to maintain in obsolete RVBIS. Such tools should help XML realize its potential and be widely recognized.

XML is the perfect tool for data exchange. XML documents can be stored either in their own XML databases or in legacy relational databases. XML data is not only exchanged, but also processed and stored. As a result, the problem of efficient and effective storage of XML data becomes primary.

Despite the need for XML to be stored efficiently, XML's own databases still represent only a small percentage of all installed databases. Why? Basically, existing relational databases are critical infrastructure in most organizations. But storing XML data in relational tables is a simple task because XML and relational approaches are built on different principles. The inherent differences in these two approaches create a need for tools that can compare XML with relational data.

Keywords: XML, VBIS, database, relational data, electronic data exchange, protocol.

Introduction.

XML technology is an open standard for defining data elements in web pages and business documents. Unlike the HTML markup language, which defines the way elements are displayed on a web page, XML defines the structured information contained in these elements (Lee Ching Kum and Sai Peck Lee.2005).

In its early days, XML was designed as an implementation profile of SGML for use over the Internet. But the simplicity of both writing applications that handle XML documents and creating XML documents made XML an immediate success for many other application areas. A truly surprising number of applications are currently being developed based on XML. One area where the advantages of XML are clear is data exchange. For example, XML is combined with EDI (electronic data interchange). (Hassana Nassiri, Mustapha Machkourb, Mohamed Hachimi. 2017).

Using XML provides many advantages. First, the design of XML is formal and concise, so it is relatively easy to write data exchange protocol processors based on standard XML components. Second, since XML documents are human-readable, a developer can find out what the content is by inspecting the XML document. Third, there is a push to create standardized XML protocols—as well as XML schemas—for almost any type of business. Thus, there is a very good chance that in the near future most operations will be performed using XML as the underlying protocol of the infrastructure (Lee Ching Kum and Sai Peck Lee.2005).

The transition from binary protocols to XML-based protocols is reminiscent of the computing field's shift from mainframe-oriented terminals and central processors to a distributed computing client-server paradigm. Like client/server before it, XML requires new ways to store data. A major side effect in the

transition from mainframes to client/server computing was the development of relational database servers.

In the same way, in case of transition to XML protocols, there is a noticeable tendency not only to exchange XML data, but also to store them directly as XML data. To support this practice, some relational database vendors and independent middleware vendors have released their own XML database products and extended relational database functions to support XML (David Olsen. 2017).

Before discussing the integration of XML technologies and relational databases, let's briefly review the technology of XML databases themselves. In many cases, XML database technology itself seems to be based on the object-oriented database technology of the early 1990s, especially its indexing methods. Compared to objective database technology and its weak list of services, proprietary XML databases benefit from the need to extract and store the application directly as XML data. While this is a huge advantage for XML data, the same XML content should be compared to enterprise data, such as those stored in relational tables, rather than content or structured text. Considering the existing RDBMS database, if the XML middleware field cannot easily integrate native-XML database and relational database technologies, it will be extremely difficult to develop native-XML technologies.

Looking to the future, we think that more developers will move to an XML-based development paradigm. But this change will not revolutionize the underlying database technology. Rather, we expect relational technology to remain the dominant technology for storing data, even though it is an important extension of XML, and we expect it to coexist with the new native-XML database technology. Of course, native-XML database technology has intrinsic differences between the relational database paradigm and the XML paradigm due to the XML-relational impedance mismatch. However, we believe that the object-relational mapping method simplifies the persistence of objects in relational repositories, and XML mapping technology can bridge the gap to correctly extract XML data from relational databases and persistent XML data.

Research material and methods.

Comparing XML to Relational

There are several important advantages of using XML and RBD comparison for XML and relational data integration:

- A new XML development paradigm based on standard software components such as XML parsers, filters, and processors can coexist with existing legacy (relational) data stores.
- XML developers should not participate in database development. This is due to the presentation of relational data in the form of a virtual XML document, that is, the presentation of relational data in XML format.
- Given the intrinsic differences between XML datasets and relational data, automatic conversion tools cannot extract all the explicit semantics that exist between relational tables and fields. As a result of the runtime specification, the necessary flexibility is provided to explicitly define the semantics of hidden data, especially the semantics of the content of XML hierarchical structures (Husam Ahmed Al Hamad. 2017).

The imaging technology to ensure smooth integration between XML and relational data is as follows (Hale As, Engin Erdem, Ata Önal. 2014):

- Rely on a declarative approach. Comparison users do not need to know how to perform comparison operations. Instead, it should be part of the underlying display infrastructure functionality. Thus, maintenance of the project is simplified, because any change to the project involves changing the rendering definition, not just changing the application code.
- Rely on W3C Schema or DTD (Document Type Definition) patterns to describe the format of an XML document that represents the XML view of relational data. This is important both for standards compliance (the W3C Schema is a W3C Recommendation) and because W3C Schemas contain XML document metadata information that describes the classes or templates of XML documents. This is a better abstraction than building relationships between single instances of XML documents and associated data.
- Link XML element/attribute definitions and table field definitions obtained from RVBIS Catalog queries. Thus, mappings are relationships between XML metadata and RDBMS metadata. As a result, the abstraction layer is consistently the same from XML to linked data.
- Using XML documents to define comparison relationships. In addition to conforming to the general XML technology, it is possible to use standardized XML software components both for parsing XML data and for displaying XML data.

- Create a GUI (graphical user interface) application. Mapping definitions are XML documents and can be edited with text editors. For complex comparison relationships, rendering implementation is mandatory.
- Generate SQL statements automatically after being processed. Considering the complexity of mapping relational information to XML info sets, it is more efficient to let the mapping do the hard work of producing the suitable SQL statement required to generate the relational data to map.
- Being independent from the relational database management system. The mapping processor must rely on a standard database access tool such as JDBC (Java DataBase Connectivity), ODBC (Open DataBase Connectivity), or OLEDB (OLE DataBase). It should also reduce the need to support vendor-specific features.
- Easily integrate with existing XML processing tools such as XPATH (XML Path Language), XSLT (Extensible Stylesheet Language Transformation), and the upcoming XQuery language.

The result. XML is the most successful technology yet because it can be integrated into relational databases. Except for HTML, no other standard has been as successful. One of the most important indicators of XML's success is its widespread use in computing. It is safe to say that almost all areas of the computing industry have adopted the XML standard in one form or another. The database industry is no exception, and XML plays an important role in the field of database management systems.

Although the industry generally agrees that XML and relational data are interchangeable, converting XML to relational data is often difficult. In fact, there is no silver bullet when a project requires the conversion of relational data into complex XML formats (XML or DTD schemas). One of the proposed solutions, automatic conversion utilities, does not address the intricacies of the required conversions. Instead, you need to draw complex display commands to show the conversion methods. To aid in this process, a GUI application can prevent syntax errors and maintain semantic consistency between all tables in relational databases. In addition, standard XML processors such as XQuery, XPath, and XSLT should be integrated with the display processor to ensure maximum flexibility of database data.

Currently, no software vendor covers all aspects of XML integration, but significant progress is being made almost daily. While some middleware companies are trying to find a solution that is applicable across database vendors, most of the major players aim to provide XML integration by extending standard SQL support with proprietary features. This bodes ill for future interactions. The general trend is a progressive movement towards an XML-oriented view of both data and data storage.

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ДОСЛІДЖЕННЯ АЕРОДИНАМІЧНОЇ ХАРАКТЕРИСТИКИ ПНЕВМОСЕПАРАЦІЙНОГО КАНАЛУ**Нестеренко О.В.**

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Вступ. Пневмосепарація є одним з найбільш енергозатратних процесів при очищенні зерна. Витрати енергії залежать не тільки від конструктивних особливостей пневмосистеми, а й від рівномірності розподілу зернового матеріалу в робочій зоні сепарації [1-3]. Так, значна частина енергії повітряного потоку витрачається на подолання опору зернового шару в тих зонах, де є його концентрація найбільша, а саме, в зоні введення та виведення очищеного зерна [3, 4]. При цьому, суттєве значення має величина питомого навантаження, збільшення якого від 1000 кг/дм-год погіршує епюру поля швидкостей повітряного потоку та різко зменшує якісні показники пневмосепараційного процесу [6-8]. Тому, одною з важливих задач при розробці або вдосконаленні пневмосепараційних каналів є створення умов для зменшення енерговитрат процесу шляхом вирівнювання опору повітряному потоку в робочій зоні сепарації [7-9].

Одним із напрямків вирішення означеної задачі є застосування живильних пристроїв, які дозволяють зменшити взаємодію компонентів зернової суміші в зоні введення в пневмоканал та знизити опір повітряному потоку [10, 11].

Мета роботи. Визначити ступінь впливу основних параметрів гравітаційного живильного пристрою на рівномірність поля швидкостей повітряного потоку в робочій зоні пневмосепарації.

Матеріали і методи. На основі аналізу роботи технічних засобів для очищення зерна повітряним потоком на кафедрі сільськогосподарського машинобудування Центральноукраїнського національного технічного університету була розроблена конструкція пневмосепаратора з гравітаційним живильним пристроєм (рис. 1) [11-13]. Така конструкція забезпечує розділення вхідного зернового матеріалу на декілька обмежених за продуктивністю потоків, які поступають в різні робочі зони по висоті пневмоканалу та дозволяє рівномірно їх заповнити [11, 14].

Найбільш значимими параметрами гравітаційного живильного пристрою пневмосепаратора для дослідження аеродинамічної характеристики були обрані: відстань між рівнями $h_{м.р.}$, величина питомого навантаження на i -тий рівень q_{yi} , швидкість введення зернового матеріалу v_y та глибина пневмосепараційного каналу C (рис. 1).

Варіювання означених параметрів відбувалось в межах вказаних в табл. 1. При цьому для отримання аеродинамічної характеристики пневмосепаратора проводилось визначення динамічного тиску в двох його перетинах I-I та II-II (рис. 1).

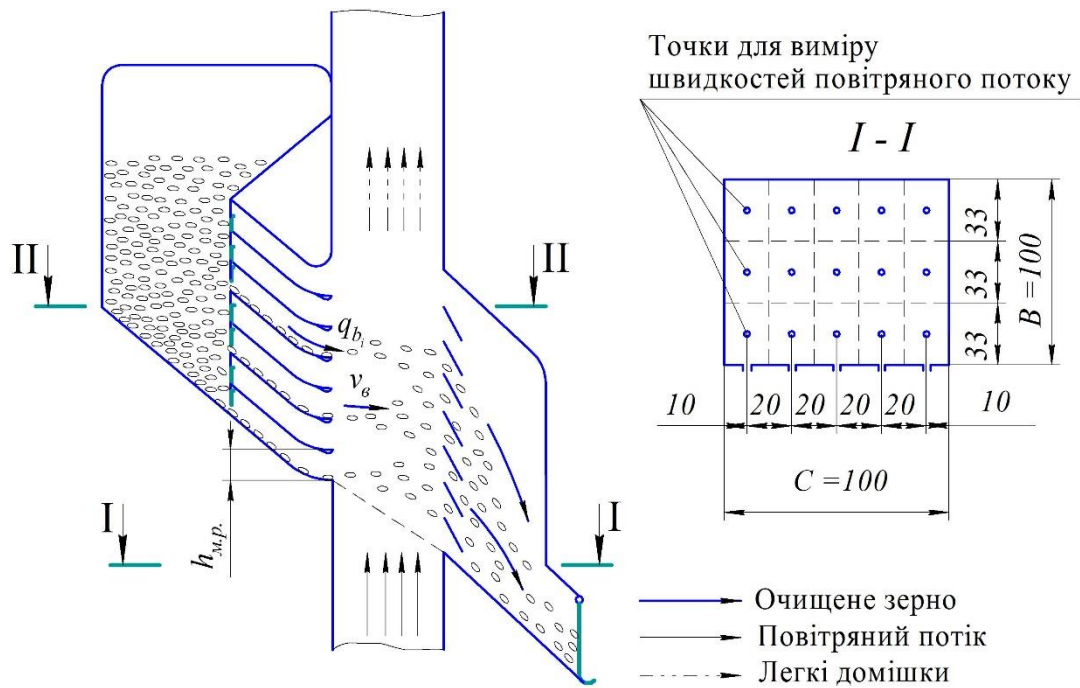


Рисунок 1. Схема пневмосепаратора для дослідження аеродинамічної характеристики.

За критерій оптимізації прийнятий коефіцієнт варіації δ , що характеризує нерівномірність швидкостей повітряного потоку в робочій зоні сепарації.

№ п.п.	Фактори		Рівні варіювання			Інтервал варіювання
	Найменування	Позначення	Нижній (-)	Основний	Верхній (+)	
1	Навантаження i -го рівня живильника, q_b кг-дм/год	x_1	300	400	500	100
2	Швидкість введення зерна в канал, v_b , м/с	x_2	0,3	0,5	0,7	0,2
3	Глибина каналу C , мм	x_3	80	100	120	20
4	Відстань між рівнями $h_{м.р.}$, мм.	x_4	25	35	45	10

Результати і обговорення. Дослідження проводили шляхом реалізації плану чотирьохфакторного експерименту. В результаті реалізації ПФЕ 4^2 отримано рівняння регресії, на основі якого побудовано поверхні відгуку (рис. 2).

$$Y = 20,4 + 3,568x_1 - 3,756x_2 + 2,07x_3 - 1,221x_4 + 1,059x_1^2 + 2,256x_2^2 + 1,648x_3^2 + 1,982x_4^2 + 0,612x_1x_2 + 1,401x_1x_3 + 0,073x_1x_4 - 1,69x_2x_3 + 0,007x_2x_4 - 0,078x_3x_4$$

Перевірка значущості коефіцієнтів отриманого рівняння регресії дозволила встановити впливовість збільшення питомого навантаження, що пояснюється підвищенням аеродинамічному опору зернового матеріалу. А також визначити раціональні значення одного з визначальних конструкційних параметрів, висоти розташування рівнів живильного пристрою, яка знаходиться в межах $h_{м.р.} = 30 \dots 40$ мм.

Слід зазначити, що швидкість введення зерна v_b та глибина каналу C є взаємопов'язаними величинами, при цьому збільшення швидкості введення відповідає меншій товщині вхідного зернового потоку. Тому більш вирівняне поле швидкостей повітряного потоку отримане саме при більших значень швидкості введення зерна, $v_b = 0,6 \dots 0,7$ м/с.

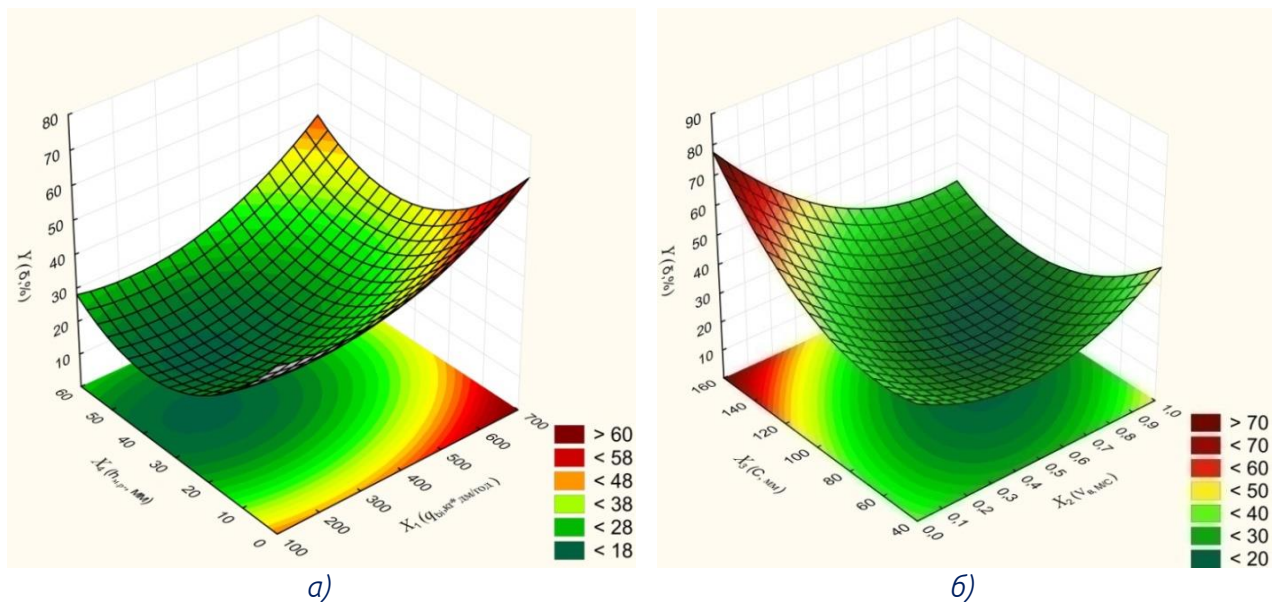


Рис. 2. Поверхні відгуку для коефіцієнта варіації $Y(\delta)$:

а) – залежність від питомого навантаження q_{bi} та відстані між рівнями $h_{m,p}$ ($X_1 \cdot X_4$);

б) – залежність глибини каналу C та швидкості введення зерна v_b ($X_3 \cdot X_2$).

Висновки. Використання запропонованої конструкції гравітаційного живильного пристрою в пневмосистемах зерноочисних машин сприяє вирівнюванню поля швидкостей повітряного потоку навіть при збільшенні питомого навантаження. При цьому визначено, що раціональне значення величини питомого навантаження на один рівень живильника при застосуванні двох і більше, знаходиться в межах $q_{bi} = 250 \dots 300$ кг·дм/год. В результаті досліджень визначено, що раціональне значення відстані між рівнями живильника $h_{m,p}$ залежить від величини питомого навантаження на i -тий рівень живильного пристрою q_{bi} , а отже й концентрації матеріалу в певній зоні сепарації, раціональне значення якого знаходиться в межах $h_{m,p} = 30 \dots 40$ мм.

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TECHNOLOGY FOR OBTAINING BETULIN FROM WHITE BIRCH BARK

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Abstract

Substances of vegetable origin widely used as biologically active supplements and drugs means [1]. Recently, it has been increasing Manie specialist positive triterpe-noidam, combining their availability with value biological activity.

Very many substances occur in the composition of plants capable of manifesting a biological activity. These biolog#ically active substances also relates betulin and lupeol, occurring in part of the birch bark. In this connection, the production of betulin and lupeol from birch bark is relevant.

The aim of this work is to obtain betulin and lupeol using various organic solvents

Keywords: betulin,lupeol,betulinic acid, extraction, triterpenoid, lupan, TLC, column chromatography, spectroscopy

The high and diverse biological activity (such as anti-inflammatory, antitumor, antimalarial, antiviral, etc.) of triterpenoids of the lupan series (lupeol, betulin, betulinic acid, etc.) arouses great interest of chemists in the synthetic transformations of functional groups in order to obtain new modified analogs with complex of medicinal properties. Medicinal preparations based on plant raw materials have a number of advantages compared to synthetic analogues.

In recent years, when birch is increasingly involved in chemical processing, its extractive substances are being studied in a broader aspect. One of the main products of its processing is betulin, which has a wide range of valuable medical properties. In this regard, it is of great importance to study the structure of betulin and substances similar to it, including derivatives

Substances of plant origin are widely used as dietary supplements and medicines. Recently, the attention of specialists to plant triterpenoids has increased, combining their availability with valuable biological activity. The outer bark of various birch species is richest in extractive substances, the extracts of which are dominated by pentacyclic triterpenoids of the lupan and β amirin series, with betulin being the main component. Betulin and its derivatives exhibit a wide range of biological activity (antiviral, antiulcer, antitumor, capillary-strengthening, etc.) Purposeful chemical modification of natural biologically active compounds in some cases leads to the production of substances that have a wider spectrum of action and low toxicity.

The bulk of the outer layer of birch bark is organic matter (about 99%), which can be divided into structural components and extractive substances. The structural components include carbohydrate and aromatic parts of wood.

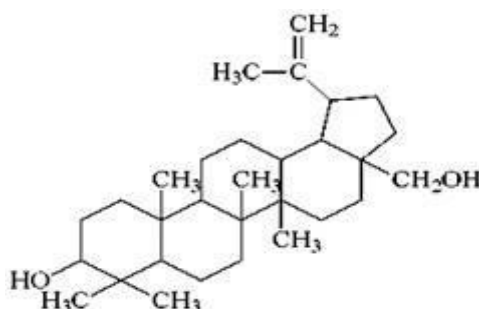
Extractive substances are substances that are extracted from raw materials with organic solvents or water without any chemical transformations [1] The bark of a birch has two clearly distinguishable parts - external and internal. The outer part of the bark is richest in extractive substances: their content reaches 40%. The main component of almost all extracts is betulin, which determines the white color of the bark [3]. Betulin is found in the warty birch, or drooping birch, and downy birch, The content of betulin in the outer part of the bark varies within 10–35% depending on the type of birch, the place and conditions of its growth, the age of the tree, and other factors [4]. The bark extracts of these birches, along with betulin, contain its oxidized derivatives: betulinic acid, betulin aldehyde, betulinic acid methyl ester, betulonic aldehyde. Betulin's constant companion is lupeol (10% of betulin). It was found to be an active cytostatic agent. A strong inhibitory effect of lupeol on human leukocyte elastase has been described. It has also been shown that lupeol has the properties of a growth suppressor of human leukemia cells [6]. The ability of lupeol to reduce the risk of formation of kidney stones is known by preventing tissue damage in the kidneys, as well as to influence the process of dissolution of urolithic calculi. Along with lupan derivatives, birch bark contains triterpenes of the oleanan and ursane series.

Betulinic acid is a plant pentacyclic triterpenoid with a selective cytotoxic effect on various tumor cells. Antitumor activity has been shown on human tumor cells (on cell lines of melanomas, lymphomas, neuroblastomas), as well as on an in vivo model, on athymic mice carrying human melanoma. Betulinic acid is currently undergoing clinical trials in the United States as a treatment for malignant melanoma.

Betulinic acid blocks the growth of melanoma without harming normal cells. Currently, biologically active additives, birch alcohol, water-fat emulsion with a betulin content of 25%, birch wax are obtained from betulin and betulinic acid under industrial conditions. Obtaining betulinic acid usually occurs in two stages: the oxidation of betulin to betulonic acid and the subsequent reduction of betulonic acid. Acyl derivatives of betulin exhibit pronounced anti-HIV, hepatoprotective, antiulcer, anti-inflammatory, wound healing and immunomodulating activities.

Betulin

Betulin is a triterpene alcohol of the lupan series, having the chemical formula $C_{30}H_{50}O_2$ and the chemical name betulenol. The amount of betulin in white birch extract is about 60%. Betulin is found in many plants (walnut, calendula, licorice, etc.), but on an industrial scale it can be obtained only from birch bark.



Structural formula of betulin

Functional foods containing betulin are very useful for middle-aged and elderly people with symptoms of gastrointestinal diseases and atherosclerosis. Daily use of food containing betulin has a therapeutic and preventive effect on the human body, from obesity, diseases of the stomach, liver and gall bladder, and pancreas. protects, lowers cholesterol in blood and tissues, prevents cancer. Scientists from the USA and Japan have proven the anti-melanoma activity of betulin itself and its derivatives. Antiseptic and wound-healing properties of betulin, anti-tumor properties have been proven at present. Betulin is capable of inhibiting the development of tuberculosis microbacteria. At the same time, the addition of betulin to food improves the quality of the product, reduces the acidity of some products and extends the shelf life of the product.

Technology for isolating an extract from birch bark

The main source of lupeol and betulin in nature is birch bark. For the first time lupeol and betulin were obtained by heating the bark in 1788 Lovitz. The name "betulin" was first applied by Mason in 1831. Later betulin was isolated by extraction.

Betulin content and lupeol in the outer cortex varies from 10 to 40% depending on the type of birch, the place and conditions of its growth, the age of the tree and the season [6;]. The dependence of betulin on the type and variety of birch is given in the following table (Table 1)

Table 1

Dependence of the content of betulin on the type of birch

Birch	Mass fraction of betulin, %
<i>Betula costata</i>	5
<i>Betula Pubescens</i>	44

Materials and methods

Extraction chromatography and column chromatography were carried out in the laboratory to isolate the extract from white birch bark. For obtaining and identifying extractive birch bark substances used organic solvents - ethanol, acetone, hexane, chloroform and methanol. For identification of extraction products thin layer chromatography was used (TLC) using Silufol chromatographic plates. Elution system - chloroform/acetone/hexane in the ratio 2:1:1. The IR spectra of the extraction products were recorded in instrument IR Tracer-100-Fourier spectrometer in the area 4000–400 cm^{-1} .

Ethanol extraction method For extraction, 20 g of birch bark and 70% ethyl alcohol were measured, extraction was carried out for 3 hours using a reflux condenser. After that, the obtained ethanol extract mixture was filtered and a yellow-gray precipitate was obtained.

Chromatography method. After drying the ethanol extract, the sum of the dry extract was 7.2 g. The melting point of this mixture was 235–237°C. Silufol-254 plates were used for TLC. $R_f = 0.6$ and 0.4. System: chloroform/acetone: 2:1.

Column chromatography method For this experiment, a column with a height of 70 cm and a diameter of 2.5 cm was used. Silica gel with a grain size of 100/50 was used as a sorbent. Silica gel was first mixed with chloroform, after obtaining homogeneous suspensions, the column was filled with this solution. After preparing this column, we mixed the previously obtained extract in a ratio of 1:3 and added chloroform. 1–7 eluents were obtained. By gradually increasing the amount of methanol, the polarity of the solvent was changed. An additional 8–27 eluents were obtained. The composition of the extract was determined by chromatography.

Results and discussion

The bark was manually cleaned of unnecessary components, and only the upper part was used bark, which contains the necessary substances for our work. The upper part of the cortex is approx. 2–5 mm from the upper layer of the birch bark (priority was given to those places of the bark where there was a characteristic white color caused by the components of lupeol and betulin). The settling method was also used birch bark in water for easier cleaning. The second stage of our work was the grinding birch bark, the bark was crushed to a certain size - from 2 to 4 mm. To study the dependence of the yield of extractive substances on the polarity of the solvent, organic solvents were used: ethanol, acetone, hexane, chloroform and methanol.

Experiments

The bark was manually cleaned of unnecessary components, and only the upper part was used bark, which contains the necessary substances for our work. Crushed bark of birch bark to size 2–4 mm. To study the dependence of the yield of extractive substances on the polarity of the solvent, organic solvents were used: ethanol, acetone, hexane, chloroform and methanol.

Ethanol extraction Used 70% ethyl alcohol. For extraction, 20 g of birch bark was measured, extraction was carried out for 3 hours using a reflux condenser. After that, the resulting mixture ethanol extract was filtered and obtained yellowish gray precipitate. After drying the ethanol extract, the amount of dry extract was 7.2 g. The melting temperature of this mixture was 235–237 °C. TLC was taken using Silufol-254 plates, $R_f = 0.6$ and 0.4 . System: chloroform/acetone: 2:1. **Acetone extraction** Anhydrous acetone was used. For extraction 20 g of birch bark was measured, extraction was carried out for 3 hours using a refrigeration refrigerator. After that, the resulting mixture of acetone extract was filtered and obtained white-yellow sediment.

Conclusion

The literature data on the properties of betulin and its main derivatives have been studied. The main ways of isolating betulin from birch bark are considered. Methods for the synthesis of its derivatives have been studied.

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