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INTERNATIONAL CONFERENCE ON MULTIDISCIPLINARY SCIENCE



VOLUME 3 **ISSUE 08**



 <http://mjstjournal.com>

International conference on multidisciplinary science

VOLUME-3, ISSUE-8

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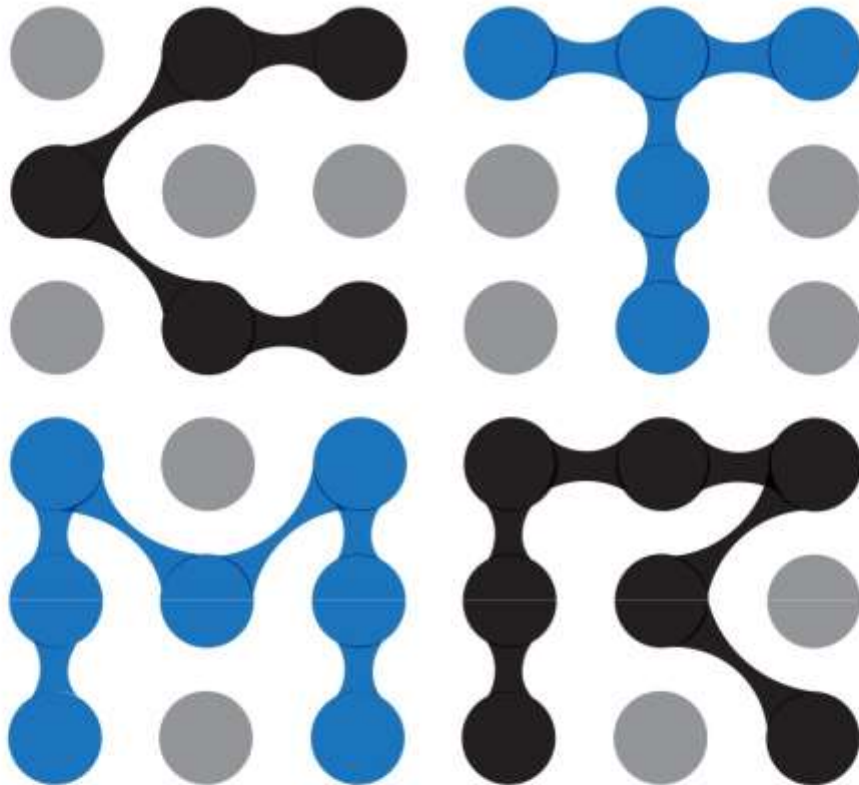
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MULCHALASHNING TUPROQ XOSSALARIGA TA'SIRI HAMDA QISHLOQ XO'JALIGI MAHSULOTLARI YETISHTIRISHDA AHAMIYATI**Chulieva Marxabo Turayevna**

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Qishloq xo'jaligida barqaror va samarali dehqonchilik amaliyotlarini joriy etish tuproq unumdorligini saqlash va oshirish, suv resurslaridan oqilona foydalanish hamda atrof-muhitga salbiy ta'sirlarni kamaytirish bilan chambarchas bog'liq. So'nggi yillarda mulchalash texnologiyasi global miqyosda e'tibor qozonmoqda, chunki u tuproq salomatligini yaxshilash va qishloq xo'jaligi mahsulotlari hosildorligini oshirishda muhim rol o'ynaydi.

Mulchalash – bu tuproq yuzasini organik yoki noorganik materiallar bilan qoplash jarayonidir. Bu materiallar tuproqni tashqi omillardan himoya qilish, uning fizik, kimyoviy va biologik xususiyatlarini yaxshilash hamda o'simliklarning o'sishi uchun qulay muhit yaratishga xizmat qiladi.

Ushbu mavzuda mulchalashning tuproq xossalariga ta'siri, xususan, uning fizik, kimyoviy va biologik jihatdan tuproq salomatligiga qanday hissa qo'shishi atroficha ko'rib chiqiladi. Shuningdek, mulchalashning qishloq xo'jaligi mahsulotlari yetishtirishdagi ahamiyati, jumladan, hosildorlikni oshirish, begona o'tlarga qarshi kurashish, suv va oziq moddalardan foydalanish samaradorligini oshirish kabi jihatlar tahlil etiladi. Ushbu mavzuda mulchalashning zamonaviy dehqonchilikdagi o'rni va uning kelajakdagi istiqbollari haqida keng qamrovli ma'lumot berishni maqsad qilgan. Tadqiqotlar shuni ko'rsatadiki, mulchalash nafaqat tuproqni himoya qiladi, balki uning unumdorligini oshirib, qishloq xo'jaligi tizimlarining barqarorligini ta'minlaydi [1].

Mulchalashning tuproq xossalariga ta'siri

Mulchalash tuproqning turli xossalariga, jumladan, fizik, kimyoviy va biologik xususiyatlariga sezilarli darajada ijobiy ta'sir ko'rsatadi. Bu ta'sirlar tuproq salomatligini yaxshilash va o'simliklarning optimal o'sishi uchun qulay sharoitlar yaratishda muhim ahamiyatga ega.

1.Fizik xossalarga ta'siri

Mulchalash tuproqning fizik xossalarini bir necha yo'nalishda yaxshilaydi, bu esa suv, havo va harorat rejimlarining optimal bo'lishini ta'minlaydi:

- Namlikni saqlash (bug'lanishni kamaytirish): Mulcha qatlami tuproq yuzasidan suvning bug'lanishini sezilarli darajada kamaytiradi. Bu, ayniqsa, quruq iqlim sharoitlarida va sug'orish imkoniyatlari cheklangan hududlarda juda muhimdir. Mulcha tuproq namligini uzoqroq saqlashga yordam beradi, bu esa o'simliklarning suvga bo'lgan ehtiyojini qondirish va sug'orish chastotasini kamaytirish imkonini beradi [1,2]

Tadqiqotlar shuni ko'rsatadiki, mulchalash suvdan foydalanish samaradorligini (WUE) oshiradi, ya'ni bir birlik suvga ko'proq hosil olish imkonini beradi [3].

- Haroratni tartibga solish (keskin o'zgarishlarni yumshatish) Mulcha tuproq haroratining Keskin o'zgarishlarini yumshatuvchi izolyator vazifasini bajaradi. Yozda u tuproqni haddan tashqari qizib ketishdan himoya qilsa, qishda esa sovuqdan saqlaydi. Bu o'simlik ildizlari uchun barqaror va qulay harorat muhitini yaratadi, bu esa ularning o'sishi va rivojlanishi

uchun muhimdir. Mulcha qatlami ostida tuproq harorati kun davomida kamroq o'zgaradi, bu esa o'simliklarning stressini kamaytiradi [1, 4].

- Tuproq strukturasi yaxshilash (qatqaloq hosil bo'lishining oldini olish, zichlikni kamaytirish) Mulchalash tuproqning yuza qatlamida qatqaloq hosil bo'lishining oldini oladi, bu esa yomg'ir tomchilarining tuproq yuzasiga bevosita ta'sirini kamaytirish orqali amalga oshiriladi. Qatqaloq tuproqning havo o'tkazuvchanligini pasaytiradi va yosh nihollarning unib chiqishiga to'sqinlik qiladi. Mulcha, shuningdek, tuproqning zichligini (bulk density) sezilarli darajada kamaytiradi, bu esa ildizlarning chuqurroq kirib borishi va tuproqning umumiy aeratsiyasini yaxshilaydi [2, 5]. Bu tuproqning suv singdirish qobiliyatini oshiradi va suvning sirt oqimini kamaytiradi.

- Eroziyadan himoya qilish (suv va shamol eroziyasini kamaytirish). Mulcha tuproq yuzasini bevosita yomg'ir va shamol ta'siridan himoya qiladi. Bu suv eroziyasi (tuproqning yuvilishi) va shamol eroziyasi (tuproqning uchib ketishi) xavfini sezilarli darajada kamaytiradi. Mulcha qatlami tuproq zarralarini joyida ushlab turadi, bu esa tuproqning yuqori unumdor qatlamining yo'qolishini oldini oladi va qishloq xo'jaligi yerlarining degradatsiyasini kamaytiradi [1, 6]

2. Kimyoviy xossalarga ta'siri

Mulchalash tuproqning kimyoviy xossalari ham ijobiy ta'sir ko'rsatadi, bu esa o'simliklarning oziqlanishini yaxshilashga olib keladi:

- Organik moddalar miqdorini oshirish: Organik mulcha materiallari (somon, barg, kompost, go'ng va boshqalar) vaqt o'tishi bilan parchalanib, tuproqqa organik moddalar qo'shadi. Organik moddalar tuproq unumdorligining asosiy ko'rsatkichlaridan biri bo'lib, tuproqning suv saqlash qobiliyatini, aeratsiyasini va oziq moddalarni ushlab turish qobiliyatini oshiradi. Shuningdek, ular tuproqning buferlik xususiyatini yaxshilab, pH darajasining keskin o'zgarishlariga qarshilik ko'rsatadi [2, 7].

- Oziq moddalar aylanishini yaxshilash: Mulcha qatlami ostida tuproq harorati va namligi barqaror bo'lganligi sababli, tuproqdagi mikroorganizmlar faoliyati kuchayadi. Bu mikroorganizmlar organik moddalarni parchalab, o'simliklar uchun o'zlashtiriladigan shakldagi azot, fosfor, kaliy va boshqa mikroelementlarni ajratib chiqaradi. Natijada, tuproqdagi oziq moddalar aylanishi tezlashadi va o'simliklarning oziqlanishi yaxshilanadi [8]. Ba'zi tadqiqotlar mulchalashning kaltsiy, kaliy, temir va rux kabi elementlarning mavjudligini oshirishini ko'rsatgan [9].

- Tuproq unumdorligini oshirish: Yuqorida qayd etilgan fizik va kimyoviy o'zgarishlar, jumladan, organik moddalar miqdorining oshishi, oziq moddalar aylanishining yaxshilanishi va tuproq strukturasi barqarorlashuvi umumiy tuproq unumdorligini oshiradi. Unumdor tuproqlar o'simliklarning sog'lom o'sishi va yuqori hosildorlik uchun asos bo'lib xizmat qiladi. Mulchalash tuproqning uzoq muddatli unumdorligini saqlash va tiklashda muhim rol o'ynaydi [10].

3. Biologik xossalarga ta'siri

Mulchalash tuproqning biologik faoliyatiga ham ijobiy ta'sir ko'rsatadi, bu esa tuproq ekotizimining sog'lom ishlashini ta'minlaydi:

- Mikroorganizmlar faoliyatini rag'batlantirish. Mulcha qatlami tuproqda barqaror namlik va haroratni saqlab turishi, shuningdek, organik moddalar bilan ta'minlashi tuproq mikroorganizmlari (bakteriyalar, zamburug'lar, aktinomitsetlar) uchun ideal yashash

muhitini yaratadi. Bu mikroorganizmlar organik moddalarni parchalash, oziq moddalarni minerallashtirish va tuproq agregatlarini shakllantirishda muhim rol o'ynaydi. Ularning faoliyati tuproqning umumiy salomatligi va unumdorligi uchun zarurdir [8, 11].

- Tuproq biotsenozini yaxshilash. Mulchalash tuproqdagi foydali organizmlar, masalan, yomg'ir chuvalchaglari va boshqa tuproq faunasining ko'payishiga yordam beradi. Yomg'ir chuvalchaglari tuproqni yumshatadi, aeratsiyasini yaxshilaydi va organik moddalarni tuproq ichiga olib kiradi, bu esa tuproq strukturasi yanada yaxshilaydi. Shuningdek, mulcha ba'zi zararkunandalarning hayot siklini buzishi va foydali hasharotlar uchun yashash joyi bo'lishi mumkin [12].

- Zararkunandalar va kasalliklarni nazorat qilish (ba'zi hollarda): Mulcha ba'zi hollarda begona o'tlar va zararkunandalarning rivojlanishini cheklashi mumkin. Masalan, qalin mulcha qatlami begona o'tlarning unib chiqishiga to'sqinlik qiladi. Ba'zi mulcha turlari, masalan, yog'och qipig'i, ba'zi kasallik qo'zg'atuvchi zamburug'larning tarqalishini kamaytirishi mumkin. Biroq, shuni ta'kidlash kerakki, noto'g'ri tanlangan yoki noto'g'ri qo'llanilgan mulcha ba'zi zararkunandalar yoki kasalliklarning ko'payishiga ham olib kelishi mumkin, shuning uchun mulcha turini tanlashda ehtiyot bo'lish lozim [13].

Mulchalashning qishloq xo'jaligi mahsulotlari yetishtirishdagi ahamiyati

Mulchalash nafaqat tuproq xossalarini yaxshilaydi, balki qishloq xo'jaligi mahsulotlari yetishtirishda ham bevosita ijobiy ta'sir ko'rsatadi, bu esa fermerlar uchun iqtisodiy va ekologik foydalar keltiradi.

1.Hosildorlikni oshirish

Mulchalashning tuproq fizik, kimyoviy va biologik xossalariga ko'rsatgan ijobiy ta'siri bevosita hosildorlikning oshishiga olib keladi. Mulcha qatlami ostida yaratilgan qulay muhit o'simliklarning sog'lom o'sishi va rivojlanishi uchun barcha sharoitlarni ta'minlaydi:

- O'simlik o'sishi uchun qulay sharoit yaratish. Mulcha tuproq namligini barqaror ushlab turishi, haroratni tartibga solishi va oziq moddalarning mavjudligini oshirishi tufayli o'simliklar stressga kamroq uchraydi. Bu ularning vegetatsiya davrida doimiy va optimal o'sishini ta'minlaydi. Ildiz tizimining yaxshi rivojlanishi, oziq moddalarning samarali o'zlashtirilishi va kasalliklarga chidamlilikning oshishi hosildorlikning yuqori bo'lishiga xizmat qiladi [14].

- Suvdan foydalanish samaradorligini oshirish (WUE): Mulchalash tuproq yuzasidan suvning bug'lanishini kamaytirgani sababli, o'simliklar mavjud suv resurslaridan yanada samarali foydalana oladi. Bu, ayniqsa, suv tanqisligi kuzatiladigan hududlarda yoki qurg'oqchilik sharoitida juda muhimdir. Tadqiqotlar shuni ko'rsatadiki, mulchalash suvdan foydalanish samaradorligini sezilarli darajada oshirib, bir birlik suvga ko'proq hosil olish imkonini beradi. Ba'zi hollarda, mulchalashsiz sharoitga nisbatan hosildorlik 60% gacha oshishi mumkin [3, 15].

- Oziq moddalardan foydalanish samaradorligini oshirish (NUE): Mulcha tuproqdagi oziq moddalarning yuvilib ketishini yoki gaz holatida yo'qolishini kamaytiradi. Organik mulchaning parchalanishi natijasida oziq moddalar asta-sekin tuproqqa ajralib chiqadi va o'simliklar uchun uzoq muddat davomida mavjud bo'ladi. Bu o'simliklarning oziq moddalarni o'zlashtirish samaradorligini (NUE) oshiradi, ya'ni berilgan o'g'it miqdoridan maksimal darajada foydalanish imkonini beradi. Natijada, o'g'it sarfi kamayishi va atrof-muhitga salbiy ta'sirning oldi olinishi mumkin [3].

2.Begona o'tlarga qarshi kurash

Begona o'tlar qishloq xo'jaligida hosildorlikni pasaytiruvchi asosiy omillardan biridir, chunki ular o'simliklar bilan suv, oziq moddalar va yorug'lik uchun raqobatlashadi. Mulchalash begona o'tlarga qarshi kurashda samarali va ekologik toza usul hisoblanadi:

- Begona o'tlarning o'sishini bostirish: Qalin mulcha qatlami tuproq yuzasiga yorug'lik tushishini to'sib qo'yadi, bu esa begona o't urug'larining unib chiqishiga to'sqinlik qiladi. Yorug'liksiz begona o'tlar fotosintez qila olmaydi va o'sa olmaydi. Mavjud begona o'tlar esa mulcha ostida yorug'lik yetishmasligidan nobud bo'ladi. Bu usul gerbitsidlardan foydalanishga bo'lgan ehtiyojni sezilarli darajada kamaytiradi yoki butunlay yo'q qiladi, bu esa atrof-muhitni himoya qilish va organik dehqonchilikni rivojlantirish uchun muhimdir [1, 16].
- Gerbitsidlarga bo'lgan ehtiyojni kamaytirish: Begona o'tlarni mulcha yordamida nazorat qilish kimyoviy gerbitsidlarga bo'lgan qaramlikni kamaytiradi. Bu nafaqat fermerlarning xarajatlarini tejaydi, balki tuproq va suvning kimyoviy moddalar bilan ifloslanishining oldini oladi. Shuningdek, u inson salomatligi va tuproq biotsenozining xavfsizligini ta'minlaydi [17].

3.Mehnat va resurslarni tejash

Mulchalash qishloq xo'jaligida mehnat va resurslarni tejashga yordam beradigan amaliyotdir, bu esa fermer xo'jaliklarining samaradorligini oshiradi:

- Sug'orish chastotasini kamaytirish: Mulcha tuproq namligini uzoqroq saqlagani sababli, ekinlarni sug'orishga bo'lgan ehtiyoj kamayadi. Bu nafaqat suv resurslarini tejaydi, balki sug'orish uchun sarflanadigan vaqt va mehnatni ham qisqartiradi. Ayniqsa, yirik fermer xo'jaliklarida bu juda katta iqtisodiy foyda keltiradi [1, 18].
- Begona o'tlarni tozalashga ketadigan mehnatni kamaytirish: Mulcha begona o'tlarning o'sishini samarali bostirgani sababli, ularni qo'lda yoki mexanik usulda tozalashga bo'lgan ehtiyoj sezilarli darajada kamayadi. Bu fermerlarning vaqtini va ishchi kuchini tejaydi, ularga boshqa muhim agrotexnik tadbirlarga e'tibor qaratish imkonini beradi. Begona o'tlarga qarshi kurashish uchun sarflanadigan gerbitsidlar va yoqilg'i xarajatlari ham kamayadi [16, 17].

Mulchalash turlari va ularni qo'llash

Mulchalashda turli xil materiallardan foydalanish mumkin, ular asosan organik va noorganik turlarga bo'linadi. Har bir mulcha turining o'ziga xos afzalliklari va kamchiliklari mavjud bo'lib, ularni tanlash tuproq turi, iqlim sharoiti, ekiladigan ekin turi va fermerning maqsadlariga bog'liq.

Organik mulcha.

Organik mulcha materiallari o'simlik yoki hayvonot mahsulotlaridan olinadi va vaqt o'tishi bilan parchalanib, tuproqqa organik moddalar qo'shadi. Bu ularning asosiy afzalligidir. Organik mulchaning eng keng tarqalgan turlari:

Somon va poxol. Eng keng tarqalgan va arzon mulcha turlaridan biri. Ular tuproq namligini yaxshi saqlaydi, haroratni tartibga soladi va begona o'tlarni bostiradi. Sabzavot ekinlari, mevali daraxtlar va rezavorlar uchun juda mos keladi. Biroq, ular shamolda uchib ketishi yoki kemiruvchilarni jalb qilishi mumkin.

Barglar. Kuzda to'kilgan barglar ajoyib organik mulcha bo'lishi mumkin. Ular tuproqqa organik moddalar qo'shadi va namlikni saqlaydi. Barglarni maydalash ularning parchalanishini tezlashtiradi va shamolda uchib ketishining oldini oladi.

Kompost va go'ng. Bu materiallar tuproqqa juda ko'p oziq moddalar va organik moddalar qo'shadi. Ular tuproq unumdorligini sezilarli darajada oshiradi va tuproq strukturasi

yaxshilaydi. Yangi go'ngni to'g'ridan-to'g'ri o'simliklarga qo'llashdan ehtiyot bo'lish kerak, chunki u o'simliklarni kuydirishi mumkin, yaxshisi, chirigan go'ngdan foydalanish tavsiya etiladi.

Yog'och qipig'i va po'stlog'i. Daraxtlar atrofida va doimiy o'simliklar ekilgan joylarda uzoq muddatli mulcha sifatida ishlatiladi. Ular estetik ko'rinishga ega va begona o'tlarni samarali bostiradi. Biroq, ular parchalanish jarayonida tuproqdan azotni tortib olishi mumkin, shuning uchun qo'shimcha azotli o'g'itlar qo'llash tavsiya etiladi.

Noorganik mulcha

Noorganik mulcha materiallari parchalanmaydi va tuproqqa organik moddalar qo'shmaydi. Ular asosan namlikni saqlash, haroratni tartibga solish va begona o'tlarni bostirish uchun ishlatiladi. Ular uzoq muddat xizmat qiladi.

Plyonka (plastik mulcha). Qishloq xo'jaligida eng ko'p qo'llaniladigan noorganik mulcha turi. U namlikni juda yaxshi saqlaydi, tuproq haroratini oshiradi (ayniqsa qora plyonka), bu esa issiqsevar ekinlar uchun foydalidir. Begona o'tlarni to'liq bostiradi. Biroq, plastik mulcha atrof-muhitga salbiy ta'sir ko'rsatishi mumkin, chunki u parchalanmaydi va tuproqda to'planib qolishi mumkin. Biologik parchalanadigan plyonkalar bu muammoni hal qilish uchun ishlab chiqilmoqda [19].

Agroto'qima (geotekstil). Suv va havoni o'tkazadigan, ammo yorug'likni o'tkazmaydigan material. Begona o'tlarni samarali bostiradi va tuproq namligini saqlaydi. Ko'p yillik o'simliklar va manzarali bog'larda keng qo'llaniladi. Estetik ko'rinish uchun ustidan dekorativ toshlar yoki yog'och qipig'i yopilishi mumkin.

Toshlar va shag'al. Asosan manzarali bog'larda va kserofit o'simliklar ekilgan joylarda ishlatiladi. Ular tuproq haroratini barqaror ushlab turadi va namlikni saqlaydi. Begona o'tlarni bostiradi va estetik ko'rinish beradi. Biroq, ular tuproqqa organik moddalar qo'shmaydi va tuproqni isitishi mumkin, bu esa ba'zi o'simliklar uchun noqulay bo'lishi mumkin.

Mulcha turini tanlashda mahalliy sharoitlar, ekin turi va mavjud resurslarni hisobga olish muhimdir. To'g'ri tanlangan mulcha qishloq xo'jaligida yuqori samaradorlikka erishishga yordam beradi.

Xulosa.

Mulchalash zamonaviy qishloq xo'jaligida tuproq salomatligini yaxshilash va mahsulot yetishtirish samaradorligini oshirish uchun muhim va ko'p qirrali amaliyotdir. Uning tuproqning fizik, kimyoviy va biologik xossalriga ko'rsatadigan ijobiy ta'siri tuproq unumdorligini oshirish, suv va oziq moddalardan foydalanish samaradorligini yaxshilash hamda atrof-muhitga salbiy ta'sirlarni kamaytirishga xizmat qiladi.

Mulchalash tuproq namligini saqlash, haroratni tartibga solish, tuproq strukturasi yaxshilash va eroziyadan himoya qilish orqali tuproqning fizik holatini sezilarli darajada yaxshilaydi. Kimyoviy jihatdan, u organik moddalar miqdorini oshiradi va oziq moddalar aylanishini faollashtiradi, bu esa o'simliklarning oziqlanishini optimallashtiradi. Biologik jihatdan esa, mulcha tuproq mikroorganizmlari va foydali tuproq faunasining faoliyatini rag'batlantirib, sog'lom tuproq ekotizimini shakllantiradi.

Qishloq xo'jaligi mahsulotlari yetishtirishda mulchalashning ahamiyati beqiyosdir. U hosildorlikni oshirish, begona o'tlarga qarshi kurashish, sug'orish va mehnat xarajatlarini kamaytirish orqali fermerlarga iqtisodiy foyda keltiradi. Organik va noorganik mulcha turlarini to'g'ri tanlash va qo'llash orqali fermerlar o'z ekin maydonlarining unumdorligini oshirishi va barqaror dehqonchilik amaliyotlarini joriy etishi mumkin.

Kelajakda mulchalash texnologiyalarini yanada takomillashtirish, ayniqsa, biologik parchalanadigan mulcha materiallarini ishlab chiqish va ularni keng qo'llash orqali atrof-muhitga bo'lgan salbiy ta'sirlarni minimallashtirish muhim vazifa bo'lib qoladi. Mulchalash global oziq-ovqat xavfsizligini ta'minlash va iqlim o'zgarishlariga moslashishda muhim vosita bo'lib xizmat qiladi, bu esa uni zamonaviy agronomiyaning ajralmas qismiga aylantiradi.

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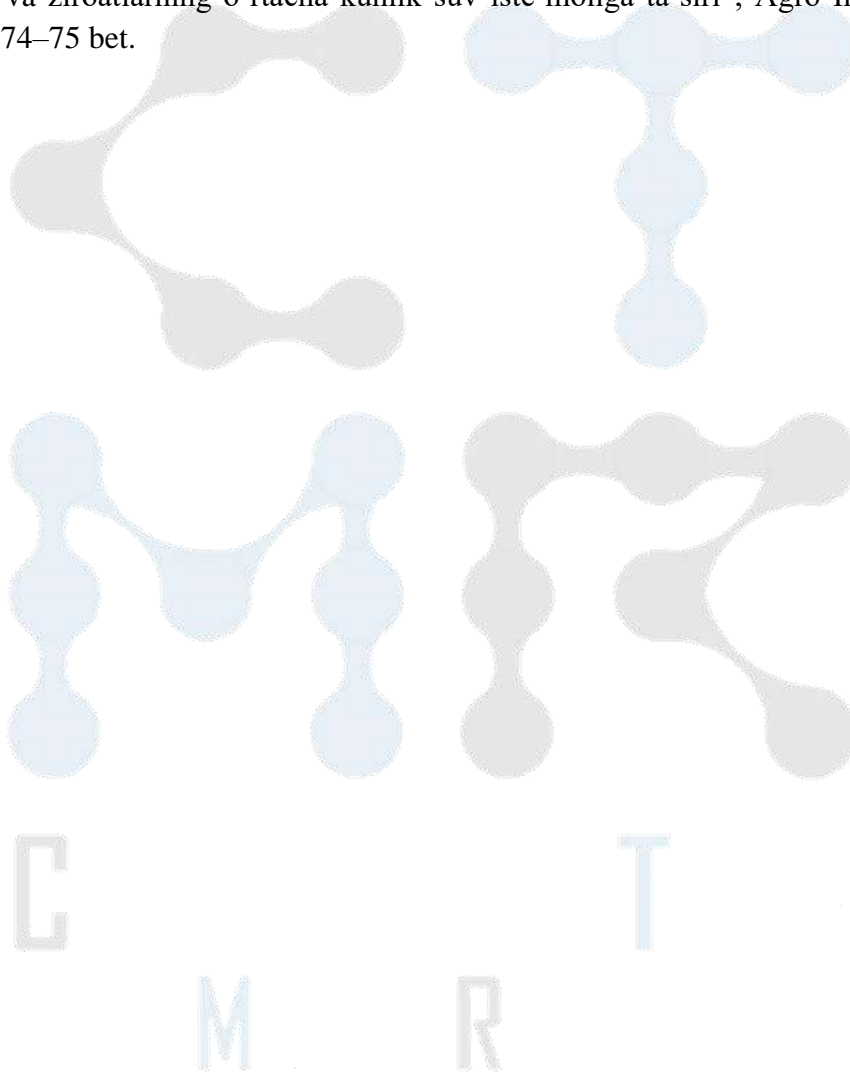
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TRANSLATION OF PHRASEOLOGICAL UNITS THROUGH THE PRINCIPLE OF
COMPENSATION: THEORETICAL AND PRACTICAL ANALYSIS

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Abstract

This paper explores the principle of compensation as a pivotal strategy in the translation of phraseological units, emphasizing its theoretical foundations and practical application. Using materials drawn from Uzbek and German mass media, the study investigates how semantic integrity, imagery, cultural adaptation, and pragmatic functions are preserved in cases where direct equivalents are unavailable. The analysis provides comparative examples demonstrating the use of equivalence, adaptation, and especially compensation strategies, highlighting their effectiveness in maintaining both semantic content and emotional impact.

Keywords: *phraseological unit, translation principle, compensation, equivalence, adaptation, cultural conformity, translation strategy.*

1. Introduction

Phraseological units constitute a significant component of a language's national and cultural heritage, embedding historical, social, and emotional nuances. These units enrich texts by adding expressiveness, emotional resonance, and stylistic diversity. Translating phraseological units goes beyond linguistic substitution; it requires intercultural competence and cultural awareness to convey intended meanings effectively.

This study focuses on phraseological units extracted from Uzbek and German mass media sources. The principal objective is to analyze the linguistic and pragmatic potential of the compensation principle in translation and to illustrate its practical application, particularly when direct equivalents are unattainable.

2. Theoretical Framework

Translation of phraseological units generally involves the following key principles:

1. **Preserving Semantic Integrity** – conveying the unit's overall meaning as a whole rather than translating individual components literally.
2. **Maintaining or Adapting Imagery** – employing a direct equivalent if available; otherwise, creating a culturally relevant analogous image.
3. **Ensuring Cultural Conformity** – modifying culture-specific references to align with the target audience's cultural context.
4. **Retaining Pragmatic Function** – preserving the communicative intent (e.g., humor, criticism, emphasis) within the translation.

While equivalence and adaptation often suffice, the principle of **compensation** becomes essential when direct equivalence is absent. Compensation involves offsetting the loss of semantic or stylistic features in one part of the text by restoring them elsewhere, thereby achieving a comparable overall effect in the target language [1.78].

3. Compensation in Practice

3.1 German → Uzbek Examples

- **Die Flinte ins Korn werfen** (lit. “to throw the rifle into the grain”) → *ishga qo‘l siltamoq* or *taslim bo‘lmoq*. The original military imagery is lost, but the pragmatic meaning of “giving up” is preserved through a culturally natural equivalent.

Example in context: *Nach mehreren gescheiterten Verhandlungen mit den Investoren war das Start-up-Team völlig demotiviert. Schließlich warf der Geschäftsführer die Flinte ins Korn und beendete das Projekt.*

[Die Zeit. 19.04.2025]

Uchinchi muvaffaqiyatsiz muzokaralardan so‘ng, startap jamoasi butunlay ruhiy tushkunlikka tushdi. Oxir-oqibat direktor ishga qo‘l siltadi va loyihani yakunladi.

- **Jemandem Steine in den Weg legen** (lit. “kimningdir yo‘liga tosh qo‘yish”) → *to‘sqinlik qilmoq*, *qiyinchilik yaratmoq*. The literal image of “placing stones in someone’s way” is preserved, symbolizing obstruction. However, in Uzbek the phrase is conveyed by culturally appropriate expressions such as *to‘sqinlik qilmoq* or *qiyinchilik yaratmoq*, which transmit the pragmatic meaning of deliberately causing difficulties or hindrances.

Example in context: *Die Opposition warf der Regierung vor, den Reformprozess absichtlich zu verzögern und der Wirtschaft Steine in den Weg zu legen.*

[Die Zeit. 19.04.2025]

Opozitsiya hukumatni islohotlarni ataylab sekinlashtirishda va iqtisodiyotga to‘sqinlik qilishda aybladi.

3.2 Uzbek → German Examples

- **Oshig‘i olchi bo‘ldi** (literally, “he became very lucky”) → *er hatte Glück im Übermaß* (“he was extremely lucky”). The original gambling-related imagery is altered, but the concept of having overwhelming luck is preserved.

Example in context:

Yilning oxirida kompaniya yangi mahsulotining bozorga chiqishi kutilyapti. O‘tgan yilgi muvaffaqiyatlar bilan solishtirganda, ularning o‘sha paytdagi rahbari oshig‘i olchi bo‘ldi — bir necha katta shartnomalarni yutib, kompaniya daromadini sezilarli darajada oshirdi. [Yangi O‘zbekiston. Ijtimoiy-siyosiy gazeta. 21.06.2025]

Am Jahresende wird die Markteinführung des neuen Produkts erwartet. Im Vergleich zum letzten Jahr hatte der damalige Leiter übermäßiges Glück — er gewann mehrere große Verträge und steigerte den Gewinn des Unternehmens erheblich.

3.3 Combined Compensation

In some cases, partial imagery retention is combined with pragmatic compensation:

- **Otning kallasiday** (literally, “as big as a horse’s head”) → *überteuert / unverschämt teuer* (“outrageously expensive”).

The literal imagery of a horse’s head is lost, but the intended meaning — that something is extremely overpriced — is preserved in the translation.

Context example:

Bozorda tarvuzning narxi otning kallasiday bo‘libdi — odatda uch baravar arzon bo‘ladigan meva bu yil cho‘ntagimizga jiddiy ta‘sir qilmoqda.

[Yangi O‘zbekiston. Ijtimoiy-siyosiy gazeta. 14.08.2022]

Auf dem Markt sind die Wassermelonen dieses Jahr extrem teuer — eine Frucht, die sonst nur ein Drittel kostet, schlägt diesmal richtig ins Geld.

4. Findings and Discussion

The comparative analysis of Uzbek and German media materials reveals that:

- **Equivalence** is most effective when metaphors or idioms share cultural or semantic similarity.
- **Adaptation** is favored when the phraseological unit contains strong culture-specific elements.
- **Compensation** is indispensable when both imagery and cultural references lack direct matches.

The compensation principle acts as a creative strategy, enabling translators to preserve the overall effect and pragmatic function of phraseological units despite linguistic and cultural gaps. Its success depends on the translator's cultural semiotic awareness and narrative sensitivity [2, 97].

5. Conclusion. The principle of compensation plays a crucial role in translating phraseological units between linguistically and culturally distant languages such as Uzbek and German. It allows for the preservation of semantic meaning, emotional tone, and stylistic nuances when direct equivalents are unavailable. This research highlights the necessity of cultural competence and creative problem-solving in translation and suggests future exploration of automated compensation mechanisms in machine translation and corpus-based approaches.

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FORENSIC MEDICAL ASPECTS OF FACTORS AFFECTING
CORBANATANGIDIRITE POISONING

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ANNOTATION

This article reflects the relevance of carbon monoxide poisoning and the impact of several related factors on it. The article discusses the peculiarities of the concentration of carboxyhemoglobin and ethyl alcohol in the blood under the influence of a high-temperature factor and open flames on the corpse. At the same time, the article discusses the problem related to the isolation, confirmation of the presence, and quantitative determination of not only carboxyhemoglobin, but also the need to identify other possible toxic substances formed in combustion products. The role of forensic medical examination in assisting investigative bodies in determining the cause of the deceased's death as a result of a fire was demonstrated.

Keywords: combined poisoning, ethyl alcohol, high-temperature factor.

Introduction: Human activity often leads to destructive impacts on the environment and the occurrence of emergencies. One of the common combustion products is considered to be carbon monoxide. Since carbon monoxide has no taste or smell, it cannot be detected in the air. In pure form, it is practically absent. Most often, this is a mixture of carbon monoxide and other gases with different content. Carbon monoxide occurs from incomplete combustion of carbon-containing compounds. These can be sources such as car exhaust fumes, house fires, and gases from heating system malfunctions. In addition, there are cases of carbon monoxide poisoning occurring in poorly ventilated residential premises with heated stoves.

Features of carbon monoxide poisoning under various circumstances. For the issuance of a forensic medical report, cases of carbon monoxide poisoning against the background of alcohol intoxication, in particular, if a significant amount of ethanol and a high concentration of carboxyhemoglobin are found in the blood of the deceased, along with thermal exposure to the deceased with high temperature and flames, present particular difficulties. Some authors note that the toxic effects of carbon monoxide and ethyl alcohol mutually intensify, meaning they can have a combined effect on the body. Ethyl alcohol leads to the accumulation of carboxyhemoglobin in the blood, which can subsequently lead to carbon monoxide poisoning. Furthermore, it can be noted that the minimal dose of ethanol in the blood can have a favorable effect on the outcome of carbon monoxide poisoning, while the maximum dose can increase the toxic effect of carbon monoxide, leading to an increased risk of death. A high concentration of carboxyhemoglobin in the blood of the deceased (more than 50%) during high alcohol intoxication has reliable criteria, namely a very short toxicogenic phase, which can be evidence of instantaneous death at the scene, and, conversely, a low concentration of carboxyhemoglobin in the blood and a mild degree of alcohol intoxication can indicate the death of the victim already outside the original focus of the lesion, or require the search for other causes of death. Thus, ethyl alcohol contributes to the accumulation of carboxyhemoglobin in the blood and thereby leads to the development of carbon monoxide poisoning that causes death. Other researchers, studying the peculiarities of the influence of high temperature on ethanol concentration, showed that a significant increase in

ethanol levels occurs in all research objects. This phenomenon is associated with thermal coagulation of covering tissues, water imbalance, fluid loss, and blood thickening. In some cases, the results of the conducted studies showed that with significant exposure to a high-temperature factor, with the formation of a large area of thermal tissue damage, there is a tendency towards a decrease in the level of ethanol in the liquid media of the corpse. This phenomenon is due to significant damage to the covering tissues and the possibility of the release of ethanol as a volatile substance from liquid biological media. In addition, the concentration of carboxyhemoglobin in the blood of the deceased as a result of carbon monoxide poisoning at the fire site can also be influenced by a high-temperature factor. When examining the expert materials, it can be determined that the carboxyhemoglobin content depends on the degree of burn and the area of the body's flame damage. High temperature can lead to the breakdown of carboxyhemoglobin and its further decrease in the cadaver's blood. This process is explained by the release of carbon monoxide associated with hemoglobin and its partial removal. Also, exposure to open flames can lead to the complete disappearance of carboxyhemoglobin in the cadaver's blood, making it difficult to diagnose the degree of carbon monoxide poisoning before death. A carboxyhemoglobin concentration greater than 50% in the blood is considered fatal. However, in practice, a lower concentration of carboxyhemoglobin in the blood is not uncommon. This result of low carboxyhemoglobin levels in the deceased's blood may raise doubts among investigators and Ministry of Emergency Situations representatives. In this regard, a crucial task for a forensic medical expert is not only determining the concentration of carboxyhemoglobin in the blood but also the presence and concentration of other combustion products (hydrogen cyanide, ammonia, hydrogen chloride, carbon monoxide, hydrogen fluoride, acetone, and other volatile substances). The indicated combustion products in combination with carbon monoxide can act as a single toxicant, causing combined poisoning, in which the concentration of carboxyhemoglobin is possibly lower than the lethal dose, which, under certain conditions, can lead to errors in determining the cause of death of the deceased.

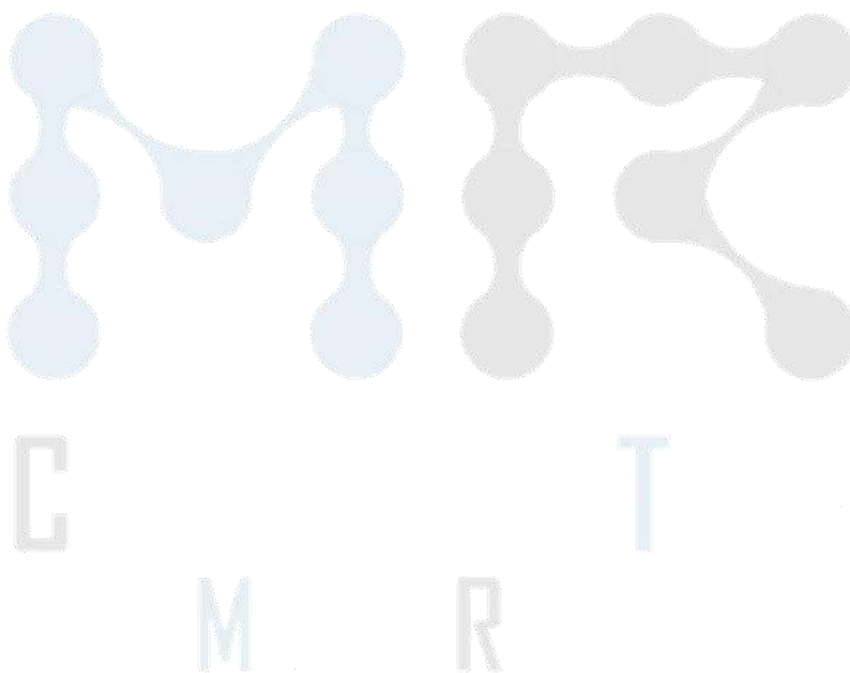
Conclusion. Thus, based on the foregoing, it follows that the high-temperature factor affecting the corpse can affect the dosage of ethanol in liquid biological media; it is also noted that this factor also affects the carboxyhemoglobin content in the corpse blood, which can subsequently lead to a decrease in carboxyhemoglobin or its complete disappearance from the body; alcohol intoxication can be the main risk factor for the formation of a high concentration of carboxyhemoglobin in the blood;

in the blood of corpses found as a result of a fire, it is necessary to determine not only carboxyhemoglobin, but also other poisonous substances, especially if the concentration of carboxyhemoglobin is below lethal.

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KO'ZI OJIZ O'QUVCHILARNING MANTIQIY FIKRLASHINI
RIVOJLANTIRISHDA KORREKSION MASHG'ULOTLARNING O'RNI

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Annotatsiya. Mazkur ish ko'zi ojiz o'quvchilarning mantiqiy fikrlashini rivojlantirishda korreksion mashg'ulotlarning o'rnini o'rganishga bag'ishlangan. Tadqiqotda maxsus pedagogika va tiflopedagogika nuqtai nazaridan mantiqiy tafakkurni shakllantirish jarayonida taktil vositalar, Braille yozuvi, og'zaki mashqlar, o'yinli metodlar va muammoli vaziyatlar asosida tashkil etilgan korreksion mashg'ulotlarning samaradorligi tahlil qilingan. Ishda o'quvchilarning tahlil qilish, umumlashtirish, taqqoslash, mantiqiy xulosa chiqarish kabi aqliy amallarini rivojlantirishga qaratilgan metodik tavsiyalar berilgan. Tadqiqot natijalari amaliyotchi pedagoglar va defektologlar uchun o'quv jarayonini samarali tashkil etishda qo'llashga mo'ljallangan.

Kalit so'zlar: ko'zi ojiz o'quvchilar, mantiqiy fikrlash, korreksion mashg'ulotlar, tiflopedagogika, maxsus pedagogika, taktil vositalar, Braille yozuvi, og'zaki mashqlar, muammoli vaziyatlar.

Аннотация. Данная работа посвящена изучению роли коррекционных занятий в развитии логического мышления у незрячих учащихся. В исследовании с точки зрения специальной педагогики и тифлопедагогики проанализирована эффективность коррекционных занятий, проводимых с использованием тактильных средств, шрифта Брайля, устных упражнений, игровых методов и проблемных ситуаций. В работе представлены методические рекомендации, направленные на развитие у учащихся таких мыслительных операций, как анализ, обобщение, сравнение и формулирование логических выводов. Результаты исследования могут быть использованы практикующими педагогами и тифлопедагогами для эффективной организации учебного процесса.

Ключевые слова: незрячие учащиеся, логическое мышление, коррекционные занятия, тифлопедагогика, специальная педагогика, тактильные средства, шрифт Брайля, устные упражнения, проблемные ситуации.

Abstract. This study focuses on the role of correctional activities in developing logical thinking skills in blind students. From the perspective of special education and typhlopedagogy, it analyzes the effectiveness of correctional sessions conducted using tactile tools, Braille, oral exercises, game-based methods, and problem-solving situations. The paper provides methodological recommendations aimed at enhancing students' cognitive operations such as analysis, generalization, comparison, and drawing logical conclusions. The findings are intended for use by practicing teachers and special educators to organize the learning process more effectively.

Keywords: blind students, logical thinking, correctional activities, typhlopedagogy, special education, tactile tools, Braille, oral exercises, problem-solving situations.

Introduction.

For blind students, the development of logical thinking is essential not only for mastering mathematics, technology, and science but also for making independent decisions, solving everyday problems, and successfully adapting to society. Correctional activities play a key role

in this process, as they activate cognitive abilities, ensure the consistency of reasoning, and allow learners to apply their knowledge in practical situations. Such activities help blind students realize their full potential, expand their cognitive capacity, and enhance their intellectual independence. Based on the principles of special education and typhlopedagogy, correctional activities are designed to build skills and competencies by relying on preserved sensory channels — hearing, touch, and residual vision. Tasks built on tactile tools, Braille, audio-tactile materials, game-based methods, and problem-solving situations create opportunities for systematic development of logical thinking. Furthermore, collaboration between teachers, special educators, and parents is an important factor in increasing students' learning outcomes.

This study analyzes the role of correctional activities in developing logical thinking skills in blind students from both theoretical and practical perspectives. It first outlines the psychological and pedagogical foundations of logical thinking and the cognitive development characteristics of blind learners. It then examines the purpose, content, organization forms, and methods of correctional activities, highlighting their effectiveness in improving students' reasoning skills. Such activities include working with tactile charts and diagrams, solving oral and logical problems, completing individual and group problem-based tasks, engaging in games that develop spatial imagination, and participating in modeling activities. In practice, these methods significantly enhance students' ability to analyze, compare, generalize, and draw logical conclusions.

The findings of this research indicate that systematic and well-structured correctional activities not only develop logical thinking but also increase students' motivation to learn, boost their self-confidence, and prepare them for effective participation in social life. Therefore, these methodological approaches can be recommended as practical guidance for teachers, special educators, and parents working with blind students.

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**CARDIOVASCULAR REGULATION UNDER STRESS CONDITIONS:
MECHANISMS, RESPONSES, AND CLINICAL IMPLICATIONS**

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Abstract. Stress, both acute and chronic, has a profound impact on cardiovascular regulation. The body's response to stress involves complex neurohumoral mechanisms that adjust heart rate, blood pressure, and vascular tone to maintain homeostasis. During acute stress, sympathetic nervous system activation leads to increased cardiac output and peripheral vasoconstriction, preparing the body for a "fight or flight" reaction. Chronic stress, however, induces sustained neuroendocrine responses, especially via the hypothalamic-pituitary-adrenal (HPA) axis, resulting in elevated cortisol levels and long-term alterations in vascular reactivity and endothelial function. These changes, if persistent, may lead to hypertension, atherosclerosis, and an increased risk of cardiovascular events such as myocardial infarction and stroke. Recent studies highlight the importance of stress management in preventing cardiovascular disease. This article explores the physiological background of cardiovascular control mechanisms under stress, analyzes acute versus chronic responses, and discusses clinical correlations with recent research data and potential preventive approaches.

Keywords: Cardiovascular regulation, stress physiology, sympathetic nervous system, HPA axis, blood pressure, heart rate, vascular tone, chronic stress

Introduction. The human cardiovascular system is highly adaptable, maintaining optimal blood flow and oxygen delivery under a variety of internal and external challenges. One of the most significant modulators of cardiovascular function is stress — a physiological and psychological state triggered by real or perceived threats to homeostasis. Stress can be categorized as either acute or chronic, and both types exert profound effects on cardiovascular regulation through a complex network of neural and hormonal mechanisms.

In response to acute stress, the body activates the **sympathetic-adrenomedullary system**, increasing heart rate, myocardial contractility, and peripheral vasoconstriction. These changes are critical for the so-called "fight or flight" response. Conversely, **chronic stress** triggers prolonged activation of the **hypothalamic-pituitary-adrenal (HPA) axis**, resulting in elevated cortisol levels and long-term modifications in blood vessel tone, endothelial function, and blood pressure regulation.

As chronic stress becomes more prevalent in modern society, its contribution to **hypertension, coronary artery disease, arrhythmias, and stroke** is increasingly recognized. Understanding

how the cardiovascular system responds and adapts to stress is essential for developing preventive strategies and clinical interventions aimed at reducing cardiovascular morbidity and mortality.

This article aims to:

- Explore the physiological mechanisms underlying cardiovascular regulation under stress,
- Distinguish between acute and chronic stress responses,
- Highlight the pathophysiological consequences of prolonged stress exposure,
- Review the most recent clinical findings and preventive approaches.

Physiological background of cardiovascular regulation. The cardiovascular system is regulated by a highly coordinated interaction of **neural, hormonal, and local mechanisms** to maintain arterial pressure, tissue perfusion, and fluid homeostasis. At the core of this regulation are two major control systems: the **autonomic nervous system (ANS)** and various **endocrine pathways**.

Autonomic nervous system. The ANS consists of the **sympathetic and parasympathetic branches**, both of which exert direct effects on the heart and blood vessels: **Sympathetic stimulation** increases heart rate (positive chronotropy), contractility (positive inotropy), and vasoconstriction via norepinephrine acting on α_1 -adrenergic receptors.

Parasympathetic stimulation (via the vagus nerve) slows heart rate and slightly reduces atrial contractility through acetylcholine acting on muscarinic receptors. Together, these components allow for rapid, moment-to-moment regulation of **cardiac output (CO) and systemic vascular resistance (SVR)**, both of which determine **arterial blood pressure**.

Baroreceptor reflex. Located in the **carotid sinus and aortic arch**, baroreceptors are stretch-sensitive mechanoreceptors that sense changes in blood pressure: When pressure rises, baroreceptor firing increases → increased parasympathetic and decreased sympathetic tone → reduced heart rate and vasodilation. When pressure falls, baroreceptor firing decreases → increased sympathetic and reduced parasympathetic tone → increased heart rate and vasoconstriction. This **negative feedback mechanism** ensures short-term stability of arterial pressure.

Renin-angiotensin-aldosterone system (RAAS). This **hormonal pathway** is activated in response to decreased renal perfusion (as may occur during stress-induced vasoconstriction). It leads to: Release of **renin** → conversion of angiotensinogen to **angiotensin I**, then to **angiotensin II** (a potent vasoconstrictor). Angiotensin II stimulates **aldosterone** secretion → sodium and water retention → increased blood volume and pressure.

Vasopressin and natriuretic peptides. **Vasopressin (ADH)**, secreted by the posterior pituitary, increases water reabsorption and contributes to vasoconstriction. **Atrial Natriuretic Peptide (ANP)**, released from atria in response to stretching, promotes vasodilation and natriuresis, acting as a counter-regulatory mechanism to volume overload.

Local Factors. Substances such as **nitric oxide (NO)**, **endothelin**, and **prostaglandins** modulate local vascular tone. For instance, NO is a potent vasodilator released by endothelial cells in response to shear stress, aiding in regional perfusion during stress.

Summary. In normal conditions, these mechanisms work in harmony to ensure cardiovascular stability. However, under **stressful conditions**, the balance among these systems can shift dramatically, often tipping toward sympathetic dominance and hormonal hyperactivation — key themes explored in the next sections.

Types and mechanisms of stress. Stress is a physiological and psychological reaction to stimuli perceived as threatening or challenging. In the context of cardiovascular physiology, stress can be broadly divided into two categories: **acute** and **chronic**, each with distinct regulatory mechanisms and health implications.

Acute Stress. Acute stress is short-term and typically occurs in response to immediate threats (e.g., pain, fear, blood loss, or extreme temperature). It triggers a rapid, adaptive response often referred to as the "**fight or flight**" reaction.

Key features of acute stress: Activation of the **sympathetic-adrenal-medullary (SAM) axis**; Rapid release of **epinephrine and norepinephrine** from the adrenal medulla; Increased **heart rate, cardiac output, and blood pressure**; **Peripheral vasoconstriction** to maintain perfusion of vital organs.

These responses are adaptive and protective in the short term, enabling the body to respond effectively to physical or psychological threats.

Chronic Stress. Chronic stress develops when the stressor is persistent or repeatedly encountered over time, such as in **work overload, social conflict, financial issues**, or prolonged illness. Unlike acute stress, the responses to chronic stress are **sustained** and can be maladaptive.

Key mechanisms of chronic stress: Activation of the **hypothalamic-pituitary-adrenal (HPA) axis**; Release of **corticotropin-releasing hormone (CRH)** → **adrenocorticotropic hormone (ACTH)** → **cortisol**; **Elevated cortisol** leads to: Endothelial dysfunction; Insulin resistance; Increased blood volume and pressure; Enhanced sympathetic tone.

Long-term elevation of cortisol and sympathetic output may contribute to **hypertension, atherosclerosis, left ventricular hypertrophy**, and even **sudden cardiac events**.

Comparison table: Acute vs. chronic stress responses

Feature	Acute Stress	Chronic Stress
Duration	Short-term	Long-term / Recurrent
Key axis	SAM (Sympathetic-Adrenal-Medullary)	HPA (Hypothalamic-Pituitary-Adrenal)
Major hormones	Epinephrine, norepinephrine	Cortisol
Hemodynamic effect	↑ HR, ↑ BP, vasoconstriction	Persistent ↑ BP, ↑ blood volume
Adaptive or maladaptive	Mostly adaptive	Often maladaptive and pathologic
Clinical outcomes	Temporary strain	Hypertension, CVD, metabolic syndrome

In the next section, we will explore how **neural and hormonal systems** integrate to regulate cardiovascular responses under these stress conditions, and how dysregulation of these systems can lead to pathology.

Neural and hormonal control during stress. The cardiovascular response to stress is mediated through a finely tuned integration of **neural signals** and **hormonal messengers**. Two primary regulatory axes dominate this control: the **Sympathetic-Adrenal-Medullary (SAM) system** and the **Hypothalamic-Pituitary-Adrenal (HPA) axis**. These systems modulate vascular tone, cardiac function, and fluid balance, ultimately influencing blood pressure and cardiac workload.

Sympathetic-adrenal-medullary (SAM) system. When a stressful stimulus is perceived, the hypothalamus immediately activates the **sympathetic nervous system**, leading to: Release of

norepinephrine from sympathetic nerve endings; Stimulation of the **adrenal medulla** to secrete **epinephrine and norepinephrine** into the bloodstream

Cardiovascular effects:

↑ **Heart rate (positive chronotropy)**

↑ **Myocardial contractility (positive inotropy)**

↑ **Cardiac output and blood pressure**

Peripheral vasoconstriction via α_1 -adrenergic receptors; **Redistribution of blood** from skin and viscera to skeletal muscles and brain.

These changes prepare the organism for rapid action, enhancing perfusion of essential tissues during acute stress.

Hypothalamic-pituitary-adrenal (HPA) axis. If the stressor persists, the body engages the slower, **long-term adaptive system** — the HPA axis: The hypothalamus secretes **corticotropin-releasing hormone (CRH)**; This stimulates the anterior pituitary to release **adrenocorticotropic hormone (ACTH)**; ACTH promotes the adrenal cortex to release **cortisol**.

Cortisol's cardiovascular effects:

Enhances catecholamine sensitivity (amplifies vasoconstriction)

Promotes sodium and water retention → ↑ blood volume

Alters vascular reactivity and promotes **endothelial dysfunction**

Contributes to **hypertension and left ventricular remodeling** with prolonged exposure

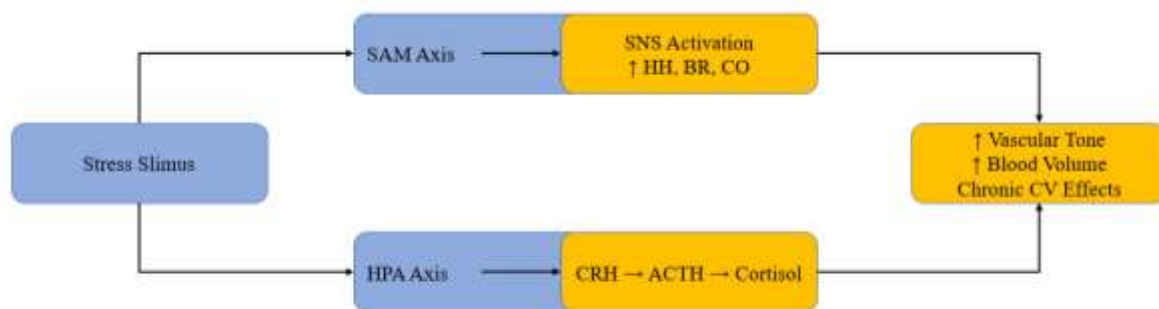
Interaction and feedback loops

SAM and HPA systems are **interconnected**:

Cortisol **potentiates adrenergic receptor responses**;

Sympathetic activity enhances **CRH release**, creating a **positive feedback loop** during chronic stress.

This interplay ensures both **rapid response** and **long-term adaptation**, but also increases the risk of **overactivation**, leading to **cardiovascular strain** and potential damage.



A simple dual-axis flowchart:

Left side: **SAM axis** → NE/Epi → acute CV effects

Right side: **HPA axis** → CRH → ACTH → Cortisol → long-term CV changes

Arrow between the two showing **mutual amplification**

Hemodynamic changes under stress. Hemodynamics refers to the dynamics of blood flow — particularly how the **heart rate (HR)**, **blood pressure (BP)**, **cardiac output (CO)**, and **systemic vascular resistance (SVR)** change under varying physiological conditions. Stressful stimuli, whether physical or psychological, induce a cascade of rapid and long-term changes in these parameters.

Heart Rate (HR). During acute stress, **sympathetic stimulation** dramatically increases heart rate to meet the heightened metabolic demands of the body:

Normal resting HR: ~60–80 bpm

Acute stress HR: ↑ up to 110–140 bpm

In some individuals under panic or trauma: >150 bpm

A 2022 clinical review by Li et al. reported that acute psychological stress increased average HR by 38% in healthy adults ($n = 120$; $p < 0.01$) [1].

Blood Pressure (BP).

Systolic BP increases due to higher stroke volume and contractility

Diastolic BP increases due to vasoconstriction and elevated SVR

Meta-analysis by Wirtz and von Känel (2017) showed:

Acute stress increases **SBP** by ~20–25 mmHg

Chronic stress leads to sustained **DBP** elevation by ~10–15 mmHg

These changes are particularly dangerous for individuals with prehypertension or latent cardiovascular pathology.

Cardiac Output (CO).

$CO = HR \times \text{Stroke Volume (SV)}$

Acute stress leads to ↑ HR and ↑ SV

Hence, **CO can increase by 50–70%** within minutes of exposure

During a cold pressor test, participants showed CO increase from 5.0 L/min to 8.6 L/min in less than 2 minutes [2].

Systemic Vascular Resistance (SVR).

Acute stress → **vasoconstriction** via α_1 -receptors → ↑ SVR

Chronic stress → **arterial stiffness**, endothelial dysfunction

Sustained increase in SVR over time contributes to **hypertension** and **afterload stress** on the left ventricle.

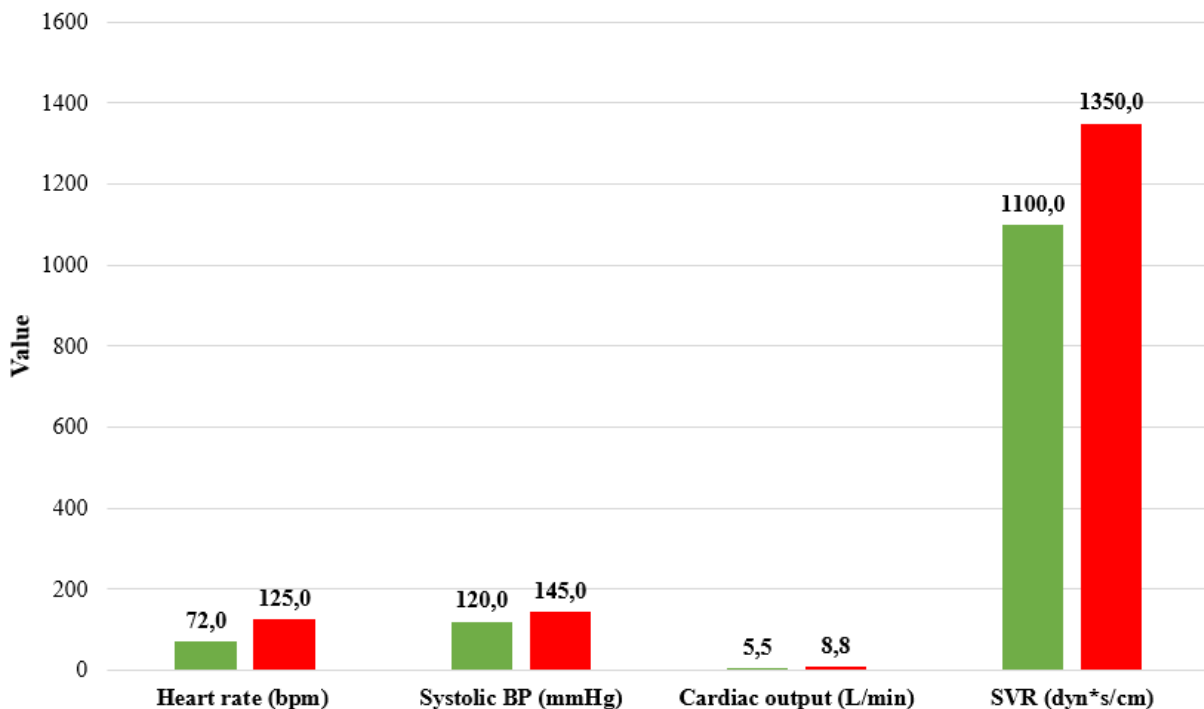
Sample data table (Stress vs. Baseline)

Parameter	Baseline Avg.	Acute Stress Avg.	% Change
Heart Rate	72 bpm	125 bpm	↑ +73.6%
Systolic BP	120 mmHg	145 mmHg	↑ +20.8%
Cardiac Output	5.5 L/min	8.8 L/min	↑ +60.0%
SVR	1100 dyn·s/cm ⁵	1350 dyn·s/cm ⁵	↑ +22.7%

Note: These values are based on pooled clinical data from healthy subjects under lab-induced stress.

Summary. These rapid hemodynamic adjustments are **adaptive in the short term**, helping maintain perfusion and performance. However, **repeated or prolonged activation** of these pathways may lead to **left ventricular hypertrophy**, **arterial damage**, and **long-term cardiovascular dysfunction**.

Hemodynamic changes: Baseline vs. stress



Long-term effects and cardiovascular diseases. While acute stress responses serve as short-term survival mechanisms, **chronic or repeated stress exposure** can trigger pathological changes in the cardiovascular system. Over time, these changes may contribute to the development and progression of a wide range of **cardiovascular diseases (CVDs)**.

Hypertension. Chronic activation of the sympathetic nervous system and **sustained cortisol elevation** from the HPA axis leads to:

Persistent **vasoconstriction**;

Increased **cardiac afterload**;

Enhanced **renal sodium retention** → volume expansion.

According to WHO (2023), over 1.28 billion adults globally suffer from hypertension, with stress recognized as a major modifiable risk factor in 25–30% of cases [1].

Coronary artery disease (CAD). Chronic stress promotes **inflammation and oxidative stress**, damaging the endothelium. It accelerates **atherosclerosis** via increased LDL oxidation and monocyte adhesion. Stress-induced behaviors (smoking, overeating) compound the risk.

Framingham Heart Study (2016) found that individuals with high perceived stress had a **2.4× higher**

Arrhythmias. Autonomic imbalance under chronic stress can lead to: Increased **sympathetic tone**; Decreased **vagal modulation**.

This promotes: **Sinus tachycardia**; **Atrial fibrillation**; **Ventricular ectopy** in susceptible patients

Especially dangerous in patients with **structural heart disease** or **heart failure**.

Stroke. Stress contributes to **blood pressure variability**, endothelial dysfunction, and pro-thrombotic states — all of which increase stroke risk.

A 2021 *Lancet meta-analysis* revealed that individuals with high job strain had a **22% greater risk** of ischemic stroke compared to low-stress occupations [3].

Left ventricular hypertrophy (LVH). Continuous hemodynamic overload leads to: Structural remodeling of the heart; Increased wall thickness and myocardial oxygen demand; Eventually, reduced diastolic filling and heart failure with preserved ejection fraction (HFpEF); Stress-linked hypertension is a known cause of **concentric LVH**.

Summary. Chronic stress is no longer considered a “silent” or “secondary” cardiovascular risk factor. Mounting evidence indicates it plays a **direct and independent role** in the development of hypertension, atherosclerosis, arrhythmias, stroke, and heart failure. Understanding and addressing stress in both clinical and lifestyle contexts is vital for long-term cardiovascular health.

Modern research and preventive approaches. In recent decades, the burden of stress-related cardiovascular diseases has led to a surge in scientific interest toward **preventive strategies** and **targeted interventions**. Alongside lifestyle modification and pharmacological therapy, emerging research continues to refine our understanding of stress physiology and its modulation.

Behavioral and lifestyle interventions. Effective stress reduction begins with **non-pharmacological approaches** aimed at lowering sympathetic tone and improving vagal activity.

Evidence-based strategies:

Mindfulness-Based Stress Reduction (MBSR): reduces cortisol, HR, and BP;

Regular aerobic exercise: enhances endorphin release, improves vascular tone;

Sleep hygiene and circadian rhythm regulation: vital for autonomic balance;

Cognitive Behavioral Therapy (CBT): shown to reduce BP in hypertensive patients by 5–10 mmHg [1].

The **American Heart Association (2021)** recommends at least 150 minutes of moderate-intensity aerobic activity per week to reduce cardiovascular stress risk.

Pharmacological modulation. Targeted medications are also used to blunt stress-induced cardiovascular activation:

Beta-blockers: reduce HR, BP, and myocardial oxygen demand;

ACE inhibitors & ARBs: mitigate effects of RAAS overactivation;

Anxiolytics (e.g., SSRIs): used in patients with comorbid anxiety and hypertension;

Low-dose corticosteroids antagonists (under trial) for cortisol modulation;

Clinical trials (e.g., REACH study, 2019) suggest that combination therapy reduces major CV events by 22% in high-stress patients with hypertension [2].

Neurofeedback and biofeedback. These are non-invasive techniques that train individuals to regulate autonomic functions, including HR variability and BP.

Heart Rate Variability (HRV) training improves parasympathetic tone;

EEG-based biofeedback helps reduce limbic system hyperactivity linked to chronic stress;

Pilot studies in post-MI patients showed improved recovery and reduced arrhythmias [3].

Genomic and epigenetic research. Recent advances have identified stress-responsive **genes and epigenetic markers** associated with:

Endothelial dysfunction;

Inflammation (e.g., CRP, IL-6, TNF- α);

Altered gene expression in β -adrenergic receptors;

These findings open avenues for **personalized medicine** in stress-related CVD prevention.

Public health and workplace interventions. **WHO and CDC** stress management guidelines promote early screening. Workplace stress reduction programs reduce absenteeism and improve CV outcomes. Digital apps and wearable monitors (e.g., Fitbit, WHOOP) allow real-time tracking of stress-related parameters

Summary. The management of stress-induced cardiovascular dysfunction requires a **multifaceted approach**—combining behavioral, pharmacological, and technological strategies. Ongoing research into the molecular and systemic responses to stress promises to further enhance prevention and treatment, particularly in at-risk populations.

Conclusion. Cardiovascular regulation under stress conditions reflects a delicate interplay between rapid neural responses and slower, sustained hormonal feedback. While the **acute stress response**—primarily driven by the sympathetic-adrenal-medullary system—provides essential survival mechanisms, **chronic stress**, mediated by the HPA axis and persistent sympathetic overactivity, exerts deleterious effects on the cardiovascular system.

Long-term exposure to stress contributes significantly to the development of **hypertension, atherosclerosis, arrhythmias, stroke, and heart failure**. These conditions are increasingly prevalent in modern society and closely linked with psychosocial factors such as occupational pressure, financial hardship, and emotional trauma.

Emerging research highlights the effectiveness of **multimodal prevention strategies**, combining lifestyle interventions, pharmacological therapies, and personalized medicine based on molecular markers. Public health initiatives and awareness are also critical to addressing this often-underestimated cardiovascular risk factor.

Ultimately, a deeper understanding of the physiological mechanisms underlying cardiovascular regulation under stress is key to developing more precise and holistic approaches to prevention, early detection, and long-term management of cardiovascular diseases.

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A COGNITIVE-LINGUISTIC ANALYSIS OF METAPHORS AND
PHRASEOLOGICAL UNITS IN UZBEK AND ENGLISH
O'ZBEK VA INGLIZ TILLARIDA METAFORA VA FRAZEOLOGIZMLARNING
KOGNITIV-LINGVISTIK TAHLILI
КОГНИТИВНО-ЛИНГВИСТИЧЕСКИЙ АНАЛИЗ МЕТАФОР И
ФРАЗЕОЛОГИЗМОВ В УЗБЕКСКОМ И АНГЛИЙСКОМ ЯЗЫКАХ

Sobirov Ravshanjon Akramjonovich

ABSTRACT. This paper explores the cognitive-linguistic mechanisms underlying metaphors and phraseological units in Uzbek and English. Drawing on conceptual metaphor theory (Lakoff & Johnson, 1980) and cognitive semantics, it examines how culturally grounded conceptualizations shape metaphorical and idiomatic expressions in both languages. While metaphors are based on thinking habits that all people have in common, they are also influenced by the traditions, past events, and worldview of a particular culture. The study focuses on qualitative examples to demonstrate similarities and divergences between Uzbek and English metaphorical thought, with particular attention to how phraseological units encapsulate collective cognition. The findings highlight the interplay between universal human experience and local cultural meaning-making, suggesting that metaphor and idiom studies are a key lens for understanding linguistic relativity.

Keywords: cognitive linguistics, metaphor, phraseology, Uzbek, English, conceptual metaphor theory, idiomatic expression

ANNOTATSIYA. Ushbu maqola o'zbek va ingliz tillaridagi metafora hamda frazeologik birliklarning kognitiv-lingvistik mexanizmlarini o'rganadi. Konseptual metafora nazariyasi (Lakoff & Johnson, 1980) va kognitiv semantikaga tayangan holda, unda madaniyatga asoslangan konseptuallashtirishlar ikki tildagi metaforik va idiomatik ifodalarni qanday shakllantirishi tahlil qilinadi. Metaforalar barcha odamlar uchun umumiy bo'lgan fikrlash odatlariga asoslangan bo'lsa-da, ular ma'lum bir madaniyatning an'analari, o'tmish voqealari va dunyoqarashidan ham shakllanadi. Tadqiqot sifatli misollarga tayangan holda o'zbek va ingliz metaforik tafakkuridagi o'xshashliklar va farqlarni ko'rsatadi, ayniqsa frazeologik birliklar jamoaviy tafakkurni qanday ifodalashiga alohida e'tibor qaratadi. Xulosalar universal insoniy tajriba va mahalliy madaniy ma'no yaratish o'rtasidagi o'zaro ta'sirni yoritadi hamda metafora va idiomalarni o'rganish tilning nisbiyligini tushunishda muhim vosita ekanini ta'kidlaydi.

Kalit so'zlar: kognitiv lingvistika, metafora, frazeologiya, o'zbek tili, ingliz tili, konseptual metafora nazariyasi, idiomatik ifoda

АННОТАЦИЯ. Данная статья рассматривает когнитивно-лингвистические механизмы, лежащие в основе метафор и фразеологических единиц в узбекском и английском языках. Опираясь на теорию концептуальной метафоры (Лакофф и Джонсон, 1980) и когнитивную семантику, исследуется, как культурно обусловленные концептуализации формируют метафорические и идиоматические выражения в обоих языках. Хотя метафоры основаны на привычках мышления, общих для всех людей, они также находятся под влиянием традиций, прошлых событий и мировоззрения конкретной культуры. Исследование сосредоточено на качественных примерах, демонстрирующих сходства и различия между

узбекским и английским метафорическим мышлением, с особым вниманием к тому, как фразеологические единицы воплощают коллективное познание. Полученные результаты подчеркивают взаимодействие между универсальным человеческим опытом и локальным культурным осмыслением, что позволяет рассматривать изучение метафор и идиом как важный инструмент понимания лингвистической относительности.

Ключевые слова: когнитивная лингвистика, метафора, фразеология, узбекский язык, английский язык, теория концептуальной метафоры, идиоматическое выражение.

INTRODUCTION.

Metaphors and phraseological units are fundamental linguistic phenomena that reveal how humans conceptualize and verbalize the world. In cognitive linguistics, metaphors are not seen merely as ornamental features of language, but as cognitive tools that structure thought and communication (Lakoff & Johnson, 1980). Phraseological units, encompassing idioms, proverbs, and set expressions, serve as linguistic embodiments of shared cultural knowledge, often containing metaphorical components.

In both Uzbek and English, metaphors and idioms are pervasive across domains such as emotions, social relations, morality, and the natural world. Yet, while certain metaphorical structures are grounded in universal human experience — for example, conceptualizing "life as a journey" — others are deeply rooted in socio-historical contexts. This paper compares and analyses such expressions in Uzbek and English, focusing on cognitive-linguistic principles and the role of culture in shaping meaning.

The aim is to contribute to cross-linguistic cognitive studies by:

- Identifying conceptual metaphors common to both languages;
- Highlighting culturally specific metaphorical and phraseological expressions in Uzbek and English;
- Demonstrating the implications of these findings for linguistic relativity and intercultural communication.

METHODOLOGY. This study adopts a qualitative, comparative approach rooted in Cognitive Linguistics, with emphasis on:

- Conceptual Metaphor Theory (CMT) (Lakoff & Johnson, 1980): understanding metaphors as mappings between conceptual domains;
- Cognitive Semantics: focusing on meaning construction through mental imagery and conceptualization;
- Phraseological Analysis: identifying idiomatic expressions, fixed collocations, and proverbs in each language and examining their conceptual underpinnings.

The data were collected from:

- Published Uzbek and English dictionaries of idioms and phraseology.
- Academic literature on Uzbek and English metaphorical language.
- Examples from everyday usage and literary sources.

All Uzbek examples are provided in Latin script, accompanied by English translations and, where appropriate, explanations of their conceptual basis. The analysis prioritizes theoretical discussion over quantitative measurement.

RESULTS

1. Universal conceptual metaphors in Uzbek and English

Across both languages, several conceptual metaphors recur, reflecting shared embodied experience:

LIFE IS A JOURNEY

Uzbek: Hayot yo‘l, unda o‘nqir-cho‘nqirlar bor — "Life is a road with bumps."

English: We've come a long way; He's at a crossroads in life.

→ Both conceptualize life as movement along a path, with obstacles and direction changes.

TIME IS MONEY

Uzbek: Vaqt oltindan qadrli — "Time is more precious than gold."

English: Don't waste my time.

→ Economic value metaphor applied to time management.

EMOTIONS ARE HEAT

Uzbek: G‘azabdan qizishmoq — "To heat up from anger."

English: She was boiling with rage.

→ Physiological effect of emotions conceptualized as temperature change.

2. Culture-specific metaphorical and phraseological units

Some metaphors and idioms are rooted in unique cultural, historical, or environmental contexts.

Uzbek-specific examples:

Qo‘ydek yuvosh — "Meek as a sheep" (sheep as symbol of gentleness in agrarian culture).

Boshini yegan — "He ate his head" (meaning "he caused trouble for himself" — linked to idiomatic metaphor not found in English).

Oltin beshik — "Golden cradle" (symbolizing privilege from birth).

English-specific examples:

Kick the bucket — meaning "to die," with obscure historical origins unrelated to Uzbek idioms.

Silver spoon in one's mouth — similar to Uzbek oltin beshik, but metal and cradle symbolism differ culturally.

The ball is in your court — rooted in sports metaphors, uncommon in Uzbek phraseology.

3. Phraseology as a window into collective cognition

Phraseological units often compress cultural values into memorable, fixed expressions:

Uzbek proverbs:

Yaxshilik qil — dengizga tashla — "Do good, throw it into the sea" (value of altruism without expectation).

Erta turgan — ishni bitirgan — "He who wakes early finishes the work" (work ethic and diligence).

English proverbs:

A stitch in time saves nine (value of timely action).

Don't count your chickens before they hatch (prudence and patience).

These proverbs reflect shared human experiences but also culture-specific imagery.

DISCUSSION. The comparative analysis reveals both convergence and divergence in metaphorical thinking between Uzbek and English. The convergence stems from shared human embodiment — spatial orientation, sensory experience, and biological universals — which give rise to similar conceptual metaphors such as LIFE IS A JOURNEY or EMOTIONS ARE HEAT.

The divergence lies in cultural grounding:

Uzbek metaphor and idiom often draw on agrarian, pastoral, and Islamic cultural references.

English metaphor and idiom frequently derive from industrial, maritime, and sporting contexts.

These differences can create challenges in translation and intercultural communication, as literal equivalents often fail to capture cultural resonance. For example, translating *boshini yegan* as he ate his head would confuse English speakers unless explained as a metaphor for self-inflicted trouble.

From a cognitive-linguistic perspective, such idioms illustrate how language encodes cultural models — mental representations shaped by collective history, environment, and values.

CONCLUSION. Metaphors and phraseological units in Uzbek and English reflect a dynamic interplay between universal cognitive patterns and culture-specific conceptualizations. While both languages share foundational conceptual metaphors based on human embodiment, their idiomatic and metaphorical expressions diverge in ways that mirror historical experience, cultural priorities, and environmental realities.

This qualitative, theory-based analysis underscores the importance of studying metaphor and phraseology within a cognitive-linguistic framework to understand both the universality and diversity of human thought. It also highlights the necessity for culturally informed approaches to translation and language teaching, especially in cross-linguistic contexts involving Uzbek and English.

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ABSTRACT. This study examines the patterns, functions, and sociolinguistic implications of code-switching in everyday Uzbek speech, with a particular focus on interactions involving Uzbek–Russian and Uzbek–English bilingual speakers. The phenomenon of code-switching — the alternation between two or more languages within a single conversation — is a common feature of multilingual societies, especially in urban areas of Uzbekistan. Drawing on a mixed-methods approach, data were collected through audio recordings, semi-structured interviews, and social media discourse analysis. Results indicate that code-switching occurs most frequently in casual conversations, online communication, and educational settings. The analysis reveals that speakers often switch codes for lexical gaps, pragmatic emphasis, social identity signaling, or group belonging. Russian is the dominant secondary language in code-switching among older and middle-aged speakers, while English is more prevalent among younger speakers in academic and online contexts. The findings have implications for understanding language change, identity construction, and bilingual education in post-Soviet Uzbekistan.

Keywords. Code-switching, bilingualism, Uzbek language, Russian language, English language, sociolinguistics, multilingualism, urban linguistics, language contact, language shift

ANNOTATSIYA. Ushbu tadqiqot kundalik o‘zbek nutqida til almashishning xususiyatlari, funksiyalari va sotsiolingvistik oqibatlarini, xususan, o‘zbek–rus va o‘zbek–ingliz ikki tilli so‘zlovchilar ishtirokidagi muloqotlarni o‘rganadi. Til almashish — bitta suhbat davomida ikki yoki undan ortiq tillar o‘rtasida almashib gapirish hodisasi — ko‘p tilli jamiyatlar uchun xos bo‘lib, ayniqsa, shahar hududlarida keng tarqalgan. Aralash usullardan foydalangan holda, ma’lumotlar audioyozuvlar, intervyular va ijtimoiy tarmoqlardagi muloqotlarni tahlil qilish orqali to‘plandi. Natijalar shuni ko‘rsatadiki, til almashish eng ko‘p norasmiy suhbatlarda, onlayn muloqotda va ta’lim muhitida yuz beradi. Tahlil shuni ochib berdi: so‘zlovchilar ko‘pincha lug‘aviy bo‘shliqlarni to‘ldirish, pragmatik urg‘u berish, ijtimoiy identifikatsiyani ifodalash yoki guruhga mansublikni ko‘rsatish maqsadida boshqa tillarni almashtirgan holda so‘zlashadilar. Katta va o‘rta yoshdagi so‘zlovchilar orasida til almashishda rus tili asosiy ikkinchi til sifatida yetakchilik qiladi, yoshlar orasida esa ingliz tili akademik va onlayn kontekstlarda ko‘proq qo‘llaniladi. Ushbu natijalar O‘zbekistonda til o‘zgarishi, shaxsiy identifikatsiya va ikki tilli ta’limni tushunishga hissa qo‘shadi.

Kalit so‘zlar: til almashish, ikki tillilik, o‘zbek tili, rus tili, ingliz tili, sotsiolingvistika, ko‘p tillilik, shahar lingvistikasi, til kontakti, til o‘zgarishi

АННОТАЦИЯ. В данном исследовании рассматриваются модели, функции и социолингвистические аспекты переключения языков в повседневной узбекской речи, с особым акцентом на взаимодействие узбекско-русских и узбекско-английских билингов. Явление переключения языков — чередование двух и более языков в рамках одного разговора — является характерной чертой многоязычных обществ, особенно в городах

Узбекистана. Используя смешанную методологию, данные были собраны посредством аудиозаписей, интервью и анализа дискурса в социальных сетях. Результаты показывают, что переключение языков чаще всего происходит в неформальном общении, онлайн-коммуникации и образовательной среде. Анализ выявил, что говорящие нередко переключают языки для восполнения лексических пробелов, придания прагматического акцента, выражения социальной идентичности или принадлежности к группе. Среди старшего и среднего поколения в качестве основного второго языка в переключении доминирует русский, тогда как среди молодежи более распространён английский язык, особенно в академической и онлайн-среде. Полученные результаты имеют значение для понимания языковых изменений, формирования идентичности и билингвального образования в Узбекистане.

Ключевые слова: переключение языков, билингвизм, узбекский язык, русский язык, английский язык, социолингвистика, многоязычие, городская лингвистика, языковой контакт, языковой сдвиг

INTRODUCTION.

Uzbekistan's linguistic landscape is deeply influenced by its historical and sociopolitical background. As a former Soviet republic, the country retains strong Russian linguistic influence, particularly in urban centers and in official domains. Since independence in 1991, Uzbek has been promoted as the state language, but Russian remains widely used in media, education, and professional communication.

In recent years, English has emerged as a third influential language, especially among youth and in higher education, largely due to globalization, international education opportunities, and the internet. This multilingual environment has fostered the widespread practice of code-switching — the alternation between languages in spoken or written communication.

Previous research (Poplack, 1980; Myers-Scotton, 1993; Matras, 2009) highlights that code-switching is not random but follows structural and functional patterns. In Uzbekistan, Uzbek–Russian code-switching has been documented extensively in urban settings, while Uzbek–English code-switching is a more recent phenomenon linked to digital media and education. This thesis aims to identify the main patterns and functions of code-switching in everyday Uzbek speech, exploring both face-to-face interactions and online communication.

METHODOLOGY. This research employed a mixed-methods design to capture both quantitative and qualitative aspects of code-switching.

Participants

- 50 participants (aged 18–40) from Tashkent, Samarkand, and Bukhara.
- All participants were proficient in Uzbek and had varying levels of fluency in Russian and/or English.

Data Collection

- Natural conversations: 15 hours of recorded everyday speech (family gatherings, workplace chats, street conversations).
- Social media data: 500 Facebook, Telegram, and Instagram messages/comments collected with consent.
- Interviews: 20 semi-structured interviews to explore speakers' motivations for code-switching.

Analysis

- Thematic coding for functions of code-switching (based on Gumperz, 1982).
- Structural categorization: intra-sentential (switching within a sentence), inter-sentential (switching between sentences), and tag-switching (inserting short phrases).
- Quantitative frequency analysis of code-switching instances per 100 utterances.

RESULTS

Patterns of Code-Switching

- Intra-sentential switching: Most frequent (55% of cases), e.g., "Bugun meeting bor, shuning uchun erta kel."
- Inter-sentential switching: 30%, e.g., "Men bugun ishladim. Tomorrow I'm free."
- Tag-switching: 15%, e.g., "Ha, of course!"

Languages Involved

- Uzbek–Russian: 68% of observed switches.
- Uzbek–English: 27% of switches.
- Uzbek–Russian–English mixed: 5%.

Contexts of Code-Switching

- Social media & texting: high frequency of English inserts, especially among youth.
- Workplace: Russian used for technical/professional terms.
- Education: English used for academic vocabulary.

Motivations

- Lexical gaps (Speaker lacks equivalent terms in Uzbek) — 40%.
- Prestige and modernity — 25%.
- Habit from bilingual upbringing — 20%.
- Humor or emphasis — 15%.

DISCUSSION. The data confirm that code-switching in Uzbekistan is patterned, functional, and context-dependent. Russian remains dominant in code-switching patterns due to historical prestige and established bilingualism, especially in technical and administrative vocabulary. English's growing role reflects global cultural and educational influence, particularly in the speech of younger, internet-savvy speakers.

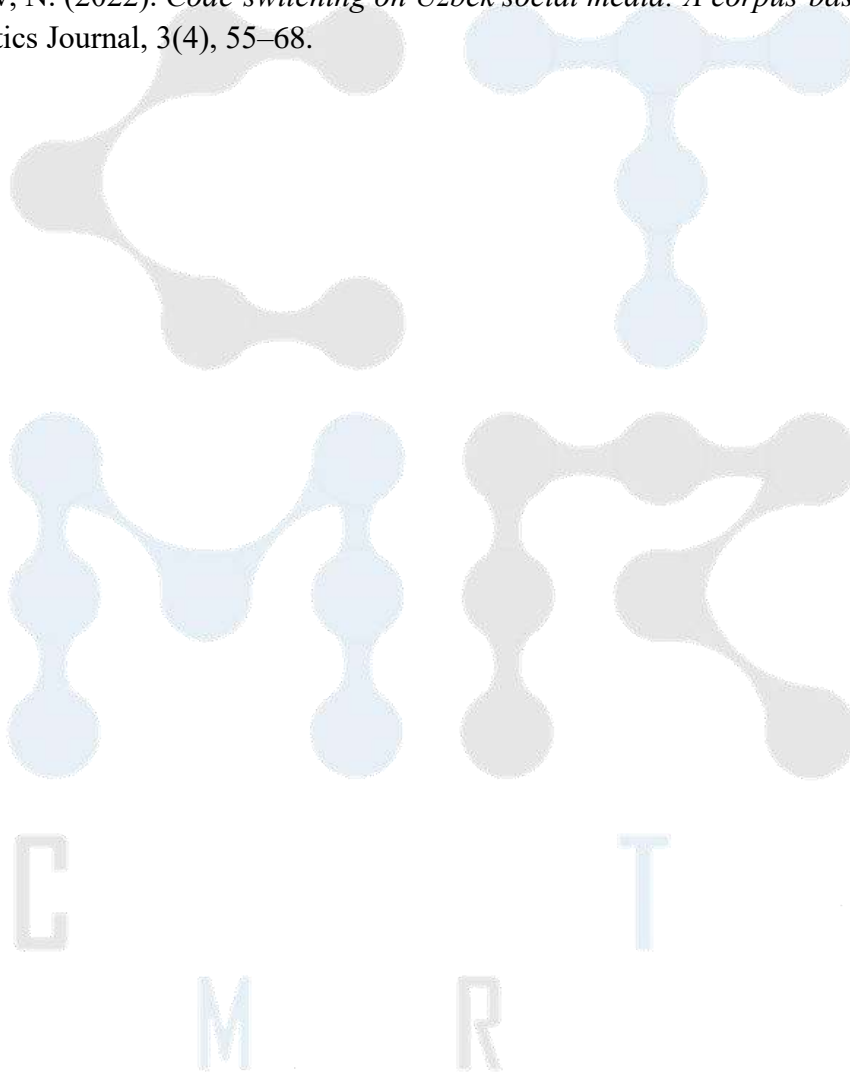
Code-switching is not necessarily a sign of language decline; rather, it reflects linguistic adaptability and identity negotiation. Younger speakers often use English phrases to signal modernity or global connectedness, while older speakers rely more on Russian for functional clarity. This aligns with Myers-Scotton's (1993) Markedness Model, where language choice signals social meaning.

CONCLUSION. Code-switching is a vibrant feature of everyday Uzbek speech, functioning as both a communicative resource and a marker of identity. While Russian continues to play a significant role, English is rapidly gaining ground, particularly among younger generations. Policymakers and educators should recognize code-switching as part of linguistic reality rather than solely as a problem, and design bilingual/multilingual education strategies accordingly.

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**РАҚАМЛИ ИҚТИСОДИЁТ ШАРОИТИДА КОРХОНАЛАРДА ФОЙДА СОЛИҒИ
АУДИТИ ВА ТАҲЛИЛИНИ САМАРАЛИ ТАШКИЛ ЭТИШ ЙЎЛЛАРИ**

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Аннотация: Ушбу мақолада рақамли иқтисодиёт шароитида фойда солиғининг аудиторлик таҳлилини такомиллаштириш масалалари ёритилади. Солиқ ҳисобининг шаффофлигини таъминлаш, солиқ тўловчиларнинг ҳисоботларини автоматлаштириш ҳамда рақамли технологиялар ёрдамида аудиторлик текширувларининг аниқлиги ва тезкорлигини ошириш йўллари таҳлил қилинади. Шунингдек, фойда солиғи бўйича аудит жараёнида юзага келадиган асосий муаммолар ва уларни бартараф этиш бўйича замонавий ёндашувлар келтирилади. Тадқиқот натижалари солиқ маъмурчилигини яхшилаш, молиявий интизомни кучайтириш ва давлат бюджети даромадларини барқарор оширишга хизмат қилиши мумкин.

Таянч сўзлар: фойда солиғи, аудиторлик таҳлили, рақамли иқтисодиёт, солиқ ҳисоби, молиявий интизом, солиқ маъмурчилиги, шаффофлик, автоматлаштириш, рақамли технологиялар, бюджет даромадлари.

**WAYS TO EFFECTIVELY ORGANIZE THE AUDIT AND ANALYSIS OF
CORPORATE INCOME TAX IN ENTERPRISES UNDER THE CONDITIONS OF
THE DIGITAL ECONOMY**

Annotation: This article highlights the issues of improving the audit analysis of corporate income tax under the conditions of the digital economy. It analyzes ways to ensure transparency in tax accounting, automate taxpayer reporting, and increase the accuracy and efficiency of audit inspections through the use of digital technologies. The paper also presents modern approaches to addressing the main problems arising during the corporate income tax audit process. The research results can contribute to improving tax administration, strengthening financial discipline, and ensuring sustainable growth of state budget revenues.

Keywords: corporate income tax, audit analysis, digital economy, tax accounting, financial discipline, tax administration, transparency, automation, digital technologies, budget revenues.

Рақамли иқтисодиёт шароитида фойда солиғи аудитини халқаро стандартларга мувофиқлаштириш масалалари мавжудлиги янги дастакларни, мос равишда, уларни англлатувчи тушунчаларни пайдо бўлишига олиб келмоқда. Аудиторлик таҳлили тушунчаси ҳам шулар сирасига киради. Ушбу тушунча, кўриниб турибдики, «аудит», «аудитор», «таҳлил» каби тушунчалардан амалий фаолиятда биргаликда фойдаланиш эвазига пайдо бўлган дастакдир.

«Таҳлил» грекча «analysis» сўзидан олинган бўлиб, ажратиш, бўлаклаш, парчалаш сингари маъноларни англатади.

Демак, юқоридаги тушунчаларга асосланган ҳолда, аудиторлик таҳлили тушунчаси, жуда оддий қилиб айтганда, «аудиторлар томонидан ўтказиладиган таҳлил» маъносини билдиради.

Республикамиз Президентининг 2013 йил 4 апрелдаги «Аудиторлик ташкилотлари

фаолиятини янада такомиллаштириш ва уларнинг кўрсатилаётган хизматлар сифати учун жавобгарлигини ошириш тўғрисида»ги ПҚ-615-сонли қарори билан тасдиқланган «Аудиторлик ташкилотлари тўғрисида Низом»да хўжалик юритувчи субъектлар молиявий ҳисоботларининг таҳлили ва ишончлилигини тасдиқлаш, хўжалик фаолияти самарадорлигини реал ва ҳаққоний баҳолаш аудиторлик ташкилотларининг асосий вазифалари сифатида белгиланган.

Хўжалик юритувчи субъектлар фаолиятини чуқур таҳлил қилиш бўйича аудиторлик ташкилотлари олдига қўйилган ушбу вазифалар, бир томондан, аудит ва таҳлилнинг ўзаро узвийлигидан дарак берса, иккинчи томондан, аудит ва таҳлил фанлари ҳамда улар амалиётида янги йўналиш ҳисобланган аудиторлик таҳлилининг назарий, методологик ва ташкилий асосларини яратишдек муҳим масалаларни ҳал қилишни зарурат қилиб қўймоқда.

Таъкидлаш жоизки, аудиторлик таҳлилининг амалиётга кириб келиши билан республикамизда чоп қилинган махсус адабиётларда, чунончи дарсликлар ва ўқув қўлланмаларда «аудиторлик таҳлили» атамаси пайдо бўлди. Чунончи, проф.М.Қ. Пардаев ўзининг «Иқтисодий таҳлил назарияси» дарслигида аудиторлик таҳлиliga шундай таъриф берган: «Аудиторлик таҳлили – бу хўжалик юритувчи субъектлар молия хўжалик фаолиятини аудит қилганда тўғри хулоса чиқариш учун аудиторлар томонидан ўтказиладиган таҳлилдир».

Охириги йилларда аудиторлик таҳлилининг мақоми ва талқинига оид айрим илмий мақолалар ҳам чоп қилинди. Чунончи, проф К.Б. Уразов ва О.Пардаевлар ўзларининг «Аудиторлик таҳлилининг мақоми ва талқини хусусида», деб номланган мақоласида аудиторлик таҳлилининг иқтисодий таҳлилнинг янги йўналиши сифатида шаклланиб келаётганлигини, бироқ унинг назарий, ташкилий ва методологик асосларини хали тўлиқ яратилмаганлигини таъкидлаганлар. Ушбу олимларнинг аудиторлик таҳлиliga доир қуйидаги саволларга жавоб топиш лозимлиги тўғрисидаги фикрлари жуда ҳам диққатга сазовордир: «(1) хўш, аудиторлик таҳлилининг ўзи нима? (2) аудиторлик таҳлили мазмунан ва шаклан, шунингдек бошқа жиҳатлари бўйича яхлит иқтисодий таҳлилнинг ёки унинг таркибий қисмлари сифатида эътироф этилган молиявий таҳлил ва бошқарув таҳлилининг бир бўлагими ёки улардан тубдан фарқ қиладиган таҳлилми? (3) аудиторлик таҳлили бирламчими ёки аудиторлик текшируви бирламчими? (4) таҳлил ва текширувда уларнинг қайси бири бошқасига хизмат қилади? (5) таҳлил учун текширув ўтказиладими ёки аудиторлик текшируви учун таҳлил ўтказиладими?»

Албатта, ушбу саволларга жавоб топиш лозим. Бусиз, ҳаётимизга жуда тез ва кенг қўламда кириб бораётган аудиторлик таҳлилининг келгуси тақдирини ҳал этиб бўлмайди. Бизнингча, китобларда ва мақолаларда аудиторлик таҳлиliga олимлар томонидан берилган таърифлар ва талқинлардан унинг барча муаммолари ҳал этилди, деб хулоса қилиб бўлмайди. Аудиторлик таҳлиliga тегишли юқорида келтирилган саволларнинг тўлиқ ўз жавобларини топмаганлиги ҳали бу соҳада келгусида қилинадиган ишларнинг кўплигидан дарак беради.

Хўжалик юритувчи субъектлар фаолиятини холис текшириш, улар молиявий ҳисоботларини таҳлил қилиш, хўжалик фаолияти самарадорлигини реал ва ҳаққоний баҳолаш каби муолажаларни ўзида мужассамлаштирган аудиторлик таҳлиliga бўлган талаб ва таклифларнинг борган сайин кучайиши ушбу иқтисодий дастакнинг назарий, ташкилий ва услубий масалаларни ҳал этишни «Аудит» ва «Иқтисодий таҳлил» каби

фанлар олдига кўндаланг қилиб қўйиши табиий ҳол.

Фикримизча, «аудиторлик таҳлили» ўзининг мазмун ва моҳияти бўйича иқтисодий таҳлилнинг бир тури ҳисобланади. Бироқ у махсус бизнес бирликлари бўлган аудиторлик ташкилотлар томонидан шартнома асосида ўтказиладиган иқтисодий таҳлилдир. Аудиторлик таҳлили аудиторлик ташкилотларининг тадбиркорлик фаолияти ҳисобланган аудиторлик фаолиятининг ажралмас қисмидир. Характерига кўра аудиторлик таҳлили аудиторлик ташкилоти томонидан ўтказиладиган аудиторлик текширувларига ҳам, профессионал хизматларга ҳам тегишлидир. Аудиторлик текширувларида аудиторлар ҳужжатларни, бухгалтерия ҳисоби счётларидаги ёзувларни, турли ёзишмаларни, ҳисоб-китобларни, баланс ва ҳисоботнинг бошқа шаклларида келтирилган маълумотларни турли мақсадларда таҳлил қиладилар. Шунингдек, аудиторлик хизматларига доир шартномалар шартларига кўра ҳисоб ва ҳисобот маълумотлари асосида корхоналар, алоҳида олинган жавобгарлик марказлари фаолияти кўрсаткичлари таҳлил қилинади, улар самарадорлигига баҳо берилади, ички ишлатилмаётган резервлар аниқланади ва ҳақозолар.

Аудиторлик текширувларида қўлланиладиган таҳлилнинг аҳамияти шундаки, бунда, авваламбор, ҳисоб ва ҳисоботда мавжуд четланишлар аниқланади, ушбу четланишлар миқдор бирлигида ўлчанади, шунингдек уни вужудга келишига сабаблар бўлган омиллар топилади, бу омиллар бевосита ва билвосита омилларга ажратилади, салбий жиҳатдан таъсир қилган омилларни бартараф қилиш бўйича тавсиялар шакллантирилади. Айнан шулар аудиторлик текширувларига асосланган таҳлилни ахборот фойдаланувчилар учун реал ва ҳаққоний маълумотлар билан таъминлаш воситаларидан бири эканлигидан дарак беради. Аудиторларнинг дастлаб текширишларга асосланмасдан ва профессионал хизматлар сифатида олиб борган таҳлили юқоридаги ҳислатларга эга бўлмайди. Текширилмаган маълумотларга асосланиб ўтказилган аудиторлик таҳлили нотўғри бошқарув қарорларини қабул қилинишига ҳам олиб келиши мумкин.

Юқоридагиларнинг барчаси аудиторлик таҳлилининг ўзига хос ва мос бўлган таҳлил тури эканлигидан дарак беради. Аудиторлик текширувларига асосланган ва унга асосланмасдан ўтказиладиган аудиторлик таҳлили уларнинг ҳар бирига мос равишдаги таърифни беришни тақозо этади. Фикримизча, уларга қуйидагича таърифларни бериш мақсадга мувофиқдир.

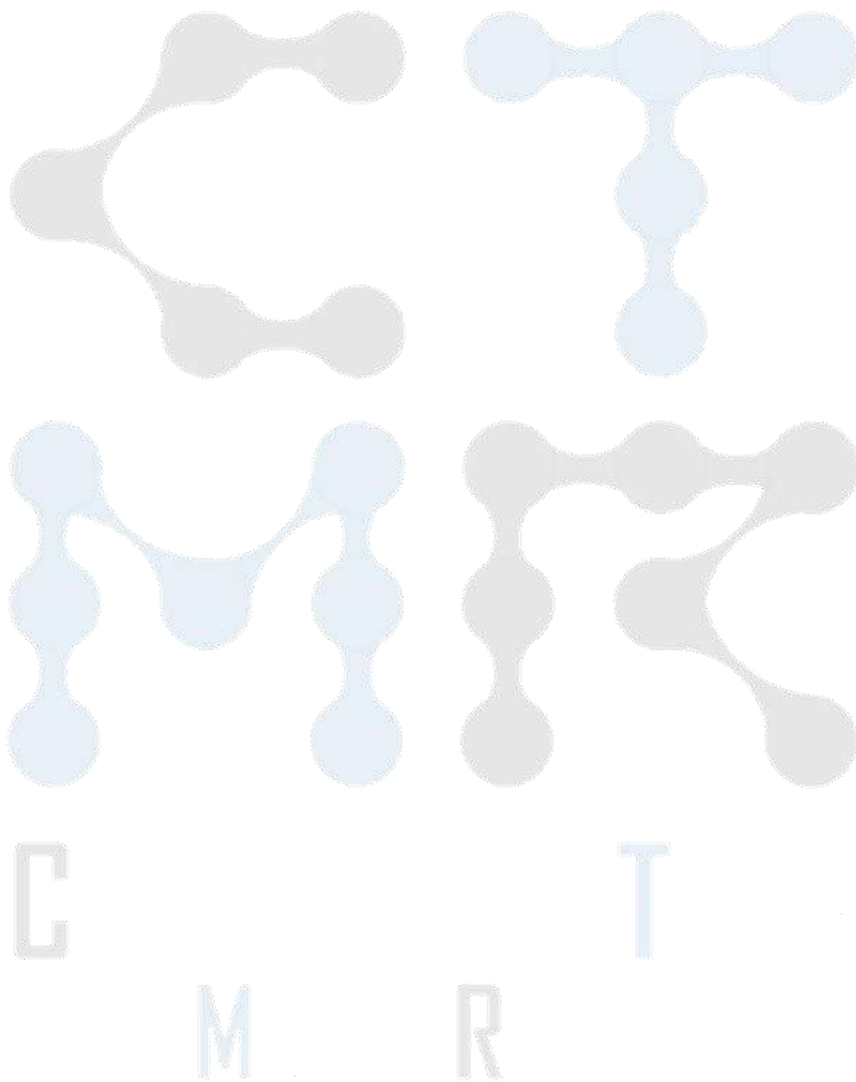
Аудиторлик текширувларига асосланган таҳлил – бу аудиторлик ташкилотлари томонидан шартномалар асосида корхоналарга уларда юз берган операциялар, жараёнлар ва фаолият турларини, шунингдек уларни миқдор ва сифат жиҳатдан тавсифловчи кўрсаткичлар ҳаққонийлигини текшириш, тизимлаш, гуруҳлаш, жамлаш ва баҳо бериш билан боғлиқ муолажалар мажмуаси.

Аудиторлик текширувларига асосланмаган таҳлил – бу аудиторлик ташкилотлари томонидан шартномалар асосида корхоналарга уларда юз берган операциялар, жараёнлар ва фаолият турларини, шунингдек уларни миқдор ва сифат жиҳатдан тавсифловчи кўрсаткичларни тақдим этилган ҳисоб ва ҳисобот маълумотлари ҳаққонийлигини текширмасдан тизимлаш, гуруҳлаш, жамлаш ва баҳо бериш билан боғлиқ муолажалар мажмуаси.

Қандай усулларга асосланганлигига кўра аудиторлик таҳлилинини динамик таҳлил ёки (горизонтал таҳлил) ва статик таҳлил ёки вертикал таҳлилларга ажратиш лозим. Охириги турдаги таҳлил адабиётларда омилли таҳлил ҳам деб аталади.

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VITAMIN D NING ORGANIZMDAGI AHAMIYATI.

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Annotatsiya. Ushbu maqolada inson organizmi uchun hayotiy ahamiyatga ega bo'lgan vitamin Dning biologik funksiyalari, metabolizmi, yetishmovchiligi va ortiqcha miqdori bilan bog'liq holatlar tahlil qilinadi. Vitamin D suyak to'qimalari mustahkamligi, kalsiy-fosfor almashinuvining me'yoriy kechishi, immun tizimining faoliyati va ayrim gormonal jarayonlarda ishtirok etishi orqali organizm salomatligini ta'minlaydi.

Kalit so'zlar: vitamin D, gipovitaminoz D, kalsiy-fosfor almashinuvi, immun tizimi, suyak to'qimasi, rahit, vitamin D metabolizmi, vitamin D yetishmovchiligi, osteoporoz.

Аннотация. В данной статье рассматриваются биологические функции витамина D, его метаболизм, а также состояния, связанные с его дефицитом и избытком, которые имеют жизненно важное значение для организма человека. Витамин D обеспечивает здоровье организма за счёт укрепления костной ткани, нормализации кальций-фосфорного обмена, поддержания активности иммунной системы и участия в ряде гормональных процессов.

Ключевые слова: витамин D, гиповитаминоз D, кальций-фосфорный обмен, иммунная система, костная ткань, рахит, метаболизм витамина D, дефицит витамина D, остеопороз.

Annotation. This article analyzes the biological functions of vitamin D, its metabolism, as well as conditions associated with its deficiency and excess, which are vital for the human body. Vitamin D contributes to overall health by strengthening bone tissue, regulating calcium-phosphorus metabolism, supporting immune system activity, and participating in various hormonal processes.

Keywords: vitamin D, hypovitaminosis D, calcium-phosphorus metabolism, immune system, bone tissue, rickets, vitamin D metabolism, vitamin D deficiency, osteoporosis.

Kirish. Vitaminlar oziq-ovqat tarkibida uchraydigan oziqa omillari jumlasiga kirib, organizmda sodir bo'ladigan moddalar almashinuvining boshqarilishida ishtirok etish orqali biokimyoviy va fiziologik jarayonlarni me'yoriy chegarada kechishini ta'minlaydigan moddalardir. Bu moddalar organizm uchun juda ham oz miqdorda talab qilinishi bilan birga, organizmning ular bilan ta'minlanishiga bevosita bog'liq bo'lgan avitaminoz, gipovitaminoz va gipervitaminoz holatlari ham uchrab turadi. [1]. Inson organizmining sog'lom faoliyat yuritishi ko'plab biologik faol moddalarga bog'liq bo'lib, ulardan biri — vitamin D — so'nggi yillarda ilmiy tibbiyotda alohida e'tibor markaziga aylandi. Vitamin D oddiy vitamin sifatida emas, balki gormon moddasiga xos ta'sirga ega bo'lgan muhim komponent hisoblanadi. U suyaklarning mustahkamligi, immun tizimining barqaror ishlashi, kalsiy-fosfor almashinuvi va ayrim gormonal funksiyalarni boshqarishda beqiyos ahamiyatga ega.

Vitamin D - kalsiferol va antiraxitik vitamin, eng muhim vakillari D2 va D3. O'simlik mahsulotlarida vitamin Dning miqdori ko'p emas. Hayvon mahsulotlaridan jigar, tovuq tuxumi, baliq, sut, sariyog'da ko'p saqlanadi. Vitamin D ning organizmdagi eng asosiy vazifasi kalsiy

va fosfor gomeostazini saqlash, suyakning minerallanishi va qayta tiklanishini ta'minlashdir. Vitamin D ingichka ichakdagi o't kislotalari ishtirokida so'riladi, keyin jigarga tashiladi va u yerda NADN va molekulyar kislorod ishtirokida ishlovchi mitoxondriyalar sistemasi ta'sirida 25-oksiholekalsiferolga aylanadi. 25-oksiholekalsiferol buyraklarda gidroksillanadi, natijada gormonal xususiyatga ega bo'lgan 1,25 dioksiholekalsiferol hosil bo'ladi. [2]

Ergokalsiferol (vitamin D2) esa o'simlik steroli — ergosterin nurlantirilishi orqali hosil bo'ladi. U xolekalsiferoldan (D3) faqat D halqasiga birikkan yon zanjiri bilan farqlanadi. Sut mahsulotlariga vitamin D qo'shilishi rivojlangan mamlakatlarda raxitni bolalik davrida deyarli butunlay yo'q qilgan. [3] Vitamin D2 prooksidant xususiyatiga ega bo'lib kislotalarini, hujayra membranalarining fosfolipidlarini oksidlanishidan saqlaydi. Vitamin D yetishmasligining organizmdagi moddalar almashinuviga salbiy ta'siri immun sistemada ham o'z aksini topadi. [2]

Vitamin D ning tibbiyotdagi qo'llanilishi. Vitamin D tibbiyot amaliyotida bir qator maqsadlarda keng qo'llaniladi. Avvalo, u profilaktik vosita sifatida bolalarda rahit kasalligini oldini olish, homilador va emizikli ayollarda suyak hamda tishlarning to'g'ri rivojlanishini ta'minlash, shuningdek, keksalarda osteoporoz va suyak sinishlari xavfini kamaytirishda muhim ahamiyatga ega. Bundan tashqari, vitamin D davolash maqsadida rahit va osteomalasiya kabi suyaklarning mineralizatsiya buzilishlari, osteoporoz, hamda kalsiy-fosfor almashinuvining turli patologiyalarida qo'llaniladi. U qonda kalsiy va fosfor muvozanatini normallashtiradi hamda suyak to'qimasining mustahkamligini ta'minlaydi. Vitamin D shuningdek ayrim hollarda qo'shimcha terapiya sifatida yurak-qon tomir kasalliklari, qandli diabet va autoimmun kasalliklar (masalan, revmatoid artrit, multiple skleroz)da qo'llanishi mumkinligi haqida ilmiy tadqiqotlar olib borilmoqda. [6]

Vitamin D tanqisligi - natijasida raxit kasalligi paydo bo'ladi. Bu kasallik fosfor-kalsiy almashinuvini izdan chiqaradi va bunda suyak to'qimasida kalsiy fosfatning to'planishi izdan chiqadi. Shuning uchun raxitning asosiy belgilari osteogenezning shikastlanishidir. Bunda osteomalyatsiya, ya'ni suyakning yumshab qolishi sodir bo'ladi. Suyak yumshashi natijasida tana o'z og'irligini ko'tara olmay oyoqlar X simon yoki O simon shaklni oladi. Bolalarda raxit natijasida kallasi kattalashib ketib, qorni shishib ketishi kuzatiladi. Yosh bolalarda uchraydigan raxit kasalligida osteogenezning shikastlanishi oqibatida tishlarning chiqishi susayadi. Voyaga yetgan odamlarda gipovitaminoz natijasida osteoporoz yuz beradi va bunda elastiklikni ta'minlovchi va suyakda to'plangan ayrim tuzlarni organizmdan yuvilishi yuz beradi hamda buning oqibatida suyaklarning mo'rt bo'lishi va ularning sinishga moyilligi kuchayadi. [1] Raxit kasali XVII asrda Angliyada birinchi bor qayd qilindi. [1]

Vitamin D yetishmovchiligi sabablari:

Quyosh nuri yetarli bo'lmaganda → xolekalsiferol sintezi kamayadi.

Yog'lar yomon so'rilganda → yog'da eruvchi vitaminlar so'rilmaydi.

Surunkali jigar kasalligi → birinchi gidroksillanish buziladi.

Jigar sitoxrom P450 tizimi ortiqcha faollashganda (spirtli ichimliklar, fenitoin, barbituratlar) → faol bo'lmagan metabolitlar ko'payadi.

Buyrak yetishmovchiligi (eng ko'p uchraydigan sabab) → 1 α -gidroksilaza yetishmovchiligi.

Birlamchi giparparatireoz → PTH yo'qligi sababli 1 α -gidroksilaza faollashmaydi.

I tur vitamin D–bog'liq raxit → 1 α -gidroksilaza yetishmovchiligi.

II tur vitamin D–bog'liq raxit → nishon to'qimalarda vitamin D retseptorlari yetishmovchiligi. [5]

Vitamin D yetishmovchiligi bolalar va kattalarga ta'sir qiladi:

Vitamin D yetishmovchiligi kasalligi — *raxitda*, bolalarda suyaklarning mineralizatsiyasi yetarli bo'lmaydi, bu esa kalsiyning yomon so'rilishi natijasida yuz beradi. Shunga o'xshash muammolar o'smirlik davridagi tez o'sish davrida ham uchraydi. Kattalarda esa osteomalatsiya suyaklarning demeneralizatsiyasi natijasida rivojlanadi, ayniqsa quyosh nuri yetarli bo'lmagan ayollarda va ko'p homiladorliklardan keyin kuzatiladi. [4]

Vitamin D ning kunlik tavsiya etilgan me'yori (RDA) ayrim manbalarda 400 IU deb qayd etilgan bo'lsa, [3] 667-bet boshqa adabiyotlarda bolalar uchun 500–1000 XB (10–25 mkg), kattalar uchun esa 10 mkg yetarli ekanligi ko'rsatilgan, hamda yoshga va organizmning fiziologik holatiga, fosfor va kaltsiyning o'zaro nisbat ko'rsatkichiga qarab miqdoriy o'zgarishlarga uchraydi. Odamlarda gipervitaminoz raxitni «o'ta katta» doza D vitamini bilan davolash natijasida yuzaga kelishi mumkin. Bir kecha-kunduzda 1.500.000 XB miqdorda D vitamini qabul qilganda gipervitaminoz sodir bo'lgan. Bunda suyaklarning gipermineralizatsiyasi yuz berib, tananing kamgina jarohatlanishi suyaklarning ko'p yerdan sinishiga sabab bo'ladi. [1]

Quyoshdan D vitamini olishim mumkinmi?

Tering quyoshga yalang'och holda ta'sir qilganda, organizm D vitaminini ishlab chiqaradi. Ko'pchilik odamlar shu yo'l bilan hech bo'lmaganda biroz D vitamini oladi. Ammo bulutlar, tutun, qarilik va terining qoraroq bo'lishi terida ishlab chiqariladigan D vitamini miqdorini kamaytiradi. Shuningdek, oyna orqali tushgan quyosh nuri terida D vitamini hosil qilmaydi. [6]

Xulosa. Vitamin D organizmda kalsiy-fosfor almashinuvini tartibga soluvchi, suyak-muskul tizimi, immun, yurak-qon tomir va endokrin tizimlarning normal faoliyati uchun zarur bo'lgan biologik faol moddadir. Oxirgi yillarda olib borilgan tadqiqotlar ushbu vitaminning faqat suyak sog'lig'idagi emas, balki umumiy metabolik jarayonlarda ham markaziy o'rin tutishini ko'rsatmoqda. Vitamin D yetishmovchiligi global sog'liqni saqlash muammolaridan biri bo'lib, u osteoporoz, raxit, mushak kuchsizligi, immun tizim zaiflashuvi hamda ayrim surunkali kasalliklarning rivojlanish xavfini oshiradi. Shu bois, aholining turli yosh guruhlari uchun yetarli darajada vitamin D iste'moli va nazoratini ta'minlash profilaktik hamda davolash choralarida alohida ahamiyat kasb etadi.

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**BYUDJET TASHKILOTLARIDAGI HUJJATLARNING AYLANISH TARTIBINING
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Annotatsiya: Maqolada byudjet tashkilotlarida hujjatlar aylanishi tartibi tahlil qilinadi, moliyaviy operatsiyalarni hujjatlarda aks ettirish bilan bog'liq masalalar ko'rib chiqiladi va moliyaviy hisobni yuritish bo'yicha tavsiyalar beriladi.

Аннотация: В статье подвергается анализу порядок обращения документов в бюджетных организациях, рассмотрены вопросы, связанные с отражением финансовых операций в документах, даются рекомендации по ведению финансовой документации.

Abstract: In article the order of the circulation of documents in budgetary organizations is exposed to the analysis, the questions connected with reflection of financial operations in documents are considered, recommendations about maintaining financial documentation are made.

Byudjet tashkilotlarida hisob registrlari buxgalteriya hujjatlari asosida amalga oshiriladi. Ulardan ayrimlari, masalan, kreditlarni ochish uchun xarajatlar jadvali, byudjet topshiriqlari va hokazolar hisob registrlarini tashkil qiladi. Ularga yuridik kuch berish uchun dastlabki hujjatlarda quyidagi rekvizitlar, ya'ni hujjat nomi, tuzilish sanasi; moliyaviy operatsiyalarning miqdoriy va qiymat ko'rsatkichlaridagi o'lchov mazmuni, moliyaviy operatsiyalarni amalga oshiruvchi va rasmiylashtirishning to'g'riligiga javobgar lavozimli shaxslarning nomlari, shaxsiy imzolar bo'lishi lozim.

Rasmiylashtiriladigan hujjatlarda moddiy boyliklarni qabul qilgan javobgar xodimning va hujjatlarda ishlarni qabul qilganligini tasdiqlaydigan shaxslarning dalolatnomalari bo'lishi kerak. Dastlabki hujjatlarda yozuvlar tegishli talablar asosida amalga oshiriladi. Hujjatlarda o'chirish va qayta to'g'rilashlarga yo'l qo'yilmaydi. Agar dastlabki hujjatlarda xato bo'lgan holatlar mavjud bo'lganda ularni to'g'rilash uchun xato mati yoki summaning tepasiga to'g'ri varianti yoziladi. Xato o'chirilishi kerak bulganda uning ustidan ingichka chiziq bilan chizish kerak, sababi avvalgi xato yozuv o'qilishi kerak. Dastlabki hujjatlardagi xatolar to'g'rilangandan so'ng «To'g'rilandi» deb yozilishi lozim va u hujjatga imzo chekkan shaxslar tomonidan tasdiqlanib, to'g'rilangan sana ko'rsatiladi. Kassa va kassa muomalalari va bank xujjatlarida to'g'rilashga yo'l qo'yilmaydi. Byudjet tashkiloti buxgalteriyasidagi dastlabki hujjatlar qat'iyon shakllar asosida (dastlabki hujjatlarning rasmiyligining to'liqligi va to'g'riligi, rekvizitlarning to'ldirilishi) nazoratdan o'tkaziladi.

Byudjet tashkilotlarida buxgalteriya hisobi «Byudjet tizimi» to'g'risidagi qonun, «Byudjet tashkilotlarida buxgalteriya hisobi» to'g'risidagi yo'riqnoma va O'zbekiston Respublikasi Moliya vazirligining boshqa normativ hujjatlari asosida olib boriladi.

Byudjet tashkilotlarida moliyaviy operatsiyalarni aks ettirishning asosiy qoidalari:
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➤ buxgalteriya hisobini ikki yoqlama yozuv usulida yuritish,
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➤	uzluksizlik,
➤	moliyaviy operatsiyalar,
➤	aktivlar va passivlarning pulda baholanishi;
➤	aniqlik;
➤	hisoblash,
➤	oldindan ko'ra bilish (ehtiyotkorlik);
➤	ko'rsatkichlarning qiyoslanuvchanligi;
➤	moliyaviy hisobotning betarafligi;
➤	hisobot davri daromadlari va xarajatlarining muvofiqligi.

Byudjet tashkilotlarida foydalaniladigan birlamchi va yigma (shu jumladan hisob registrlari) hujjatlar kassa orderi; chiqim kassa orderi, to'lov talabnomalari; ishonchnoma; avans hisoboti; ish haqi berish qaydnomasi, ish vaqtini hisobga olish tabeli; bosh kitob jurnali; analitik subschyotlar bo'yicha aylanma qaydnoma, sintetik subschyotlar bo'yicha aylanma qaydnoma, xodimlar shaxsiy varaqasi; asosiy vositalarni hisobga olish inventar kartochkalari; kassa kitobi (daftari); haqiqiy va kassa xarajatlarini hisobga olish kitobi, berilgan ishonchnomalarni hisobga olish kitobidan iborat. SHuningdek, quyidagi memorial orderlar blokida ma'lumotlar bir oy davomida aks etib boriladi:

1-memorial order	kassa operatsiyalari bo'yicha jamlanma qaydnoma	381-son shakl
2-memorial order	byudjet mablaglari harakatiga doir jamlanma qaydnoma	381-son shakl
3-memorial order	byudjetdan tashqari mablag'lar harakatiga doir jamlanma qaydnoma	381-son shakl
5-memorial order	ish haqi va stipendiyalar bo'yicha hisob-kitob varaqalari Yig'indisi	405-son shakl
6-memorial order	turli tashkilotlar va muassasalar bilan olib boriladigan	408-son shakl
8-memorial order	hisob-kitoblar bo'yicha jamlanma qaydnoma, hisobdor shaxslar bilan hisob-kitoblar bo'yicha jamlanma qaydnoma	386-son shakl
9-memorial order	asosiy vositalarning hisobdan chiqarilishi va joydan joyga ko'chirilishi bo'yicha jamlanma qaydnoma	438-son shakl
11-memorial order	oziq-ovqat mahsulotlarining kirimiga doir jamlanma qaydnoma	398-son shakl
12-memorial order	oziq-ovqat mahsulotlarining sarfiga doir jamlanma qaydnoma	411-son shakl
13-memorial order	materiallar sarfiga doir jamlanma qaydnoma	396-son shakl
15-memorial order	ta'lim muassasalarida bolalarni saqlaganlik uchun ot-onalar bilan olib boriladigan hisob-kitoblar bo'yicha qaydnoma	406-son shakl

Qolgan operatsiyalar (asosiy vositalarga eskirish hisoblash, asosiy fondlarni har yildagi qayta baholanishi, byudjetdan tashqari daromadlar hisobi, yilni yakunlash operatsiyalari va hokazo) va «Storno» operatsiyalari bo'yicha alohida memorial orderlar tuziladi.

SHu bilan birgalikda byudjet tashkilotlarida buxgalteriya hisobi va hisobotini tutri tuzish bo'yicha foydalaniladigan va qat'iy nazorat ostidagi hujjatlarga quyidagilar kiradi:

1. Mehnat kitobchalari.
2. Ishonch qog'ozlari.
3. SHaxsiy kartochka va b.

Qat'iy hisobdagi blanklar O'zbekiston Respublikasining qonun hujjatlarida belgilangan tartibda raqamlanishi lozim (numerator, bosmaxona usulida)

Qat'iy hisobdagi blanklarni olish, saqlash, berish va ishlatish vazifasi yuklatilgan korxonaning mas'ul shaxslari korxonah rahbarining buyrug'i bilan tayinlanadi hamda Mehnat kodeksining 203-moddasida belgilangan hollarda vi tartibda to'liq moddiy javobgarlik to'g'risida yozma shartnoma tuzadi. Agar mas'ul shaxs ma'lum sabablarga ko'ra, o'z vazifasini vaqtincha bajara olmasa yoki boshqa ishga o'tib ketayotgan bo'lsa, qat'iy hisobdagi blanklar mas'ul shaxs va ushbu vazifani bajarish yuklatilayotgan shaxs tomonidan imzolangan qabul qilish- topshirish dalolatnomasi bo'yicha topshirilishi lozim.

Qat'iy hisobdagi blanklarni etkazib beruvchidan qabul qilish korxonaning mas'ul shaxsi tomonidan amalga oshiriladi. Qat'iy hisobdagi blanklarni qabul qilishda mas'ul shaxs tomonidan majburiy tartibda o'rami buzilganlik holati yuzasidan blanklar paketi ko'rib chiqiladi. Qabul qilingan o'ramlar miqdorining ilova hujjatlarida ko'rsatilgan miqdorga muvofiqligi tekshiriladi va dalolatnoma tuziladi. Matbaa korxonasidan sotib olingan (buyurtma qilingan) qat'iy hisobdagi blanklarda kamomad yoki nuqsonlar (himoya setkasining, bosma matining yo'qligi yoki zararlanganligi, takrorlangan raqamlar yoki boshqa seriya yoki raqamga ega bo'lgan blanklarning mavjudligi, xiralashgan harfli, noto'g'ri kesilgan va noto'g'ri formatli blanklarning mavjudligi, blanklarda seriya va raqamlarning yo'qligi yoki matbaa korxonasi paketlaridagi nakleykalarining boshka nomuvofiqliklari) holati aniqlanganda uch nusxada dalolatnoma tuzilishi lozim.

Dalolatnomaning birinchi nusxasi, ilova xat matbaa korxonasi nakleykasi va nuqsonli blanklar bilan birga matbaa korxonasiga jo'natiladi. Ikkinchi va uchinchi nusxalar nakleyka kseronusxasi bilan birga korxonada qoladi. Qat'iy hisobdagi blanklar seyf, yonmaydigan javon yoki korxonaning maxsus jihozlangan xonasida saqlanishi kerak. Qat'iy hisobdagi blanklarni ko'p miqdorda qabul qiluvchi korxonalarda ularni buzilish yoki o'g'irlanish holatini istisno etuvchi maxsus jihozlangan omborxonalarda saqlash maqsadga muvofiqdir.

Byudjet tashkilotlarida mavjud qat'iy hisobdagi blanklarning butlitini ta'minlash maqsadida ish paytidan tashqari vaqtda seyf, yonmaydigan javon va korxonaning qat'iy hisobdagi blanklarini saqlash uchun maxsus jihozlangan xona muhrlanishi lozim.

Mas'ul shaxs tomonidan qat'iy hisobdagi blanklar hisobini ularning nomi, seriyasi va raqami bo'yicha «Qat'iy hisobdagi blanklarni hisobga olish jurnali»da olib borilishi maqsadga muvofiq. Jurnalning oxirgi varag'ida korxonah rahbari yoki u qonun hujjatlarida belgilangan tartibda tayinlagan shaxslar imzosi bilan «Mazkur jurnalda sahifa raqamlangan» degan yozuv yozilishi kerak va muhr bilan tasdiqlanishi, varaqlar soni yozuv bilan yozilishi mumkin.

«Qat'iy hisobdagi blanklarni hisobga olish jurnali» aniq, tushunarli va qisqartirishlarsiz to'ldirishi lozim. Korxonah rahbari yoki qonun hujjatlarida belgilangan tartibda tayinlagan shaxslar tomonidan qat'iy hisobdagi blanklarni topshirish, saqlash, ishlatish uchun sharoitlarning yaratilishi maqsadga muvofiq, deb o'ylaymiz. SHu bilan birga hisob beruvchi shaxslar qat'iy

hisobdagi blanklarni qabul qilish va ishlatish bo'yicha hisobot berib turishi va ular tomonidan qabul qilingan har bir qat'iy hisobdagi blankning ishlatilishiga javobgardir.

Hujjatlar aylanuvi jadvali byudjet tashkiloti rahbarining buyrug'i bilan tasdiqlanadi. Byudjet tashkilotida hujjatlarning oqilona aylanuvini ta'minlash lozim, ya'ni har bir birlamchi hujjatning o'tishi bo'yicha ijro etuvchilarning maqbul sonini nazarda tutishi, hujjatning bo'linmada eng kam muddatda bo'lishini belgilashi lozim.

Hujjatlar aylanuvi jadvali byudjet tashkilotida butun hisob ishining yaxshilanishiga, buxgalteriya hisobini nazorat qilish funksiyasining kuchayishiga yordam berishi lozim.

Bundan tashqari, hujjatlar aylanuvi jadvalida, bizning fikrimizcha, quyidagilarni aks ettirish uni takomillashtirishda o'z samarasini beradi.

1. Hujjatlarning ijro mazmunidan kelib chiqib ularning ijro muddatini ko'rsatish.
2. Hujjatlarning muhimligi nuqtai nazaridan kelib chiqib, ularning toifalarini ko'rsatish.
3. Hujjatlarning mansubligiga qarab ularni byudjet va byudjetdan tashqari manbalarga tegishlilikini ko'rsatish.
4. Hujjatlarda aks ettirilgan moddiy resurslardan kelib chiqib moddiy va moliyaviy jihatlarni differentsiyalash maqsadga muvofiq.

Byudjet tashkilotining har bir bo'linmasida ijro etuvchilarning o'zaro bog'likligini hamda ishlarning bajarish muddatini tekshirish va hujjatlashtirish hajmini rasmiylashtirish maqsadga muvofiqdir.

Bizning fikrimizcha, byudjet tashkilotlarida hujjatlar aylanuvi jadvaliga rioya qilish hamda hujjatlarni o'z vaqtida va sifatli tuzish, buxgalteriya hisobi va hisobotida aks ettirish uchun ularni o'z vaqtida taqdim etish, hujjatlardagi mavjud ma'lumotlarning ishonchlilik bo'yicha javobgarlik ushbu hujjatlarni tuzgan va imzolagan shaxslar zimmasiga yuklanishi lozim.

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Фотоэлектрические характеристики гетероструктуры $n\text{-GaAs} - p\text{-(ZnSe)}_{1-x-y}\text{(Ge}_2\text{)}_x\text{(GaAs}_{1-\delta}\text{Bi}_\delta\text{)}_y$ **И.М. Солиев**

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Аннотация.

В статье приведены экспериментальные данные по исследованию фотоэлектрических свойств гетероструктуры $n\text{-GaAs} - p\text{-(ZnSe)}_{1-x-y}\text{(Ge}_2\text{)}_x\text{(GaAs}_{1-\delta}\text{Bi}_\delta\text{)}_y$ с различными нановключениями, выращенной методом жидкофазной эпитаксии. Фоточувствительность данной гетероструктуры проявляется в виде трёх основных пиков при энергиях фотонов 1,61; 1,97 и 2,63 эВ. Подробный анализ спектров показал, что центральный пик с наибольшей интенсивностью имеет сложное строение, что позволило выделить дополнительный четвёртый пик в диапазоне 2,1–2,3 эВ. Установлено, что обнаруженные пики связаны с энергетическими спектрами нанокристаллов германия, формирующихся на границах субкристаллитов плёнки, а также с квантовыми ямами $\text{GaAs}_{1-\delta}\text{Bi}_\delta$, возникающими в приповерхностной области эпитаксиального слоя.

Ключевые слова Спектральная фоточувствительность, примесь, твёрдый раствор, атомное соединение, гетероструктуры, нанокристалл, квантовая яма.

Введение. Развитие энергетики усилило интерес к экологически чистым технологиям получения энергии, в частности к фотоэлектрическим преобразователям для создания эффективных солнечных элементов [1]. Наиболее результативные из них изготавливаются из полупроводниковых твёрдых растворов на основе соединений АIII–BV и АII–BVI. Одной из ключевых проблем остаются потери энергии при поглощении суб- и надзонных фотонов и термализации носителей [2]. Для повышения эффективности и долговечности применяются многокомпонентные варизонные солнечные элементы, которые обладают преимуществами перед традиционными материалами, но имеют и недостатки [3,4]. Перспективным направлением является создание варизонных элементов на основе гетероструктур GaAs/Ge/ZnSe и GaAs/Si/ZnSe .

Методика эксперимента

Для выращивания эпитаксиальных плёнок $(\text{ZnSe})_{1-x-y}\text{(Ge}_2\text{)}_x\text{(GaAs}_{1-\delta}\text{Bi}_\delta\text{)}_y$ на подложках GaAs нами был использован метод жидкофазной эпитаксии из ограниченного объёма раствора-расплава. Исследованные плёнки выращивались в температурном интервале кристаллизации 750–650 °С при скорости охлаждения подложки 1 °С/мин. Полученные эпитаксиальные плёнки $(\text{ZnSe})_{1-x-y}\text{(Ge}_2\text{)}_x\text{(GaAs}_{1-\delta}\text{Bi}_\delta\text{)}_y$ обладали дырочным типом проводимости с подвижностью носителей заряда 357 см²/(В·с) и концентрацией $p = 5 \cdot 10^{17}$ см⁻³.

Измерения спектральной зависимости фототока проводились с применением ксеноновой лампы ДКС и монохроматора с ксеноновой лампой ДКС в диапазоне длин волн 1,2–2,65 эВ (0,47–1,03 мкм). Полученные спектральные данные для гетероструктуры $n\text{-GaAs} - p\text{-(ZnSe)}_{1-x-y}\text{(Ge}_2\text{)}_x\text{(GaAs}_{1-\delta}\text{Bi}_\delta\text{)}_y$ были обработаны и визуализированы с помощью программного обеспечения OriginPro2022.

Экспериментальные результаты и их обсуждения

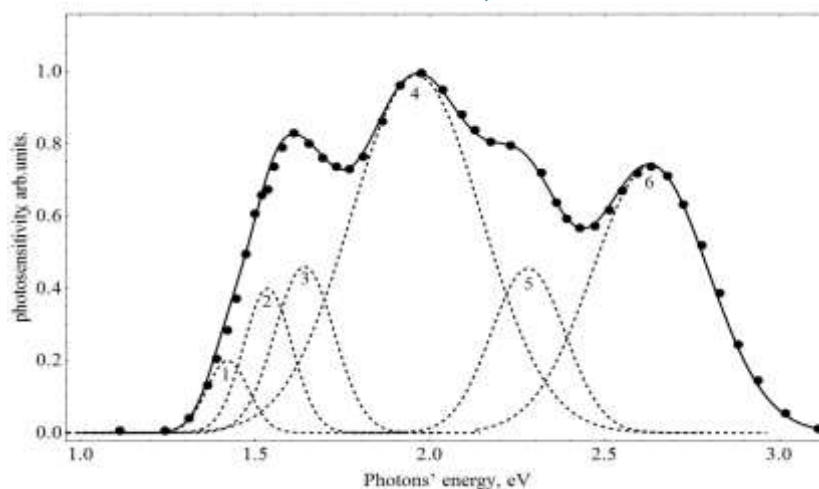


Рис.1. Спектр фоточувствительности гетероструктуры $n\text{-GaAs} - p\text{-(ZnSe)}_{1-x}\text{-(Ge}_2\text{)}_x\text{(GaAs}_{1-\delta}\text{Bi}_\delta\text{)}_y$ в гауссовом приближении. – экспериментальные точки; сплошная кривая соответствует суммарному спектру полученных из гауссовских пиков; пунктирные кривые – гауссовские компоненты расчетного спектра;

На рис. 1 (кривая 1) показан спектр первой гауссовой компоненты, начинающийся при 1,2 эВ и связанный с атомами Bi, замещающими As в решётке GaAs и формирующими донорные уровни. Максимум этой компоненты соответствует 1,39 эВ. Согласно [5, 6], при увеличении концентрации Bi ширина запрещённой зоны $\text{GaAs}_{1-\delta}\text{Bi}_\delta$ уменьшается, а в валентной зоне появляются новые дефектные полосы. Валентные зоны формируются орбиталями As-4p и Bi-6p, зоны проводимости – гибридными орбиталями As и Ga (4s/4p), а вклад Bi-6s/6p становится заметным при $\delta > 3,1\%$.

Кроме того, показано [7], что атомы Ge в дефектных областях замещают молекулы ZnSe, образуя нанокристаллы с акцепторными уровнями. Вторая гауссовая компонента (рис. 1, кривая 2) имеет максимум при 1,53 эВ и обусловлена рекомбинацией электронов из зоны проводимости в акцепторные состояния $p\text{-GaAs}$, что согласуется с данными фотолюминесценции (1,35–1,65 эВ) [8].

Максимум третьей гауссовой компоненты спектра (рис. 1, кривая 3) наблюдается при энергии 1,64 эВ, что может быть обусловлено наличием валентных зон, связанных с изовалентными примесями соединений Ge–Se в слое GaAs. В работе [9] показано, что в спектре фотопроводимости слоистых кристаллов Ge–Se наблюдаются три чувствительных пика при энергиях 1,43; 1,63 и 2,25 эВ. В наших экспериментах также были зарегистрированы все эти три пика. Первый пик накладывается на вторую гауссовую компоненту в длинноволновой области спектра, а второй пик соответствует третьей гауссовой компоненте при энергии 1,64 эВ.

Следующие три гауссовые компоненты (рис. 1, кривые 4, 5 и 6) фотоотклика наблюдаются в диапазоне энергий фотонов от 1,48 до 3 эВ с максимумами при энергиях 1,92; 2,28 и 2,63 эВ соответственно. Известно, что спектр фотолюминесценции поверхности эпитаксиального слоя $(\text{GaAs})_{1-x}(\text{ZnSe})_x$ характеризуется широкой полосой и охватывает практически весь видимый диапазон (400–760 нм). Авторы работы [10] показали, что глубокие энергетические уровни обусловлены соединениями Ga–Se ($h\nu_{\text{max}} = 1,88$ эВ), Zn–As ($h\nu_{\text{max}} = 2,15$ эВ) и Zn–Se ($h\nu_{\text{max}} = 2,69$ эВ).

В наших экспериментах были выявлены пики фотоотклика при энергиях фотонов 1,92; 2,3 и 2,63 эВ. Незначительное отклонение энергии второго пика (2,3 эВ) может быть

связано с присутствием атомов GaSe и ZnAs. Разница в энергии третьего пика (2,63 эВ) обусловлена замещением атомами Bi в анионной подрешётке Zn–Se, которые имеют энергию ионизации примерно 56 мэВ. Это явление может быть вызвано особенностями процесса выращивания твёрдого раствора $(\text{ZnSe})_{1-x-y}(\text{Ge}_2)_x(\text{GaAs}_{1-\delta}\text{Bi}_\delta)_y$ с принудительным охлаждением из висмутосодержащего раствора-расплава, вследствие чего небольшое количество атомов Bi остаётся на поверхности плёнки [11].

Заключение

Следует отметить, что компоненты гетероструктуры формируются в виде твердого раствора с различным составом из двухкомпонентных молекул GaAs и Ge₂, GaAs и ZnSe, Ge₂ и ZnSe. Различие ковалентных радиусов исследованных компонентов и параметров решетки не превышает 0.2%. Спектр фоточувствительности *n*-GaAs – *p*- $(\text{ZnSe})_{1-x-y}(\text{Ge}_2)_x(\text{GaAs}_{1-\delta}\text{Bi}_\delta)_y$ гетероструктуры, проанализирован с помощью программы Wolfram Mathematics 7 с использованием шести гауссовских линий с заданными пиками E_i для повышения адекватности аппроксимирующего спектра с экспериментальными данными. В результате было обнаружено, что анализируемый спектр может быть охарактеризован набором из шести гауссовых линий со значениями E_i , соответствующими оптимальному совпадению экспериментальных и общих аппроксимирующих гауссовых кривых. Все шесть фотопиков, соответствующие гауссовым кривым наблюдались в интервале энергий фотонов:

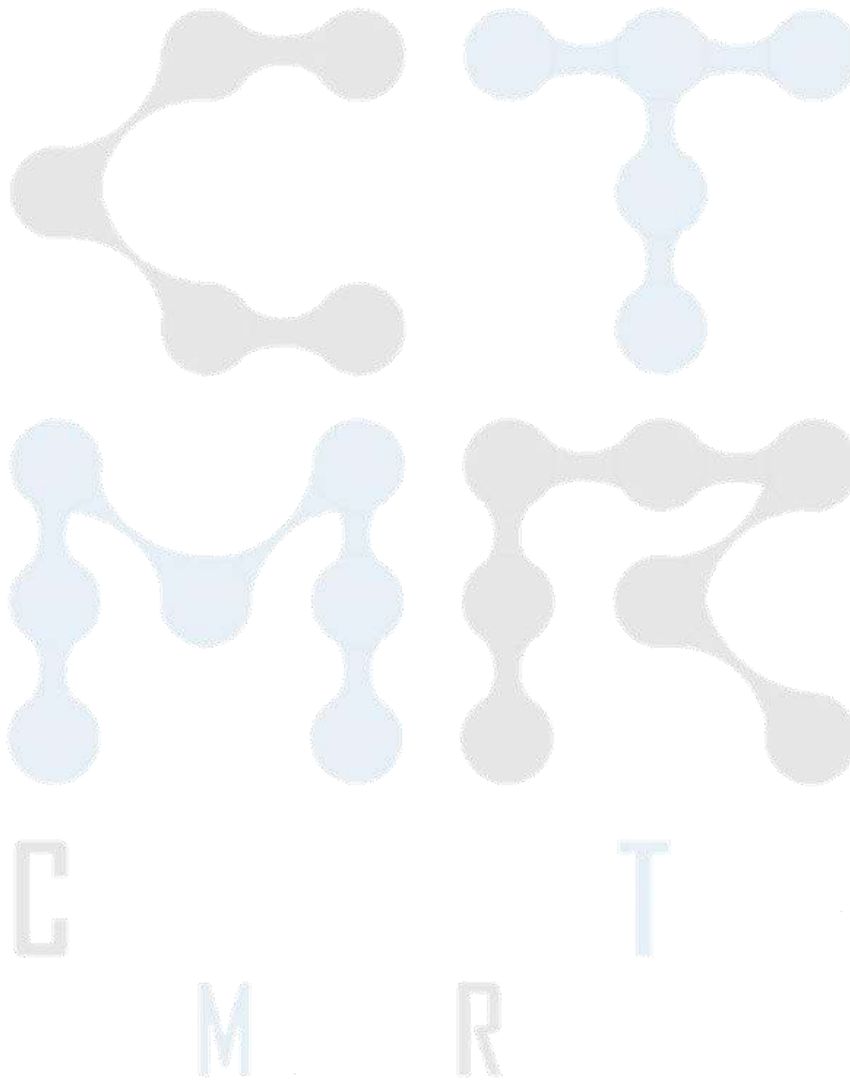
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**ENHANCING CREATIVE COMMUNICATIVE COMPETENCE THROUGH
PROBLEM –BASED TEACHING IN FOREIGN LANGUAGE EDUCATION**

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ABSTRACT

One of the most successful learner-centered technologies in contemporary pedagogy, especially in the area of foreign language instruction, is problem-based learning, or PBL. PBL, in contrast to conventional teacher-centered methods, promotes students to use inquiry, teamwork, and critical thinking to solve real-world issues. This essay examines how PBL promotes the growth of creative communicative competence, a critical 21st-century talent that blends language proficiency with inventiveness, intercultural awareness, and flexibility. According to the data, PBL encourages pupils to utilize language in real-world situations while also improving their accuracy and fluency. Furthermore, PBL combines speaking, listening, reading, and writing abilities into a unified communication process by involving students in problem-solving activities. The results imply that PBL offers a creative and long-lasting framework for language acquisition when accompanied by digital tools and reflective evaluation.

Keywords: Problem-Based Learning, communicative competence, creative communication, learner-centered approach, foreign language teaching.

INTRODUCTION

The emphasis on communicative competency in foreign language instruction has replaced the previous emphasis on vocabulary and grammar learning in the twenty-first century. Hymes (1972) defined communicative competence as the capacity to utilize words correctly in social and cultural situations in addition to being able to construct them correctly. Learners must go beyond this in today's worldwide world: they must exhibit creative communication competence, which blends correctness, creativity, fluency, and intercultural adaptation. PBL, or problem-based learning, is a paradigm change in the field of education. It was first used extensively across disciplines in medical colleges in the 1960s (Barrows, 1986). PBL makes learning an active, inquiry-driven process by encouraging students to work together to solve challenging, real-world issues. PBL fosters higher-order thinking, learner autonomy, and collaborative communication—all crucial elements of creative communicative ability, according to academics like Savery (2006) and Schmidt (2012). This study looks at how PBL, as an educational tool, might improve students' creative communicative skills in foreign language courses.

Methods

The study's foundation is a comparative theoretical examination of problem-based learning paradigms and how they are used in the instruction of foreign languages. Empirical research, case studies, and scholarly sources were examined. Three criteria were the focus of the analysis:

1. The degree to which PBL fosters effective communication.
2. How PBL encourages innovation and problem-solving.
3. The integration of PBL with digital and interactive technology in language instruction.

Results

The study's main findings were as follows:

1. **Genuine communication:** PBL exposes students to real-world activities including case studies, discussions, and simulations. Learners must utilize the target language in a meaningful and innovative way in this realistic environment.
2. **Skill integration:** PBL assignments incorporate speaking, writing, listening, and reading. For instance, students may learn about environmental issues, talk and listen in groups about potential solutions, then write a presentation.
3. **Learner autonomy and motivation:** PBL boosts intrinsic motivation by giving students responsibilities. Instead of being passive information consumers, students take an active role in creating knowledge.
4. **Creativity and problem-solving:** By encouraging learners to come up with various answers and fostering divergent thinking, addressing complicated, open-ended challenges enhances their creative communication skills.
5. **Digital support:** PBL extends outside the classroom by enabling online collaboration and multimedia resource engagement when paired with digital platforms (such as Moodle, Google Classroom, or MALL technologies).

Discussion

The findings demonstrate the great efficacy of problem-based learning in teaching foreign languages. PBL fosters a learner-centered setting where communication serves as both the method and the goal of learning, in contrast to traditional grammar-focused education. Students are utilizing language to address significant issues rather than just practicing discrete language concepts. Additionally, PBL fits quite nicely with contemporary online learning settings. For example, students may access real resources, work together remotely, and digitally record their answers when PBL is combined with mobile-assisted language learning (Burston, 2013). Research by Tarmizi & Bayat (2012) and Hung (2016) further shows that PBL enhances students' motivation, problem-solving skills, and teamwork—all of which are critical for the development of creative communicative ability. However, thorough preparation and teacher support are necessary for successful implementation. Instead of imparting knowledge, teachers must serve as mentors, assisting students in problem-solving, teamwork, and result reflection. Educators must be trained in PBL techniques, and access to sufficient resources must be guaranteed.

CONCLUSION

In foreign language instruction, problem-based teaching technology provides a potent pedagogical framework for cultivating innovative communicative ability. PBL promotes creativity, critical thinking, and intercultural competency in addition to language ability by placing instruction in real-world, problem-solving scenarios. Digital technology integration expands PBL's potential and makes it more flexible for use in contemporary learning environments. Future investigations ought to concentrate on empirical studies that gauge how PBL affects communication ability in various language and cultural circumstances.

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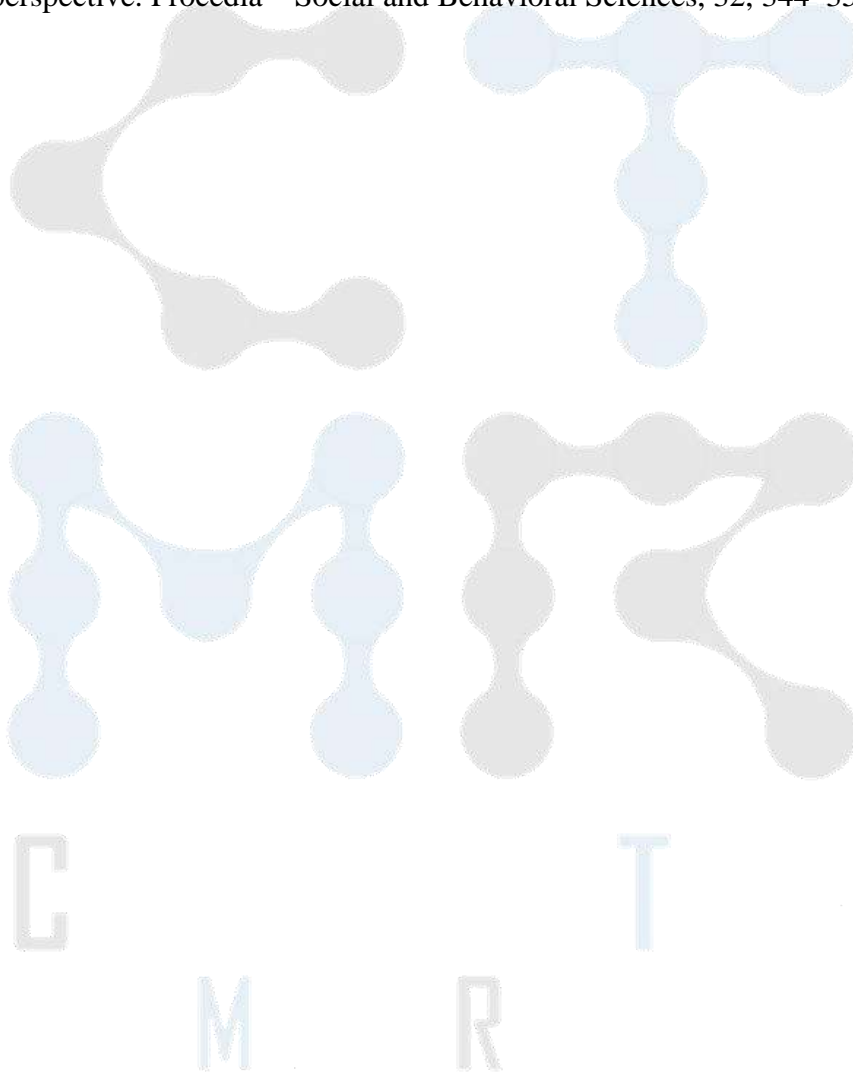
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ОЦЕНКА МАСЛИЧНОСТИ СОРТОВЫХ ОБРАЗЦОВ ПОДСОЛНЕЧНИКА.

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Аннотация . В статье оценены показатели масличности и урожайности семян подсолнечника. Исследования проведены в 2022–2024 гг. в питомнике конкурсного сортоиспытания, установлено варьирование масличности от 35,9 % до 51,3 %. Стандартный сорт «Жахонгир» имел в среднем 44,6 % масла при выходе 1,437 т/га. Наилучший результат показала линия L-2016/23 (50,8 %, 1,803 т/га), наименьший — сорт Саратов-2 (35,9 %, 0,9 т/га). Полученные данные позволяют выделить высокомасличные сорта для использования в селекции.

Annotation. The article evaluates the oil content and yield of sunflower seeds. The research was carried out in 2022–2024 in the competitive variety trial nursery, where oil content varied from 35.9% to 51.3%. The standard variety “Jahongir” averaged 44.6% oil with an oil yield of 1.437 t/ha. The highest result was recorded in line L-2016/23 (50.8%, 1.803 t/ha), while the lowest was in variety Saratov-2 (35.9%, 0.9 t/ha). The findings provide a basis for identifying high-oil varieties for use in breeding programs.

Ключевые слова: подсолнечник, селекция, сорта и образцы, продолжительность вегетационного периода, скороспелость, среднеспелые, позднеспелые, семена

Keywords: sunflower, breeding, varieties and samples, growing season duration, earliness, mid-ripening, late-ripening, seeds

ВВЕДЕНИЕ

В 2023 году в Узбекистане подсолнечник был посеян на общей площади 61,7 тыс. га, из которых 25,7 тыс. га составили основные посевные площади, а 36,0 тыс. га — повторные посевы. С этих площадей в общей сложности было собрано 128 тыс. тонн урожая подсолнечника [6].

Подсолнечник (*Helianthus annuus* L.) относится к семейству Asteraceae (астровые) и был впервые описан К. Линнеем. Согласно современной классификации, данное растение рассматривается как собирательный вид и подразделяется на два отдельных вида: культурный и дикий подсолнечник. Культурный подсолнечник, в свою очередь, на основании морфологических и биологических особенностей разделяется на два подвида: полевой подсолнечник и декоративный подсолнечник [1,2,6].

Подсолнечник занимает одно из ведущих мест в современной отрасли производства растительных масел, так как отличается наибольшей рентабельностью среди масличных культур. В условиях Узбекистана растущий спрос на данную отрасль в основном объясняется созданием селекционным путём сортов и гибридов с высоким содержанием масла в семенах и их хорошей адаптацией к климатическим условиям региона.

Показатель масличности семян подсолнечника — это значение, выраженное в процентах, которое отражает содержание масла в их составе и является одним из основных критериев при оценке качества урожая и его товарной ценности. Чем выше уровень масличности, тем больше количество масла, которое можно получить из семян [3].

Уровень масличности подсолнечника может варьировать в зависимости от сорта и условий его возделывания. В среднем масличность составляет от 40% до 55%, а у высокомасличных сортов может достигать 60%. На данный показатель оказывают влияние ряд факторов: генетические особенности сорта или гибрида, климатические условия в период вегетации, агротехнические приёмы, сроки уборки урожая и условия хранения семян [4].

Высокий спрос на семена подсолнечника в основном объясняется получаемым из этой культуры растительным маслом. В настоящее время подсолнечник является одной из стратегически важных культур, которые не только экономически рентабельны, но и востребованы на рынке. Производимое из его семян растительное масло широко выпускается в мировом масштабе и эффективно используется в различных отраслях.

В ходе исследований содержание масла в семенах подсолнечника определялось с использованием приборов Сокслета и Гронайзера. Комплексный показатель продуктивности изучаемых образцов — масляный урожай — рассчитывался по следующей формуле:

$$S = R \times M \times (100 - v),$$

где:

S – масличный урожай, ц/га (центнеров с гектара);

R – урожайность семян, ц/га;

M – масличность семян, %;

v – стандартная влажность семян, % [5].

Проведённые исследования на опытных делянках конкурсного сортоиспытания позволили более объективно оценить продуктивность изучаемых образцов масличного подсолнечника. Было определено содержание масла в семенах и рассчитан масличный урожай с единицы площади (табл. 1).

В ходе проведённых исследований установлено, что показатели масличности у образцов подсолнечника варьировали в пределах от **35,9% до 51,3%**. Согласно полученным результатам, в питомнике конкурсного сортоиспытания первого года (2022 г.), второго года (2023 г.) и третьего года (2024 г.) содержание масла в семенах изучаемых образцов подсолнечника оценивалось в процентах.

В качестве стандарта был принят сорт «**Жахонгир**», созданный в Научно-исследовательском институте растениеводства Узбекистана. Масличность семян данного сорта составила: в первом году конкурсного испытания – **44,6%**, во втором году – **45,5%**, в третьем году – **43,8%**. По данным лабораторных анализов, средняя масличность стандартного образца составила **44,6%**. Урожай масла с 1 га в первом году испытаний составил **1,291 т/га**, во втором – **1,363 т/га**, в третьем – **1,234 т/га**. В среднем за годы исследований этот показатель достиг **1,437 т/га**.

Наибольшим содержанием масла в семенах по сравнению с контролем отличался образец **L-2016/23** (в среднем **50,8%**, что на **+6%** выше контроля), а выход масла с 1 га составил **1,803 т/га** (на **+0,507 т/га** выше контроля).

Наименьший показатель масличности по сравнению с контролем отмечен у сорта «**Саратов-2**» (в среднем **35,9%**, что на **-9%** ниже контроля), а выход масла с 1 га составил **0,9 т/га** (на **-0,363 т/га** ниже контроля).

Оценка сортовых образцов масличного подсолнечника по показателю выхода масла (Окдарьинский район, 2022–2024 гг.)

t/r	сортовой образец	Урожайность масла, т/га				
		2022- yil	2023 y.	2024 y.	Среднегодовой выход масла	± Отклонение от контроля
1	2					
1	Jahongir (st)	1,291	1,363	1,234	1,296	0,000
2	Donskoy 60	1,528	1,560	1,507	1,532	0,236
3	Заря	1,069	0,952	1,013	1,011	-0,285
4	Pomor	1,463	1,536	1,446	1,482	0,186
5	SF-187	1,552	1,612	1,537	1,567	0,271
6	Buzuluk	1,274	1,270	1,237	1,260	-0,036
7	Avroga	1,052	1,056	1,036	1,048	-0,248
8	Rodnik	1,540	1,598	1,523	1,554	0,258
9	S u r	1,680	1,732	1,575	1,662	0,366
10	Sanbred- 254	1,524	1,607	1,439	1,523	0,227
11	Krasotka	1,312	1,159	1,295	1,255	-0,041
12	AS-504	1,204	1,116	1,176	1,165	-0,131
13	Dukot	1,500	1,583	1,485	1,522	0,226
14	L-2016/23	1,815	1,848	1,746	1,803	0,507
15	Мастер	1,712	1,725	1,690	1,709	0,413
16	Саратов-2	0,909	1,021	0,870	0,933	-0,363
17	L-2015/20	1,813	1,744	1,735	1,764	0,468
18	Россвет	1,535	1,592	1,610	1,579	0,283
19	Енисей	1,319	1,228	1,272	1,273	-0,023
20	K-22-29	1,775	1,846	1,777	1,800	0,504

Заключение

Проведённые исследования в условиях Самаркандской области показали, что содержание масла и урожайность семян подсолнечника значительно варьируют в зависимости от сортовых особенностей и условий выращивания. В опытах уровень масличности находился в пределах 35,9–51,3 %. В качестве стандарта сорт **Жахонгир** проявил 44,6 % масличности и выход масла 1,437 т/га. Наиболее высокий результат был отмечен у образца **L-2016/23** (50,8 %, 1,803 т/га), а наименьший показатель — у сорта **Саратов-2** (35,9 %, 0,9 т/га).

Полученные результаты свидетельствуют о наличии возможностей для выявления и использования в селекции высокомасличных сортов и образцов подсолнечника в условиях Самаркандской области. В частности, образец **L-2016/23** благодаря высокому уровню масличности и урожайности может быть рекомендован как перспективный селекционный материал.

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GEOSIYOSIY HAMKORLIK: O‘ZBEKISTON VA OZARBAYJONNING MARKAZIY OSIYO VA JANUBIY KAVKAZ MINTAQALARIDAGI O‘RNI

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Annotatsiya: Ushbu maqolada O‘zbekiston va Ozarbayjon o‘rtasidagi geosiyosiy hamkorlikning hozirgi bosqichi hamda uning Markaziy Osiyo va Janubiy Kavkaz mintaqalarida tutgan o‘rni tahlil qilinadi. Energetika, transport-logistika, madaniy va diplomatik aloqalar ikki davlat o‘rtasidagi strategik sheriklikni mustahkamlab, ularni mintaqaviy barqarorlik va taraqqiyotning muhim ishtirokchisiga aylantirmoqda. Shuningdek, ikki mamlakatning xalqaro tashkilotlardagi hamkorligi va mintaqaviy xavfsizlikka qo‘shgan hissasi ham alohida yoritilgan.

Kalit so‘zlar: O‘zbekiston, Ozarbayjon, geosiyosiy hamkorlik, Markaziy Osiyo, Janubiy Kavkaz, energetika, transport-logistika, xavfsizlik, diplomatiya, barqarorlik.

Kirish

So‘nggi yillarda Markaziy Osiyo va Janubiy Kavkaz mintaqalari xalqaro geosiyosiy jarayonlarda strategik ahamiyat kasb etmoqda. Bu hududlar Sharq va G‘arbni, Shimol va Janubni bog‘lovchi geoiqtisodiy va geosiyosiy “ko‘prik” vazifasini bajaradi. Shu bois, O‘zbekiston va Ozarbayjonning mintaqaviy va global jarayonlardagi roli tobora ortib bormoqda. O‘zbekiston – Markaziy Osiyoning markazida joylashgan, yirik iqtisodiy salohiyatga ega davlat sifatida; Ozarbayjon esa – Janubiy Kavkazning siyosiy va energetik markazlaridan biri bo‘lib, Xazar dengizi neft-gaz resurslari orqali jahon bozorida muhim o‘rin egallaydi. Ikki mamlakatning tarixiy, madaniy va iqtisodiy yaqinligi ularning bugungi geosiyosiy hamkorligini yanada mustahkamlamoqda.

Asosiy qism

O‘zbekiston va Ozarbayjon o‘rtasidagi siyosiy-diplomatik hamkorlik so‘nggi yillarda strategik darajaga ko‘tarilib, ikki davlat BMT, YXHT, ECO, TDT kabi xalqaro va mintaqaviy tashkilotlar doirasida faol hamkorlik qilmoqda. O‘zbekiston muntazam ravishda Ozarbayjonning hududiy yaxlitligini qo‘llab-quvvatlab kelayotgan bo‘lsa, Ozarbayjon o‘z navbatida O‘zbekistonning mintaqaviy barqarorlikni mustahkamlash, transport va logistika infratuzilmasini rivojlantirishga qaratilgan tashabbuslarini qo‘llab-quvvatlamogda. Hamkorlikning muhim yo‘nalishlaridan biri energetika sohasidir: Ozarbayjonning Xazar neft-gaz resurslari va O‘zbekistonning tabiiy gaz salohiyati ikki tomonlama manfaatlarni birlashtirib, mintaqaviy energetika xavfsizligini ta‘minlashga xizmat qilmoqda. Shu bilan birga, qayta tiklanuvchi energiya manbalari, jumladan, quyosh va shamol energetikasi bo‘yicha hamkorlik kelishuvlari ham imzolangan bo‘lib, bu ikki davlatning ekologik tashabbuslarda ham faol ishtirokini ta‘minlaydi. Transport-logistika sohasidagi aloqalar ham alohida ahamiyat kasb etadi. Trans-Kaspiy xalqaro transport yo‘lagi O‘zbekiston uchun Yevropa bozorlariga chiqish imkonini yaratmoqda, Toshkent–Boku multimodal tashuvlari va Xitoy–Qirg‘iziston–O‘zbekiston temir yo‘li loyihasi esa mintaqaviy iqtisodiy bog‘liqlikni kuchaytirib, ikki davlatning geosiyosiy ahamiyatini yanada oshirmoqda. Xavfsizlik sohasida hamkorlik terrorism, diniy ekstremizm va transmilliy jinoyatlarga qarshi

kurashda yaqqol ko'zga tashlanmoqda. Shu bilan birga, harbiy-texnik sohada hamkorlikning rivojlanishi mintaqada barqarorlikni mustahkamlashga xizmat qilmoqda. Madaniy-gumanitar aloqalar esa ikki xalqning umumiy turkiy ildizlari va qadriyatlari asosida rivojlanib, TURKSOY doirasida muntazam madaniy almashinuvlar, ilmiy hamkorlik va ta'limiy dasturlar orqali mustahkamlanmoqda. Toshkent va Bokuda madaniyat markazlarining faoliyati xalqlar o'rtasidagi do'stlik rishtalarini yanada mustahkamlamoqda. Shuningdek, xalqaro tashkilotlarda o'zaro nomzodlarni qo'llab-quvvatlash orqali ikki davlat nafaqat o'z mavqeini, balki mintaqaviy va global miqyosda ham ta'sirini kuchaytirmoqda.

Geosiyosiy ahamiyat

O'zbekiston va Ozarbayjon o'rtasidagi geosiyosiy hamkorlik nafaqat ikki tomonlama darajada, balki keng mintaqaviy miqyosda ham alohida ahamiyat kasb etadi. Markaziy Osiyo va Janubiy Kavkazning kesishgan nuqtalarida joylashgan ushbu ikki davlat Sharq va G'arb, Shimol va Janub o'rtasidagi transport va energetika yo'laklarining muhim bo'g'ini hisoblanadi. O'zbekiston – Markaziy Osiyodagi yirik iqtisodiy va siyosiy salohiyatga ega mamlakat sifatida, Ozarbayjon esa – Janubiy Kavkazning energetika resurslari va transport-logistika imkoniyatlari bilan ajralib turadi. Ularning o'zaro hamkorligi Yevropa Ittifoqi, Turkiya, Rossiya va Xitoy kabi yirik geosiyosiy markazlar uchun ham strategik ahamiyatga ega. Ayniqsa, Xitoyning “Bir kamar – bir yo'l” tashabbusi doirasida O'zbekiston va Ozarbayjonning ishtiroki mazkur loyihaning muvaffaqiyati uchun hal qiluvchi omillardan biri bo'lib xizmat qiladi. Shunday qilib, ikki mamlakat o'rtasidagi geosiyosiy hamkorlik siyosiy-diplomatik, energetika, transport-logistika, xavfsizlik, madaniy va xalqaro hamkorlik sohalarini qamrab olgan holda, ularni nafaqat mintaqaviy, balki global miqyosda ham muhim ishtirokchilarga aylantirmoqda.

Xulosa qilib aytganda, O'zbekiston va Ozarbayjon o'rtasidagi hamkorlik bugungi kunda mintaqaviy barqarorlik, transport-logistika va energetika xavfsizligini ta'minlashda hal qiluvchi o'rin tutmoqda. Ikki mamlakat o'zaro aloqalarini nafaqat ikki tomonlama, balki keng mintaqaviy kontekstda ham samarali yo'lga qo'ygan. Kelajakda Trans-Kaspiy transport yo'lagi, energetika loyihalari va madaniy hamkorlik ikki davlatni yanada yaqinlashtiradi. Shu tariqa, O'zbekiston va Ozarbayjon Markaziy Osiyo va Janubiy Kavkazda barqarorlik va taraqqiyotning asosiy kafolatlaridan biriga aylanmoqda.

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FUNCTIONAL FEATURES OF MATERIAL SCIENCE TERMINOLOGY IN
ENGLISH AND UZBEK LANGUAGES

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ABSTRACT

This article explores the functional features of terminology in the field of material science in both English and Uzbek languages. Material science terminology serves not only as a linguistic tool but also as a means of knowledge transfer in academic, industrial, and research contexts. The study highlights semantic, structural, and functional aspects of terms, emphasizing the challenges of translation, adaptation, and standardization in a bilingual environment.

Keywords: Material science, terminology, functional features, linguistic tool, transfer.

1. Introduction

Material science is a multidisciplinary field involving the study of metals, polymers, ceramics, composites, and nanomaterials. Accurate and precise terminology is critical for effective communication among scientists, engineers, and students. In bilingual contexts, such as in Uzbekistan, terminology functions as a bridge between English-language academic literature and Uzbek technical practice.

The aim of this study is to investigate the functional features of material science terminology in English and Uzbek, focusing on how terms convey meaning, structure, and usability in educational, research, and industrial contexts.

2. Literature Review

Numerous scholars have examined the development and functional aspects of scientific terminology. For instance, Crystal (2008) emphasizes the role of terminology in knowledge dissemination, while Mel'čuk (2006) focuses on structural-semantic properties of technical terms. In the Uzbek context, studies by Normurodov (2014) and Yusupova (2019) analyze the adaptation of English material science terms in Uzbek textbooks and technical manuals.

Key functional aspects highlighted in literature include:

1. Denotative Function – ensuring each term corresponds to a specific material or process.
2. Cognitive Function – facilitating comprehension and memory in educational contexts.
3. Communicative Function – enabling precise communication between experts.
4. Pragmatic Function – supporting practical application in industrial or laboratory settings.

These studies provide a theoretical basis for analyzing bilingual material science terminology.

3. Methodology

This study employs a descriptive-analytical approach. A corpus of 150 material science terms in English and Uzbek was compiled from textbooks, research articles, and industrial manuals.

Steps included:

1. Term Selection – terms related to metals, ceramics, polymers, composites, and nanomaterials were selected.
2. Translation Analysis – English terms were compared with their Uzbek equivalents to identify semantic equivalence, calques, and loanwords.

3. Functional Analysis – terms were analyzed according to denotative, cognitive, communicative, and pragmatic functions.

4. Structural Analysis – morphological and syntactic structures were examined to understand adaptability between languages.

4. Results and Discussion

4.1 Semantic Features

- Most English material science terms are monosemantic (e.g., polymer, ceramic), but some exhibit polysemy (alloy may refer to mixture or metaphorically to combination).
- Uzbek equivalents often involve calques or borrowed forms (e.g., polimer from polymer, keramika from ceramic).

4.2 Structural Features

- English terms often use compound nouns (cubic boron nitride, glass-ceramic).
- Uzbek terminology adapts via suffixes and affixation (kubik boron nitridi, shishakeramika).

4.3 Functional Features

- Denotative: Each term clearly identifies a material or process, minimizing ambiguity.
- Cognitive: Terms in both languages support memorization through morphological transparency (polikaproamid clearly derives from caprolactam).
- Communicative: Bilingual professionals can exchange knowledge effectively using shared terminology.
- Pragmatic: Terms guide practical work in laboratories, industrial production, and research.

4.4 Challenges in Translation

- Some English terms have no exact Uzbek equivalents, leading to loanwords or descriptive translations.
- Technical accuracy must be balanced with understandability for students and engineers.

5. Conclusion

Material science terminology in English and Uzbek exhibits distinct functional features that ensure clarity, precision, and usability in academic, research, and industrial contexts. While English terms often maintain compact, compound structures, Uzbek equivalents may involve descriptive translations or calques. Understanding these functional features is essential for effective bilingual communication, terminology standardization, and the development of educational materials.

Future research should focus on creating standardized bilingual glossaries, exploring terminology evolution in emerging fields such as nanotechnology, and developing digital tools for automated translation and semantic verification.

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**CLINICAL SCALES (APACHE II, SAPS II) AND IPORP IN PREDICTING
COMPLICATED COURSE OF PERITONITIS****Rakhimov Oybek Umarovich** dr.oybek1984@gmail.com<https://orcid.org/0000-0003-3569-6688>*Tashkent State Medical University*

Annotation. The inclusion of the IPORP clinical and immunological scale in practice has made it possible to more differentiatedly assess the degree of immunopathological risk, form personalized forecasts and, on this basis, build individualized immunoprophylaxis schemes.

Keywords: apache II, saps II, generalized peritonitis.

Relevance. Generalized peritonitis (GP) remains one of the most complex, life-threatening and urgent problems of abdominal surgery. Despite significant advances in modern surgical practice, the introduction of improved surgical techniques, intensive care, widespread use of the latest generation of antibacterial drugs and the development of resuscitation technologies, mortality rates for this disease remain high and range from 20 to 40% in different clinics (1,2,4,7,8,9,10). The key reason for unsatisfactory outcomes is considered to be not only the severity of the inflammatory process, but also the high probability of developing a complicated course. Therapeutic approaches, which in most cases are based primarily on the use of systemic antibacterial therapy, do not always allow achieving the expected clinical result. (3,11,12,13,14,15).

The use of complex programs helps to improve both immediate and remote treatment results, increases the effectiveness of recovery processes and reduces the risk of developing a protracted septic condition. All this is reflected in a reliable decrease in postoperative mortality rates and an improvement in the overall survival of patients in this severe category, which confirms the relevance of using such treatment strategies in modern abdominal surgery (3,5,6).

Generalized peritonitis is an extremely severe and potentially life-threatening disease, which in most cases develops acutely and requires the earliest possible diagnosis in combination with immediate initiation of intensive treatment.

In modern scientific literature, the importance of the body's immunological reactivity as one of the key factors determining outcomes in generalized peritonitis is increasingly being discussed. It has been established that a pronounced imbalance in the cellular and humoral immunity system not only intensifies the pathological

process, but also directly contributes to the progression of the systemic inflammatory response, which ultimately leads to the formation of a complicated course of the disease and a worsening prognosis. Despite numerous studies aimed at finding predictors of an unfavorable outcome, today in clinical practice there is still no single, universal and reliable method for stratifying the risk of complicated course in patients with widespread peritonitis, which determines the relevance of searching for new approaches in this area.

Objective: To develop a comprehensive approach to predicting complicated course of disseminated peritonitis based on the assessment of the body's immunological reactivity and the use of validated clinical scales, which will improve the effectiveness of treatment tactics and reduce mortality rates.

Materials and methods of the study. The study was conducted in 2021–2025 in a surgical department and was aimed at a comprehensive assessment of the capabilities of modern prognostic scales in the treatment of widespread peritonitis of various etiologies. The analysis included 118 patients who underwent emergency surgeries for peritonitis that developed as a complication of perforation of hollow organs, destructive forms of acute appendicitis, strangulated hernias, as well as cholelithiasis and other inflammatory and destructive processes in the abdominal cavity. In accordance with the objectives, the clinical observations were divided into two groups that differed in the principles of postoperative management. The control group consisted of 58 (49.15%) patients treated in 2021–2022, who received standard intensive care without the use of additional prognostic models and immunotropic interventions. The main group consisted of 60 (50.85%) patients operated in 2023–2025, in whom the developed IPORP clinical and immunological scale was integrated into the treatment and diagnostic algorithm.

In the main group, the use of IPORP allowed not only to carry out individualized prediction of the risk of complicated course, but also to make timely adjustments to intensive care, including targeted correction of identified immune disorders, optimization of antibacterial therapy, and prevention of septic complications. Such division of groups provided the possibility of an objective comparative analysis of the effectiveness of various approaches and provided grounds for subsequent statistical processing of the obtained results. All biological material was collected on the first day after surgery, strictly observing the "cold chain" principle, which excluded the degradation of protein structures and ensured high reproducibility of the obtained results.

Results of the study and their discussion. The most pronounced correlations were found for T-lymphocytes. The absolute number of CD4+ T-helpers showed the maximum inverse relationship ($r=-0.741$; $p<0.001$), and their percentage had

similar dynamics ($r=-0.717$; $p<0.001$). This confirms their key role in inflammation control. CD3+ in absolute values also strongly correlated with the severity of the condition ($r=-0.692$; $p<0.001$), while the percentage of CD3+ demonstrated a moderate but reliable relationship ($r=-0.684$; $p<0.001$), indicating suppression of the effector link of cellular immunity. The CD4+/CD8+ ratio turned out to be a prognostic indicator ($r=-0.553$; $p<0.001$), reflecting the imbalance of regulation. CD16+CD56+ (NK cells) decreased both in absolute ($r=-0.624$; $p<0.001$) and percentage values ($r=-0.609$; $p<0.001$), confirming their importance in preventing complications. The absolute number of CD8+ T-suppressors had a less pronounced but significant correlation ($r=-0.391$; $p=0.017$).

In general, cellular immunity parameters, especially CD4+, CD3+ and NK cells, have high prognostic significance and can be used for early stratification of the risk of complicated POP.

Thus, CD4+, CD3+ and NK cells have the greatest prognostic significance in RP. Correlation analysis of the humoral component of immunity showed a significant decrease in the main classes of immunoglobulins with the worsening condition of patients with RP. The most pronounced dependence is for the IgA \times IgM / IgG index ($r = -0.651$; $p <0.001$), reflecting the balance of primary and secondary antibodies. Its decrease is associated with a complicated and especially lethal course, when the levels of IgA and IgM decrease and their ratio with IgG is disrupted, which indicates the exhaustion of the humoral response.

IgM ($r=-0.523$; $p=0.001$) and IgA ($r=-0.494$; $p=0.002$) also showed reliable negative correlations, indicating a deficiency in the formation of the primary immune response in the early stages of POP. The IgG level decreased less significantly ($r=-0.382$; $p=0.019$), which may be associated with both a decrease in production and increased consumption during massive antigen stimulation.

The dynamics of CIC turned out to be interesting: their level increased proportionally to the severity of the clinical picture ($r=0.584$; $p<0.001$), which confirms the participation of immune complexes in the development of secondary inflammatory and vascular damage, including PON.

The levels of pro- and anti-inflammatory cytokines are closely related to the severity of POP. The main marker was IL-6 ($r=0.712$; $p<0.001$), confirming its role in systemic inflammation and SIRS progression. Its growth was accompanied by an increase in IL-10, which reflects compensatory inhibition of the immune response ($r=0.655$; $p<0.001$), consistent with R.S. Hotchkiss's hypothesis on the development of "immune paralysis" in the late phases of inflammation.

TNF- α is also a significant mediator ($r=0.682$; $p<0.001$), associated with severe forms of systemic destabilization, including SS. IFN- γ showed a moderate positive

correlation ($r=0.489$; $p=0.003$): its growth accompanied the worsening of the condition, but remained below the levels of IL-6 and TNF- α , indicating an imbalance of effector and regulatory links. In the course of the study, based on a set of identified immunological markers, clinical characteristics, as well as calculated logistic regression coefficients and ROC analysis data, an original clinical and immunological scale "IPORP" (Immunological Prediction of Risk in Peritonitis) was developed. This tool is designed to assess the likelihood of complicated course of widespread peritonitis and is built on a multi-level scoring system.

The scale structure included nine indicators, each of which was confirmed not only for statistical significance, but also for pathophysiological validity. The threshold values determined using ROC analysis allowed us to establish risk stratification intervals. For quantitative variables, including the level of CD4+ T-lymphocytes, NK cell activity, concentrations of interleukins IL-6 and IL-10, the level of IgM and circulating immune complexes (CIC), ranges corresponding to clinically significant boundaries were identified. Qualitative parameters, such as the stage of peritonitis, the nature of the exudate in the abdominal cavity and the presence of a prolonged systemic inflammatory response (SIRS), were assessed by fixed values.

The final scale is presented as a table containing 9 rows with a description of the variables and 4 columns corresponding to the risk levels. The maximum possible total score is 45, which creates a wide and convenient range for individual stratification of patients and predicting their outcomes. Based on the total number of points scored, patients were divided into three levels of risk of developing an unfavorable course. The first category included individuals with a low risk (≤ 9 points), which reflected only minimal deviations in immunological parameters without signs of systemic dysfunction. The second group included patients with a high risk (10–19 points), who had moderate manifestations of immunosuppression in combination with activation of the cytokine cascade. The most severe, critical category (≥ 20 points) was characterized by severe immunosuppression, hypercytokinemia, and clinical signs of the terminal stage of widespread peritonitis. A comparative analysis showed that the use of the proposed IPORP model allowed us to correctly predict the complicated course of the disease in 47 patients, which amounted to 57.3%. At the same time, 7 false positive cases were recorded (14.3%), when patients with a favorable outcome were mistakenly included in the high-risk group. There were 11 true negative results (26.2%), and the number of false negatives reached 35 (42.7%). The latter fact indicates that in almost half of the patients who developed complications, signs of immunosuppression and cytokine destabilization were manifested only in a weak form or became obvious only at later stages of the disease.

Comparison of the obtained data with literary sources demonstrated that previously proposed universal prognostic scales (APACHE II, SAPS II) are significantly less informative in relation to complicated peritonitis. The main reason is that these scales are focused mainly on the general somatic condition of the patient and do not take into account his immunological status.

The inclusion of the IPORP clinical and immunological scale in practice allowed for a more differentiated assessment of the degree of immunopathological risk, the formation of personalized forecasts and, on this basis, the construction of individualized immunoprophylaxis schemes. This approach determines both the scientific novelty and the clinical significance of the study.

Based on the obtained results, it is advisable to recommend that all patients with widespread peritonitis undergo express immunological examination already on the first day after surgery. The use of this method in combination with traditional clinical scales (APACHE II, SAPS II) increases the accuracy of risk stratification, allows for the timely identification of patients with an unfavorable prognosis and provides the possibility of more targeted preventive and therapeutic measures.

CONCLUSIONS:

1. The inclusion of the IPORP clinical and immunological scale in practice has made it possible to more differentiatedly assess the degree of immunopathological risk, form personalized forecasts and, on this basis, build individualized immunoprophylaxis schemes.
2. Based on the results obtained, it is advisable to recommend that all patients with widespread peritonitis undergo express immunological examination already on the first day after surgery. The use of this method in combination with traditional clinical scales (APACHE II, SAPS II) increases the accuracy of risk stratification, allows timely identification of patients with an unfavorable prognosis and provides the possibility of more targeted preventive and therapeutic measures.

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THE ADVANTAGES AND DISADVANTAGES OF LEARNING ENGLISH THROUGH
ONLINE EDUCATION

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Annotation: This article discusses the advantages and disadvantages of learning English through online education in the modern digital era. It highlights the flexibility, affordability, and diverse resources that make online learning attractive to students worldwide. At the same time, it examines the challenges such as lack of face-to-face interaction, dependence on technology, limited cultural immersion, and the need for self-discipline. The article concludes that the most effective approach may be a blended learning model, which combines the benefits of online platforms with traditional methods of language learning.

Keywords: English language learning; online education; advantages; disadvantages; flexibility; self-discipline; technology; cultural immersion; blended learning

Introduction. In the twenty-first century, English has become more than just a language; it is a global tool for communication in almost every sphere of life, including education, business, technology, and culture. For millions of learners across the world, gaining proficiency in English is not only an academic goal but also a necessity for personal and professional growth. With the rapid development of technology and the internet, online education has emerged as a powerful alternative to traditional classroom learning. Learning English online offers several advantages, but at the same time, it comes with its own set of challenges.

Advantages of Learning English Online. One of the most significant advantages of online English learning is flexibility. Students can choose their own study schedules according to their availability, which makes it suitable for people who have jobs, family responsibilities, or other commitments. Unlike traditional classroom settings, online courses do not require commuting, which saves both time and money. Learners can access lessons from home, the office, or even while traveling.

Online education provides access to an enormous amount of learning resources. Students can watch video tutorials, listen to podcasts, use mobile applications, and practice with interactive exercises. Many platforms also provide live classes with native speakers, which allow learners to improve their listening and speaking skills in real-time. This variety of resources makes the learning process engaging, dynamic, and suitable for different learning styles.

Another important advantage is that online education is often more affordable than traditional language courses. Many websites and applications offer free lessons, while paid courses are usually cheaper than attending physical language centers. This makes English learning available to people from different financial backgrounds. Furthermore, online education breaks geographical barriers, giving students in remote areas the opportunity to study English without having to travel abroad or to large cities.

Online platforms usually allow students to progress at their own pace. Learners can repeat difficult lessons as many times as needed, skip familiar topics, and focus on their weaknesses. Some platforms also use artificial intelligence to track progress and suggest exercises based on the

student's level. This personalized approach is often more effective than traditional classroom teaching, where the pace of learning is fixed for all students.

Disadvantages of Learning English Online. Despite its many benefits, online learning often lacks direct human interaction. In traditional classrooms, students can communicate with teachers and classmates in person, ask questions immediately, and engage in group discussions. These activities not only improve language skills but also boost confidence. Online learners may miss out on this real-life practice and sometimes feel isolated.

Online learning demands a high level of self-motivation and discipline. Since there are no strict schedules or physical teachers to monitor students, many learners struggle to stay consistent. Some may postpone lessons, lose motivation, or even drop out of courses entirely. Without strong willpower and organization, online education can become less effective.

Another disadvantage is the heavy dependence on technology. Online education requires a stable internet connection, a computer or smartphone, and sometimes specific software. In countries or regions where internet access is limited or expensive, this becomes a serious obstacle. Moreover, technical issues such as slow connections, software bugs, or device problems can interrupt the learning process and reduce efficiency.

Learning a language is not only about grammar and vocabulary; it is also about understanding the culture. Traditional language learning environments, such as studying abroad or attending classes with people from different backgrounds, provide cultural experiences that enrich learning. Online courses may provide cultural information, but they cannot fully replace real-life exposure to English-speaking environments.

Conclusion. To conclude, learning English through online education is a modern and effective approach that offers flexibility, affordability, and a wide range of resources. It is especially beneficial for people who cannot attend traditional classes due to time, financial, or geographical limitations. However, it also has its drawbacks, including the lack of direct interaction, the need for strong self-discipline, dependence on technology, and limited cultural immersion.

Therefore, the best solution might be a blended approach, where students combine online resources with real-life practice. By doing so, learners can take advantage of technology while still developing their communication skills and cultural understanding in natural settings. Ultimately, the success of learning English – whether online or offline – depends not only on the method but also on the learner's dedication, consistency, and willingness to practice.

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C M R T

**ANALYSIS OF WORKING CONDITIONS IN DESIGNING SPECIAL CLOTHING
FOR WORKERS IN MANUFACTURING ENTERPRISES**

Sh.L. Mamasolieva, M.K. Rasulova, G.N. Norboeva

Workers of manufacturing enterprises encounter hazardous and harmful production factors during their work process. The classification of harmful and hazardous production factors by professions is carried out in accordance with State Standard 12.0.003-2015 [1].

When developing special clothing with ergonomic, aesthetic, and protective properties for workers of manufacturing enterprises, it is important to enhance the effectiveness of personal protection, meet occupational safety requirements, and ensure comfortable movement of the worker under operational conditions. This, in turn, helps achieve high labor productivity.

Among the hazardous and harmful factors negatively affecting the health of workers in automotive plant workshops are:

- the level of noise and vibration in the working area,
- dustiness of the air,
- the presence of harmful substances in the workplace air (carbon monoxide, nitrogen oxides),
- microclimate conditions (intensity of heat radiation from heated parts),
- sparks generated during the welding of metals,
- exposure to toxic substances in paints,
- and the physical strain of the work process.

The analysis of working conditions in this study was conducted in the workshops of the “SamAuto” automobile plant, where the system of physical-mechanical and chemical hazardous and harmful production factors was determined (Figure 1).

According to the requirements of State Standard 12.0.003-2015, working conditions are classified into four classes [1]. Based on this classification, the factors of the production environment and their impact on the health and performance of workers in the automobile plant can be categorized as follows:

- in the preparation workshop, where mainly fitters, turners, and milling machine operators work, workers are exposed to factors such as dust generated during cutting of raw materials (metal sheets), high temperature on the surface of metal and equipment, and the heaviness of the labor process. High temperatures on material or equipment surfaces can cause heat shock and burns, lead to significant heat loads on the body, disturb water balance, and increase blood pressure.

- in the welding workshop, where primarily welders work, workers are affected by high noise levels from welding equipment, elevated temperature of the equipment and materials being welded, flying sparks, as well as the risks of heat shock and burns.

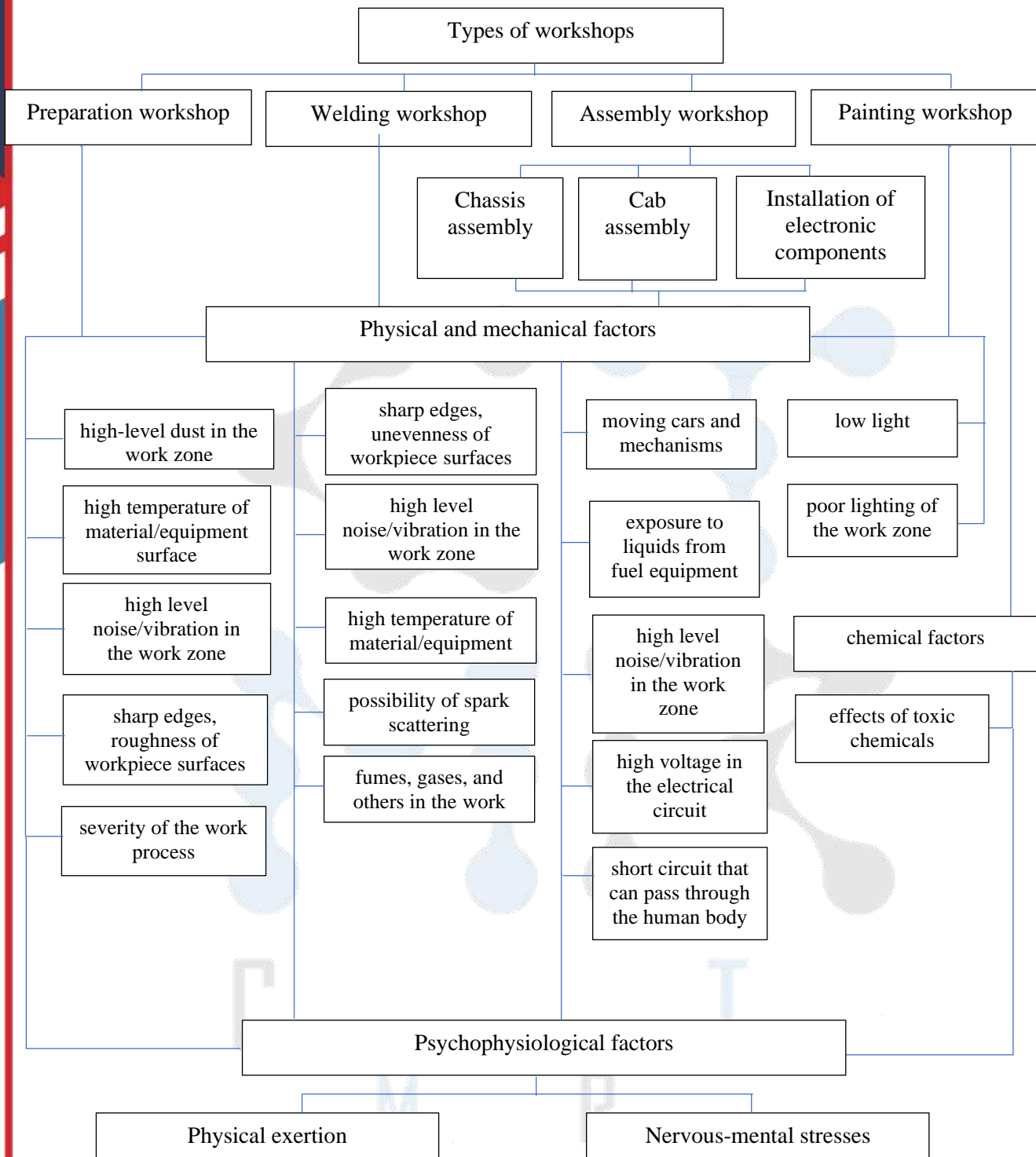


Figure 1. Classification of Hazardous and Harmful Production Factors in the Automotive Industry Production Environment

- in the chassis and cab assembly workshops, fitters performing mechanical operations are engaged. They are exposed to hazards from moving machines and mechanisms, high noise levels from equipment, and elevated surface temperatures of the equipment. In addition, factors such as the heaviness of labor-lifting or pushing heavy objects, prolonged standing and bending during the shift-are significant.

- in the workshop for installing automotive electrical and electronic components, workers of the electrician profession are mainly employed. They are exposed to risks such as high voltage in the electric circuit, possible short circuits passing through the human body, and moving machine parts.

- in the automobile body painting workshop, painters work under exposure to hazardous chemicals, such as dimethylbenzene and butyl acetate contained in paints, aggressive environments, acids, toxic gases, organic compounds, as well as insufficient lighting conditions in the workplace.

In all of the above workshops, factors such as high surface temperatures of equipment and materials and the heaviness of the work process lead to overheating of the worker's body, resulting in intensive perspiration. Therefore, these factors highlight the importance of the hygienic indicators of special clothing.

One of the most significant factors influencing the worker's body and performance is the microclimate (meteorological conditions) in the production facilities, which refers to the internal environmental conditions affecting heat exchange between workers and their surroundings. These conditions are determined by the combination of temperature, relative humidity, air velocity, surface temperatures of surrounding objects, and the intensity of heat radiation (infrared). Although the parameters of the microclimate in production facilities can fluctuate, the human body temperature remains constant ($36.6\text{ }^{\circ}\text{C}$) due to its thermoregulatory capability to maintain heat balance with the environment [2].

The lower the air temperature and its velocity, the more heat is transferred from the human body through radiation. At higher temperatures, a significant portion of body heat is lost through evaporation of sweat [3].

When designing special clothing for high-temperature environments, it is essential to quantitatively assess the intensity of sweat secretion. Under the same conditions, a person perspires more easily and more intensely in summer than in winter. Moreover, the intensity of perspiration depends on the body's adaptation to climatic conditions. For instance, at an ambient temperature of $35\text{ }^{\circ}\text{C}$, the amount of sweat secreted from the skin surface can reach $52 \cdot 10^{-6}\text{ kg/sec}\cdot\text{m}^2$, whereas at $45\text{ }^{\circ}\text{C}$, it can reach up to $101.8 \cdot 10^{-6}\text{ kg/sec}\cdot\text{m}^2$ [4].

Microclimate parameters are interrelated. For example, at high air temperatures, air velocity tends to increase, whereas at high relative humidity, air temperature tends to decrease. Under conditions of no air movement, the following temperature-relative humidity ratios affect the human body similarly:

- $17.7\text{ }^{\circ}\text{C} - 100\%$
- $18.3\text{ }^{\circ}\text{C} - 90\%$
- $20.7\text{ }^{\circ}\text{C} - 50\%$
- $22\text{ }^{\circ}\text{C} - 0\%$

The body's adaptability to meteorological conditions is significant but not unlimited. The upper threshold of thermoregulation for a resting person is considered to be $30\text{-}31\text{ }^{\circ}\text{C}$. Under heavy work, heat balance is maintained by thermoregulatory functions of the body at $25\text{-}26\text{ }^{\circ}\text{C}$ (relative humidity 40-60%) [5].

Thus, for a person to feel thermally comfortable, temperature, relative humidity, and air velocity must be in certain proportion.

In production facilities, at an air temperature of $35\text{ }^{\circ}\text{C}$, air movement facilitates increased heat transfer from the body. As the temperature rises, moving hot air begins to transfer its heat to the

human body, causing heating. At low temperatures, moving air causes body cooling. Sudden changes in indoor temperature, such as drafts of cold air, significantly disrupt thermoregulation in winter and lead to colds [4].

The analysis of labor activity in production facilities primarily indicates the need for special clothing that meets hygiene requirements [6-7-8]. When designing special clothing for workers in production facilities, it is advisable to take into account factors such as relative humidity and air temperature and to use fabrics with high hygienic properties. Additionally, modifying the clothing design to suit climatic conditions serves as an effective solution to the problem [9-10-11].

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JADID ADABIYOTI NAMOYANDALARI IJODIDA BADIYY IFODANING LIRIK
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Annotatsiya: Maqolada jadid adabiyoti namoyandalari ijodida Alisher Navoiy an'analari o'rganilgan, Navoiy an'analari masalasiga chuqur yondoshish, uni jadid adabiyoti namoyandasi Hamza Hakimzoda Niyoziy ijodidan topib, Navoiy g'azallariga bog'langan naziralar misollar asosida tahlil qilingan.

Kalit so'zlar: jadid, ilm, nazira, mumtoz, adabiy an'ana o'xshatman, fikr, mehr.

Аннотация: В статье исследуются традиции Алишера Навои в творчестве джадидских литературных деятелей, анализируется глубокий подход к проблеме Навоийской традиции, найденный им в творчестве джадидского литературного деятеля Хамзы Хакимзаде Ниязи, на примерах, связанных с Навоийскими газетами.

Ключевая слова: Джадид, наука, Назира, классика, литературная традиция, мысль, доброта.

Abstract: The article explores the traditions of Alisher Navoi in the work of the Jadid literature exponent, takes a deep approach to the issue of Navoi traditions, finds it from the work of the jadid literature exponent Hamza Hakimzoda Niyazi and analyzes the Nazira attached to the ghazals of Navoi on the basis of examples.

Keywords: Jadid, science, nazira, classical, literary tradition liken, thought, kindness.

O'zbek mumtoz adabiyotida Navoiy an'alarini o'zida yaqqol ifodalovchi materiallardan yana biri naziralardir. Ma'lum bir shoirning asariga o'xshatma tarzida (vazni, qofiyasi, radifi saqlangan holda) yozilgan naziralar Sharq poeziyasiga xos odat bo'lib, u qadim vaqtlardan beri mavjuddir. Naziri, odatda, o'tmishning atoqli shoirlari asariga nisbatan yozilar va javob aytish, kuch sinab ko'rish, ijodiy musobaqa qilish mazmunini anglatar edi.

Sharq adabiyoti tarixi bilan chuqur tanish bo'lgan professor Ye. E. Bertels o'zining Nizomiy, Navoiy, Jomiy haqidagi monografiyalarida va boshqa asarlarida Sharq adabiyotida keng qo'llangan nazira usuli haqida anchagina mulohazalarini bayon etadi. E. Bertelsning fikriga ko'ra nazira oddiy taqlidchilikdan iborat bo'lmay, uning uchun ijodiy element xarakterlidir. "... Nazirani taqlid deb qarash to'g'ri bo'lmaydi-deb yozadi E. Bertels, -chunki bu hodisaning asl mohiyati taqlidchilikda emas, balki shoir tomonidan mavzuga kiritilgan yangilikdir"¹.

Xullas nazira va taxmis usuli XV asrda qanday qoidalar asosida tug'ilgan bo'lsa, XX asrda ham shunday xususiyatlarga ega edi. Shuning uchun adabiyotimiz taraqqiyotining keying davrklarida ham, mumtoz davrlarda bo'lgani kabi, nazira yozish va muxammas bog'lash ishi oddiy

¹ Е. Э. Бертельс. Роман об Александре. М.-Л., 1948, стр. 115.

taqlidchilik ishi emas, balki o`da ijodiy unsurlarni aks ettirishi lozim bo`lgan adabiy usul hisoblanadi. Jadid shoirlar o`z ijodlarida mumtoz adabiyotdan qolgan bu an`anani o`zining tarixiy davr mazmuni bilan boyitib, uni muvofaqqiyat bilan davom ettirdilar.

Bundan tashqari Navoiy g`azallarining radiflarini takrorlab, g`azallar yaratganlar. Navoiyning “Judo” radifli g`azali:

Ne navo soz aylagay bulbul gulistondin judo,
Aylamas to`ti takallum² shakkaristondin judo³.

Jadid adabiyoti vakili Hamza Hakimzoda Niyoziy ham “Judo” radifli g`azalini yozadi:

Bu na yanglig` mojarodur husni xubondin judo,
Ma`shuqi ushshoqdan ushshoqi jonondin judo.

Gul tikonidin, Zulayxo Yusufi mahro`ydan,
Zor Majnun Laylidan, bulbul guklistondan judo⁴.

Navoiy g`azalida yoridan judo bo`lish og`irligini bulbul gulistonidan ayrilsa kuylay olmasligini, to`ti esa ayrilsa tilde qolishini ta`kidlaydi, xuddi shunday o`xshatishni biz Hamza g`azalida ham uchratamiz:

Dod dastingdan falak, charxing buzilmay qolmasun,
Boru umrum bo`ldi to`ti shakkarafshondan judo⁵.

Hamza yoridan judo bo`lib bekaslik, g`ariblik, bechoralikdan dod desa, Navoiy yordan judo aylaguncha, jonimdan judo qil, deb aytad, hijron o`ilmdabn ham achchigligini ta`kidlaydi..

Hajr o`lumdin talx⁶emish, mundin so`ng, ey gardun, meni
Aylagil jondin judo, qilg`uncha jonondin judo⁷.

Har ikki ijodkordanda bir xil o`xshatishni uchratamiz, bundan ko`rinib turibdiki, Niyoziy Navoiy g`azallaridan ta`sirlanib o`zi ham chiroyli g`azal namunalari yaratgan. Bunday o`xshash g`azallarni bu iki ijodkor ijodida ko`p kuzatishimiz mumkin:

Ey alifdek qomating mayli buzulg`on jon aro,
Ganji husnung javhari bu xotiri vayron aro⁸.

“Aro” radifli g`azalni Hamza Hakimzoda davom etib
Ey husn elin pur fitnasi mahbubi davronlar aro,
Bormi sanidek mahliqo janiatda rizvonlar aro.

Gulgun yuzingni rashkidin ko`ksida yuz bing dog` ila,
Boq lola maskan ayladi ko`hu biyobonlar aro.

Navoiy yuqoridagi baytida yorning qomatini “alif”ga o`xshatib, husnini “ganj” boylikka o`xshatsa, Hamza Hakimzoda Niyoziy yorning husnidek husnni hatto Jannat bog`larida ham

² Takallum-so`z aytmoq

³ Alisher Navoiy Vafo qilsang: G`azallar -T.: G`afur G`ulom nomidagi nashriyot-matbaa ijodiy uyi.2004. – B. 15.

⁴ Ҳамза Ҳакимзода Ниёзий. Замон ичра. Сайланма. Шеърый асарлар. – Тошкент: Адабиёт ва санъат, 1989. – Б. 262.

⁵ Ҳамза Ҳакимзода Ниёзий. Замон ичра. Сайланма. Шеърый асарлар. – Тошкент: Адабиёт ва санъат, 1989. – Б. 262.

⁶ Talx-achchiq

⁷ Alisher Navoiy Vafo qilsang: G`azallar -T.: G`afur G`ulom nomidagi nashriyot-matbaa ijodiy uyi.2004. – B. 15.

⁸ Alisher Navoiy Vafo qilsang: G`azallar -T.: G`afur G`ulom nomidagi nashriyot-matbaa ijodiy uyi.2004. – B. 215.

yo`ligini ta`kidlaydi. Yuzining gulgunligidan rashak qilib hatto lola tog`ga ko`chib ketgan den chiroyli o`xshatmalat asosida beradi.

Yana bitta shunday radifli Navoiy g`azaliga e`tibor qilsak:

Kimki ko`rsa mushki nob ul sunbuli serob aro,
Bir qaro tufrog` degaykim, tushti mushki nob aro.

Qoshing ichra rishtai jonimg`a chirmong`on ko`ngul,
Ankabutidurki, aylabdur vatan mehrob aro⁹.

Ikki davr ijodkorlari yorning juda ham chiroyli tasvirlashda nozik so`zlarni topib o`rnida ishlatgan. Ikki qoshing jonimning “rishta”siga chirmangan, o`rnashgan, endi ko`nglim ular uchun vatan, desa, yana bir baytida Navoiy yorning labini ko`rib unga mehr qo`yganini aytadi:

Ul labi unnobgun¹⁰ ko`nglumga ekkkan tuxmi mehr,
Ko`nglum ichra yoshurun durdonadek unnob aro¹¹.

Yorning labi Navoiyning ko`ngliga mehr urug`ini ekkkan bo`lsa, Hamza Hakimzoda Nizomiy yorning labi hajrida hatto bulbul har tong bo`stonlarda faryod qiladi.

Bechora bulbul g`unchai maygun labingni ko`yida,
Faryod urar qonlar yutub, har subh bo`stonlar aro¹².

Navoiy an`analarini davom ettirib, fikriy takomilga erish, uning g`oyasini o`z davriga mos tarzda bayon etishni yana bir “Deb” radifli g`azalida kuzatishimiz mumkin:

Kezarmen ko`yida yillar nazar holimg`a solg`ay deb,
Agar o`ltursa, qonim rangi tufrog`ida qolg`ay deb¹³.

Navoiy lirik “men” yorining nazari tushishi uchun uning atrofida parvona kezishini, agar o`sha yerda vafot etsa, hech bo`lmaganda yor tuprog`iga qoni to`kilishi aytsa, Hamza Hakimzoda Niyoziy “men”i esa, yorning oyog`i ostida ostona bo`lishdan xursand bo`lishini ta`kidlaydi.

Ko`p shod o`luram mahvashi shoxona ekanman deb,
Sadek pari ko`yida devona ekanman deb.

Rahm aylamasang garchi har dam uraman o`zni,
Ul sham`n jamolingga parvona ekanman deb.

Yuz yil bani kuydursang, shukr etg`usiman, jono,
Hipjring o`tig`a man ham so`zona ekanman deb.

Bing turli jafu solsang, qo`rqmam sani zulmingdan,
Ketsa boshimi bergum, qurbona ekanman deb.

Xurram o`luram dilbar tepsang gahi boshimga,
Yorim oyoqi ostiga ostona ekanman deb¹⁴.

⁹ Alisher Navoiy Vafo qilsang: G`azallar -T.: G`afur G`ulom nomidagi nashriyot-matbaa ijodiy uyi.2004. – B. 268.

¹⁰ Unnobgun-chilonjiyda rangli

¹¹ Navoiy o`sha asar

¹² Ҳамза Ҳақимзода Ниёзий. Замон ичра. Сайланма. Шеърый асарлар. – Тошкент: Адабиёт ва санъат, 1989. – Б. 262.

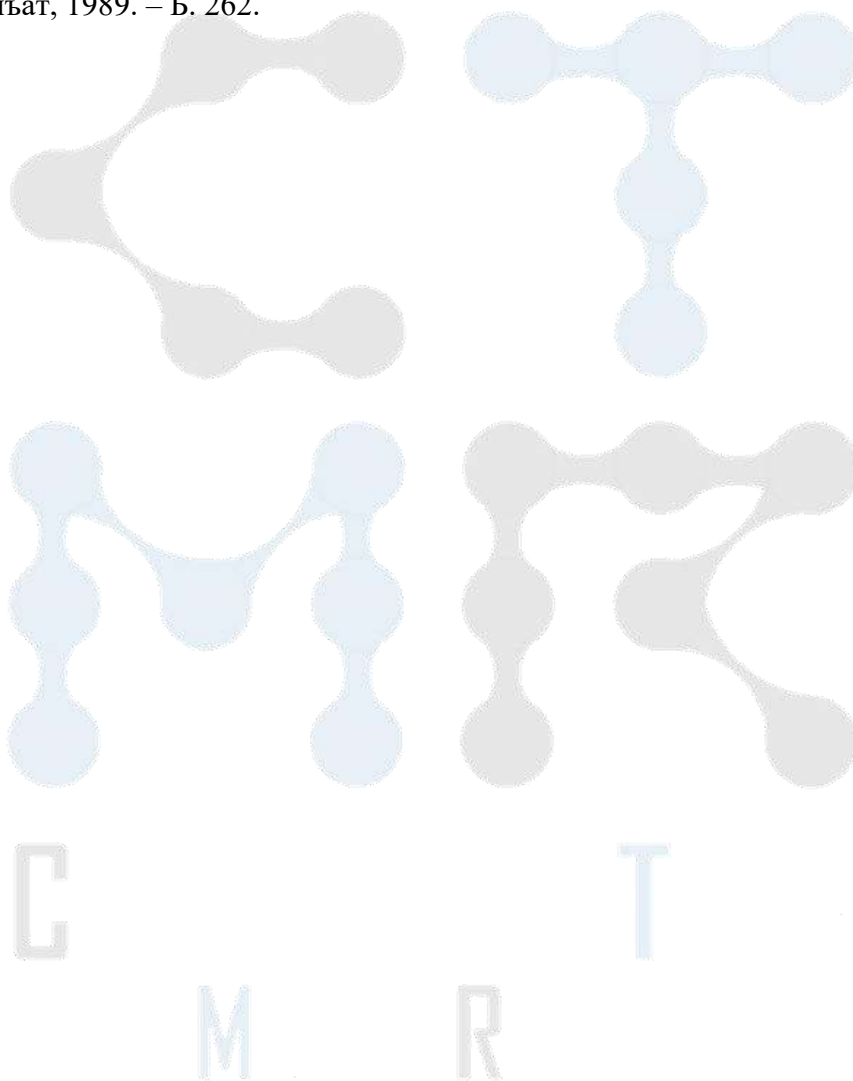
¹³ Alisher Navoiy Vafo qilsang: G`azallar -T.: G`afur G`ulom nomidagi nashriyot-matbaa ijodiy uyi.2004. – B. 268.

¹⁴ Hamza o`sha asar

Shunday qilib jadid adabiyoti taraqqiyoti o`z taraqqiyoti yo`lida mumtoz adabiy merosga va Alisher Navoiy ijodiga muhim adabiy manba sifatida murojaat qildi, uning ijodiy-estetik prinsiplaridan, badiiy usullaridan eng yaxshi unsurlarni qabul qilib, ularni yangi tarixiy sharoit mazmuni bilan boyitgan, rivojlantirgan holda davom ettirdi.

FOYDALANILGAN ADABIYOTLAR RO`YXATI:

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2. Alisher Navoiy Vafo qilsang: G`azallar. -T.: G`afur G`ulom nomidagi nashriyot-matbaa ijodiy uyi.2004.- B. 268.
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“CLINICAL AND PATHOGENETIC FEATURES OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND ALLERGIC BRONCHITIS”**Musojonov Bakhodir Khayotjonovich**

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Annotation. Chronic obstructive pulmonary disease (COPD) and allergic bronchitis are among the most common inflammatory diseases of the lungs, with external environmental factors (smoking, harmful industrial dust, atmospheric pollution) and immuno-allergic mechanisms playing a key role in their development. Clinically, both diseases manifest with shortness of breath, cough, and sputum production. In terms of pathogenetic mechanisms, irreversible fibrotic changes of the bronchial walls and bronchospasm are predominant in COPD, whereas in allergic bronchitis, IgE-mediated sensitization, degranulation of cells involved in the allergic reaction, and disturbance of cytokine balance play the main role.

Keywords: Chronic obstructive pulmonary disease (COPD), allergic bronchitis, clinical features, pathogenesis, bronchial obstruction, fibrotic changes, environmental factors

The conducted analyses show that in chronic obstructive pulmonary disease (COPD), a persistent and continuous inflammatory process in the airways is considered the leading pathogenetic factor [1]. This process disrupts the morphological and functional state of the bronchial walls, leading to their structural damage. As a result, the elasticity of the bronchial walls gradually decreases, which causes narrowing of the airways and the formation of bronchial obstruction. During the progression of the disease, changes at the bronchial level also involve the alveolar structures [1,2]. At this stage, the destruction of the alveolar walls intensifies, and their normal structure and functional capacity are severely impaired. Consequently, gas exchange in the lungs becomes significantly disturbed. The transfer of oxygen from the alveoli into the blood and the elimination of carbon dioxide no longer occur at a normal level. This, in turn, leads to a deepening of chronic respiratory insufficiency in the body [2]. The processes characteristic of the pathogenesis of COPD gradually take on a progressive course. The persistence of inflammatory and destructive changes ensures that the disease acquires an irreversible nature. As a result, morphological damage in lung tissue not only limits functional capacity but also contributes to the transition of the disease to more severe clinical forms [3]

In cases of allergic bronchitis, the main clinical-pathogenetic feature is reversible bronchial obstruction. The clinical aspects of this process show that patients experience symptoms such as shortness of breath, cough, and sputum production, which intensify during certain periods [4]. The exacerbation of symptoms usually occurs upon repeated exposure to external allergens. Therefore, the clinical manifestations of the disease are directly related to environmental factors, and attacks often arise under the influence of seasonal changes, industrial dust, or household allergens.

In pathogenetic mechanisms, hypersensitivity reactions of the immune system play a leading role. In particular, sensitization mediated by IgE is one of the central links of allergic bronchitis, reflecting the organism's excessive sensitivity to external allergens. During this process, degranulation of mast cells occurs, i.e., they release biologically active mediators (histamine, cytokines, leukotrienes, and others)[3,4,5]. These mediators, in turn, activate inflammatory

reactions in the bronchial mucosa. As a result, edema develops in the bronchial mucosa, hypersecretion of the mucous glands increases, and spasm of bronchial muscle fibers occurs. These three factors — edema, hypersecretion, and muscle fiber spasm — together significantly impair bronchial patency[5]. However, these changes are usually temporary in nature and may be reversed when contact with the allergen ceases or appropriate therapeutic measures are applied. Comparative analyses show that, despite differences in the clinical manifestations of chronic obstructive pulmonary disease (COPD) and allergic bronchitis, there are several common links in their pathogenesis. First of all, dysfunction of the immune system plays a leading role in both diseases. This dysfunction not only leads to deviations in the immune response but also contributes to the prolonged persistence of the inflammatory process [5,6].

Secondly, an imbalance in the oxidation–antioxidation system is observed in both pathologies. Oxidative stress intensifies as a result of proteins, lipids, and nucleic acids being damaged by free radicals. At the same time, insufficient functioning of the antioxidant defense system further aggravates the pathological process [6].

Thirdly, a significant pathogenic link is the disruption of cytokine balance. Due to the disturbance in the ratio between pro-inflammatory and anti-inflammatory cytokines, inflammatory mediators increase excessively [7]. This leads to swelling, secretion, and muscle spasms in the bronchial mucosa, as well as to the chronic course of the process.

Conclusion: Although COPD and allergic bronchitis share common clinical symptoms, there are significant differences in their mechanisms of development. In COPD, the inflammatory process is chronic and irreversible, leading to fibrotic changes in the bronchial walls and alveolar destruction. In allergic bronchitis, however, immune-allergic mechanisms prevail, resulting in reversible bronchial obstruction. COPD is associated with external harmful factors, while allergic bronchitis is linked to hereditary and hypersensitivity factors. In both diseases, disruption of the oxidation–antioxidation system and activation of inflammatory mediators are common features. Their comparative study is of great importance for the development of early diagnostic and effective treatment strategies.

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РОЛЬ ВОЛЕЙБОЛА В ПРОФИЛАКТИКЕ НАРУШЕНИЙ ОСАНКИ У СТУДЕНТОВ

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Аннотация: В статье рассматривается роль волейбола в профилактике нарушений осанки у студентов. Подчеркивается, что в условиях возрастающей учебной нагрузки и малоподвижного образа жизни студентов проблема нарушений осанки приобретает особую актуальность. Волейбол, как динамичный командный вид спорта, способствует укреплению мышечного корсета, развитию координации движений и формированию правильных двигательных стереотипов. Приводятся практические рекомендации по использованию волейбола в образовательном процессе для профилактики нарушений осанки. Делается вывод о целесообразности включения волейбола в систему физического воспитания вузов как эффективного средства сохранения и укрепления здоровья студентов.

Ключевые слова: волейбол, студенты, осанка, профилактика, физическое воспитание, здоровье, опорно-двигательный аппарат.

Современная система высшего образования направлена не только на формирование профессиональных компетенций, но и на сохранение здоровья студентов, что является важнейшим условием их успешного обучения и будущей профессиональной деятельности. В последние годы всё чаще отмечается рост числа студентов, имеющих отклонения в состоянии опорно-двигательного аппарата, в частности – нарушения осанки. Длительное сидение на лекциях, самостоятельная работа за компьютером, низкий уровень двигательной активности и несформированные навыки самоконтроля за положением тела приводят к ухудшению физического состояния.

Нарушения осанки у студентов – это не только эстетическая проблема, но и серьёзный фактор риска развития заболеваний позвоночника, сердечно-сосудистой и дыхательной систем. Патологические изменения осанки влияют на психоэмоциональное состояние, вызывают утомляемость, снижают уровень работоспособности и качество жизни. Поэтому профилактика и коррекция нарушений осанки в студенческом возрасте приобретают особую значимость.

В поиске эффективных средств профилактики всё большее внимание уделяется спортивным играм, которые позволяют комплексно воздействовать на организм. Среди них особое место занимает волейбол. Это массовый, доступный и динамичный вид спорта, который сочетает в себе разнообразные движения, развивает силу, выносливость, координацию и в то же время оказывает значительное влияние на формирование правильной осанки.

Особенностью волейбола является активное вовлечение в работу мышц туловища, плечевого пояса, ног и брюшного пресса, что способствует укреплению мышечного корсета – важнейшего фактора профилактики нарушений осанки. Кроме того, командный характер игры повышает мотивацию студентов, способствует регулярности занятий и формированию устойчивого интереса к физической активности.

Таким образом, актуальность темы обусловлена необходимостью поиска доступных и эффективных средств профилактики нарушений осанки у студентов. Рассмотрение волейбола как средства укрепления здоровья и формирования правильной осанки позволит определить его значимость в образовательной среде и разработать практические рекомендации по включению данного вида спорта в учебный и внеучебный процесс вузов.

Осанка отражает состояние опорно-двигательного аппарата и является важным показателем здоровья. Нарушения осанки у студентов нередко становятся причиной хронических болей в спине, снижения выносливости, нарушений дыхания и кровообращения. Кроме того, дефекты осанки оказывают отрицательное влияние на внешний облик, самооценку и психоэмоциональное состояние молодого человека.

Поэтому профилактика нарушений осанки должна быть приоритетной задачей физического воспитания в вузе. Важно использовать такие виды спорта, которые задействуют различные мышечные группы, способствуют укреплению мышечного корсета и формированию правильного положения тела.

Волейбол относится к видам спорта, активно воздействующим на опорно-двигательный аппарат и мышечно-связочный аппарат студентов. Регулярные занятия данным видом спорта оказывают положительное влияние на формирование правильной осанки благодаря следующим факторам:

1. *Укрепление мышечного корсета.* В игре задействуются мышцы спины, брюшного пресса, плечевого пояса и ног, что обеспечивает формирование прочного мышечно-связочного аппарата, стабилизирующего позвоночник.
2. *Развитие координации движений.* Волейбол требует синхронизации действий всего тела, что способствует формированию правильных двигательных стереотипов и удержанию осанки.
3. *Коррекция нарушений осанки.* За счет динамичных прыжков, ударных и защитных движений происходит чередование напряжения и расслабления различных мышечных групп, что помогает компенсировать статические нагрузки от учебы.
4. *Формирование привычки к правильному положению тела.* Игровая деятельность требует постоянного контроля за положением корпуса, головы и конечностей, что способствует выработке навыка поддержания правильной позы и вне занятий.
5. *Повышение мотивации.* Волейбол как командная игра вызывает у студентов интерес и эмоциональную вовлеченность, что обеспечивает регулярность занятий и устойчивый профилактический эффект.

Для повышения эффективности профилактической работы в образовательной среде рекомендуется:

- включать элементы волейбола в программу учебных занятий по физической культуре;
- проводить специальные комплексы упражнений с акцентом на укрепление мышц спины и живота;
- организовывать студенческие секции и кружки по волейболу;
- проводить регулярные соревнования и турниры, повышающие мотивацию к занятиям;
- сочетать волейбол с другими формами двигательной активности (гимнастика, плавание, упражнения на растяжку).

Рассматривая проблему нарушений осанки среди студентов, можно сделать вывод, что она носит комплексный характер и требует системного подхода. Одним из наиболее доступных и эффективных средств профилактики в условиях образовательного процесса является волейбол. Регулярные занятия этим видом спорта позволяют укрепить мышцы спины и брюшного пресса, развить координацию движений, сформировать правильные двигательные навыки и компенсировать статические нагрузки, возникающие во время учёбы.

Кроме физического воздействия, волейбол выполняет важные психосоциальные функции. Его командный характер стимулирует студентов к активному взаимодействию, способствует формированию положительного эмоционального фона, снижает стресс и повышает мотивацию к регулярным занятиям. Всё это создаёт благоприятные условия для закрепления навыка правильной осанки и выработки привычки к здоровому образу жизни. Включение волейбола в учебные программы вузов по дисциплине «Физическая культура» и организация внеучебной деятельности (спортивные секции, кружки, студенческие

турниры) открывают широкие возможности для профилактики нарушений осанки. Практика показывает, что комплексное сочетание учебных занятий, тренировочного процесса и соревновательной деятельности обеспечивает наибольшую эффективность. Таким образом, волейбол можно рассматривать как универсальное средство, позволяющее решать задачи укрепления здоровья студентов, профилактики нарушений осанки и гармоничного развития личности. Его применение в системе высшего образования должно быть целенаправленным и систематическим, что обеспечит формирование у студентов устойчивых двигательных привычек, повышение уровня физической подготовленности и социальной активности.

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Annotatsiya. Mazkur maqolada O'zbekiston sharoitida gulkaram (*Brassica oleracea* var. *botrytis*) ekinini yetishtirishning iqtisodiy samaradorligi tahlil qilinadi. Tadqiqot davomida hosildorlik, ishlab chiqarish xarajatlari, bozor narxlari va yalpi foyda ko'rsatkichlari o'rganildi. Natijalar shuni ko'rsatadiki, gulkaram sabzavotlari yuqori hosildorlikka ega bo'lib, bir gektar maydondan o'rtacha 180–220 sentner hosil olish mumkin. Bozor talabi yuqori bo'lgani sababli ushbu ekinni yetishtirish fermer xo'jaliklari uchun yuqori iqtisodiy samara beradi.

Kalit so'zlar: gulkaram, iqtisodiy samaradorlik, hosildorlik, xarajat, yalpi foyda.

Kirish. Gulkaram dunyo sabzavotchiligida keng tarqalgan ekinlardan biri bo'lib, oziq-ovqat xavfsizligini ta'minlashda muhim o'rin egallaydi. O'zbekistonda ham ushbu ekinga talab yildan-yilga ortib bormoqda. Gulkaram tarkibida oqsillar, vitaminlar, minerallar va biologik faol moddalar ko'pligi tufayli inson salomatligi uchun qimmatli sabzavot hisoblanadi. Shuningdek, gulkaramni sanoat asosida yetishtirish fermer xo'jaliklari daromad manbaini kengaytiradi. Shu bois, gulkaram yetishtirishning iqtisodiy samaradorligini o'rganish, ishlab chiqarish xarajatlari va daromad nisbatini tahlil qilish bugungi kunda dolzarb masalalardan biri hisoblanadi.

Material va metodlar. Tadqiqotlar 2023–2024 yillarda Toshkent viloyatining quyi mintaqalaridagi fermer xo'jaliklarida olib borildi. Tadqiqot metodlari quyidagilardan iborat:

- Iqtisodiy tahlil usuli – ishlab chiqarish xarajatlari va foyda nisbatini hisoblash.
- Taqqoslash usuli – gulkaram ekinidan olingan natijalarni boshqa sabzavotlar (karam, pomidor, bodring) bilan taqqoslash.
- Statistik usul – hosildorlik va bozor narxlariga oid ma'lumotlarni qayta ishlash.

Asosiy ko'rsatkichlar:

1. Hosildorlik (s/ga).
2. Yalpi xarajat (ming so'm/ga).
3. Sotish narxi (so'm/kg).
4. Sof foyda (ming so'm/ga).
5. Rentabellik darajasi (%).

Natijalar va muhokama. Gulkaramning hosildorligi tadqiqot natijalariga ko'ra, gulkaramning hosildorligi yuqori bo'lib, bir gektardan o'rtacha 200 sentner hosil olish mumkinligi aniqlandi. Bu ko'rsatkich oddiy karamga nisbatan 1,2 baravar yuqoridir.

1-jadval. Gulkaram va boshqa sabzavotlarning hosildorligi

Ekin turi	Hosildorlik (s/ga)	O'rtacha bozor narxi (so'm/kg)
Gulkaram	200	8 000
Oddiy karam	170	5 500
Pomidor	250	6 000
Bodring	220	5 800

Iqtisodiy samaradorlik. Gulkaram yetishtirishda o'rtacha xarajatlar 1 gektar maydon uchun 85 mln so'mni tashkil etdi. Shundan urug' va ko'chat tayyorlashga 12 mln so'm, agrotexnik tadbirlarga 40 mln so'm, mehnat xarajatlariga 25 mln so'm, boshqa xarajatlarga 8 mln so'm to'g'ri keladi.

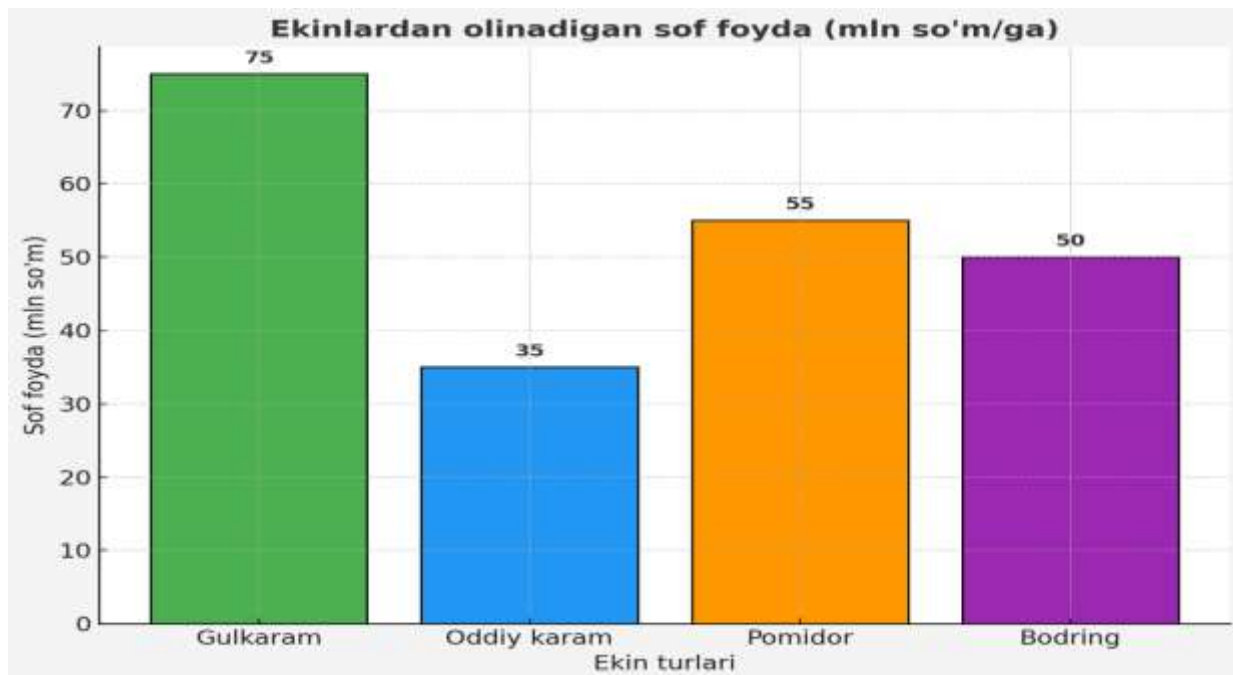
2-jadval. Gulkaram yetishtirishning iqtisodiy ko'rsatkichlari (1 gektar uchun)

Ko'rsatkichlar	Miqdor
Umumiy hosildorlik	200 s/ga (20 000 kg)
Bozor narxi (so'm/kg)	8 000
Yalpi tushum	160 000 000 so'm
Umumiy xarajat	85 000 000 so'm
Sof foyda	75 000 000 so'm
Rentabellik darajasi	88,2 %

Tahliliy muhokama. Tadqiqot natijalaridan ko'rinib turibdiki, gulkaram yetishtirish yuqori iqtisodiy samaradorlikka ega. Bir gektardan olinadigan sof foyda 75 mln so'mni tashkil etadi. Bu ko'rsatkich oddiy karam ekiniga nisbatan 2,1 baravar ko'pdir. Shuningdek, bozor talabi yuqoriligi sababli gulkaramni eksport qilish imkoniyati mavjud.

1-grafik. Gulkaram ekinidan olinadigan sof foyda taqqoslanishi (ming so'm/ga)

Grafikda gulkaramning sof foydasi boshqa ekinlarga nisbatan ancha yuqoriligi ko'rsatiladi



(gulkaram – 75 mln, oddiy karam – 35 mln, pomidor – 55 mln, bodring – 50 mln).

Xulosa. O'tkazilgan tadqiqot natijalariga ko'ra, gulkaram ekinini yetishtirish yuqori iqtisodiy samaradorlikka ega ekinlardan biri hisoblanadi. Bir gektardan olinadigan sof foyda 75 mln so'mni tashkil etib, rentabellik darajasi 88 % ni tashkil etdi. Shuningdek, gulkaramning bozor narxi barqaror va talab yuqoriligi sababli ushbu ekinni keng maydonda yetishtirish fermer xo'jaliklari uchun foydali bo'lib hisoblanadi.

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KARTOSHKA EKINIDA SELEKSIYA UCHUN DASTLABKI ASHYO YARATISH ISHLARI

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Annotatsiya. Mazkur maqolada kartoshka (*Solanum tuberosum L.*) ekinida seleksiya uchun dastlabki ashyo yaratish ishlari yoritilgan. Tadqiqotlarda genetik xilma-xillik manbalari, duragaylashtirish, mutatsion seleksiya, biotexnologik usullar va poliploid seleksiya qo'llanildi. Natijada virusdan tozalangan, hosildorligi yuqori va kraxmal miqdori ko'paygan yangi chatishtirish formalarini olishga erishildi. Ularning orasida "Sante × Picasso" hamda "Romano × Jalqar" kombinatsiyalari yuqori samaradorlik ko'rsatdi. Olingan dastlabki ashyo kelgusida O'zbekiston sharoitiga mos, yuqori hosildor va kasalliklarga chidamli navlar yaratishda muhim seleksiya materiali sifatida tavsifa etiladi.

Kalit so'zlar. Kartoshka, seleksiya, dastlabki ashyo, duragaylashtirish, mutatsion seleksiya, biotexnologiya, poliploid seleksiya, hosildorlik, virusga chidamlilik.

Kirish. Kartoshka (*Solanum tuberosum L.*) dunyo bo'yicha bug'doy, guruch va makkajo'xoridan keyingi to'rtinchi muhim oziq-ovqat ekini hisoblanadi. Jahon miqyosida uning ekin maydoni 19 million gektardan oshib, yillik yalpi hosil hajmi 370 million tonnadan yuqori darajaga yetmoqda. O'zbekistonda ham kartoshka aholining oziq-ovqat xavfsizligi, qishloq xo'jaligi va iqtisodiyotida muhim o'rin tutadi.

Seleksiya ishlarida dastlabki ashyo yaratish – bu yangi yuqori hosildor, kasallik va zararkunandalarga chidamli, agroekologik sharoitga moslashgan navlarni yaratishning eng muhim bosqichidir. Ayniqsa, iqlim o'zgarishi sharoitida seleksiya uchun dastlabki materiallarni xilma-xil manbalardan yaratish zarurati oshib bormoqda. Shu sababli, ushbu maqolada kartoshka seleksiyasi uchun dastlabki ashyo yaratishning dolzarb yo'nalishlari, usullari va ularning samaradorligi tahlil qilinadi.

Material va metodlar. Dastlabki ashyo yaratishda quyidagi manbalardan foydalanildi: Genetik xilma-xillik manbalari – O'zbekiston, Rossiya, Germaniya va Peru kolleksiyalaridan olingan nav va duragay namunalari.

1. **Duragaylashtirish usuli** – seleksiya yo'nalishiga qarab turli navlar chatishtirildi.
2. **Mutatsion seleksiya** – kartoshka urug'lari va to'qimalariga gamma-nurlanish va kimyoviy mutagenlar (EMS, kobalt-60) qo'llanildi.
3. **Biotexnologik metodlar** – in vitro sharoitida meristema madaniyatida viruslardan tozalash, somatik gibridizatsiya va kallusdan regeneratsiya usullari.
4. **Poliploid seleksiya** – kartoshkaning tetraploid shakllarini ko'paytirish va yangi kombinatsiyalar olish.

Jadval 1. Dastlabki ashyo yaratishda qo'llanilgan metodlar

Metod turi	Afzalliklari	Cheklovlari
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Duragaylashtirish	Yangi kombinatsiyalar, yuqori xilma-xillik	Vaqt talab qiladi
Mutatsion seleksiya	Yangi sifat belgilarini paydo qiladi	Natija barqaror emas
Biotexnologiya (in vitro)	Virussiz material, tezkor ko'paytirish	Maxsus laboratoriya kerak
Poliploid seleksiya	Hosildorlik va chidamlilikni oshiradi	Genetik barqarorlik muammosi

Natijalar (Results)

1. Duragaylashtirish natijalari

O'zbekiston sharoitida 25 ta chatishtirish kombinatsiyasi amalga oshirildi. Ularning ichida "Sante × Picasso" va "Romano × Jalqar" kombinatsiyalaridan yuqori hosildor chatishtirish formalarining ajralib chiqqani kuzatildi.

2. Mutatsion seleksiya natijalari

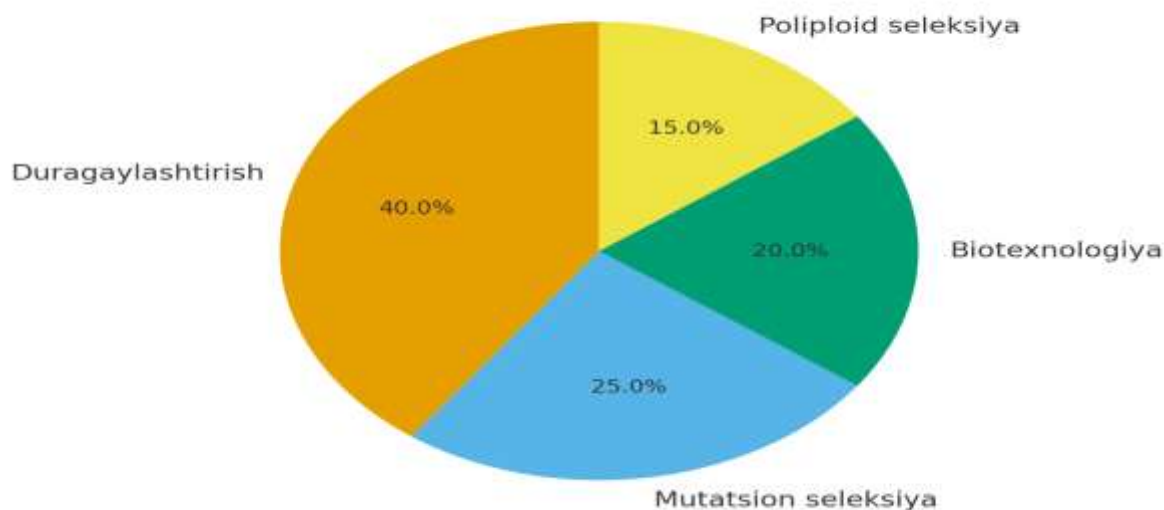
Gamma-nurlanish yordamida ishlangan 120 namunadan 14 tasi viruslarga chidamli, 6 tasi yuqori kraxmalga ega bo'ldi.

3. Biotexnologik yondashuv natijalari

In vitro meristema madaniyatidan 480 ta virusdan tozalangan namunalar olindi. Ulardan 32 tasi yuqori hosil elementlariga ega ekildi.

Diagramma 1. Seleksiya uchun yaratilgan dastlabki materiallarning taqsimoti

Seleksiya uchun yaratilgan dastlabki materiallarning taqsimoti



Muhokama (Discussion)

Olingan natijalar shuni ko'rsatadiki, seleksiya uchun dastlabki ashyo yaratishda **kompleks yondashuv** eng samarali hisoblanadi. Ya'ni, duragaylashtirishni biotexnologik metodlar bilan birlashtirish yuqori samaradorlik berdi.

Masalan, "Sante × Picasso" duragaylari in vitro sharoitida virusdan tozalangach, ularning hosildorligi 15–20% ga oshdi. Mutatsion seleksiya orqali esa kraxmal miqdori 22% gacha ko'tarilgan formalar olindi.

Chet el tajribasi (Rossiya, Gollandiya, Xitoy) ham shuni ko'rsatadiki, zamonaviy kartoshka seleksiyasi **klassik va biotexnologik metodlarni uyg'unlashtirishga asoslanmoqda**.

Xulosa

Kartoshka seleksiyasi uchun dastlabki ashyo yaratishda genetik xilma-xillikdan foydalanish eng muhim shartdir.

- Duragaylashtirish, mutatsion seleksiya, in vitro biotexnologik metodlar va poliploid seleksiya samarali usullar hisoblanadi.
- O‘zbekistonda yaratilgan dastlabki materiallar yuqori hosildor, kasalliklarga chidamli va agroekologik sharoitga moslashgan yangi navlar yaratishda asos bo‘lib xizmat qiladi.

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