AHMET YESEVİ ÜNİVERSİTESİ

I. INTERNATIONAL TURKIC WORLD BIOLOGY CONGRESS

NOVEMBER 23-24, 2023

AKHMET YASSAWI UNIVERSITY, TURKESTAN, KAZAKHSTAN

ABSTRACT BOOK

Edited by

Prof. Dr. Zeliha Selamoğlu

Dr. Nurlan Akhmetov

ISBN: 978-625-8329-13-1

ABSTRACT BOOK

I. INTERNATIONAL TURKIC WORLD BIOLOGY CONGRESS

November 23-24, 2023

Akhmet Yassawi University, Turkestan, Kazakhstan

EDITORS

Prof. Dr. Zeliha Selamoğlu

Dr. Nurlan Akhmetov

ISBN: 978-625-8329-13-1

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Turkestan, 2023

CONGRESS ID

TITLE OF CONGRESS

I. INTERNATIONAL TURKIC WORLD BIOLOGY CONGRESS

PARTICIPATION

Keynote & Invited

DATE - PLACE

November 23-24, 2023

Akhmet Yassawi University, Turkestan, Kazakhstan

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TOTAL ABSTRACTS: 147

The number of abstracts from foreign countries: 116

The number of abstracts from Türkiye: 31

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Turkish, Kazakh, English

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KONGRESİ


I. ULUSLARARASI TÜRK DÜNYASI BİYOLOJİ KONGRESİ
Ahmet Yesevi University
I. ХАЛЫҚАРАЛЫҚ ТҮРКІ ӘЛЕМІ

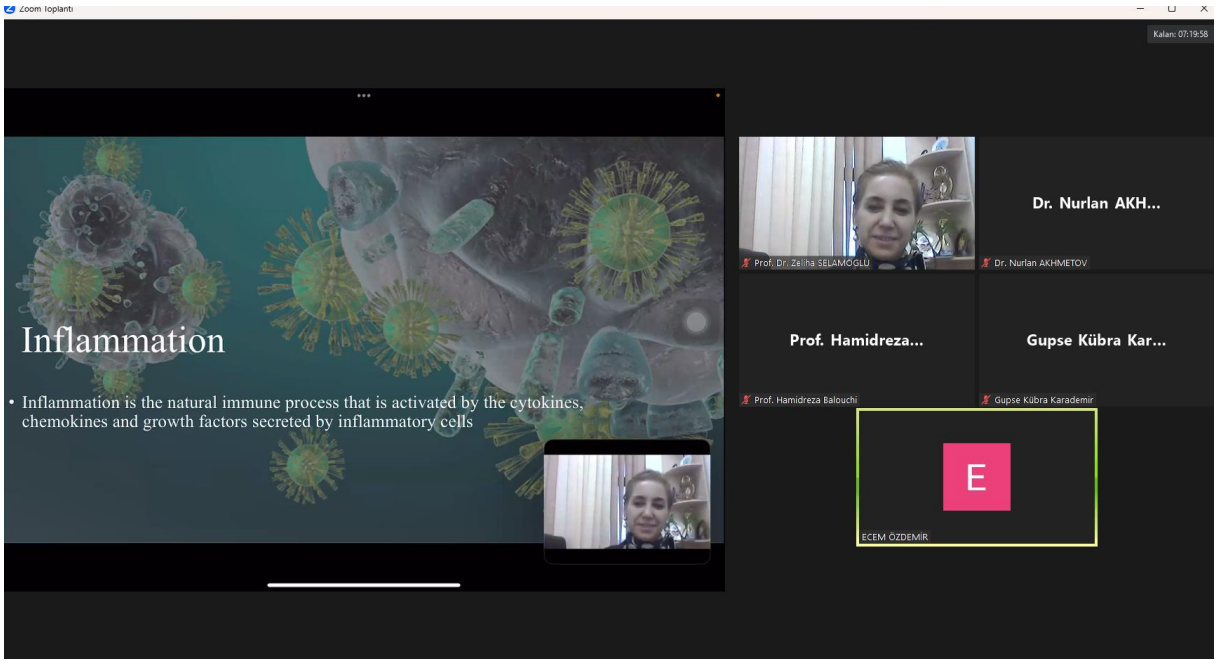

Терең тарихтан жарқын болашаққа
I. ХАЛЫҚАРАЛЫҚ ТҮРКІ ӘЛЕМІ биология конгресі
I. ULUSLARARASI TÜRK DÜNYASI

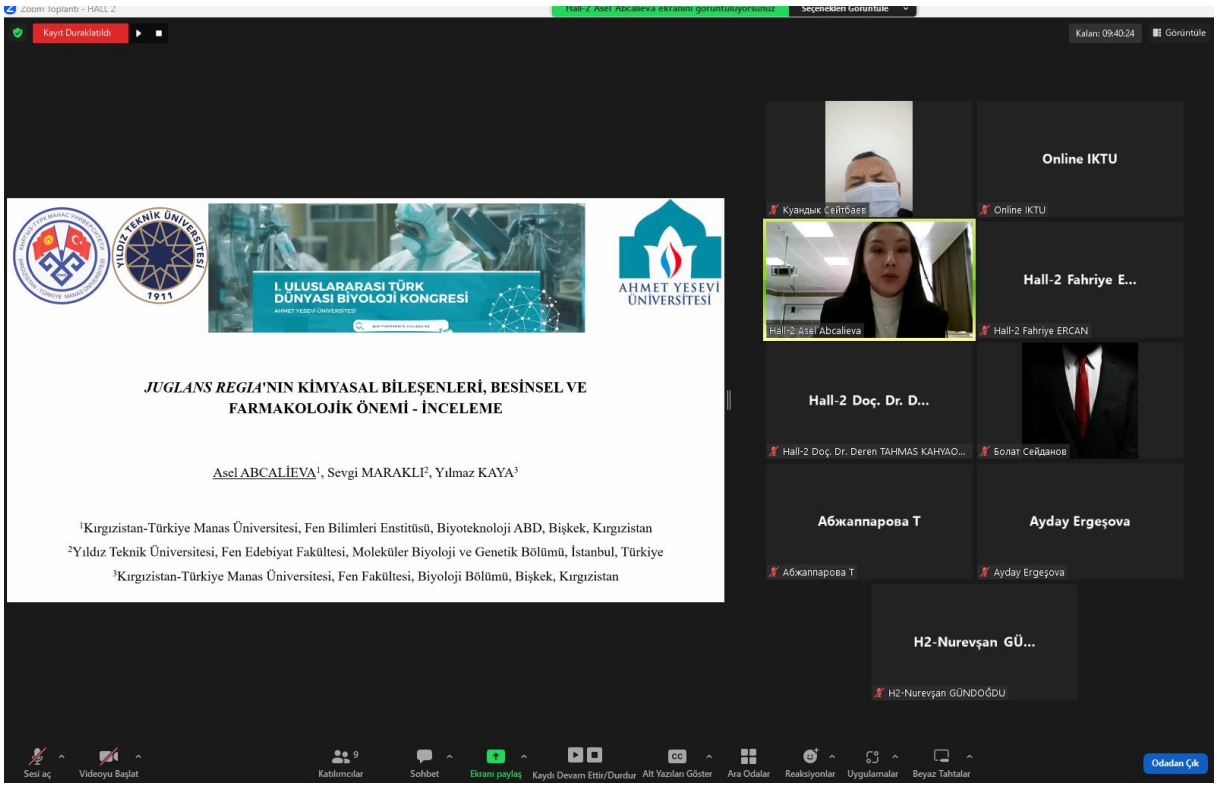

Зерттеудің негізгі бағыттарының кезеңдері
PISA-2000
PISA-2003
PISA-2006
PISA-2009
PISA-2012
PISA-2015
PISA-2018
PISA-2022
оқу сауаттылығы
математика
жаратылыстану


БИОЛОГИЯ КАФЕДРАСЫНЫҢ ТЫНЫСЫ
ОПҚ ҚҰРАМЫ
ОҚУ- ӘДІСТЕМЕЛІК ЖҰМЫСТАР
ОҚУ ҚҰРАЛДАР
ҒЫЛЫМИ - ЗЕРТТЕУ ЖҰМЫСТАР
МОНОГРАФИЯЛАР
ТӘРБИЕ ЖҰМЫСТАР
ІС - ШАРАЛАР
КАФЕДРА ЖЕТ


ДЖУМАХАНОВ Б.М.
А-ШГГК., ДОЦЕНТ


ДЖУМАХАНОВ Б.М.
А-ШГГК., ДОЦЕНТ


Zoom toplantı
Kalan: 07:19:58
Inflammation
• Inflammation is the natural immune process that is activated by the cytokines, chemokines and growth factors secreted by inflammatory cells
Prof. Dr. Zeliha SELAMOĞLU
Dr. Nurlan AKH...
Dr. Nurlan AKHMETOV
Prof. Hamidreza...
Prof. Hamidreza Balouchi
Gupse Kübra Kar...
Gupse Kübra Karademir
E
ECEM ÖZDEMİR


Zoom toplantı - HALL 2
Kayıt Duraklatıldı
Kalan: 09:40:24
Görüntüle
I. ULUSLARARASI TÜRK DÜNYASI BİYOLOJİ KONGRESİ
AHMET YESEVİ ÜNİVERSİTESİ
JUGLANS REGIA'NIN KİMYASAL BİLEŞENLERİ, BESİNSEL VE FARMAKOLOJİK ÖNEMİ - İNCELEME
Asel ABCALİEVA[1], Sevgi MARAKLI[2], Yılmaz KAYA[3]
[1]Kırgızistan-Türkiye Manas Üniversitesi, Fen Bilimleri Enstitüsü, Biyoteknoloji ABD, Bişkek, Kırgızistan
[2]Yıldız Teknik Üniversitesi, Fen Edebiyat Fakültesi, Moleküler Biyoloji ve Genetik Bölümü, İstanbul, Türkiye
[3]Kırgızistan-Türkiye Manas Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, Bişkek, Kırgızistan
Куандык Сейтбаев
Online IKTU
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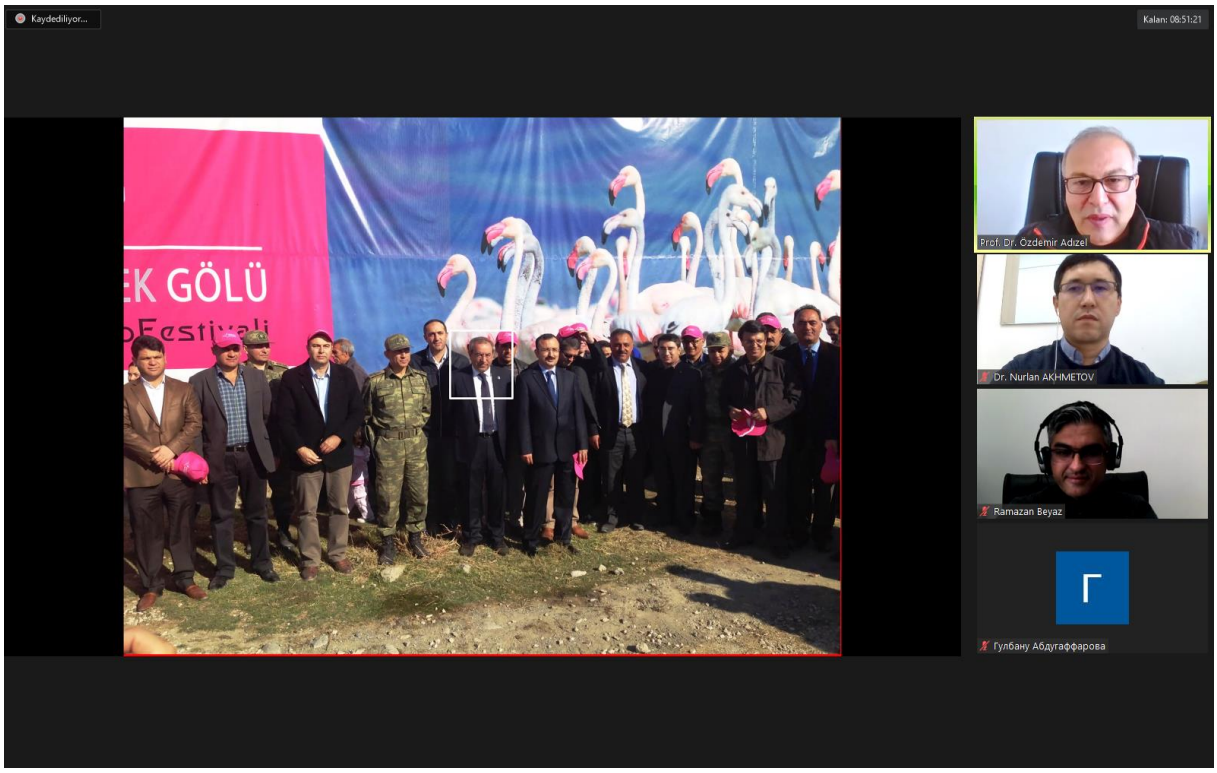
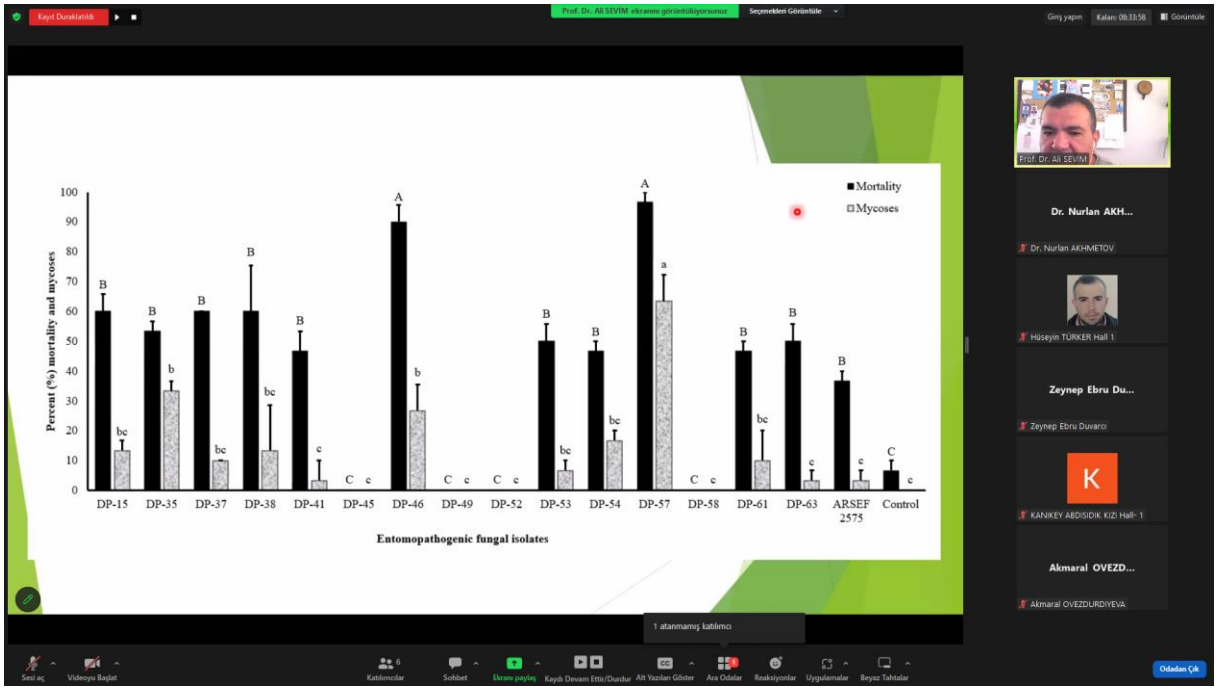
Hall-2 Asel Abcalieva
Hall-2 Fahriye E...
Hall-2 Fahriye ERCAN
Hall-2 Doç. Dr. D...
Hall-2 Doç. Dr. Deren TAHMAS KAHYAO...
Болат Сейданов
Абжаппарова Т
Ayday Ergeşova
Абжаппарова Т
Ayday Ergeşova
H2-Nurevşan GÜ...
H2-Nurevşan GÜNDOĞDU
Sesi aç
Videoyu Başlat
Katılımcılar
Sohbet
Ekranı paylaş
Kaydı Devam Ettir/Durdur
Alt Yazıları Göster
Ara Odalar
Reaksiyonlar
Uygulamalar
Beyaz Tahtalar
Odadan Çık


Kaydediliyor...
Kalan: 08:51:21
Prof. Dr. Özdemir Adizel
Dr. Nurlan AKHMETOV
Ramazan Beyaz
Гулбану Абдугаффарова


Kayıt Duraklatıldı
Prof. Dr. Ali SEVİM ekranını görüntülüyorsunuz
Seçenekleri Görüntüle
Kalan: 08:33:58
Görüntüle
Mortality
Mycoses
Percent (%) mortality and mycoses
DP-15
DP-35
DP-37
DP-38
DP-41
DP-45
DP-46
DP-49
DP-52
DP-53
DP-54
DP-57
DP-58
DP-61
DP-63
ARSEF 2575
Control
Entomopathogenic fungal isolates
Prof. Dr. Ali SEVİM
Dr. Nurlan AKH...
Dr. Nurlan AKHMETOV
Hüseyin TÜRKER Hall 1
Zeynep Ebru Du...
Zeynep Ebru Duvarcı
KANIKEY ABDISIDIK KIZI Hall- 1
Akmaral OVEZD...
Akmaral OVEZDURDIYEVA
1 atanmamış katılımcı
Sesi aç
Videoyu Başlat
Katılımcılar
Sohbet
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Uygulamalar
Beyaz Tahtalar
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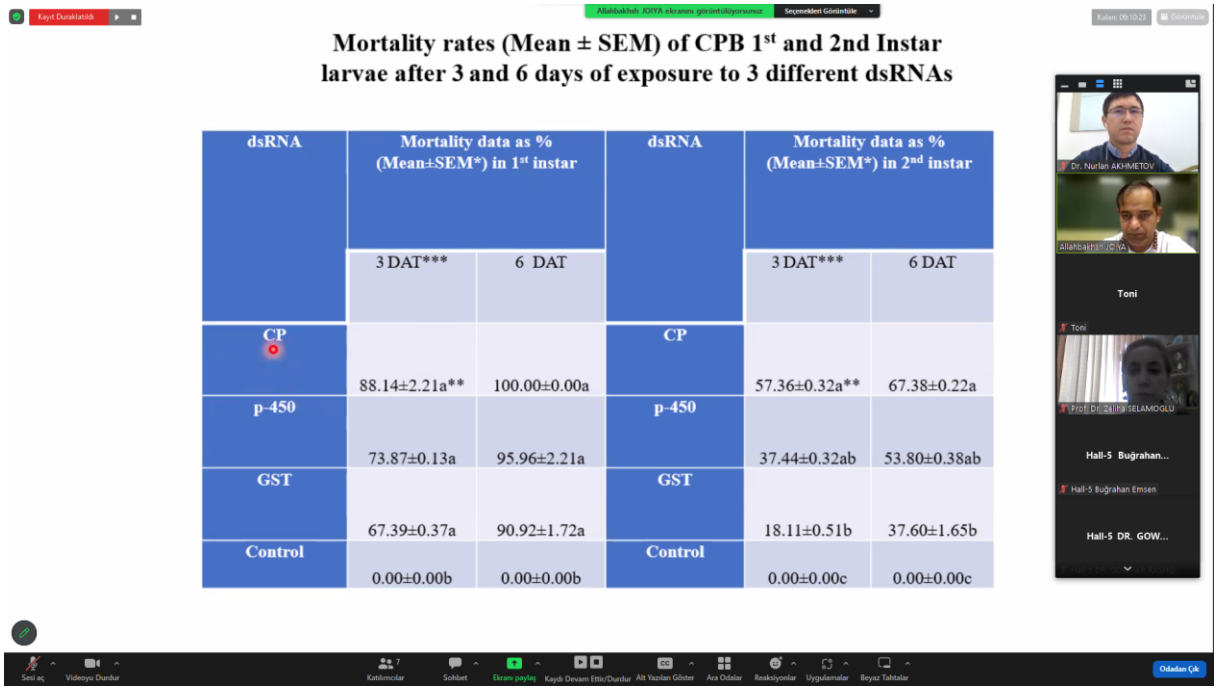

Mortality rates (Mean ± SEM) of CPB 1st and 2nd Instar larvae after 3 and 6 days of exposure to 3 different dsRNAs

dsRNA	Mortality data as % (Mean±SEM*) in 1st instar		dsRNA	Mortality data as % (Mean±SEM*) in 2nd instar	
	3 DAT***	6 DAT		3 DAT***	6 DAT
CP	88.14±2.21a**	100.00±0.00a	CP	57.36±0.32a**	67.38±0.22a
p-450	73.87±0.13a	95.96±2.21a	p-450	37.44±0.32ab	53.80±0.38ab
GST	67.39±0.37a	90.92±1.72a	GST	18.11±0.51b	37.60±1.65b
Control	0.00±0.00b	0.00±0.00b	Control	0.00±0.00c	0.00±0.00c

I. INTERNATIONAL TURKIC WORLD BIOLOGY CONGRESS

November 23-24, 2023

Akhmet Yassawi University, Turkestan, Kazakhstan

CONGRESS PROGRAM

Participating Countries:

Kazakhstan, Türkiye, Karakalpakstan, Uzbekistan, Kyrgyzstan, Azerbaijan, Romania, Pakistan, Japan, India, Kosovo, Egypt, Spain, Greece, Poland, Iran, Serbia, Tunisia, Bangladesh, Indonesia, Italy, Ukraine, Iraq, Algeria

ПРОТОКОЛ АШЫЛУ САЛТАНАТЫ
PROTOKOL VE AÇILIŞ KONUŞMALARI

23.11.2023 / Бейсенбі
23.11.2023 / Perşembe
23.11.2023
10:00-11:00 (KZ)

Өтетін орны: Мәдениет орталығы үлкен зал
Yer: Kültür Merkezi Büyük Salon

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Илкер Пак
(Т.Р. Түркістан бас консулы)
İlker Pak
(T.C. Türkistan baş konsolosu)

23.11.2023 / Бейсенбі
23.11.2023 / Perşembe
23.11.2023
11:15-12:30 (KZ)

Өтетін орны: Мәдениет орталығы үлкен зал
Yer: Kültür Merkezi Büyük Salon

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(Ahmet Yesevi Üniversitesi, Kazakistan)

а-ш.ғ.к., доц. Джумаханов Б.М. / PhD., Assoc. Prof. Djumakhanov B.M.
(Қазақстан ауыл шаруашылығы ғылымдары академиясы «Яссауи» білім тарату орталығының директоры /
Director of «Yassawi» Knowledge Dissemination Center Academy of Agriculture Sciences of Kazakhstan)
Өсімдіктер гендік қорының маңызы, Қазақстандағы жағдайы
Bitki gen havuzunun önemi, Kazakistan'daki durum

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(Government College университеті, Фейсалабад, Пәкістан) / (Government College University, Faisalabad, Pakistan)
Expression Profiling of Nickel Responsive Genes in Sunflower Under Stress Conditions
Стресс жағдайында күнбағыстағы никельге жауап беретін гендердің экспрессиялық профилі

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(Кыршехир Ахи Евран университеті / Kırşehir Ahi Evran üniversitesi, Türkiye)
Kazakistan tarımının dünü, bugünü ve yarını
Қазақстан ауыл шаруашылығының өткені, бүгіні және болашағы

Док. проф. Сачио Абуратани / Prof. Dr. Sachiyo Aburatani
(Director, Research Planning Office, Department of Life Science and Biotechnology
National Institute of Advanced Industrial Science and Technology (AIST) Biotechnology Central 1, Japan)
Application of Structural Equation Modelling to Infer Transcriptional Regulation in D.Melanogaster Embryo

Талқылау / Değerlendirme

23 Қараша 2023 / Бейсенбі
23 Kasım 2023 / Perşembe
14.30-15.45 (KZ)
Өтетін орны: Ректорат №201 конференция залы
Yer: Rektörlük binası 201 nolu konferans salonu

ҒЫЛЫМИ ЗЕРТТЕУЛЕР МЕН БИОЛОГИЯЛЫҚ БІЛІМ БЕРУДІҢ ИННОВАЦИЯЛЫҚ ТЕХНОЛОГИЯЛАРЫ / BİLİMSEL ARAŞTIRMALAR VE BİYOLOJİK EĞİTİMİN YENİLİKÇİ TEKNOLOJİLERİ
СЕКЦИЯ ТӨРАҒАСЫ / OTURUM BAŞKANI
техн.ғ.к., доцент м.а. Исаев Ғани Исаұлы / Doç. Dr. Gani İssayev

п.ғ.к., проф. Жумагулова Калампыр Абжаппаровна / Prof. Dr. Kalampır Cumagulova (Қазақстан / Kazakistan)
PISA ХАЛЫҚАРАЛЫҚ ЗЕРТТЕУЛЕР НӘТИЖЕСІ БОЙЫНША БІЛІМ БЕРУ ЖЕТІСТІКТЕРІН МОНИТОРИНГІЛЕУ

техн.ғ.к., доцент м.а. Исаев Ғани Исаұлы / Doç. Dr. Gani İssayev (Қазақстан / Kazakistan)
Алимова Шахноза Марибқызы / Şahnoza Alimova (Қазақстан / Kazakistan)
БИОЛОГИЯ ПӘНІНДЕ ПӘНДІК-ТІЛДІ КІРІКТІРЕ ОҚЫТУ ТЕХНОЛОГИЯЛАРЫН ҰЙЫМДАСТЫРА ОТЫРЫП ОҚУШЫЛАРДЫҢ ФУНКЦИОНАЛДЫҚ САУАТТЫЛЫҒЫН ҚАЛЫПТАСТЫРУ

PhD., Майматаева Асия Дуйсенгалиевна / Dr. Asiya Maymatayeva (Қазақстан / Kazakistan)
БИОЛОГИЯ ОҚУЛЫҚТАРЫНДАҒЫ PISA БОЙЫНША ТАПСЫРМАЛАРҒА САЛЫСТЫРМАЛЫ ТАЛДАУ

Халикова Гулмира Сатыбалдықызы / Gulmira Halikova (Қазақстан / Kazakistan)
ВИЗУАЛИЗАЦИЯНЫ КӘСІБИ ҚҰЗЫРЕТТІЛІКТІҢ БІР ТҮРІ РЕТІНДЕ БИОЛОГИЯ САБАҒЫНДА ПАЙДАЛАНУ

Prof. Dr. Калкабаева С.А. / Prof. Dr. Kalkabayeva S.A. (Қазақстан / Kazakistan)
БИОЛОГИЯЛЫҚ БІЛІМ БЕРУДЕ ИННОВАЦИЯЛЫҚ ТЕХНОЛОГИЯ ҚҰРАЛДАРЫН КІРІКТІРУ САБАҚТАРЫНЫҢ ӘДІСТЕМЕСІ

Талқылау / Değerlendirme

23 Қараша 2023 / Бейсенбі
23 Kasım 2023 / Perşembe
14.30-15.45 (KZ)
Өтетін орны: Кітапхана
Yer: Kütüphane

ҚАЗІРГІ БИОЛОГИЯ ЖӘНЕ БИОТЕХНОЛОГИЯ МӘСЕЛЕЛЕРІ МЕН БОЛАШАҒЫ / BİYOLOJİ VE BİYOTEKNOLOJİNİN GÜNCEL SORUNLARI VE GELECEĞİ
ҚАЗАҚСТАННЫҢ БИОЛОГИЯ САЛАСЫ ЗЕРТТЕУЛЕРІНІҢ ҚАЗІРГІ ЖАҒДАЙЫ / KAZAKİSTAN'DA BİYOLOJİ ALANINDAKİ ARAŞTIRMALARIN MEVCUT DURUMU
СЕКЦИЯ ТӨРАҒАСЫ / OTURUM BAŞKANI
PhD., Ахметов Нурлан Абдурахманович / Dr. Nurlan Akhmetov

Зияева Гүлнар Керімбекқызы, Тулеубаев Жаксыбай, Жорабек Ғалия Еркінбекқызы (Қазақстан / Kazakistan)
БИОЛОГИЯЛЫҚ ЖҮЙЕЛЕРДІҢ (МОЛЕКУЛАЛЫҚ-ПОПУЛЯЦИЯЛЫҚ) ҰЙЫМДАСТЫРЫЛУЫ МЕН ҚЫЗМЕТІН ЗЕРТТЕУДЕ АРНАЙЫ БИОИНФОРМАТИКАЛЫҚ БАҒДАРЛАМАНЫ ӘЗІРЛЕУ ЖӘНЕ ҚОЛДАНУДЫҢ МАҢЫЗЫ

Oserbaeva T. (Қарақалпақстан / Karakalpakstan)
CHARACTERISTICS OF THE GROWTH AND DEVELOPMENT OF SOY VARIETIES IN LOW-SALINITY SOILS OF THE ARAL SEA

Shamuratova Nagima Genjemuratovna, Shamuratova Nasima Genjemuratovna (Қарақалпақстан / Karakalpakstan)
THE SCIENTIFIC BASIS OF MEASURES TO CONTROL SUCKING PESTS ON CUCURBITS CROPS IN THE CONDITIONS OF KARAKALPAKSTAN

Abdalova Gulistan Nuranovna (Өзбекстан / Özbekistan)
RESTORE THE PRODUCTIVITY OF ABANDONED AND EROSIONED LAND

Сейтбаев Қ.Ж. (Қазақстан / Kazakistan)
БИОЛОГИЯЛЫҚ КОНЦЕПЦИЯЛАРҒА НЕГІЗДЕЛГЕН ЖАРАТЫЛЫСТАНУ-ҒЫЛЫМИ КӨЗҚАРАСТЫ ҚАЛЫПТАСТЫРУ ЖӘНЕ ДАМЫТУ ЖҮЙЕСІ

Ерденов Мұрат (Қазақстан / Kazakistan)
БОТАНИКАЛЫҚ БАҚ – БИОЛОГИЯ ҒЫЛЫМЫНЫҢ ТІРЕГІ

Талқылау / Değerlendirme

23 Қараша 2023 / Бейсенбі
23 Kasım 2023 / Perşembe
14.30-15.45 (KZ)
Өтетін орны: Мәдениет сарайы кіші зал
Yer: Kültür merkezi toplantı salonu

БИОАЛУАНТҮРЛІЛІКТІ ҚОРҒАУДА ЕРЕКШЕ ҚОРҒАЛАТЫН ТАБИҒИ АЙМАҚТЫҢ РӨЛІ / BİYOLOJİK ÇEŞİTLİLİĞİN KORUNMASINDA ÖZEL KORUMA ALTINDAKİ DOĞAL ALANLARIN ROLÜ

ҚҰРЫЛЫМДЫҚ БОТАНИКА, МИКОЛОГИЯ ЖӘНЕ МИКРОБИОЛОГИЯ ҒЫЛЫМЫНЫҢ МӘСЕЛЕЛЕРІ / YAPISAL BOTANİK, MİKOLOJİ VE MİKROBİYOLOJİNİN SORUNLARI

СЕКЦИЯ ТӨРАҒАСЫ / OTURUM BAŞKANI
Доц. Аймбетова Индира Оразгалиевна / Doç. Dr. İndira Aimbetova

б.ғ.д., проф. Байтурсинов К.К., Акайчикова М. (Қазақстан / Kazakistan)
ҚАЗАҚСТАНДАҒЫ ЖАБАЙЫ ТҰЯҚТЫ ЖАНУАРЛАРДЫҢ ГЕЛЬМИНТТЕРІ

Тилляходжаева Н.Р., Автономов В.А. (Қазақстан / Kazakistan)
ПРИМЕНЕНИЕ НОВОГО БИОПРЕПАРАТА ПРОТИВ ГОММОЗА ХЛОПЧАТНИКА

Аймбетова Индира, Канали Аружан (Қазақстан / Kazakistan)
ЖАНУАРЛАРҒА БЕРІЛЕТІН ЖОҒАРЫ АҚУЫЗ ҚҰРАМДЫ ТАҒАМ ТҮРЛЕРІНІҢ ТЕХНОЛОГИЯСЫН ЖАСАУ МАҚСАТЫНДА ТАМАҚ ӨНЕРКӘСІБІ ҚАЛДЫҚТАРЫН ПАЙДАЛАНУ

а-ш.ғ.к., доц. Дайрабаев Рустем, Әзімбай Абылайхан (Қазақстан / Kazakistan)
«СЫРДАРИЯ - ТҮРКІСТАН » ӨҢІРЛІК ТАБИҒИ САЯБАҒЫНДА БҰҚАР БҰҒЫНЫҢ (CERVUS ELAPHUS BACTRIANUS) ПОПУЛЯЦИЯСЫН ЖАҢҒЫРТУДЫҢ КЕЙБІР МӘСЕЛЕЛЕРІ

Талқылау / Değerlendirme

ОНЛАЙН СЕКЦИЯЛАР

ÇEVRİMİÇİ OTURUMLAR

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Meeting ID: 991 5640 4738/ Passcode: 513328
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СЕКЦИЯ ТӨРАҒАСЫ / OTURUM BAŞKANI
Prof. Dr. Ali Sevim

Prof. Dr. Nurbek Aldayarov, Kanykei Adysydyk kyzy (Қырғызстан / Kırgızistan)
EFFECT OF METHANOL EXTRACT OF ARUM KOROLKOWII REGEL TUBERS ON TESTOSTERONE LEVELS IN THE BLOOD SERUM AND TESTES OF ADULT MALE GUINEA PIGS

Dr. Öğr. Üyesi, Hüseyin Türker (Түркия / Türkiye)
IN VITRO CONSERVATION OF ENDEMIC CENTAUREA SP. SPECIES BY MICROPROPAGATION

Dr. Öğr. Üyesi, Hüseyin Türker (Түркия / Türkiye)
BIOSYNTHESIS OF PHENOLIC COMPOUNDS AND USES IN BIOTECHNOLOGY

Zeynep Ebru Duvarcı, Prof. Dr. Bengü Türkyılmaz Ünal (Түркия / Türkiye)
ETHNOBOTANICAL USE OF THYME AND SECONDARY METABOLITES ENHANCEMENT STUDIES

Akmaral Övezdurdiyeva, Bakıt Borkoyev (Қырғызстан / Kırgızistan)
INVESTIGATION OF ABSORBENT PROPERTIES OF RICE HUSK AND DESIGN OF A PORTABLE WATER PURIFIER

Prof. Dr. Ali Sevim (Түркия / Türkiye)
Beauveria pseudobassiana: A GOOD CANDIDATE FOR CONTROLLING OF Diprion pini L. (HYMENOPTERA: DIPRIONIDAE)

Prof. Dr. Ali Sevim, Dr. Rahşan Akpınar, Dr. Seyit Hasan Öztürk, Dr. Fatih Yılmaz, Dr. Ümit Kayaboynu, Prof. Dr. Elif Sevim, Dr. Hasan Ese, Dr. Ümit Karataş, Dr. Mücahit Buldağ, Prof. Dr. Şinasi Umur (Түркия / Türkiye)
PCR-BASED SCREENING OF PATHOGENS IN Bombus terrestris POPULATIONS OF TURKEY

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Зал - 2 / Salon - 2 / Hall - 2
СЕКЦИЯ ТӨРАҒАСЫ / OTURUM BAŞKANI
Prof. Dr. Özdemir ADIZEL Aa123@45

Nazgul Imanberdieva (Қырғызстан / Kırgızistan)
FEATURES OF BETA VULGARIS CULTIVATION IN KYRGYZSTAN AND DETERMINATION OF ITS SUGAR CONTENT

Asel Abcalieva, Sevgi Maraklı, Yrd. Doç. Dr. Yılmaz Kaya (Қырғызстан / Kırgızistan)
CHEMICAL CONSTITUENTS OF JUGLANS REGIA, ITS NUTRITIONAL AND PHARMACOLOGICAL IMPORTANCE - A REVIEW

Msc Nurvşan Gündoğdu, Prof. Dr. Bengü Türkyılmaz Ünal (Түркия / Türkiye)
ALTERNATIVE TREATMENTS TO REDUCE OXIDATIVE STRESS DAMAGE IN PLANTS

Assoc. Prof. Dr. Deren TAHMAS Kahyaoğlu (Түркия / Türkiye)
A PLANT-BASED FUNCTIONAL BY-PRODUCT: AQUAFABA

Assoc. Prof. Dr. Deren TAHMAS Kahyaoğlu (Түркия / Türkiye)
A POWERFUL ALTERNATIVE IN FOOD PRESERVATION: BACTERIOCINS

Assoc. Prof. Dr. Fahriye Ercan, Prof. Dr. Sevacn Öztemiz (Түркия / Türkiye)
CHARACTERS USED IN THE IDENTIFICATION OF EGG PARASITOID TRICHOGRAMMA (HYMENOPTERA: TRICHOGRAMMATIDAE) SPECIES

Prof. Dr. Özdemir Adızel (Түркия / Türkiye)
EXAMINING THE ROLE OF PROTECTED NATURAL AREAS IN THE PROTECTION OF BIODIVERSITY IN THE CASE OF ERÇEK LAKE (VAN-TÜRKİYE)

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Prof. Dr. Ali ASLAN

Prof. Dr. Ali Aslan, Prof. Dr. Peyami Battal, Assoc. Prof. Dr. Buğrahan Emsen (Түркия / Türkiye)
USE OF LICHES IN CITIES PLANNING

Ayşe Merve Aslan, Prof. Dr. Abdullah Kaya (Түркия / Türkiye)
EDIBLE MACROFUNGI DETERMINED IN ALUÇDAĞI-NATURE PARK (ÇAMLIDERE -ANKARA)

Dr. Süreyya Kadıoğlu, Prof. Dr. Ahmet Balcı (Түркия / Türkiye)
ANTIBACTERIAL EFFECTS of CORE-SHELL STRUCTURED PARTICLES

Zeliha Üstün Argon, Hatice Banu Keskinkaya, Süleyman Doğu, Turan Akdağ (Түркия / Türkiye)
THE EFFECT OF DIFFERENT PRESSURE APPLICATIONS ON THE EFFICIENCY OF LEMON AND ORANGE EXTRACTS OBTAINED BY SUPERCRITICAL CO2 EXTRACTION

Rauşan Murataalıeva (Қырғызстан / Kırgızistan)
BİŞKEK'TEKİ İÇ MEKAN ÇİÇEK YETİŞTİRİCİLİĞİNDE STERNORRHYNCHA (HEMIPTERA) ALTTAKIMINA BAĞLI ZARARLILARIN ARAŞTIRILMASI

Nazgül İmanberdieva, Baktıbek kızı Canıl (Қырғызстан / Kırgızistan)
THE ROLE OF SPECIALLY PROTECTED NATURAL AREAS IN PRESERVING BIODIVERSITY

Ibragimova Jale Muhtar, Mukhtarov Mahir Mazahir, Bayramova Saedet Davakhan (Әзірбайжан / Azerbaycan)
THIOL HOMEOSTASIS IN THE CRYSTALLINE EYE AND INFLUENCE ON IT IRRADIATION BY DECIMETER ELECTROMAGNETIC RADIATION (EXPERIMENTS ON RATS)

İbrahim Nuri Gündoğdu (Түркия / Türkiye)
EFFECTS OF CLIMATE CHANGE ON SEED DISPERSAL MECHANISMS
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СЕКЦИЯ ТӨРАҒАСЫ / OTURUM BAŞKANI
Assist. Prof. Dr. Mevlüde Alev Ateş

Prof. Dr. Farhat Jabeen (Пәкістан / Pakistan)
RECENT DEVELOPMENTS IN BIOLOGICAL SCIENCES

Neelam Iftikhar, Abdullah Ijaz Hussain (Пәкістан / Pakistan)
BIOACTIVITY-GUIDED ISOLATION AND ANTIHYPERTENSIVE ACTIVITY OF CITRULLUS COLOCYNTHIS POLYPHENOLS IN RATS WITH GENETIC MODEL OF HYPERTENSION

Dr. Syed Makhdoom Hussain (Пәкістан / Pakistan)
PLANT BASED INNOVATIONS FOR SUSTAINABLE AQUACULTURE OUTPUT

Mudassir Hassan, Azhar Rasul (Пәкістан / Pakistan)
HERBAL NANOMATERIAL-BASED WOUND DRESSING FOR EFFECTIVE TREATMENT OF DIABETIC FOOT ULCERS

Hammad Ullah, Alessandro Di Minno, Daniele Giuseppe Buccato, Lorenza Francesca De Lellis, Alessandra Baldi, Maria Daglia (Италия, Қытай / İtalya, Çin)
EVALUATING EFFECTIVENESS AND TOLERABILITY OF MULTI-ENZYME COMPLEX IN PATIENTS WITH FUNCTIONAL DYSPEPSIA

Anupama Shukla, Anita Narang (Үндістан / Hindistan)
THE LABOULBENIALES: AN ENIGMA

Assist. Prof. Dr. Mevlüde Alev Ateş (Түркия / Türkiye)
MATURASE K (MATK) GENE: SECRET BOX OF PLANT BIODIVERSITY

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Prof. Dr. Zeliha Selamoğlu

Prof. Dr. Faruk Selçuk (Түркия / Türkiye)
TÜRKİYE'NİN BİYOÇEŞİTLİLİĞİ

Allah Bakhsh (Пәкістан / Pakistan)
MODAY DAY TECHNOLOGIES TO CONTROL INSECT PESTS OF CROPS; EFFICIENT IPM, BETTER FARM PRODUCTIVITY

Jini D (Үндістан / Hindistan)
PHYTOCHEMICAL ANALYSIS OF PIPER BETEL EXTRACTS AND ITS EFFICACY AS FOOD PRESERVATIVE AGENT

Antoni Sureda, Amanda Cohen-Sánchez, Antoni Gabriel Sánchez-Mairata, José María Valencia, Antonio Box, Samuel Pinya, Silvia Tejada (Испания / İspanya)
ANTIOXIDANT AND IMMUNE RESPONSE OF TWO FISH SPECIES, XYRICHTHYS NOVACULA AND CORIS JULIS, RELATED TO A TREMATODE ECTOPARASITE IN IBIZA ISLAND (SPAIN)

Bugrahan Emsen, Ali Aslan (Түркия / Türkiye)
THE ROLE AND IMPORTANCE OF LICHENS IN ALTERNATIVE AND COMPLEMENTARY TREATMENT

Alexandros G. Georgakilas, Zeliha Selamoglu (Грекия / Yunanistan)
USE OF SYSTEMS BIOLOGY APPROACHES TO UNDERSTAND BETTER THE BIOLOGICAL EFFECTS OF IONIZING RADIATION

Gowhar Rashid, Gulzar Ahmad Bhat, Tahseen Bilal Rather, Syed Nisar Ahmad, Tariq Rasool Malik, Farooq Ahmad Jan, Zeliha Selamoglu, Marjan Assefi, Syed Mudassar (Үндістан / Hindistan)
UNRAVELING COLORECTAL CANCER RISK: GENETIC VARIANTS AND FAMILY HISTORY INSIGHTS

Romeo Cavaleriu, Gabriel Plavan, Oana Mare Roșca, Zeliha Selamoğlu (Румыния / Romanya)
SOME ASPECTS OF THE INFLUENCE OF INTENSIVE AQUACULTURE IN FLOATING CAGES, ON SOME CHEMICAL PARAMETERS OF THE ACTUALLY SEDIMENTS IN IZVORU MUNTELUI-BICAZ RESERVOIR

Zoulikha Abdelsadek, Abdelhamid Khalifa, Ahmed Albahnasawi, Parick Masset
INTERCALATION OF BIOACTIVE MOLECULE IN HDL MATRIX : BIOTECHNOLOGY APPLICATION
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Prof. Dr. Osman SEYYAR

Kadırbay Çekirov, Adinay Karipova, Aisuluu Kaçibekova (Қырғызстан / Kırgızistan)
KARYOLOGICAL FEATURES OF THE SCOTS PINE (PÍNUS SYLVÉSTRIS) IN THE CONDITIONS OF ANTHROPOGENIC POLLUTION IN BISHKEK

Çolponay Niymatova, Gülbübü Kurmanbekova, Salkın Beyşenalieva, Nurjamal Omurzakova (Қырғызстан / Kırgızistan)
STATUS OF THE HEMOSTASIS SYSTEM IN CHRONIC ALCOHOLISM

Dilyara Bekboeva, Gülbübü Kurmanbekova, Salkın Beyşenalieva, Nurjamal Omurzakova (Қырғызстан / Kırgızistan)
STUDY OF THE EFFECT OF FATTY HEPATOSIS ON FAT METABOLISM

Öğr. Gör. Şeyda Kaya, Prof. Dr. Sevgi Durna Daştan, Doç. Dr. Taner Daştan (Түркия / Türkiye)
NETWORK PHARMACOLOGY, MOLECULAR DOCKING AND BIOINFORMATIC ANALYSIS TO DETERMINE THE THERAPTIC ACTIVITY OF THE HERB AYNISAFA (CALENDULA OFFICINALIS) USED ETHNOPHARMACOLOGICALLY IN GASTIRIT DISEASE

Gulnara Hasanova (Әзірбайжан / Azerbaycan)
MICROSCOPIC FUNGI IN SOME RIVER WATERS OF AZERBAIJAN

Prof. Dr. Osman Seyyar, Prof. Dr. Hakan Demir (Түркия / Türkiye)
BIODIVERSITY OF TURKISH GROUND SPIDER (ARANEAE: GNAPHOSIDAE)

Eda Özdemir, Prof. Dr. Hakan Demir, Prof. Dr. Osman Seyyar (Түркия / Türkiye)
INVESTIGATION OF SETA MORPHOLOGY OF TURKISH LYNX SPIDERS (ARANEAE, OXYOPIDAE)

Begimay Urstembek Kızı, Yrd. Doç. Dr. Yılmaz Kaya (Қырғызстан / Kırgızistan)
CURRENT STATUS OF RESEARCH ON GENETICALLY MODIFIED RICE: A REVIEW

Талқылау / Değerlendirme

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Prof. Dr. Sevgi Durna Daştan

Bermet Isaeva, Yrd. Doç. Dr. Yılmaz Kaya (Қырғызстан / Kırgızistan)
THE IMPACT OF GENETICALLY MODIFIED (GM) COTTON VARIETIES IN AGRICULTURE: CURRENT STATUS AND PROSPECTS FOR THE FUTURE

Taner Daştan, Çağlanur Biçer, Şeyda Kaya, Sevgi Durna Daştan (Түркия / Türkiye)
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Ecem Özdemir, Zeynep Mine Coşkun Yazıcı, Melike Ersöz, Karolin Yanar (Түркия / Türkiye)
EFFECT OF TURKISH PROPOLIS ON COX-2 AND NF- κB MRNA EXPRESSIONS IN C6 GLIOMA CELLS

Venera Arstanalı Kızı, Doc. Dr. Kadyrbai Chekirov (Қырғызстан / Kırgızistan)
GROWTH CHARACTERISTICS AND FORAGE VALUES OF SILPHIUM PERFOLIATUM L IN KYRGYZSTAN

Öğr. Gör. Dr. Nuri Ercan, Prof. Dr. Alparslan Yıldırım (Түркия / Türkiye)
MICROSPORIDIOSIS

Nazgul Imanberdieva (Қырғызстан / Kırgızistan)
FEATURES OF BETA VULGARIS CULTIVATION IN KYRGYZSTAN AND DETERMINATION OF ITS SUGAR CONTENT

Жумадилов Болат Зулхайнарович / Bolat Cumadilov (Қазақстан / Kazakistan)
БИОРАЗНООБРАЗИЕ РАСТИТЕЛЬНОГО ПОКРОВА ЕРТЫССКОГО ФЛОРИСТИЧЕСКОГО ОКРУГА

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Prof. Dr. Elif Sevim

Gizem Sakallı (Түркия / Türkiye)
REVIEW OF ANTIOXIDANT EFFECTIVENESS OF ROSEMARY (ROSMARINUS OFFICINALIS)

Prof. Dr. Elif Sevim, Prof. Dr. Ali Sevim, Doç. Dr. Fikriye Milletli Sezgin (Түркия / Türkiye)
MOLECULAR CHARACTERIZATION OF CARBAPENEM RESISTANCE IN THREE Enterobacter cloacae STRAINS ISOLATED FROM CLINICAL SAMPLES

Bektore Mansurov, Gulbubu Kurmanbekova, Yılmaz Kaya, Bermet Kydyralieva (Қырғызстан / Kırgızistan)
APPLICATION OF POLYPHENOL OXIDASE ENZYME IN BIOTECHNOLOGY

Ayday Ergeşova, Kadırbay Çekirov, Yılmaz Kaya (Қырғызстан / Kırgızistan)
MALUS SIEVERSII and MALUS NIEDZWETZKYANA A REVIEW ON NUTRITIONAL FEATURES, CHEMICAL COMPOSITION, TRADITIONAL and MEDICINAL VALUE

Bakıt Borkoyev, Akmaral Övezdurdiyeva (Қырғызстан / Kırgızistan)
INVESTIGATION OF ABSORBENT PROPERTIES OF RICE HUSK AND DESIGN OF A PORTABLE WATER PURIFIER

Ergün Ergenekon, Nihal Şimşek Özek, Ömer Köksal Erman (Түркия / Türkiye)
CLASSIFICATION OF MALE INDIVIDUALS OF SPECIES BELONGING TO THE GENUS LACCOPHILUS (COLEOPTERA, DYTISCIDAE) USING FTIR SPECTROSCOPY TECHNIQUE

Gupse Kübra Karademir (Түркия / Türkiye)
OVERVIEW OF EXOSOME-BASED STUDIES IN PARASITES

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Prof. Dr. Sevgi Durna Daştan

Qurat Ul Ain Sajid, Muhammad Umair Asghar, Mariusz Korczyński (Польша / Polonya)
EXPLORING THE EFFECT OF HERBAL FEED ADDITIVES AND BOTANICAL NUTRACEUTICALS IN MONOGASTRIC ANIMAL NUTRITION

Ardalan Shariat (Иран / İran)
ETHICAL CONSIDERATIONS IN TELEEDUCATION FOR BIOLOGY STUDENTS: A NARRATIVE REVIEW

Boban Stanković (Сербия / Sırbistan)
THE BIRDS OF JAGODINA REGION (SERBIA): STATUS AND CHECKLIST

Hania Hamrouni, Walid Elfalleh (Тунис / Tunus)
GREEN SYNTHESIS OF SILVER NANOPARTICLES USING MEDICINAL PLANTS

Anita Narang, Anupama Shukla (Үндістан / Hindistan)
IN VITRO REGENERATION OF ACACIA HOLOSERICEA A. CUNN EX G. DON THROUGH COTYLEDONARY NODES

Sampath K, Shubhashree M. (Үндістан / Hindistan)
BIOLOGICAL PROPERTIES OF RUTHENIUM COMPLEXES

Neda Hosseinipour, Ebrahim Alinia-Ahandani, Sahebeh Hajipour, Zeliha Selamoglu (Iran)
MEDICINAL PLANTS EFFECTIVE IN THE TREATMENT AND CONTROL OF FEVER IN CHILDREN
Талқылау / Değerlendirme

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16.00-18.00 (KZ)
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СЕКЦИЯ ТӨРАҒАСЫ / OTURUM BAŞKANI
Prof. Dr. Zeliha Selamoğlu

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KAZAKİSTAN VE TÜRK DEVLETLERİ TARIMININ DÜNÜ, BUGÜNÜ VE YARINI

YESTERDAY, TODAY AND TOMORROW OF AGRICULTURE IN KAZAKHSTAN AND TURKISH STATES

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Özet

Günümüzde yedi bağımsız Türk devletinden biri olan Kazakistan 2.724.900 km² yüzölçümü ile dünyanın dokuzuncu en büyük alana sahip ülkesidir. Toprakları çoğunlukla Orta Asya'da yer alır ve Doğu Avrupa'ya kadar uzanır. Ülke, yaklaşık 19 milyon nüfusa sahiptir. Kazakistan'nın başlıca ekonomik gelir kaynakları; tarım, hayvancılık ve yeraltı kaynakları olarak bilinmektedir. Ülkede sert karasal iklim hâkim olmasına ve dolayısıyla ülke topraklarının çoğunlukla çöl ve yarı çöllerden oluşmasına karşın, bitkisel üretim için elverişli geniş araziler mevcuttur. İklimin de etkisiyle arazilerde toprak erozyonu, çölleşme ve zaman zaman kurak periyotların yanı sıra kısıtlı sermayeden kaynaklanan sorunlar tarımsal faaliyetleri sınırlandıran faktörler olarak belirtilebilir. Ancak son yıllarda yeni teknolojik girdilerin tarımsal faaliyetlerde kullanılmaya başlanması, kırsal alanlardaki koşulların iyileştirilmesi, 1998-2015 yılları arasında hayata geçirilen üç aşamalı tarım stratejisi reformları ve üretici desteklerinin iyileştirilmesi gibi politikalar sayesinde tarım ve hayvancılık faaliyetleri ivme kazanmıştır. Kazakistan'nın başlıca tarım ürünleri; tahıl, patates, üzüm, sebze ve hayvancılık olarak ön plana çıkmaktadır. Bununla birlikte Kazakistan'da yetiştirilen bazı ürünlerin 2001- 2021 üretim verilerine bakıldığında; üzüm, domates, biber, hıyar, patates gibi ürünlerde ciddi artışlar gözlenmiştir. Buna karşılık buğday, arpa, pamuk gibi ürünlerin üretim miktarlarının ise 2001 yılına oranla benzer seviyede kaldığı ya da düşüş olduğu görülmüştür. Ülke tarımının bir diğer önemli kolu ise hayvancılıktır. Kazakistan Orta Asya'daki Türk kültürünün de etkisi nedeniyle hayvancılık faaliyetlerinin yoğun olarak gerçekleştirildiği bir ülkedir. Son yıllarda hayvancılık faaliyetleri de artmaktadır. Yine 2001-2021 verileri kıyaslandığında; sığır, koyun, keçi ve tavuk hayvan varlıkları yaklaşık olarak 1,5 kat artmıştır. Dolayısıyla ülke, tarım ve hayvancılık faaliyetleri açısından oldukça yüksek bir potansiyele sahip olmasına rağmen bunu üretime tam olarak yansıtamamaktadır. Üretim ve ihracat açısından oldukça önemli bir potansiyele sahip olmasına rağmen ülkede hem tarımsal

üretim yetersiz hemde birçok tarımsal ürün ithal edimektedir. Bu nedenle gerek bitkisel üretim gerekse hayvancılık faaliyetleri için gelişen teknolojinin tarımsal faaliyetlere entegre edilmesi, teknik personel sayısının artırılması, üretim alanlarının ve koşulların iyileştirilmesi, özellikle kırsal kesimlerdeki üreticilerin bilgilendirilmesi ve doğru tarım tekniklerinin yaygınlaştırılması gibi uygulamalar hayata geçirilerek ülkenin sahip olduğu bu potansiyelin daha etkin değerlendirilmesi ile mümkündür.

Anahtar Kelimeler: Kazakistan, Tarım, Hayvancılık, Bitkisel Üretim, Tahıl

Abstract

Today, Kazakhstan, one of the seven independent Turkish states, is the country with the ninth largest area in the world, with a surface area of 2,724,900 km². Its territory is mostly located in Central Asia and extends into Eastern Europe. The country has a population of approximately 19 million. Kazakhstan's primary economic income sources are; It is known as agriculture, animal husbandry, and underground resources. Although the harsh continental climate prevails in the country, and therefore, the country's territory consists mainly of deserts and semi-deserts, there are large areas of land suitable for crop production. With the influence of the climate, soil erosion, desertification, and dry periods occur from time to time, and problems arising from limited capital can be stated as factors that limit agricultural activities. However, in recent years, agricultural and livestock activities have gained momentum thanks to policies such as the use of new technological inputs on agricultural activities, the improvement of conditions in rural areas, the three-stage agricultural strategy reforms implemented between 1998 and 2015, and the increments of producer support. The main agricultural products of Kazakhstan are; grain, potatoes, grapes, vegetables, and livestock come to the fore. In addition, when looking at the 2001-2021 production data of some products grown in Kazakhstan, significant increases were observed in products such as grapes, tomatoes, peppers, cucumbers, and potatoes. On the other hand, it was observed that the production amounts of products such as wheat, barley, and cotton either remained at a similar level or decreased compared to 2001. Another important area of the country's agriculture is animal husbandry. Kazakhstan is a country where animal husbandry activities are carried out intensively due to the influence of the Turkish culture in Central Asia. Livestock activities have also been increasing in recent years. When comparing 2001-2021 data, The number of cattle, sheep, goats, and chickens increased approximately 1.5 times. Therefore, the country has a very high potential in terms of agriculture and livestock activities. For this reason, in both crop production and animal husbandry activities, It is possible to use this potential of the country more effectively by implementing practices such as integrating developing technology into agricultural activities, improving production areas and conditions, informing producers, especially in rural areas, and disseminating correct agricultural techniques.

Keywords: Kazakhstan, Agriculture, Livestock, Crop Production, Grain.

EFFECT OF METHANOL EXTRACT OF *ARUM KOROLKOWII* REGEL TUBERS ON TESTOSTERONE LEVELS IN THE BLOOD SERUM AND TESTES OF ADULT MALE GUINEA PIGS

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Abstract

Arum korolkowii Regel is a herb widely used in the alternative medicine of the Kyrgyz people. The different tinctures of the tubers are used to enhance human sexual potency. However, no current scientific data confirms the curative characteristics of the *Arum korolkowii* Regel tubers, particularly their pharmacological effect on human sexual power.

This study was conducted to evaluate the aphrodisiac effect and safety of *Arum korolkowii* Regel tuber methanol extract after disposable and twenty-eight consecutive daily oral administrations in adult guinea pigs.

Thirty-three male outbred guinea pigs, aged 46-48 months, were used in the current experimental study. Animals were randomly divided into seven experimental groups – three groups for acute (3 animals per group) and four groups for subacute (6 animals per group) oral toxicity studies. In an acute oral toxicity study, the *Arum korolkowii* Regel tuber methanol extract was administered orally to adult guinea pigs at the disposable small (300 mg/kg) dose and high (2000 mg/kg) dose. In a subacute oral toxicity test, the extract was administered to animals at doses of 500, 1000 and 1500 mg/kg for 28 days. Tested animal's behavior for toxic symptoms or other changes was observed. Ultimately every guinea pig was anesthetized, blood from the cranial vena cava was collected for hematological and serum biochemical assays. Animals were euthanized by exsanguination and a necropsy was performed for gross anatomical and histopathological examination. Obtained data statistical analysis was performed.

Arum korolkowii Regel tuber methanol extract significantly increased the serum and testes testosterone levels ($p<0.05$; both at 0.000), total protein ($p<0.05$; 0.003), testes and body weights ($p<0.05$; 0.001 and 0.000 respectively), physical activity and appetite in guinea pigs after repeated 28-day oral administration compared with the control and disposable oral administration groups. Whereas other serum biochemical (urea, creatinine, albumin, globulin, total bilirubin, ALP, ALT, AST) and hematological parameters (WBC, heterophils, lymphocytes, monocytes, eosinophils, Fao-Kurloff cells, basophils, RBC, MCV, Hgb, MCH, MCHC, Hct, platelet, mean platelet volume) showed no statistically significant difference between control and all treated groups at $p>0.05$. Oral administration of *Arum korolkowii* Regel tuber methanol extract did not cause treatment-related mortality, hematological and serum biochemical alterations, gross anatomical and histopathological signs of toxicity in all tested guinea pigs throughout the study. *Arum korolkowii* Regel tuber methanol extract was found to be non-toxic and well-permitted in adult guinea pigs at a dose of up to 1500 mg/kg administered for 28 days.

Arum korolkowii Regel tuber methanol extract has a positive effect in terms of improving the sexual capability of adult guinea pigs by enhancing the secretion of testosterone in serum and testes.

Keywords: *Arum korolkowii* Regel tubers, methanol extract, testosterone, oral toxicity, adult guinea pigs

ENDEMİK *CENTAUREA* SP. TÜRLERİNİN MİKROÇOĞALTIM YÖNTEMİYLE *IN VITRO* KORUNMASI

IN VITRO CONSERVATION OF ENDEMIC *CENTAUREA* SP. SPECIES BY MICROPROPAGATION

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Özet

Bitki biyoçeşitliliği ekosistemdeki süreçlerin belirli bir düzen içerisinde işlemesi için oldukça önemlidir. Bitkiler çevreye besin sağlamaları ve doğal tehlikelerden korunma gibi olanaklar sundukları için insanlar ve diğer canlılar onlara büyük ölçüde bağımlıdırlar. Uluslararası Doğa Koruma Birliği (IUCN) verilerine göre çeşitli etmenler nedeniyle yaklaşık 20.360 bitki türünün tehdit altında olduğu ve 165 bitki türünün ise neslinin tükendiği ve doğada yok olduğu bilinmektedir. Biyoteknoloji alanındaki gelişmeler ile *in vitro* koruma yöntemleri oluşturulmuş ve bu yöntemler tehdit altındaki bitkilerin korunmasında en çok tercih edilen araçlarından biri haline gelmiştir. *İn vitro* koruma çalışmalarında genellikle mikroçoğaltım yöntemi kullanılmaktadır. İlgili yöntem *in vitro* ex-situ koruma çalışmalarında en çok tercih edilen teknikler arasında yer almaktadır. Bu derlemede endemik *Centaurea* sp. türlerinde gerçekleştirilen *in vitro* koruma çalışmaları hakkında bilgiler verilecektir.

Anahtar Kelimeler: Biyoçeşitlilik, *Centaurea* sp., Endemik tür, *İn vitro* koruma, Mikropropagasyon

Abstract

Plant biodiversity is quite important for the processes in the ecosystem to function in a certain order. Because plants provide the environment with nutrients and protection from natural hazards, humans and other living organisms are highly dependent on them. According to the data of the International Union for Conservation of Nature (IUCN), it is known that approximately 20,360 plant species are under threat due to various factors and 165 plant species are extinct and extinct in nature. With the advancements in the field of biotechnology, *in vitro* conservation methods have been established and these methods have become one of the most preferred tools for the conservation of threatened plants. The micropropagation method is generally used in *in vitro* conservation studies. This method is one of the most widely preferred techniques in *in vitro* ex-situ conservation studies. In this review, *in vitro* conservation studies on endemic *Centaurea* sp. species will be given.

Keywords: Biodiversity, *Centaurea* sp., Endemic species, *In vitro* conservation, Micropropagation

FENOLİK BİLEŞİKLERİN BİYOSENTEZİ VE BİYOTEKNOLOJİDE KULLANIM ALANLARI

BIOSYNTHESIS OF PHENOLIC COMPOUNDS AND USES IN BIOTECHNOLOGY

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Özet

Fenolik bileşikler, genellikle bitki dokularında bulunan ve antioksidan, anti-enflamatuar, antimikrobiyal ve antiproliferatif aktiviteler gibi biyoaktiviteler gösteren doğal biyoaktif moleküllerdir. Fenolik bileşiklerin sahip olduğu bu özellikler çeşitli endüstriler tarafından büyük ilgi duyulmasına neden olmuştur. Yapılan araştırmalar, antioksidan kaynağı bakımından zengin meyve ve sebze diyeti ile kanserler, diyabet ve kardiyovasküler gibi oksidatif stresle ilgili birçok hastalık riskini önemli ölçüde azalttığını göstermektedir. Fenolik bileşik(ler)deki hidroksil grubunun sayısı ve konumu, antioksidan potansiyellerinde farklılığa neden olmaktadır. Fenolik bileşikler üzerinde yapılan çok sayıda bilimsel çalışmaya rağmen, bu bileşiklerin organizmalardaki etkilerinin derinlemesine anlaşılması gibi bazı konuların hala incelenmesi ve çözülmesi gerekmektedir. Bu derleme, fenolik bileşiklerin sentez yolaklarını ve biyoteknoloji alanındaki güncel uygulamalarına odaklanmaktadır.

Anahtar Kelimeler: Antioksidant, Biyoteknolojik uygulamalar, Fenolik bileşikler, Fitokimyasallar, Sentez yolakları

Abstract

Phenolic compounds are natural bioactive molecules that are generally found in plant tissues and show bioactivities such as antioxidant, anti-inflammatory, antimicrobial, and antiproliferative activities. These properties of phenolic compounds have caused great interest in various industries. Research shows that a fruit and vegetable diet rich in antioxidants significantly reduces the risk of many oxidative stress-related diseases such as cancers, diabetes, and cardiovascular disease. The number and position of the hydroxyl group in phenolic compound(s) cause differences in their antioxidant potential. Despite the large number of scientific studies on phenolic compounds, some issues, such as the in-depth understanding of the effects of these compounds in organisms, still need to be studied and resolved. This review focuses on the synthesis pathways of phenolic compounds and their current applications in biotechnology.

Keywords: Antioxidant, Biotechnological treatments, Phytochemicals, Phenolic compounds, Synthesis pathways

МРНТИ 34.33.33

АҚМОЛА ОБЛЫСЫНЫҢ СУ БИОТОПТАРЫНДА КЕЗДЕСЕТІН КЕЙБІР БАЛЫҚ ТҮРЛЕРІНІҢ ЖЕЛБЕЗЕКТЕРІНІҢ САЛЫСТЫРМАЛЫ ГИСТОЛОГИЯЛЫҚ СИПАТТАМАСЫ

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Аңдатпа

Мақалада Ақмола облысында тіршілік ететін мөңке, аққайран, оңғақ балықтарының желбезектеріне гистологиялық зерттеу жүргізілді. Барлық зерттелген балық желбезектерінде морфологиялық өзгерістер анықталды. Бұл мақалада Ақмола облысының су биотоптарында мекендейтін мөңке, аққайран, оңғақ балықтарының желбезектерін гистологиялық зерттеуі ұсынылған. Зерттеудің алғышарты - табиғи ортадағы елеулі және қайтымсыз өзгерістерге әкелетін адамның экономикалық қызметінің қоршаған ортаға әсерінің артуы. Зерттеудің проблемасы - бұл өзгерістердің балықтардың тіршілік ету ортасына әсері туралы білімнің жетіспеушілігі, әсіресе су объектілерінің ластануы тұрғысынан. Зерттеудің мақсаты - ластанудан туындаған балық желбезектеріндегі морфологиялық өзгерістерді зерттеу. Зерттеу нысаны болып табылатын балықтар Ақмола облысында кездесетін мөңке, аққайран және оңғақ балықтары. Зерттеудің мәнмәтіні Қазақстандағы ластанған су айдындарындағы балықтардың тыныс алу қабілеттілігі, олардың желбезектерінің морфологиялық ерекшеліктері, желбезек құрылысының өзгерістері және функциялық қызметтерінің жағдайы болып табылады. Адамның экономикалық белсенділігінен туындаған балықтардың тіршілік ету ортасындағы бұл өзгерістер, атап айтқанда су объектілерінің тұрмыстық және өнеркәсіптік улы қалдықтармен, ауыр металдармен, химикаттармен, мұнай өнеркәсібінің өнімдерімен ластануы су биотоптарының терең өзгеруіне әкеледі және популяция, организм, орган деңгейінде арнайы зерттеулер жүргізуді талап етеді. Көптеген технологиялық ластанулар Қазақстандағы су айдындарына өз әсерін тигізуіне байланысты балықтар санының күрт өзгеруіне әкеліп соқтырды. Осы жағдайды ескере отырып, балық желбезегіне гистологиялық зерттеуге деген қызығушылық туындайды. Зерттеудің практикалық маңызы - Ақмола облысындағы әр түрлі су айдындарында тіршілік ететін балықтар желбезегінің гистологиялық құрылысын тереңірек көруге және оларды бір бірімен салыстыру арқылы балық желбезегінде болатын өзгешеліктерді бақылауға мүмкіндік береді. Сонымен қатар, Ақмола облысындағы әр түрлі су айдындарында кездесетін ауыр металлдардың балық желбезегіне әсерін көруге болады. Нәтижелер барлық зерттелген балықтардың желбезектерінде морфологиялық өзгерістер табылғанын көрсетеді. Зерттеу нәтижелері адамның экономикалық белсенділігінен туындаған Ақмола облысының су биотоптарындағы терең өзгерістерді түсіну үшін популяциялық, организмдік және орган жүйесі деңгейінде қосымша зерттеулер жүргізу қажеттілігін көрсетеді.

Түйін сөздер: балық, желбезек, гистологиялық зерттеу, ламелла, гематоксилин-эозин, аққайран, оңғақ, майбалық, ластану, су биотоптары, Ақмола облысы

Abstract

The article carried out a histological study of the gills of crucian carp, akkayran, right-handed fish living in the Akmola region. Morphological changes were found in all the studied fish gills. This article presents a histological study of the gills of crucian carp, akkayran, right-handed fish living in the aquatic biotopes of the Akmola region. A prerequisite for the study is the increase in the impact of human economic activity on the environment, which leads to significant and irreversible changes in the natural environment. The problem of the study is the lack of knowledge about the impact of these changes on the habitat of fish, especially in terms of pollution of water bodies. The aim of the study is to study morphological changes in fish gills caused by pollution. The object of the study is crucian carp, akkayran and right-handed fish found in the Akmola region. The context of the study is the respiratory capacity of fish in polluted water bodies in Kazakhstan, morphological features of their gills, changes in the structure of gills and the state of functional functions. These changes in the habitat of fish caused by human economic activity, in particular, pollution of water bodies with domestic and industrial toxic waste, heavy metals, chemicals, products of the oil industry, lead to a deep change in water biotopes and require special research at the level of population, organism, organ. Many technological pollution has led to a sharp change in the number of fish due to their impact on water bodies in Kazakhstan. Given this circumstance, interest arises in histological examination of fish gills. The practical significance of the study is that it allows you to more deeply see the histological structure of the gills of fish living in different bodies of water in the Akmola region and observe the differences that occur in the gills of fish by comparing them with each other. In addition, it is possible to see the effect of heavy metals on fish gills, which are found in various bodies of water in the Akmola region. The results indicate that morphological changes were found in the gills of all studied fish. The results of the study indicate the need for additional research at the population, Organismic and organ system levels to understand the profound changes in the aquatic biotopes of the Akmola region caused by human economic activity.

Keywords: fish, gills, histological examination, lamellae, hematoxylin-eosin, carp, tinca tinca, leuciscus idus , pollution, aquatic biotopes, Akmola region

CURRENT STATUS OF RESEARCH ON GENETICALLY MODIFIED RICE: A REVIEW

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Abstract

Genetically engineered crops represent the most promising achievement of today's scientists. Given that rice is a staple food worldwide, it is imperative to accord significant importance to its enhancement. Creating rice varieties resistant to biotic and abiotic stress will safeguard farmers from the adverse effects of chemicals employed as insecticides and fungicides. Specific abiotic factors like drought, cold, heat, and salinity, which impede rice growth, can be combated by developing genetically modified rice-carrying genes that enhance tolerance to these factors. Genetically designed rice has been approved by the ISAAA's GM approval database as safe for human and animal consumption. This crop aims to improve the crop yield, nutritional value, and food safety of rice grains. Furthermore, the increased production and utilization of some genetically modified rice would offer essential nutrients, especially to the impoverished, addressing their nutritional needs. However, the commercialization of genetically modified crops remains a contentious issue, as global acceptance is yet to be achieved. Ultimately, the prospects of genetically modified rice are promising as long as potential loopholes are addressed. This review study presents a summary of the research data on genetically modified plant and its potential role in improving the double burden of malnutrition, primarily through increasing nutritional quality and environmental issues. It also reviews the potential health benefits of specific bioactive components generated in genetically modified rice.

Keywords: *Oryza sativa*, Golden rice, biotic and abiotic stress, pesticides

THE IMPACT OF GENETICALLY MODIFIED (GM) COTTON VARIETIES IN AGRICULTURE: CURRENT STATUS AND PROSPECTS FOR THE FUTURE

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Abstract

Cotton (*Gossypium hirsutum* L.) stands as a significant cash crop globally, renowned for its lucrative products including fiber is used in the textile industry today, while its linters find application in the paper, furniture, and cellulose industry, its seeds in the oil industry, and as hulls and meal in the feed industry. As a pivotal fiber crop, it holds immense economic importance. When delving into the agronomy of cotton, several fundamental issues surface. One prominent concern is the extensive use of pesticides in its cultivation, surpassing that of any other crop. The chemicals applied to cotton fields often leach into water sources, causing detrimental environmental pollution. Genetically modified cotton are promising to mitigate current and future problems in commercial agriculture and environment, with proven case studies in global cotton production. Fortunately, the adoption of transgenic cotton presents a viable solution to these challenges. The integration of transgenic cotton has already yielded crucial environmental, social, and economic advantages. These benefits include reduced pesticide usage, indirect positive effects on yield increase, decreased environmental pollution, and minimized costs and labor in cultivation. Advancements in cotton genetic transformation systems have facilitated genetic enhancements by allowing researchers to transfer specific genes across species and integrate them into the cotton genome. Since the development of the first genetically engineered cotton plant in 1987, various desirable traits such as resistance to biotic factors (insects, viruses, bacteria, and fungi), tolerance to abiotic stressors (drought, chilling, heat, salt), herbicide tolerance, and manipulation of oil and fiber characteristics have been reported. Genetic engineering has become an indispensable tool in cotton breeding programs, supplementing traditional strategies to improve yield and its contributing factors. This review underscores the strides and efforts in cotton genetic engineering achieved through modern biotechnological approaches by researchers globally. Furthermore, it discusses the future prospects of transgenic cotton.

Keywords: cotton, genetically modified (GM) cotton, diseases, resistance, genetic transformation, cotton biotechnology.

PCR-BASED SCREENING OF PATHOGENS IN *Bombus terrestris* POPULATIONS OF TURKEY

TÜRKİYE'DEKİ *Bombus terrestris* POPÜLASYONLARINDA YER ALAN PATOJENLERİN PCR TEMELLİ TARANMASI

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Abstract

Bumblebees are an important group of insects in the pollination of various vegetables, fruits, oilseeds, legumes, and the fodder crops. Compared to honeybees, they have a wider choice of

hosts and a longer flight period. These bees are used especially for the pollination of plants in greenhouses and are commercially produced for this purpose. Recently, serious decreases have been occurring in bumblebee populations due to various reasons such as pathogens, and some of species are even threatened with extinction. Due to the worldwide decline in pollinator insects, determining of the distribution and prevalence of bumblebee pathogens is of great importance. Therefore, this study was conducted to determine the incidence and prevalence of pathogens in Turkish bumblebee populations and how much of each pathogen was in bumblebee samples. A total of 172 *Bombus terrestris* (Linnaeus,1758) samples (21 samples from commercial enterprises, 79 samples from greenhouses and 72 samples from nature) randomly collected from three provinces (Antalya, Mersin and İzmir) where greenhouse cultivation is intensively carried out in Turkey. 89 of these samples were collected in the spring and 83 in the autumn. The presence of four pathogens (*Nosema bombi*, *Crithidia bombi*, *Apicyctis bombi* and *Locustacarus buchneri*) was investigated by PCR using universal primers. The overall prevalence of *Nosema bombi*, *Crithidia bombi*, *Apicyctis bombi* and *Locustacarus buchneri* was determined as 7.55%, 9.3%, 11.62% and 4.65%, respectively. Co-infections (5.81%) were only detected in wild-caught (nature) samples. *C. bombi* and *A. bombi* infections were detected at higher rates in the spring samples than the autumn samples ($p<0.05$). There was no significant difference between the spring and autumn samples with respect to the presence of *N. bombi* and *L. buchneri* ($p>0.05$). The results obtained could be important in determining the prevalence and spread rates of the bumblebee diseases in Turkey and in order to determine appropriate protection measures. The information gathered should increase our knowledge about the presence of these pathogens in Turkey and could contribute to improve apiarist's practice. More studies are needed to determine the transmission pathways of these pathogens between the populations. Also, complex pathogen interactions in bumblebee populations should be considered in the future to improve bumblebee health.

Keywords: Bumblebee, Pathogen, Prevalence, PCR

Beauveria pseudobassiana: A GOOD CANDIDATE FOR CONTROLLING OF *Diprion pini* L. (HYMENOPTERA: DIPRIONIDAE)

Beauveria pseudobassiana: *Diprion pini* L. (HYMENOPTERA: DIPRIONIDAE)'NİN MÜCADELESİ İÇİN İYİ BİR ADAY

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Abstract

The common pine sawfly, *Diprion pini* (Linnaeus, 1758) (Hymenoptera: Diprionidae), is a well-known defoliating pest of various pine forests in almost all over the world including Europe. It can cause damage many pine species but usually opts *Pinus sylvestris* Linnaeus and *P. nigra* laricio Poiret. The prohibition of the use of chemical insecticides in forests (at least for Türkiye) has led to the fact that other control methods have become to the fore in the control of this pest. In this respect, the biological control which is environmentally friendly has an important potential in the control of *D. pini*. Therefore, in this study, diverse entomopathogenic fungi (15) were isolated from pine forest soils and identified by gene sequencing and phylogenetic analysis. Ten isolates (DP-37, DP-38, DP-45, DP-46, DP-49, DP-53, DP-54, DP-57, DP-58, and DP-63) were identified as *Beauveria pseudobassiana*, four isolates (DP-35, DP-41, DP-52, and DP-61) were identified as *B. bassiana* and only one isolate was identified as *Metarhizium robertsii* (DP-15). All isolates were tested against the larvae of the pest under laboratory conditions and the highest mortality and mycosis values (96.6% and 63.3 %) were obtained from *B. pseudobassiana* DP-57. This isolate was also tested against the pest under outdoor conditions using different concentrations of conidia. Based on probit analysis, LC_{50} value was estimated as 1.09×10^9 and LC_{90} value was estimated as 2.44×10^9 conidia/ml. Results show that *B. pseudobassiana* DP-57 could be good candidate in the biological control of *D. pini*.

Keywords: The common sawfly, microbial control, entomopathogenic fungi, *Beauveria pseudobassiana*

ŞEHİRLERİN PLANLANMASINDA LİKENLERİN KULLANILMASI

USE OF LICHES IN CITIES PLANNING

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Özet

Hava kirliliğinin belirlenmesinde likenler en ideal indikatör organizmalar olarak bilinirler. Günümüzde giderek artan havadaki çeşitli kirleticilerin canlılar üzerine olumsuz etkilerinin araştırılması en güncel konulardan birisidir. Likenlerin hava kirliliğinde belirlenmesinde kullanılması ile ilgili çok sayıda araştırmalar giderek artmaktadır. Bu çalışmalar genellikle şehirlerde ve bölgelerde yapılan bilimsel çalışmalardır. Liken dağılım haritalarının belirli aralıklarla belirlenmesi ile hava kirliliği arasında bir korelasyon olduğu tespit edilmiştir. Liken haritalama yöntemi kullanılarak şehirlerde çok kirli, normal kirli ve az kirli yada temiz bölgelerin haritalarıda çıkarılmaktadır. Likenler kirliliğe karşı son derece hassas simbiyotik organizmalardır. Bu nedenle hava kirliliği belirli oranların üzerine çıktığı zaman likenler yavaş yavaş ortamdan yok olmaktadırlar. Hava kirliliği likenlerin üreme potansiyelinde düşüşlere, gelişimde azalmaya, morfolojik ve anatomik değişikliklere, zar bütünlüğünün bozulmasına, fotosentez ve solunumda azalmaya, pigment ve azot fiksasyonunda azalmalara sebep olduğu tespit edilmiştir. Günümüzde likenoloji alanında çalışmalar yapan bilim insanları; Hawksworth ve Rose'un 1970 yılında geliştirdikleri likenlerin zon cetveli tablosu ile şehirlerdeki kirlik hakkında fikir edinmeleri mümkün olmaktadır. Kirliliğin belirlenmesinde kullanılan diğer bir yöntem ise liken transplantasyon yöntemidir. Bu yöntemde temiz bölgelerden toplanan liken örnekleri şehirlerdeki trafik yoğunluğuna bağlı olarak belirlenen istasyonlara yerleştirilerek çeşitli peryotlarda alınan örneklerin direkt kirlilik parametrelerinin ölçülmesi ile elde edilmektedir. Buna göre en kirli bölgeler ve temiz bölgeler belirlenerek haritalar yapılmakta ve buna göre yeni yerleşim alanları oluşturulmaktadır.

Anahtar Kelimeler: Hava Kirliliği, Likenler, şehirlerin planlanması

Abstract

Lichens are widely known as ideal indicator organisms for the determination of air pollution. Investigating the adverse effects of various pollutants in the air, which are increasingly prevalent in today's world, is one of the most current topics. Research on the use of lichens in

assessing air pollution is on the rise. These studies are typically conducted in cities and regions as part of scientific research. By establishing lichen distribution maps at regular intervals, a correlation between lichens and air pollution has been observed. Lichen mapping is used to create maps of heavily polluted, moderately polluted, and clean or lightly polluted areas in cities. Lichens are highly sensitive symbiotic organisms to pollution. Therefore, when air pollution exceeds certain thresholds, lichens gradually disappear from the environment. It has been determined that air pollution leads to decreases in the reproductive potential of lichens, reduced growth, morphological and anatomical changes, damage to the thallus structure, decreased photosynthesis and respiration, as well as reduced pigment and nitrogen fixation. In the present day, scientists working in the field of lichenology can gain insights into pollution levels in cities using the lichen zone scale table developed by Hawksworth and Rose in 1970. Another method used to determine pollution is lichen transplantation. In this method, lichen samples collected from clean areas are placed at stations determined based on traffic density in cities. Samples are collected at various intervals, and direct measurements of pollution parameters are made. This allows for the identification of the most polluted and cleanest areas, which can then be used to create maps and guide the development of new residential areas.

Keywords: Air pollution, Lichens, Cities Planning

MOLECULAR CHARACTERIZATION OF CARBAPENEM RESISTANCE IN THREE *Enterobacter cloacae* STRAINS ISOLATED FROM CLINICAL SAMPLES

KLİNİK ÖRNEKLERDEN ELDE EDİLEN ÜÇ *Enterobacter cloacae* SUŞUNDA KARBAPENEM DİRENCİNİN MOLEKÜLER KARAKTERİZASYONU

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Abstract

Infections caused by *Enterobacteriaceae* isolates producing carbapenemase are the most common health problems in our country as well as all over the world. Carbapenemase-producing microorganisms are very important to be able to develop resistance against all beta-lactam antibiotics, causing high mortality in infections, extending the length of hospitalization time and depletion of effective antibiotic options that can be used in treatment. *Enterobacter cloacae* has recently emerged as one of the most common carbapenem-resistant *Enterobacteriaceae* members. The emergence and spread of metallo-beta-lactamase-producing *E. cloacae* have posed an immediate threat globally. In this study, the presence of New delhi metallo beta lactamase-1 ($bla_{\text{NDM-1}}$) was detected in three carbapenem resistant *Enterobacter cloacae* complex (CR-ECC) strains isolated from clinical specimens at Kırşehir Ahi Evran University Training and Research Hospital, Microbiology Laboratory. While CR-ECC En28 and En29 strains were determined as ST78 clonal type, En30 strain were determined to be a new clonal type (ST1514). As well as NDM-1 resistance, $bla_{\text{OXA-1}}$, $bla_{\text{CTX-M15}}$, *aac(6 ')-ib-cr* genes and Class-1 integron containing *dfr*A15 were detected in CR- ECC En28 isolate. $bla_{\text{OXA-1}}$, $bla_{\text{CTX-M15}}$, *aac(6')-ib-cr*, Class-1 integron containing *dfr*A15 and Class-2 integron containing *dfr*A1-*sat* were detected in other CR-ECC En 29 isolate that is the producer of NDM-1. bla_{TEM}, $bla_{\text{OXA-1}}$, $bla_{\text{CTX-M15}}$, *aac (6 ')- ib-cr* and Class-2 integron containing *dfr*A1-*sat* gene were detected in another NDM-1 producer, CR-ECC En 30. It was determined that resistance genes detected in all isolates were carried on conjugative plasmids and pTcEn28 and pTcEn29 of the plasmids which had IncFIB replication origin. It was also determined by PCR-based replication origin determination method that the other conjugative plasmid pTcEn30 had IncFIB and IncL/M replication origin. It has been also determined that the genetic environment of $bla_{\text{NDM-1}}$ in three isolates consists of the same gene sequences. The ISAba125 insertion sequence was determined by primary walking experiments in which the $bla_{\text{NDM-1}}$ gene is in the upstream region.

Keywords: Carbapenem Resistant *Enterobacter cloacae* complex (CR-ECC), New delhi metallo beta lactamase-1 (*bla*$_{NDM-1}$), Resistance genes, conjugative plasmid

ВЫРАЩИВАНИЕ ЛИМОНА В ДОМАШНИХ УСЛОВИЯХ (ВНЕ КЛАССНАЯ РАБОТА ПО ИЗУЧЕНИЮ ПРЕДМЕТА «БИОЛОГИЯ»)

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Аннотация

В данной статье говорится о процессе выращивания лимона сорта Пандероза с учащимися в домашних условиях, в целях закрепления материала предмета «Биология» по теме «Вегетативное размножение». Внеклассная работа учащихся формирует повысить активность, развивает эстетический вкус, прививает интерес к изучаемому предмету, а также позволяет улучшить контроль знаний, полученных уроках биологии. В статье рассматривается способ вегетативного размножения лимона сорта Пандероза неспециализированными частями растения (участками стебля - черенками). Также в статье изучаются вопросы ухода за саженцами на различных стадиях развития. Существуют и другие опасности, которые подстерегают лимоны, выращиваемые в горшке. С других растений на них могут перейти вредители, прежде всего паутинный и красный клещик, которого называют красным паучком. Самыми распространенными среди этих вредителей являются паутинные и красные клещи (называемые также красными паучками). В статье даются рекомендации по проведению защитных мероприятий от вредителей и болезней лимона сорта Пандероза в домашних условиях.

Ключевые слова: саженцы, вегетативное размножение, черенок, обогащенный грунт, питательные вещества.

Abstract

This article talks about the process of growing a lemon of the Panderosa variety with students at home, in order to consolidate the material of the subject "Botany" on the topic "Vegetative reproduction". Extracurricular work of students forms to increase activity, develops aesthetic taste, instills interest in the subject being studied, and also allows to improve the control of knowledge gained in botany lessons. The article discusses the method of vegetative propagation of lemon of the Panderosa variety by non-specialized parts of the plant (stem sections - cuttings). The article also examines the issues of caring for seedlings at various stages of development. There are other dangers that lie in wait for lemons grown in a pot. Pests can move from other plants to them, primarily spider and red mite, which is called a red spider. The most common among these pests are spider and red mites (also called red spiders). The article provides recommendations on pr

Keywords: seedlings, vegetative reproduction, cuttings, enriched soil, nutrients.

COMPARISON OF THE NUTRIENT COMPOSITIONS IN RED AND GREEN AMARANTHUS (*AMARANTHUS HYPOCHONDRIACUS*)

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Abstract

Amaranth is a commonly consumed and nutritious vegetable. Amaranth has two morphological types, one is green and another is red. In this study, we collected five red and five green morph samples to analyze in terms of proximate, minerals, antioxidants, phytochemicals, and antioxidant activity in three replications. We found remarkable potassium (6.55 mg/g), calcium (2.63 mg/g), magnesium (3.01 mg/g), iron (10.94 µg/g), manganese (13.16 µg/g), copper (2.01 µg/g), zinc (11.57 µg/g), carotenoids (47.13 mg/100g), total phenolics (14.36 GAE µg/g), vitamin C (50.74 mg/100g) and antioxidant activity (ABTS+) (25.27 TEAC µg/g) in the red amaranth leaves. These data indicated that red and green could be considered enriched in antioxidants. Red amaranth is an excellent source of nutrients, antioxidant pigments, minerals, and phytochemicals compared to green amaranth. In this investigation, it was revealed that flavonoids, phenolic compounds, and carotenoids had strong antioxidant activity and significantly contributed to the antioxidant activity of the green and red amaranth. Red amaranth could be a potential source of nutritional components. The leaves of red amaranth are an outstanding source of dietary fiber, carbohydrates, moisture, and protein.

Keywords: Nutrient; Proximate; Mineral; TPC; TFC; TAC (ABTS+) and Amaranthus.

DETERMINATION OF POTENTIAL ANTAGONIST FROM ALKALOIDS AS AN ALTERNATIVE TREATMENT FOR NICOTINE DEPENDENCE USING *IN SILICO* APPROACH

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Abstract

Smoking is a common practice of recreational drug use. Smoking has been known for its adverse effects on both physical and mental health. Smoking also leads to nicotine dependence, which produces various deleterious effects on smokers. The latest data from WHO revealed that smoking is the leading cause of death due to non-communicable diseases. Smoking has killed 8 million people worldwide and this number keeps increasing, especially in low- to middle- income countries. Treatment for nicotine dependence has been widely developed and shown good efficacy in inducing abstinence; however, this utilization remains low due to limited treatment options. Hence, providing a new alternative for smoking cessation to give a new treatment option could be helpful to achieve cessation success. This study aims to determine the lead compound from natural alkaloids that could act as an antagonist towards nicotinic acetylcholine receptors (nAChrs) using *in silico* approach. The target receptor nicotinic acetylcholine receptor (nAChRs) subtype α4β2 is one of the target receptors responsible for the occurrence of nicotine dependence in humans. The experiment includes a virtual screening of potential nAChRs subtype α4β2 antagonist with Quantitative Structure-Activity Relationship (QSAR) analysis, molecular docking using Patchdock, visualization, and toxicity analysis. Of 43 alkaloids, 6 alkaloids showed good potential as an antagonist based on the complementary geometry scores and binding potential.

Keywords: nAChrs, in silico, QSAR, molecular docking, alkaloid

IMPROVING THE GERMINATION AND VIGOR OF QUINOA (*CHENOPODIUM QUINOA*) BY SEED COATING WITH BIOCHAR AND ACTIVATED CARBON UNDER SALINITY STRESS

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Abstract

This experiment was conducted in order to investigate the effect of seed coating with biochar and activated carbon on some quinoa seed germination indicators, and it was implemented as a factorial in the form of a completely randomized design with four replications in 2019, in Yasouj University's Faculty of Agriculture. The first factor is seed coating in four levels (no coating, coating with activated carbon, coating with biochar, and coating with activated carbon + biochar) and the second factor includes salinity stress in four levels (zero, 75, 150, and 225 mM sodium chloride). The results of the interaction of salinity stress and seed coating showed that the highest content of soluble sugar (28.578 mg/g seed FW) and malondialdehyde (2.97 µmol/g seed FW) was obtained by coating with activated carbon in 150 mM salinity stress. Also, the highest amount of seed hydrogen peroxide (0.18 µmol/g seed FW) and proline (10.49 µmol/g seed FW) at the level of 225 mM sodium chloride was obtained by covering the seeds with biochar and active carbon, respectively. Covering seeds with activated carbon and biochar led to an increase in the length of root and shoot under salt stress conditions. However, under salinity stress conditions, the root weight and length vigor index of the seed improved more by coating seeds with activated carbon. It can be stated that seed coating can greatly reduce the harmful effects of osmotic stress on germination and biochemical traits in quinoa seedlings and improve seedling growth.

Keywords: Hydrogen peroxide, Proline, Seed coat, Germination percentage, Sodium chloride.

STRUCTURE-BASED DRUG REPURPOSING TO INHIBIT THE DNA GYRASE OF *MYCOBACTERIUM TUBERCULOSIS*

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Abstract

Drug repurposing is an alternative avenue for identifying new drugs to treat tuberculosis (TB). Although TB can be cured with anti-tubercular drugs, the emergence of multidrug-resistant and extensively drug-resistant strains of *Mycobacterium tuberculosis* H37Rv (Mtb), as well as the significant death toll globally, necessitate the development of effective drugs to treat TB.

In this study, drug repurposing approach was employed to address this drug resistance problem by screening drugbank database to identify novel inhibitors of the Mtb target enzyme, DNA gyrase. The compounds were screened against the ATPase domain of gyrase B subunit (MtbGyrB47), and the docking results showed Echinacoside, Doxorubicin, Epirubicin, and Idarubicin possess high binding affinities against MtbGyrB47. Comprehensive assessment using fluorescence spectroscopy, SPR, and CD titration studies revealed that Echinacoside as a potent binder against MtbGyrB47. Further, ATPase, and DNA supercoiling assays exhibited IC_{50} values of 2.1-4.7 µM for Echinacoside, Doxorubicin, Epirubicin, and Idarubicin. Among these compounds, the least MIC_{90} of 6.3 µM and 12 µM were observed for Epirubicin and Echinacoside, respectively. Hence, our findings indicate that Echinacoside and Epirubicin target mycobacterial DNA gyrase, inhibit its catalytic cycle, and retard mycobacterium growth. Further these compounds exhibits potential scaffolds for optimizing novel anti-mycobacterial agents that can act on drug-resistant strains.

CONSUMERS BEHAVIORAL ASPECTS RELATED TO HALAL LABNEH PRODUCTION

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Abstract

The gelatin production is always remained a concern of great debate worldwide. The collagen found in animal bones, skins, and connective tissues is partially hydrolyzed to produce gelatin, a water-soluble protein. Gelatin has a wide range of uses in many different industries, including the food, pharmaceutical, and cosmetics industries. But in Halal and Kosher food industries, it is regarded as one of the most contentious components. The acceptability of items containing gelatin is determined by the animal from which it was derived and it is impossible to determine the source animal from which the gelatin originated after it is combined with food or pharmaceutical products. As a result, there is a chance of financially motivated adulteration or mislabeling. In labneh production, milk is incorporated with gelatin to counter the syeresis problem during storage but gelatin source is unknown which led to Halal or Haram ethical issues. This study focused on labneh production from transglutaminase enzyme extracted from plant source as gelatin replacer and to examine the rheological properties of yogurt. The effects of varied enzyme concentrations ranging from 1%, 2% and 4% with various setting temperatures of 35˚C and 45˚C with different time treatment of 60 and 90 minutes were evaluated. The enzymatic treatment of milk proved beneficial to retard the syneresis phenomenon during yogurt storage at 4˚C which improved water holding capacity during centrifugation. The post-acidification procedure and stability of yogurt samples were both effected by cross-linking of transglutaminase with milk protein that proved effective tool for improving functional properties of labneh. As consumer concerns about the authenticity of Halal and Kosher food and non-food products have grown. Therefore, Gelatin's species origin must be detected and quantified in order to ensure its integrity with regard to Halal and Kosher issues.

Keywords: Gelatin, Kosher, Labneh, Tranglutaminase enzyme, Halal source.

BİTKİLERDE OKSİDATİF STRES HASARLANMASINI AZALTMADA ALTERNATİF UYGULAMALAR

ALTERNATIVE TREATMENTS TO REDUCE OXIDATIVE STRESS DAMAGE IN PLANTS

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Özet

Bitkiler bulundukları çevre ile karşılıklı etkileşim içerisindedir. Değişen iklim şartları ve kirletici faktörlerin varlığı ile bitkilerin yaşamları olumsuz yönde etkilenmektedir. Abiyotik stres ve biyotik stres faktörleri "oksidatif stres" adı verilen bir stresin oluşumuna sebep olur. Oksidatif stres hücre bileşenlerine zarar vererek işlevsel bozukluklara neden olan ve stres koşullarının ortak bir özelliği olarak kabul edilen ikincil bir strestir. Bu stres faktörü 'reaktif oksijen türleri' (ROS) olarak adlandırılan moleküllerin aşırı üretimi ve birikmesiyle gerçekleşir. Stres koşulları altında bitki hücrelerinde ROS fazlalığı proteinler, lipitler, karbonhidratlar ve DNA gibi biyomoleküllerin yanı sıra hücre membranlarının zarar görmesine neden olabilir. Bu oksijen türevleri biyolojik redoks reaksiyonlarının kaçınılmaz ürünleridir ve bitkilerde de diğer organizmalarda olduğu gibi bu moleküllerle başa çıkabilmek için çok sayıda mekanizma bulunmaktadır. Bitkilerin sahip olduğu bu antioksidan sistem çeşitli antioksidan molekül ve enzimlerden oluşmaktadır. Bu savunma sistemi elemanları reaktif oksijen türlerini ortadan kaldırarak oluşabilecek zararları önler. Ancak stres koşullarında ROS üretimi, antioksidan sistemin zararsız hale getirme kapasitesini aşarak oksidatif strese neden olur. Antioksidan savunma sisteminin kapasitesi ve aktivitesi, oksidatif hasarın önlenmesinde ve metabolizma için normal olarak gerekli olandan fazla üretilen reaktif oksijen türlerinin yok edilmesinde belirleyicidir. Transgenik bitkiler üzerinde yapılan tek enzim arttırma çalışmaları bitkilerin bu stres faktörüne karşı toleranslarının belli bir dereceye kadar arttırılabildiğini göstermektedir. Transgenik bitkiler dışında oksidatif stres hasarlanmasının azaltıldığı farklı uygulamalarda mevcuttur. Bu çalışmalarla bitkilerin yaşamlarını devam ettirebilmeleri ve verimlerinin korunması sağlanmaktadır. Bildiri kapsamında oksidatif stresin tanımı, reaktif oksijen türlerinin kaynakları, antioksidan savunma sistemi ve oksidatif stres ile mücadelede kullanılan tohum astarlaması, tohum ön muamelesi ve eksojen elisitör uygulamalarından bahsedilmiştir.

Anahtar Kelimeler: antioksidan sistem, eksojen elisitör uygulamaları, oksidatif stres, tohum astarlama, tohum ön muamelesi

Abstract

Plants interact with their environment. The life of plants is negatively affected by changing climatic conditions and polluting factors. Abiotic stress and biotic stress factors cause stress

called “oxidative stress”. Oxidative stress is a secondary stress that causes functional disorders by damaging cell components and is considered a common feature of stress conditions. This stress factor occurs through the excessive production and accumulation of molecules called 'reactive oxygen species' (ROS). An excessive production of ROS in plant cells under stress conditions can cause damage to cell membranes as well as biomolecules such as proteins, lipids, carbohydrates, and DNA. These oxygen derivatives are inevitable products of biological redox reactions and, plants, like other organisms, have many mechanisms to deal with these molecules. This antioxidant system that plants have consists of various antioxidant molecules and enzymes. These defense system elements prevent possible damage by eliminating reactive oxygen species. However, under stress conditions, ROS production exceeds the neutralization capacity of the antioxidant system, causing oxidative stress. The capacity and activity of the antioxidant defense system are determinative in preventing oxidative damage and eliminating reactive oxygen species, which are produced more than generally required for metabolism. Single enzyme enhancement studies conducted on transgenic plants show that the tolerance of plants to this stress factor can be increased to a certain extent. Apart from transgenic plants, there are different applications in which oxidative stress damage is reduced. These studies ensure that plants can continue their lives and maintain their productivity. Within the scope of the paper, the definition of oxidative stress, sources of reactive oxygen species, antioxidant defense system, seed priming, seed pretreatment, and exogenous elicitor applications used in combating oxidative stress were mentioned.

Keywords: antioxidant system, exogenous elicitor treatments, oxidative stress, seed priming, seed pretreatment

SOME ASPECTS OF THE INFLUENCE OF INTENSIVE AQUACULTURE IN FLOATING CAGES, ON SOME CHEMICAL PARAMETERS OF THE ACTUALLY SEDIMENTS IN IZVORU MUNTELUI-BICAZ RESERVOIR

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Abstract

The previous investigations focused on the influence on the mineral and organic matter resulted from the aquaculture activity represented by unconsumed feeds, faeces and excreta on the sediment composition from the floating cages area, have been made during 1979 – 1983 period, when the trout production was between 3 and 10 tons per year and the quantity of feeds administrated to the fishes was between 8.7 and 27 tons per year. In 2021 we have resumed the researches on the chemical parameters of the actually sediments in the aquaculture floating farm area and in other areas, uninfluenced by this activity. The influence of the trout aquaculture in floating cages upon the chemical characteristics of the actual sediments in the farms neighboring area is reduced by a series of factors which cause that just a part of the organic and mineral matter introduced in the ecosystem to arrive on the bottom, under the cages. These effects appear on limited areas in the farms neighboring area and may be explained as forms of a limited eutrophication.

Keywords: intensive aquaculture, chemical parameters, Izvoru Muntelui-Bicaz reservoir

Maturase K (*mat*K) GENE: SECRET BOX OF PLANT BIODIVERSITY

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Abstract

In the past several years, there has been an increasing tendency in molecular phylogenetic research of plant families to incorporate gene regions into their investigations. DNA barcoding was selected as a preferred method for labeling. Multiple studies have employed different segments of the barcoding gene across diverse taxonomic hierarchies. The CBOL working group has put up several alternative gene regions after amassing a substantial amount of data for the purpose of barcoding. The chloroplast matK gene spans a length of 1500 base pairs and is located within the trnK intron. The gene exhibits potential as a valuable research instrument in the realm of plant systematics and evolution, owing to the notable rates of substitution reported among the species. The matK-trnK gene pair is frequently utilized in studies of plant evolution due to its ability to yield insights at several taxonomic levels. The optimum characteristics of the matK gene include its size, substitution rate, nucleic acid variation at the first and second codon locations, transition/transversion ratio, and the presence of mutably conserved domains. The aforementioned characteristics of the matK gene are utilized to elucidate familial and species-level connections. The utilization of gene regions for the purpose of distinguishing subspecies or varieties in plants has been suggested as a result of molecular systematic studies, mostly focusing on the species level. Furthermore, it is imperative that the taxonomic methodologies employed consider not just morphological characteristics, but also molecular commonalities at the molecular level.

Keywords: *mat*K, biodiversity, plant, phylogenetic

TÜRK PROPOLİSİNİN C6 GLİOMA HÜCRELERİNDE COX-2 ve NF- κB mRNA EKSPRESYONLARI ÜZERİNDEKİ ETKİSİ

EFFECT OF TURKISH PROPOLIS ON COX-2 AND NF- KB MRNA EXPRESSIONS IN C6 GLIOMA CELLS

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Özet

Propolis doğal reçineli bir maddedir ve arı kovanlarından elde edilir. Yapılan çalışmalar propolisin anti-oksidan, anti-inflamatuar ve anti-tümör özelliklere sahip olduğunu göstermektedir. Glioma en sık görülen beyin tümörüdür. Glioblastoma, gliomanın en öldürücü formudur ve tüm glioma tanılarının %70'ini oluşturur. C6 Glioma hücreleri insan glioblastomanın histolojik özelliklerini gösterdiklerinden dolayı beyin tümörü araştırmalarında model hücreler olarak kullanılır. Bu çalışmanın amacı, C6 Glioma hücrelerinde Türk propolisinin siklooksijenaz-2 (COX-2) ve nükleer faktör-kappaB (NF-κB) mRNA ekspresyonları üzerindeki etkisinin belirlenmesini araştırmaktır. Bu amaçla, Tekirdağ-Türkiye'den toplanan ham propolis %70'lik alkolde ekstrakte edilerek membran filtreden süzüldü. %5 fetal sığır serumu, 0,2 mM L-glutamin, 100 U/ml penisilin ve 100 µg/ml streptomisin ile desteklenmiş DMEM/F12 ortamındaki C6 glioma hücreleri 6 oyuklu plakalara ekildi ve %5 CO_2 'den oluşan nemli havada 37 °C 'de inkübe edildi. Sonrasında C6 Glioma hücreleri propolis ekstraktının farklı konsantrasyonlarıyla (100, 250 ve 500 µg/ml) 24 saat muamele edildi. Elde edilen hücre lizatlarından RNA izolasyonu ve cDNA sentezi kit prosedürüne göre gerçekleştirildi. NF-κB ve COX-2 mRNA ekspresyon seviyeleri Gerçek zamanlı Polimeraz Zincir Reaksiyonu ile analiz edildi. Matriks metalloproteinaz (MMP)-2, MMP-9 ve c-Jun NH(2)-terminal kinaz/stress-aktive protein kinaz (JNK/SAPK) düzeyleri Enzim Bağlı İmmünosorbent Testi (ELISA) kitleri kullanılarak ölçüldü. NF-κB ve COX-2 mRNA ekspresyon seviyeleri Pfaffl yöntemi kullanılarak hesaplandı. İstatistiksel analizler GraphPad Prism kullanılarak yapıldı. Deneysel sonuçlar; doza bağlı olarak uygulanan Türk propolisinin C6 Glioma hücrelerinde COX-2 ve NF-κB mRNA ekspresyon seviyelerini kontrol grubu hücrelerine göre azalttığını, JNK/SAPK düzeyini arttırdığını, MMP-2 ve MMP-9 seviyeleri üzerinde ise bir etkisi olmadığını gösterdi. Sonuç olarak, Türk propolisi C6

Glioma hücrelerinde anti-tümör etkisi göstermektedir ve bu sonuçlar daha fazla çalışmayla desteklenmelidir.

Anahtar Kelimeler: propolis; gen ekspresyonı; C6 Glioma; inflamasyon; matriks metalloproteinaz.

ABSTRACT

Propolis is a natural resinous substance and is obtained from beehives. Studies show that propolis has anti-oxidant, anti-inflammatory and anti-tumor properties. Glioma is the most common brain tumor. Glioblastoma is the most lethal form of glioma and accounts for 70% of all glioma diagnoses. C6 glioma cells are used as model cells in brain tumor research because they show histological features of human glioblastoma. The aim of this study is to investigate the determination effect of Turkish propolis on cyclooxygenase-2 (COX-2) and nuclear factor-kappaB (NF-κB) mRNA expressions in C6 Glioma cells. For this purpose, Crude propolis collected from Tekirdağ-Turkey was extracted in 70% alcohol and filtered through a membrane filter. C6 glioma cells in DMEM/F12 medium supplemented with 5% fetal bovine serum, 0.2 mM L-glutamine, 100 U/ml penicillin and 100 µg/ml streptomycin were seeded in 6-well plates and incubated at 37 °C in a humidified atmosphere of 5% CO_2. After that C6 Glioma cells were treated with different concentrations of propolis extract (100, 250 and 500 µg/ml) for 24 hours. RNA isolation and cDNA synthesis from the obtained cell lysates were performed according to the kit procedure. NF-κB and COX-2 mRNA expression levels were analyzed by Real-time Polymerase Chain Reaction. Matrix metalloproteinase (MMP)-2, MMP-9 and c-Jun NH(2)-terminal kinase/stress-activated protein kinase (JNK/SAPK) levels were measured using Enzyme Linked Immunosorbent Assay (ELISA) kits. NF-κB and COX-2 mRNA expression levels were calculated using the Pfaffl method. Statistical analyzes were performed using the GraphPad Prism. Experimental results; It showed that Turkish propolis applied dose-dependently decreased COX-2 and NF-κB mRNA expression levels in C6 Glioma cells compared to control group cells, increased JNK/SAPK levels, and had no effect on MMP-2 and MMP-9 levels. In conclusion, Turkish propolis shows an anti-tumor effect on C6 Glioma cells and these results should be supported by further studies.

Keywords: propolis; gene expression; C6 Glioma; inflammation; matrix metalloproteinase.

BİTKİ BAZLI FONKSİYONEL BİR YAN ÜRÜN: AQUAFABA

A PLANT-BASED FUNCTIONAL BY-PRODUCT: AQUAFABA

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Özet

Baklagiller iyi bir protein, kompleks karbonhidrat ve diyet lifi kaynağıdır ve bu da onları değerli bir besin kaynağı yapar. Ayrıca %17-30 arasında yüksek protein içeriği nedeniyle hayvansal proteinlerin ekonomik ve çevresel açıdan sürdürülebilir bir alternatifi olarak kabul edilmektedir. Diğer bitki bazlı kaynaklarla karşılaştırıldığında alerjen olarak tanımlanmadığı ve genetiği değiştirilmediği için rağbet gören bir alternatiftir. Ayrıca düşük alerjenitenin besinsel faydaları, sürdürülebilir üretim, düşük fiyat ve yüksek üretim potansiyeli endüstriyel kullanımını artırmaktadır. Pişirme baklagilleri işlemenin ve genel olarak yemek hazırlamanın en yaygın yoludur. Bakliyat tohumlarının suda konserve edilerek veya kaynatılarak ısıl işleme tabi tutulması aquafaba adı verilen jelatinimsi sıvı bir yan ürün oluşturur. Bakliyat konserve suları genellikle nohuttan elde edilmektedir ancak diğer bazı baklagillerden (bezelye, beyaz fasulye, kırmızı fasulye, soya) de elde edilebilir. Fabrikalarda, profesyonel mutfaklarda ve evlerde bakliyat konserve suları değerlendirilmeyip atılmaktadır. Ancak ıslatma ve pişirme işlemleri gibi işleme koşulları sırasında baklagiller işlemin sonunda aquafaba olarak adlandırılan pişirme suyuna önemli miktarda organik molekül salar. Bu sebeple aquafaba kazandığı fonksiyonel özellikleriyle hayvansal bazlı proteinlerin yerini almak için büyük bir potansiyele sahiptir ve besin bileşimi açısından zengindir. Aquafabanın fonksiyonel özellikleri (emülsifiye etme, köpük oluşturma, jelleşme ve kıvam artırma); yapısında bulunan protein, suda çözünür/çözünmez karbonhidratlar (oligosakarit, nişasta, selüloz, hemiselüloz veya lignin), polisakkarit protein kompleksleri, saponinler ve fenolik bileşiklerden kaynaklanmaktadır. Ayrıca aquafaba erişilebilirliği, bitki kökenli olması, çevre dostu olması ve düşük kalorili içeriği nedeniyle birçok tüketicinin ilgisini çekmektedir.

Baklagiller zengin besin içeriği, işlenmesinde birçok yan ürün oluşması, fonksiyonel ve teknolojik özellikleri, gıdalardaki kullanım çeşitliliği nedeniyle gıda endüstrisine ve üretimde sürdürülebilirliğe fayda sağlayan en önemli gıda kaynaklarından biridir ve atık sularının kullanımı gıda israfını azaltmada bir alternatif olarak umut vericidir.

Anahtar Kelimeler: Protein, ısıl işlem, emülsiyon, köpürme, jelleşme.

Abstract

Legumes are a good source of protein, complex carbohydrates and dietary fiber, and these properties make them a valuable food source. It is also considered an economically and environmentally sustainable alternative to animal proteins due to its high protein content (17-30%). Compared to other plant-based sources, it is a popular alternative because it is not identified as an allergen and is not genetically modified. In addition, the nutritional benefits of low allergenicity, sustainable production, low price and high production potential increase its

industrial use. Cooking is the most common way to process legumes and prepare food in general. Heat treatment of legume seeds by canning or boiling in water creates a gelatinous liquid by-product called aquafaba. Canned legume liquids are usually obtained from chickpeas, but can also be obtained from some other legumes (peas, white beans, red beans, soy). Canned legume liquids are not used and thrown away in factories, professional kitchens and homes. However, during processing conditions such as soaking and cooking, legumes release significant amounts of organic molecules into the cooking water, called aquafaba, at the end of the process. For this reason, aquafaba has a great potential to replace animal-based proteins with its functional properties and is rich in nutritional composition. The functional properties of aquafaba (emulsifying, foaming, gelling and thickening) arise from the protein, water-soluble/insoluble carbohydrates (oligosaccharide, starch, cellulose, hemicellulose or lignin), polysaccharide protein complexes, saponins and phenolic compounds found in its structure. In addition, aquafaba attracts the attention of many consumers due to its accessibility, plant origin, environmental friendliness and low calorie content.

Legumes are one of the most important food resources that benefit the food industry and sustainability in production due to their rich nutritional content, formation of many by-products in processing, functional and technological properties, diversity of uses in foods, and the use of wastewater is promising as an alternative to reduce food waste.

Keywords: Protein, heat treatment, emulsion, foaming, gelation.

GIDALARIN KORUNMASINDA GÜÇLÜ BİR ALTERNATİF: BAKTERİYOSİNLER

A POWERFUL ALTERNATIVE IN FOOD PRESERVATION: BACTERIOCINS

Deren Tahmas Kahyaoğlu

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Özet

Gıda güvenliği açısından patojen mikroorganizmaların gıdalarda gelişimi önlenmelidir. Bu amaçla patojen bakteriler üzerinde antagonistik etki gösteren mikroorganizmaların ve metabolik bir ürün olan bakteriyosinlerin kullanımı giderek önem kazanmıştır. Bakteriyosinler, belirli bir bakteri türü tarafından sentezlenen, yakın ilişkili türlere karşı inhibitör etki gösteren ancak üretici organizma üzerinde etkili olmayan, antibiyotiklere göre daha sınırlı bir etki spektrumda olan protein yapısındaki doğal antimikrobiyal maddelerdir. Doğal antimikrobiyaller olarak bakteriyosinler, genellikle Gram (+) bakteriler üzerinde etkilidirler ve gıdaların bozulmasına neden olan mikrobiyal gelişimi kontrol etmek için daha az kimyasal antimikrobiyal kullanımıyla tüketici talebinde bir alternatif oluşturmaktadır. Bununla birlikte Gram (-) bakterilerin dış zarlarının bütünlüğünün zarar görmesi halinde bakteriyosinlere karşı hassasiyet gösterdikleri bildirilmiştir. Bakteriyosinler renksiz, tatsız ve kokusuz moleküller olduğundan gıdaların fiziksel, kimyasal ve duyusal özelliklerinde değişime neden olmazlar ve insan sağlığı üzerinde olumsuz bir etki yapmazlar. Protein yapısında oldukları için proteolitik enzimlerden ve mide salgılarından etkilenerek kolayca sindirilirler. Çeşitli bakteriyosinler düşük pH değerlerinde, geniş bir tuz konsantrasyonu aralığında ve yüksek sıcaklıklarda işlevseldir ve dolayısıyla çok çeşitli gıda ürünlerinde kullanılabilirler. Bakteriyosinler gıdalara çeşitli şekillerde uygulanabilir. Bunlar; kısmen saflaştırılmış bakteriyosinler, bakteriyosin içeren fermente ürünler, bakteriyosin üreten kültürler, kaplamalara ve ambalaj filmlerine katılan bakteriyosinler olarak 4 gruba ayrılabilir. Gıda üreticileri güvenli ve uzun raf ömrüne sahip gıdalar elde etmek, tüketiciler kimyasal korucuyu içermeyen gıdalar tüketmek istediği için bakteriyosinler her iki grubun isteklerini de karşılayabilecek potansiyeldedir. Bakteriyosinin güvenilirliğini doğrulamak için bakteriyosin immünojenitesi ve toksisitesi üzerine kapsamlı araştırmalar yapılmalı ve Dünya Sağlık Örgütü (WHO) ve Gıda ve İlaç Dairesi (FDA) gibi düzenleyici kurumlar tarafından onaylanmalıdır. Gıdalarda koruyucu kültür olarak genellikle laktik asit bakterileri, bakteriyosin olarak yasal kullanımına izin verilmiş olan nisin kullanılır.

Anahtar Kelimeler: Gıda güvenliği, inhibisyon, antimikrobiyal, raf ömrü, nisin

Abstract

For food safety, the growth of pathogenic microorganisms in foods should be prevented. For this purpose, the use of microorganisms that have an antagonistic effect on pathogenic bacteria and bacteriocins, a metabolic product, has become increasingly important. Bacteriocins are natural antimicrobial substances in protein structure that are synthesized by a specific type of bacteria, have an inhibitory effect against closely related species, but have no effect on the producing organism, and have a more limited spectrum of action than antibiotics.

As natural antimicrobials, bacteriocins are generally effective on Gram (+) bacteria and represent an alternative in consumer demand with less use of chemical antimicrobials to control microbial growth that causes food spoilage. However, it has been reported that Gram (-) bacteria are sensitive to bacteriocins if the integrity of their outer membrane is damaged. Since bacteriocins are colorless, tasteless and odorless molecules, they do not cause changes in the physical, chemical and sensory properties of foods and do not have a negative effect on human health. Since they are in protein structure, they are easily digested by being affected by proteolytic enzymes and gastric secretions. Various bacteriocins are functional at low pH values, a wide range of salt concentrations, and high temperatures and can therefore be used in a wide variety of food products. Bacteriocins can be applied to foods in a variety of ways. They can be divided into four groups: partially purified bacteriocins, fermented products containing bacteriocins, bacteriocin-producing cultures, and bacteriocins added to coatings and packaging films. Since food producers want to obtain foods that are safe and have a long shelf life, and consumers want to consume foods that do not contain chemical preservatives, bacteriocins have the potential to meet the demands of both groups. To confirm the safety of the bacteriocin, extensive studies on bacteriocin immunogenicity and toxicity must be conducted and approved by regulatory agencies such as the World Health Organization (WHO) and the Food and Drug Administration (FDA). Lactic acid bacteria are generally used as a protective culture in foods, and nisin, which is legally permitted for use, is used as a bacteriocin.

Keywords: Food safety, inhibition, antimicrobial, shelf life, nisin

KEKİĞİN ETNOBOTANİK KULLANIMI ve SEKONDER METABOLİTLERİNİN ARTTIRIM ÇALIŞMALARI

ETHNOBOTANICAL USE OF THYME AND SECONDARY METABOLITES ENHANCEMENT STUDIES

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Özet

Kekik çok sayıda ülkede kültürü yapılan ve çeşitli kullanım alanlarına (kozmetik, gıda, tarımsal zararlılarla mücadele vb.) sahip olan aromatik bir bitkidir. Bununla birlikte içerdiği sekonder metabolitleri nedeniyle oldukça kıymetli bir tıbbi bitkidir. Karvakrol ve timol kekik uçucu yağının asıl bileşenleridir. Timol bileşenin kristalleşme kabiliyetinin yüksek olmasından dolayı ilaç endüstrisinde oldukça önemli bir bileşendir. Karvakrol bileşeni ise kristalleşmediği için ilaç endüstrisinde sınırlı kullanımı bulunmaktadır. Karvakrol bileşeni antifungal ve antibakteriyel özelliğe sahip olması ile gıdaların bozulmalarını önler ve raf ömürlerini uzatır. Biliyer etkiye sahip olan kekik bitkisi sindirim sistemi spazmlarını önlemektedir. Tümör oluşumunu önleyici, yara iyileştirici, mikrop öldürücü, tansiyon arttırıcı (kekik suyu), antihipertansif (uçucu yağ) etkileri bulunmaktadır. Anti-mutajenik, antispazmodik, AChE inhibitörü (Alzheimer hastalığında etkilidir), antigenotoksik, serbest radikal süpürücü, antioksidan, analjezik ve antienflamatuar, antielastaz (kronik akciğer yetmezliği ve amfizeme karşı etkilidir), hepatoprotektif/anti-hepatotoksisite ve karaciğerde iskemik hasarı önleyici özelliği de mevcuttur. Antibiyotiklere alternatif olması amacıyla hayvan yemlerine eklenmektedir. Kekik bitkisi tüm dünyada ihracatı yapılan önemli türler arasındadır. Türkiye kekik yetiştiriciliğinde dünyada önemli bir yere sahiptir ve ticareti yapılan yaygın türler *Thymus, Origanum, Thymbra, Coridothymus, Satureja*'dır. Ülkemizin kekik ihracatının en az %90 kadarı *Origanum* türlerinden sağlanmaktadır. *Origanum* türleri içerisinden de en çok tarımsal üretimi yapılan ve toplananı *O. onites* L. türüdür. Bunu *O. vulgare* türü izlemektedir. Doğala yönelimin artmasıyla bitkisel ham madde elde etme ve hammadde miktarını arttırma çalışmaları da önem kazanmıştır. Kekik türleri de içeriğinde çok sayıda sekonder metabolit içermekte ve bu metabolitlerin in vitro koşullarda bitki büyüme düzenleyicileri vb. elisitörler kullanımıyla miktarları artırılabilmektedir. Bu derlemede kekik bitkisinin kullanım alanlarından, ekonomik öneminden ve içeriğindeki sekonder metabolitlerin arttırılmasında kullanılan yöntemlerden bahsedilmiştir.

Anahtar Kelimeler: Aromatik bitki, Elisitör, Sekonder Metabolitler, Tıbbi bitki, Timol

Abstract

Thyme is an aromatic plant cultivated in many countries and has various uses (cosmetics, food, agricultural pest control, etc.). It is also a very valuable medicinal plant due to the secondary metabolites it contains. Carvacrol and thymol are the main components of thyme

essential oil. Thymol is a very important component in the pharmaceutical industry due to its high crystallisation ability. Since the carvacrol component does not crystallise, it has limited use in the pharmaceutical industry. Carvacrol component has antifungal and antibacterial properties and prevents spoilage of foods and prolongs their shelf life. Thyme plant, which has a biliary effect, prevents digestive system spasms. It has anti-tumour, wound healing, germicidal, blood pressure increasing (thyme juice), antihypertensive (essential oil) effects. It has anti-mutagenic, antispasmodic, AChE inhibitor (effective in Alzheimer's disease), antigenotoxic, free radical scavenger, antioxidant, analgesic and anti-inflammatory, antielastase (effective against chronic lung failure and emphysema), hepatoprotective/anti-hepatotoxicity and preventing ischaemic damage in the liver. It is added to animal feeds as an alternative to antibiotics. Thyme plant is among the important species exported all over the world. Turkiye has an important place in the world in thyme cultivation and common species traded are *Thymus, Origanum, Thymbra, Coridothymus, and Satureja*. At least 90% of the thyme plant exports of our country come from *Origanum* species. Among the *Origanum* species, *O. onites* is the most agriculturally produced and collected species. This species is followed by *O. vulgare*. With the increasing trend towards nature, efforts to obtain plant raw materials and increase the amount of raw materials have also gained importance. Thyme species contain many secondary metabolites, and the amounts of these metabolites can be increased under in vitro conditions by using elicitors such as plant growth regulators. In this review, the usage areas of the thyme plant, its economic importance, and the methods used to increase the secondary metabolites in its content are mentioned.

Keywords: Aromatic Plant, Elicitor, Medical Plant, Secondary Metabolites, Thymol

YUMURTA PARAZİTOİDİ, *TRICHOGRAMMA* (HYMENOPTERA: TRICHOGRAMMATIDAE) TÜRLERİNİN TEŞHİSİNDE KULLANILAN KARAKTERLER

CHARACTERS USED IN THE IDENTIFICATION OF EGG PARASITOID *TRICHOGRAMMA* (HYMENOPTERA: TRICHOGRAMMATIDAE) SPECIES

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Özet

Trichogramma türleri (Hymenoptera: Trichogrammatidae), biyolojik mücadele etmeni olarak başarıyla kullanılan yumurta parazitoitleridir. Biyolojik mücadeledeki önemi bu cinse olan ilgiyi artırmıştır. Bu cinse ait türlerin, genel morfolojilerinin grup içinde benzerlik göstermesi ve boyutlarının çok küçük olması teşhislerini zorlu hale getirmiştir. Vücut rengi, vücut kıllarının boyu ve uzunluğu gibi belirli morfolojik özellikler, mevsime, yetiştirme sıcaklığına ve parazitoitin yetiştirildiği konukçuya bağlı olarak değişebilmektedir. Bu durum morfolojik karakterlerin kullanımını kısıtlamıştır. Erkek genitalinin morfometrik özellikleri esas alınarak yapılan teşhiste pek çok önemli türün oldukça benzer genital yapıya sahip olması ve bazen erkek bireylerin yokluğu durumundaki çoğalmada (telitoki) *Trichogramma* teşhisini olanaksız hale getirebilmektedir. Bu gibi sebepler araştırıcıları teşhis için daha güvenilir ve değişmez olan farklı yöntemlere yönlendirmiştir. Böylece yakın ilişkili taksonları birbirinden ayırt edebilmek için farklı biyokimyasal ve moleküler yöntemler geliştirilmiştir. Bu yöntemler arasında rDNA'nın ITS2 bölgesinin dizi analizine dayalı tekniğin geliştirilerek *Trichogramma* teşhisinde etkili şekilde kullanılmaya başlanması bu türlerin teşhislerinin aydınlatılmasında büyük bir aşama kat edilmesini sağlamıştır. Ülkemiz *Trichogramma* türlerinin moleküler teşhisi konusunda çalışmalar hızla devam etmektedir.

Anahtar Kelimeler: *Trichogramma*, rDNA-ITS2, moleküler teşhis, biyolojik mücadele, parazitoid.

Abstract

Trichogramma species (Hymenoptera:Trichogrammatidae) are egg parasitoids that have been successfully used as biological control agents.. Its importance in biological control has increased the interest in this genus. The similarity of the general morphology of the species belonging to this genus within the group and their small size have made their identification difficult. Certain physical characteristics, such as body color and body hair size and length, may vary depending on body size, season, rearing temperature, and the host in which the parasitoid is reared. This situation restricted the use of morphological characters. In the identificaiton based on the morphometric features of the male genitalia, the fact that many important species have very similar genital structures and sometimes the reproduction in the absence of male individuals (thelytoky) can make the diagnosis of *Trichogramma* impossible.. Such reasons have led researchers to different methods for diagnosis that are

more reliable and stable.. Thus, different biochemical and molecular methods have been developed to distinguish closely related taxa from each other. Among these methods, the development of the technique based on sequence analysis of the ITS2 locus of rDNA and its effective use in the diagnosis of *Trichogramma* has made a great progress in clarifying the diagnosis of these species. Studies on molecular diagnosis of *Trichogramma* species in our country continue rapidly.

Keywords: *Trichogramma*, rDNA-ITS2, molecular identification, biological control, parasitoid.

TÜRKİYE YER ÖRÜMCEKLERİNİN (ARANEAE GNAPHOSIDAE) BİYOÇEŞİTLİLİĞİ

BIODIVERSITY OF TURKISH GROUND SPIDER (ARANEAE: GNAPHOSIDAE)

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Özet

Türkiye, zoocoğrafik konumundan dolayı diğer canlı gruplarında olduğu gibi örümcek bakımından zengin bir biyoçeşitliliğe sahiptir. Yer örümcekleri de ülkede yayılış gösteren en zengin familyadır. Bu zamana kadar yer örümceklerini belirlemek üzere birçok çalışma yapılmıştır. Bu durum yer örümcekleri üzerine yapılan çalışmaların belirli peryotlarda derlenmesi gerekliliğini ortaya çıkarmaktadır. Bu amaçla Türkiye'de yayılış gösteren Gnaphosidae familyası üzerine yapılan taksonomik çalışmalar bu çalışmayla derlenmiş ve taksonun güncel durumu ortaya konmaya çalışılmıştır. Yapılan çalışma sonucunda 163 taksonun varlığı ortaya konmuştur.

Anahtar Kelimeler: Oxyopidae, taksonomi, seta morfolojisi, Araneae, Türkiye

Abstract

Türkiye has a rich spider biodiversity as other living groups due to its zoogeographical position. Since many studies have been carried out in Türkiye to detect ground spiders by this time. It has been necessary to compile these studies to determine the total Gnaphosidae fauna periodically. According to all data, family Gnaphosidae is the most dominant spider family in Türkiye and it contains 163 taxa in total.

Keywords: Biodiversity, Spider, Gnaphosidae, fauna, Türkiye

TÜRKİYE'DE YAYILIŞ GÖSTEREN VAŞAK ÖRÜMCEKLERİNİN (ARANEAE: OXYOPIDAE) SETA MORFOLOJİSİNİN ARAŞTIRILMASI

INVESTIGATION OF SETA MORPHOLOGY OF TURKISH LYNX SPIDERS (ARANEAE, OXYOPIDAE)

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Özet

Bu çalışmasında, Oxyopidae familyasından *Oxyopes* cinsine ait *Oxyopes globifer* Simon, 1876, *O. heterophthalmus* (Latreille, 1804), *O. lineatus* Latreille, 1806 ve *O. ramosus* (Martini & Goeze, 1778) türlerinin prozoma, opistozoma ve bacakları üzerindeki setaların morfolojileri SEM ile belirlenmiştir. Pulsu tipte cinse özgü bir setanın olduğu görülmüştür ve erkek ve dişi bireylerde bu seta tipinin küçük farklılıklar gösterdiği tespit edilmiştir. Ayrıca, bu çalışma ve literatür verileri dikkate alındığında Oxyopidae familyasında cins düzeyinde setaların taksonomik bir karakter olarak kullanılabileceği fakat cinsine ait türlerin ayrımında taksonomik karakter olarak kullanılamayacağı sonucuna varılmıştır. Bu çalışma ülkemizde yayılış gösteren Oxyopidae familyasına ait türlerin seta morfolojilerini belirlemek üzerine yapılan ilk çalışmadır.

Anahtar Kelimeler: Oxyopidae, taksonomi, seta morfolojisi, Araneae, Türkiye

Abstract

In this thesis, the morphology of the setae on the prosoma, opisthosoma and legs of *Oxyopes globifer* Simon, 1876, *O. heterophthalmus* (Latreille, 1804), *O. lineatus* Latreille, 1806 and *O. ramosus* (Martini & Goeze, 1778) belonging to the genus *Oxyopes* of the family Oxyopidae were determined by SEM. It was observed that there is a genus-specific scaly type seta and this seta type showed slight differences in male and female individuals. In addition, considering this study and literature datas, it was concluded that setae can be used as a taxonomic character at the genus level in the family Oxyopidae, but cannot be used as a taxonomic character in the identification of species belonging to the genus *Oxyopes*. This study is the first study to determine the seta morphology of the species belonging to the family Oxyopidae distributed in Turkey.

Keywords: Oxyopidae, taxonomy, seta morphology, Araneae, Türkiye

PIRINÇ KABUĞUNUN EMICI ÖZELLIKLERININ INCELENMESI VE PORTATIF SU ARITMA CIHAZI TASARIMI

INVESTIGATION OF ABSORBENT PROPERTIES OF RICE HUSK AND DESIGN OF A PORTABLE WATER PURIFIER

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Özet

Ağır metaller canlı organizmaların sağlığı için oldukça zararlıdır ve insanlar için büyük bir tehdit oluşturmaktadır. Bu nedenle ağır metallerin sudan uzaklaştırılması, ekosistemi ve insan sağlığını korumak için önemlidir.Su kirliliği kontrolü için mevcut çeşitli teknolojiler arasında adsorpsiyon işlemi, tasarımının kolaylığı ve basitliği nedeniyle diğer işlemlerden üstün kabul edilmektedir.

Bitkiler çeşitli kimyasalların kaynağıdır. Ancak bitki bileşenlerinin kimyasal bileşimi ile ilgili bilgi bolluğuna rağmen tarımsal atıkların büyük bir kısmı tarlada yakılmaktadır.Bu nedenle son yıllarda mısır artıkları, narenciye kabukları, buğday kepeği, kayısı, ceviz, badem ve pirinç kabukları kirleticilerin arıtımında doğal bir sorbent olarak kullanılmıştır. Doğal sorbentlerin avantajı bolluk, mevcudiyet, ucuzluk ve yüksek sorpsiyon kapasiteleridir.

Bu çalışmada, pirinç kabuğunun sorpsiyon özellikleri üzerine bir araştırma yapılmış ve portatif su arıtma cihazı tasarlanmıştır. Su ve alkali ile modifiye edilmiş pirinç kabuğunun emici özellikleri incelenmiş, pirinç kabuğunun ağır metalleri metilen mavisi, nikel (Ni), krom (Cr) ve bakır (Cu) adsorpsiyonu ve maksimum adsorpsiyon kapasitesi belirlenmiştir.Pirinç kabuğunun sudaki ağır metalleri adsorplama kapasitesini belirlemek için Langmuir ve Freundlich adsorpsiyon izotermi ve adsorpsiyon kinetiği yöntemleri kullanılmıştır. Adsorbent ile adsorbat arasında oluşan güçlü bağ, yani kimyasal adsorpsiyon Langmuir izotermi ile, basit fiziksel adsorpsiyon ise Freundlich izotermi ile tanımlanır. Adsorban yüzeyinin heterojenliği Freundlich izotermine göre ifade edilir. Adsorpsiyon kinetiğini incelemek için entegre hız kanunu yöntemi kullanılmıştır ve reaksiyon derecesi ve reaksiyon hız sabiti bulunmuştur.Pirinç kabuğunun emici özellikleri incelendikten sonra, portatif su arıtma cihazının tasarımında kullanılmıştır.Bu cihazın temel amacı, su arıtma için kullanımı kolay portatif bir kamp filtresi oluşturmak ve yüksek düzeyde kirliliğe sahip suyların güvenilir bir şekilde arıtılmasını sağlamaktır.

Abstract

Heavy metals are very harmful to the health of living organisms and pose a great threat to humans. Therefore, removal of heavy metals from water is important to protect the ecosystem and human health. Among the various technologies available for water pollution control, the adsorption process is considered superior to other processes due to the ease and simplicity of its design.

Plants are a source of various chemicals.However, despite the abundance of information on the chemical composition of plant components, most of the agricultural waste is burned in the field. Therefore, in recent years, corn residues, citrus peels, wheat bran, apricots, walnuts, almonds and rice husks have been used as a natural sorbent in the treatment of pollutants. The advantage of natural sorbents is their abundance, availability, cheapness and high sorption capacity.

In this study, a research was conducted on the sorption properties of rice husk and a portable water purification device was designed. The absorbent properties of rice husk modified with water and alkali were examined, and the adsorption and maximum adsorption capacity of heavy metals methylene blue, nickel (Ni), chromium (Cr) and copper (Cu) of rice husk were determined. To determine the capacity of rice husk to adsorb heavy metals in water, Langmuir and Freundlich adsorption isotherm and adsorption kinetics methods were used. The strong bond formed between the adsorbent and the adsorbate, that is, chemical adsorption, is defined by the Langmuir isotherm, and simple physical adsorption is defined by the Freundlich isotherm. The heterogeneity of the adsorbent surface is expressed according to the Freundlich isotherm. The integrated rate law method was used to study the adsorption kinetics, and the degree of reaction and reaction rate constant were found. After examining the absorbent properties of rice husk, it was used in the design of a portable water purification device. The main purpose of this device is to create an easy-to-use portable camping filter for water purification and to provide high To ensure reliable purification of polluted water.

RECENT DEVELOPMENTS IN BIOLOGICAL SCIENCES

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Abstract

Rising global demands of food, commodities, fuels, biomaterials due to increasing population, raising living standards, and massive economic activities have changed the trends in almost every field including biology. The advent of modern scientific techniques including next-generation DNA/RNA sequencing, multi-OMICs, and emergence of computational biology has modernized the biology, genetics, and biotechnology. As a matter of fact, these developments have enabled the biologists to address various challenges related to food safety and security, environmental sustainability, synthesizing modern vaccines, developing personalized medicines, integrated aquacultures, improved drugs, renewable biofuels, to produce cost-effect biochemicals and biomaterials leading the world to shift from chemical-based economy to bioeconomy while ensuring the energy-environment-water nexus sustainability. It is believed that these emerging trends will help the mankind to achieve the Sustainable Development Goals in a sustainable manner.

FEATURES OF *BETA VULGARIS* CULTIVATION IN KYRGYZSTAN AND DETERMINATION OF ITS SUGAR CONTENT

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Abstract

Beta vulgaris one of the most important crops in world agriculture. Sugar beet is a technical crop with a high sucrose content. After all, sugar is used not only in cooking, it is an integral part of confectionery, canned fruits and vegetables, pasta and other products, and is also used for the production of enzymes. Currently, farms are pursuing not only obtaining high yields of sugar beet, they are also interested in obtaining economically pure sugar beet products, since not only sugar is produced from this crop, its processed products are widely used as valuable feed, as it contains a number of amino acids, vitamins and minerals. Currently, sugar beet is grown in the Chui and Issyk-Kul regions, the yield percentage differs by year: in 2020, 449,000 tons were received, in 2019, the harvest was 39.8% more. However, the yield of sugar beet depends on climatic conditions and proper management of agrotechnical techniques, taking into account that the studied crop is moisture-loving. *Beta vulgaris* a biennial tuberous plant from the family *Chenopodiaceae*. In the first year, the plant has leaves and a fleshy tuber. Depending on the variety and growing conditions, the sucrose content in the club can not be from 8 to 20%. The seed material comes to Kyrgyzstan in the form of dragees and ordinary gray-yellow seeds with corners. In order to protect plants during the initial period of growth and development from diseases and pests, seeds are treated with appropriate means before sowing. It is known that for germination beet seeds absorb 1.5 times more moisture than the seeds themselves. With a sufficient supply of moisture in the soil and optimal air and soil temperature, mass beet growth usually occurs 7-10 days after sowing. Under prolonged cold conditions, the mass growth of plants is delayed for about 18-20 days. In the conditions of the sharply continental climate of Kyrgyzstan, sudden cold in the spring period is characteristic. For the formation of sugar beet seedlings, a sum of positive temperatures of about 140 degrees is required. The value of sugar beet depends not only on its taste properties and the quality of root crops. Such an important indicator as the sugar beet digestion or the level of its sugar content plays an important role in assessing the harvest. The digestion is determined in the laboratory using chemical analysis of the pulp of root crops – the higher the indicator, the better the technological properties of beets, and the more sugar can be produced from it. According to a laboratory study, the sugar content of sugar beet grown in the Chui region was 19.6%, and grown in the Issyk-Kul region – 24.3%.

Keywords: sugar beet, growth, development, climate, sugar content.

THE LEVEL OF DIABETICS IN THE MUNICIPALITY OF SHTIME AND IMPACTING FACTORS

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Abstract

The WHO reports that the number of people experiencing hormonal alterations, which are the starting point for many diseases like type 1 and type 2 diabetes, is rising daily.

High blood glucose (or blood sugar) levels are the hallmark of diabetes, a chronic metabolic disease that over time causes significant harm to the heart, blood vessels, eyes, kidneys, and nerves. The most prevalent type of diabetes is type 2, which often affects adults, and develops when the body stops producing enough insulin or becomes resistant to it. Type 2 diabetes has been much more common during the past three decades in nations of all income levels. Juvenile diabetes, often known as type 1 diabetes, or diabetes with insulin dependence, is a long-term syndrome in which the pancreas produces little to no insulin on its own. Access to cheap medications, such as insulin, is essential for those who have diabetes to survive. By 2025, it is the goal that has been universally agreed upon to stop the rise in diabetes and obesity.

In addition to the fundamental genetic susceptibility, malnutrition and a poor diet without nutritional supplements such proteins, vitamins, fibers, natural carbs, and healthy fats can also contribute to the development of the condition of diabetes.

White bread and other pastries made with wheat flour form the foundation of our Kosovar society's unique food products.

Our study is based on data collected from the family medicine clinic in the town of Shtime - Diabetes Counseling, Asma - based on patient routine checks and laboratory analysis of blood samples from a two-month glycemia analysis. For our study, we selected 10 individuals with diabetes and 10 non-diabetics, and we monitored their blood sugar levels for two weeks-14 days—before and after ingesting food containing roughly 100 grams of goods made with wheat flour. The results of this study answer the question of how much regular eating of foods containing wheat affects the rise in blood sugar.

Keyword: Analyzes, diabetics, food, glucose, non-diabetics ,wheat

HALAL MEAT QUALITY AND CERTIFICATION STANDARDS IN MEAT INDUSTRY

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Abstract

As a key source of protein and a source of necessary vitamins and minerals, animal products and meat play a crucial role in ensuring that dietary needs are met. Globally, consumer demand for wholesome, hygienic, secure meat and meat products is rising as a result of rising population, economic levels, and dietary preferences. Because area, religion, and economic status are the key factors influencing dietary preferences. Food products made from halal beef are now extensively available globally. From raw materials through the final production stage, the manufacturing and supply chain for halal meat-based products involves numerous crucial control points and risks. It is crucial to increase the understanding and knowledge of all key industry participants and stakeholders about the halal meat-based food sector to better control and manage company trading and manufacturing policies. Therefore, the governing structure will aid in making it easier for participants in the halal meat business to obtain a halal certification for their goods. They are ultimately, ensuring that Muslim consumers can take advantage of halal, secure food products. A tool that can encourage product design and enhance food quality systems is the deployment of quality functions (QFD). One of the requirements for accessing the international halal market is halal certification. Utilizing the idea of halal toyyiban throughout the full chain of supply, from farm to fork, it does enable the identification of high-quality and secure products. To maintain the halal status, the system in the meat industry includes everything from the proper raising of animals on the farm through post-slaughter oversight. Islam mandates that when animals are killed, they must be killed consciously and attentively preached by the Prophet Muhammad. Islam also teaches that there should be zero tolerance for any type of animal maltreatment throughout the supply chain of halal meat production. A Muslim nation prefers a higher degree of division than a culture that is not Muslim. In comparison to non-Muslim nations, Muslim nations are more willing to shell out money for a halal transportation network. Additionally, it is very much the manufacturer's responsibility to offer halal security for chain administration. Since different certifying bodies have different procedures for giving Halal certificates, it is important to understand the distinctions between these chosen certification agencies to determine the gaps between them. Then, using comparative analysis, it was possible to identify the variations between these certifying bodies. Based on the nine areas outlined by the investigation's findings, JAKIM is the organization that grants organizations Halal certification in the tightest manner.

Keywords: Halal meet, Halal Management, Quality Control, Halal Certification, Halal industry.

ROLE OF ENDOPHYTIC BACTERIA IN IMPROVING SAFFRON PLANTS RESISTANCE TO ABIOTIC STRESSES

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Abstract

Endophytic bacteria colonize the internal tissues of their host plants can promote the growth and yield and enhance their resistance to environmental stresses. Endophytes can also regulate the synthesis of secondary metabolites with significant medicinal properties and produce various biological effects. *Crocus sativus* L. is a triploid, sterile plant that has been utilized as a medicinal plant and a spice for thousands of years. The plant's stigma is the source of a wide range of carotenoids and some sort of apocarotenoids such as crocins and picrocrocin have pharmacological properties. Moreover, saffron is a rich source of bio-molecules such as polyphenols and antioxidants. The high yield of saffron depends on multiple factors such as environmental conditions and the ability of plants to adjust their metabolism to tolerate environmental functions. In present study, the effects of four endophytic bacteria (*Bacillus subtilis, Bacillus pumilus, Pseudomonas geniculata,* and *Pseudomonas brassicacearum*) on tolerance of saffron plant to salinity (0, 50, 100, 150 mM NaCl), drought (25, 50 and 100% field capacity) and cadmium (0, 200, 400 and 600 µm) were studied. Results showed that the salinity reduced the growth indices and the content of photosynthetic pigments, but the increased the content of proline and total phenol and also the activity of antioxidant enzymes sharply. Inoculation of endophytic bacteria improved the yield of saffron plant and photosynthetic capacity under salinity stress by increasing photosynthetic pigments, and the growth by promoting the activity of antioxidant enzymes and preventing oxidative damage to the enzyme system and cell membrane structure, and also strengthening the antioxidant defense system via increasing proline and phenol contents. On the other hand, cadmium decreased the growth indices, the content of photosynthetic pigments with exception of carotenoids, soluble sugars, and the activity of superoxide dismutase and catalase, but increased the content of hydrogen peroxide, malondialdehyde, total phenol, and proline and the activity of polyphenol oxidase and peroxidase. However, inoculation of endophytic bacteria had positive effects on the most of biochemical parameters and improved the yield of saffron plant under cadmium stress. In addition, drought stress reduced growth indices and the content of photosynthetic pigments, total phenol, flavonoids, malondialdehyde, and hydrogen peroxide, but increased the content of proline, total protein and soluble sugars and the activity of antioxidant enzymes. Inoculation of endophytic bacteria could promote saffron plant yield by improving the biochemical parameters under drought stress.

Keywords: cadmium, drought, endophytic bacteria, saffron, salinity.

EXPLORING THE EFFECT OF HERBAL FEED ADDITIVES AND BOTANICAL NUTRACEUTICALS IN MONOGASTRIC ANIMAL NUTRITION

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Abstract

Feed additives are extensively utilized in animal production to fulfill several requirements, such as improved feed utilization, growth performance, and vital nutrient supplementation. When selecting these additives, the health of animals with high development potential is a crucial consideration. In addition, given the rising needs of consumers, it is necessary to explore more feasible and reliable alternatives. However, Probiotics, prebiotics, enzymes, minerals with high bioavailability, and botanical extracts are emerging as an alternative feed source nowadays. Herbs and plant extracts have a variety of uses, such as promoting feed intake and natural secretions or acting as anthelmintic, coccidiostatic, or antibacterial agents. They are also useful in preventing oxidation of animals and their products. Due to cost-effectiveness, harmful residuals, and antibiotic restrictions, the use of standardized dosages of herbal feed additives is becoming more and more popular. Botanical products including olive leaves, ginger roots, and fenugreek seeds are becoming more and more recognized for their beneficial properties as nutraceuticals in monogastric animal nutrition. In the absence of antibiotic growth promoters, these botanical feed additives have the potential to enhance animal health and production particularly. In monogastric animals like broilers and hens, these botanical products, which are high in essential oils and fatty acids, boost body weight and egg production while also supporting gastrointestinal health and activating genes related to growth, metabolism, and immunity. They also increase the animal reproductive system, growth, and effectiveness. Considering the prohibition on antibiotics, this review emphasizes the significant contributions made by botanical products to monogastric nutrition and provides promising substitutes for growth promotion.

Keywords: Feed additives, Monogastric animals, Herbs, Botanical feed, Plant-based.

EVALUATING EFFECTIVENESS AND TOLERABILITY OF MULTI-ENZYME COMPLEX IN PATIENTS WITH FUNCTIONAL DYSPEPSIA

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Abstract

Functional dyspepsia is chronic disease of sensation and peristalsis in the upper gastrointestinal tract, where onset of dyspeptic symptoms is strongly linked with the dysfunction and /or deficiency of digestive enzymes. The current study is aimed to evaluate the effectiveness and tolerability of multi-enzyme blend (Poolzyme® Multi, Giellepi S.p.A., Italy) in dyspeptic subjects, with the assessment of quality of life as a primary outcome and severity of pain and quality of sleep as secondary outcomes. In a randomized, placebo-controlled, double-blind, clinical trial, the enrolled subjects (aged 18 – 59 years) were treated for 2-months either with 2-capcules per day of food supplement (containing 200 mg of the multi-enzyme blend/capsule) or placebo (n = 60, each). The quality of life was assessed using Nepean Dyspepsia Index-SF (NDI-SF) questionnaire, while severity of pain and quality of sleep were determined using Visual Analogue Scale (VAS) and Pittsburgh Sleep Quality Index (PSQI) questionnaires, respectively. Results showed an improvement in NDI-SF1, NDI-SF2-5, VAS, and PSQI scores in subjects treated with food supplement in comparison with subjects treated with placebo, which indicated the improvement of the quality of life and sleep, and the severity of pain. Moreover, the food supplement was well-tolerated in all subjects, with no side effects and allergies being reported. In conclusion, multi-enzyme complex was found effective in the reducing the symptoms of functional dyspepsia and in improving the quality of sleep, with favorable tolerability. If these promising results are confirmed in other randomized clinical trials on larger scale, it would be a fruitful strategy to include digestive enzymes supplementation in the treatment options in the published guidelines on dyspepsia.

Keywords: Functional dyspepsia, digestive enzymes, efficacy, tolerability.

ETHICAL CONSIDERATIONS IN TELEEDUCATION FOR BIOLOGY STUDENTS: A NARRATIVE REVIEW

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Abstract

During the COVID-19 pandemic, the approach of professors and, lecturers to digital education or teleeducation services was changed. With attention to the absence of approved code of ethics about teleeducation, now, the most important concern is awareness and compliance with ethical considerations in teleeducation platforms especially for biology students, who need to do more practice and communication with their lecturers.

In this presentation, the important ethical axes were brought up in the form of eight tips.

A review was conducted by using the available sources including the Scopus, PubMed, and Web of Sciences, for the years 2017 to 2023. Non-English language articles and proceedings texts were excluded. Papers related to the ethics of teleeducation, teleconsultation and medical students were included.

It was shown that among medical courses, some of the courses and fields such as biology need to more practice and communication among students and lecturers. So, the importance of attention to the ethical consideration in these fields are significant. The most important ethical considerations were "privacy", "equality and accessibility", "trust", "professional commitment and responsibility", "confidentiality", "validity and reliability", "evaluation and feedback" and "license and certification".

The lecturers and all the students should consider the mentioned ethical points during using educational online platforms. It is important to teach those ethical consideration before start the online courses, not only to the students, but also to the lecturers as well.

Keywords: Teleeducation, Telehealth, Biology students, Ethics

СЫНДАРЛЫ ОҚЫТУДЫҢ БІЛІМ АЛУШЫЛАРДЫҢ ОЙЛАУ ЖӘНЕ ПАЙЫМДАУ ДАҒДЫЛАРЫН ҚАЛЫПТАСТЫРУҒА ӘСЕРІ

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Аңдатпа

Мақалада қазіргі кезеңдегі мұғалімнің өз білімін үнемі жетілдіріп отыруының және оның құзыреттілік деңгейін арттырудың негізгі себептері көрсетілген. Сындарлы оқыту әдістемесінде шығармашылық ортаны қалыптастыру, топтағы атмосфераны жақсарту, ынтымақтастық ортасын үйлестіру, шығармашылықпен байланысты конструктивтілік, ғылыми ақпарат жинау, өнертабыстағы белсенділік, жаңа технологиялық мәселелерді шешу қарастырылады. Сонымен қатар мақалада дәстүрлі білім беру жүйесінде сабақ барысында жиі белсенділік танытатын мұғалім болса, қазіргі кезде оқушының барлық мүмкіндігін іске қоса отырып оның белсенділігін арттыру арқылы оқу мақсатына бірлескен түрде жету ұсынылады. Осыған сәйкес дәстүрлі және сындарлы оқыту тәсілдерінің ерекшеліктері салыстырылған. Білім алушы алған білімдерін кәсіби қызметте қолдану үшін өзін-өзі оқыту жүйесін ұйымдастыру алгоритмі талданды.

Кәсіби сындарлы оқыту әрқайсымыздан жаңа қасиеттерді талап етеді, ол жаңа идеялардың туындауы, басқалар көре алмайтын мәселелерді түсіну, сезіну, бастапқы кезде анықтау қиын болған мәселелерді шеше білу, қиындықтарды тез жеңу қабілеті, қабылданған пікірлерге сыни көзқараспен қарау және жаңа идеялармен жұмыс істеуге мүмкіндік беретін қасиеттерді қалыптастыру, компьютерлік технологиялар, мотивациялар және өз тәжірибеңізде оқыту сапасын арттыру үшін өзгерту керектігі туралы заманауи көзқарастар.

Зерттеудің мақсаты - мұғалімнің өз қызметін ұйымдастыру қабілетін дамыту және жоғары ғылыми қабілеттері бар тұлғаны дайындау. Міндеттері: дәстүрлі әдіспен салыстырғанда сындарлы оқыту әдісінің өзектілігін анықтау; жан-жақты білімді және заманауи бәсекеге қабілетті білім беру саласының негізін қалаушыларды дайындау.

Оқытудың сындарлы тәсілінің өзектілігі оны дәстүрлі тәсілмен салыстыру арқылы анықталады. Бұл тәсілдің бір бөлігі ретінде мұғалім оның нәтижесіне емес, оқу процесіне көбірек көңіл бөлуі керек. Оның алдына жаңа міндеттер қойылады, оларды шешу жауапкершілік пен уақытты талап етеді. Сындарлы оқыту сабақтастыққа негізделген. Оқушылардың сыни ойлауын дамыту, рефлексия жүргізу, кері байланыс беру, сыныптағы диалогқа назар аудару, ақпараттық технологиялар дағдыларын дамыту, саралау әдістерін қолдану маңызды.

Кілтті сөздер: сындарлы оқыту, постер, рефлексия, презентация, танымдық іс-әрекет.

Abstract

The article outlines the main reasons why a modern teacher is constantly improving his knowledge and increasing the level of his competence. The methodology of constructive learning considers the formation of a creative environment, improving the atmosphere in a group, creating an environment of cooperation, constructiveness associated with creativity, collecting scientific information, activity in invention, solving new technological problems. In addition, the article suggests that if there is a teacher in the traditional education system who is often active during classes, it is currently proposed to achieve the learning goal in a joint way by increasing the student's activity, activating all his capabilities. In accordance with this, the features of traditional and constructive approaches to learning are compared. The algorithm of the organization of the self-learning system for the application of the acquired knowledge to students in professional activity is analyzed.

Professional constructive creativity requires new qualities from each of us: the need for new ideas, understanding of problems that others cannot see, feel, identifying new production fields that are difficult to define from the initial point of view, the ability to quickly overcome difficulties, a critical attitude to generally accepted opinions and ways of forming qualities that allow working with new ideas, computer technologies, motivation and in your practice, modern ideas are embodied about what needs to be changed to improve the quality of training.

The purpose of the study is to develop the teacher's ability to build their activities and prepare a person with high scientific abilities. Objectives: to identify the relevance of the method of constructive learning in comparison with the traditional method; to prepare the founders of the field of education comprehensively educated and modern competitive teachers.

The relevance of a constructive approach to learning is determined by comparing it with the traditional approach. As part of this approach, the teacher should pay more attention to the learning process rather than its outcome. New tasks are set before him, which require attention and time to solve. Constructive learning is based on continuity. It is important to develop students' critical thinking, conduct reflection, give feedback, pay attention to the dialogue in the classroom, develop information technology skills, apply differentiation methods.

Keywords:constructive learning, poster, reflection, presentation, cognitive activity.

JUGLANS REGIA'NIN KİMYASAL BİLEŞENLERİ, BESİNSEL VE FARMAKOLOJİK ÖNEMİ - DERLEME

CHEMICAL CONSTITUENTS OF *JUGLANS REGIA*, ITS NUTRITIONAL AND PHARMACOLOGICAL IMPORTANCE - A REVIEW

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Özet

Yetiştirilmesi çok eski çağlara dayanan ceviz (*Juglans regia* L.), Orta Asya'dan batıya kadar uzanan geniş bir bölgeye yayılmaktadır. Cevizin bu denli geniş etkiye sahip olmasının temel sebebi ekonomik bakımından dünya çapındaki değeridir. Hâlihazırda cevizin; Güney Avrupa, Kuzey Afrika, ABD, Batı Güney Amerika, Asya gibi kıtalarda ve ülkelerde ticari olarak üretimi sağlanmaktadır. Fitokimyasal analizler cevizin; indirgeyici şekerler, alkaloidler, tanenler, fenoller ve saponinler içerdiğini belirlemiştir. Bitkinin çeşitli kısımları geleneksel tıpta ve tıbbi pek çok alanda uzun süredir kullanılmaktadır. Farmakolojik çalışmalar cevizin farklı bölümlerinin ayrıca beslenme, kardiyovasküler, antioksidan, antikanser, antidiyabetik, antimikrobiyal, antiparaziter, immünolojik, antiinflamatuar, analjezik, koruyucu, gastrointestinal, endokrin ve diğer pek çok etkiye sahip olduğunu göstermiştir. Orta Asya ülkeleri özelinde ise Kırgızistan'da bulunan ceviz ormanları Asya kıtasının önemli doğal ceviz ormanları alanı olarak kabul edilmekte ve genetik kaynaklar olarak değerlendirilmektedir. Dünyanın en büyük doğal ceviz ormanı olan Arslanbob, Kırgızistan'ın güneyinde Calal-Abad bölgesinde yer almaktadır. Doğal ceviz ormanları söz konusu bölgelerin Fergana ve Çatkal dağ yamaçlarının batı ve güneybatı sırtları arasında yetişmekte ve yüksek bir biyolojik çeşitlilik olarak karakterize edilmektedir. Bununla birlikte bölgedeki cevizin özellikleriyle ilgili detaylı araştırmalar eksiktir. Mevcut çalışma, *Juglans regia*'nın kimyasal bileşenlerini, besinsel, farmakolojik ve terapötik özelliklerini vurgulamaktadır.

Anahtar Kelimeler: doğal ceviz ormanı, fitokimyasal, terapötik

Abstract

The cultivation of walnuts (*Juglans regia* L.), whose history stretches back thousands of years, has extended over a vast area from Central Asia to the West. Walnuts' significant global influence is mostly due to their high economic value. Walnuts are currently grown commercially in several continents and nations, including Asia, Western South America, the USA, Southern Europe, and North Africa. According to phytochemical analyses, walnuts

were shown to contain reducing sugars, alkaloids, tannins, phenols, and saponins. Various parts of the plant have been used in traditional medicine and many medical fields for a long time. Pharmacological studies showed that different parts of walnuts possessed nutritional, cardiovascular, antioxidant, anticancer, antidiabetic, antimicrobial, antiparasitic, immunological, anti-inflammatory, analgesic, protective, gastrointestinal, and endocrine, and many other pharmacological effects. Regarding Central Asian nations, Kyrgyzstan's walnut woods assessed as genetic resources are regarded as significant natural walnut forest regions on the Asian continent. Arslanbob is the largest natural walnut forest in the world located in the Jalal-Abad region in the south of Kyrgyzstan. Natural walnut forests, which are known for their great biodiversity, are found in the areas between the southwestern and western ridges of the Fergana and Chatkal mountain ranges. However, detailed research on the properties of walnuts in the region is lacking. The present study highlights the chemical composition, nutritional, pharmacological and therapeutic properties of *Juglans regia*.

Keywords: natural walnut forest, phytochemical, therapeutic

BİYOÇEŞİTLİLİĞİN KORUNMASINDA KORUNAN DOĞAL ALANLARIN ROLÜNÜN ERÇEK GÖLÜ ÖRNEĞİNDE İRDELENMESİ (VAN-TÜRKİYE)

EXAMINING THE ROLE OF PROTECTED NATURAL AREAS IN THE PROTECTION OF BIODIVERSITY IN THE CASE OF ERÇEK LAKE (VAN-TÜRKİYE)

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Özet

Erçek Gölü uluslararası düzeyde tanınan önemli bir sulak alandır. Gölde en az 240 kuş türünün yaşadığı bilimsel çalışmalarla ortaya çıkarıldı. Araştırmalar devam ettikçe bu sayının artacağı kesindir. Van'a üniversitenin kurulmasından kısa bir süre sonra göldeki ornitolojik çalışmalar başladı. Başlangıç yıllarında gölde başta avcılık olmak üzere ciddi bir tahribat mevcuttu. Alanın biyoçeşitlilik bakımından değeri bilimsel çalışmalarla ortaya konduktan sonra, tanıtım faaliyetlerine geçildi. Bu amaçla çeşitli faaliyetlerin yer aldığı bir ornitofestival düzenlendi. Festivalin her yıl tekrarlanmasına çaba gösterildi. Görselliğinden dolayı Flamingo bayrak tür olarak seçildi. İlk festival aktivitesi ile birlikte alana ilgi artmaya başladı. Ayrıca basın yolu ile de alan tanıtıldı.

Festivalin yapıldığı Erçek ve Karagündüz köylerinde altyapı iyileşti. Kuş gözlem kuleleri yılın her sezonunda meraklılara hizmet vermektedir. Halk alanı sahiplendi. Kuş populasyonları arttı.

Festival sonucunda yöre insanının çevre bilinci arttı. İdarecilerin ve siyasilerin olaya bakışı olumlu yönde değişti. Turizm çeşitlendi. Kuşlar tanıtıma ciddi katkı sağladı. Alan tur programlarına girmeye başladı.

Olay başta sadece bir akademik çalışma iken, şimdi toplumun farklı kesimlerine yarar sağlamaktadır. Yöreye ve ülkeye katma değer kattı. Bölgede başka alanlarda da benzer faaliyetlerin başlamasına neden oldu. Günümüzde alan öğrencilerin çevre eğitiminde doğal laboratuvar olarak kullanılmaktadır. En önemlisi yaban canlılarının ve habitatlarının korunmasına çok önemli katkı sağladı. Bu çabalar alanın 2020 yılında ''Kesin Korunacak Hassas Alan" olarak resmen tescil edilmesini sağladı.

Anahtar Kelimeler: Erçek Gölü, Koruma, Kuş faunası, Flamingo festivali, Biyoçeşitlilik

Abstract

Erçek Lake is an internationally recognized important wetland. Scientific studies have revealed that at least 240 bird species live in the lake. It is certain that this number will increase as research continues. Shortly after the establishment of the university in Van, ornithological studies on the lake began. In the early years, there was serious damage to the lake, primarily from hunting. After the value of the area in terms of biodiversity was revealed through scientific studies, promotional activities began. For this purpose, an ornitofestival was organized with various activities. Efforts were made to repeat the festival every year. Flamingo was chosen as the flag type due to its visuality. With the first festival activity, interest in the area began to increase. The area was also introduced through the press.

Infrastructure has improved in the villages of Erçek and Karagündüz, where the festival is held. Bird observation towers serve enthusiasts in every season of the year. The public took ownership of the area. Bird populations increased.

As a result of the festival, environmental awareness of the local people increased. The view of administrators and politicians on the incident has changed positively. Tourism has diversified. Birds made a significant contribution to promotion. The area started to be included in tour programs.

While the event was initially just an academic study, it now benefits different segments of society. It added value to the region and the country. It caused the start of similar activities in other areas in the region. Today, the area is used as a natural laboratory in the environmental education of students. Most importantly, it made a significant contribution to the protection of wild creatures and their habitats. These efforts enabled the area to be officially registered as a "Sensitive Area to be Strictly Protected" in 2020.

Keywords: Erçek lake, Protection, Avifauna, Flamingo festival, Biodiversity

BİŞKEK'TE ANTROPOJENİK KİRLİLİK KOŞULLARINDA İSKOÇ ÇAMI (PÍNUS SYLVÉSTRIS) KARYOLOJİK ÖZELLİKLERİ

KARYOLOGICAL FEATURES OF THE SCOTS PINE (PÍNUS SYLVÉSTRIS) IN THE CONDITIONS OF ANTHROPOGENIC POLLUTION IN BISHKEK

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Özet

Bişkek şehrinde antropojenik kontaminasyon koşulları altında ve Kegeti Gorge'daki doğal popülasyonu olarak büyüyen İskoç çamı (Pínus sylvéstris) tohum materyalinin kök meristem hücrelerinin karyolojik bir analizi yapıldı. Toplanan biyomalzemelerden hazırlanan geçici mikropreparasyonlar, 40 x 10, 100 x 10 büyütmelerde bir Boeko Jean Nikon ECLIPSE 50i mikroskobu altında incelendi. Farklı mitoz aşamalarındaki hücrelerin mikrografları Nikon Digital Sight DS-Fi1 video kameralar kullanılarak elde edildi.

Çalışmalar, Bişkek'te (% 2.36) büyüyen İskoç çamı (Pínus sylvéstris) tohum yavrularının kontrol popülasyonuna (% 0.46) kıyasla yüksek mitoz bozuklukları insidansı gösterdiğini göstermiştir.

Çalışmalara dayanarak, aşağıdaki mitotik anomali türleri keşfedildi: kromozomun metafaz plakasının dışında yer alan halka kromozomu, B kromozomu, alıştırma ve gecikmeli kromozomlar, kromozom fragmanları, kromozom köprüleri. Çalışmalar sonucunda elde edilen veriler, kozalaklı tohumların karyolojik değişkenliğinin sitotoksisitenin bir göstergesi olduğunu ve kentin hava ortamının genotoksik etkilerini izlemek için kullanılabileceğini göstermektedir.

Anahtar Kelimeler: sitogenetik göstergeler, kromozomal anormallikler, mitoz patolojisi, sitotoksisite, genotoksik.

Abstract

A karyological analysis of the rootlet meristem cells of the Scots pine (Pínus sylvéstris) seed material in the conditions of anthropogenic pollution in Bishkek and the natural population of Kegeti Gorge was conducted. Temporary microslides, which were prepared from the collected biomaterials, were studied under a Boeko and Nikon ECLIPSE 50i microscope at magnifications of 40 × 10, 100 × 10. Micrographs of cells of different stages of mitosis were obtained using Nikon Digital Sight DS-Fi1 video cameras.

Studies have shown that the seed progeny of the Scots pine (Pínus sylvéstris) growing in Bishkek (2.36%) compared to the control population (0.46%) shows a high incidence of mitosis disorders.

Based on the studies, the following types of mitotic anomalies were discovered: the ring chromosome, B-chromosome, run-in and lagging chromosomes located outside the metaphase plate of the chromosome, chromosome fragments and chromosome bridges. The data obtained as a result of studies suggests that the karyological variability of the seed progeny of conifers is an indicator of cytotoxicity and can be used to monitor the genotoxic effects of the air environment of the city.

Keywords: cytogenetic indicators, chromosomal abnormalities, mitosis pathology, cytotoxicity, genotoxic.

THE LABOULBENIALES: AN ENIGMA

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Abstract

The fungi and arthropods have been sharing habitats for more than 300 million years, and parasitism has evolved between them. Till date approximately 135,000 species of fungi have been described and an approximated 3 to 6 million more are yet to be discovered. Entomogenous fungi belong to 12 classes. My interest is in the Laboulbeniomycetes, with an estimated 2325 species belonging to 115 genera, that are obligate parasites of arthropods as biotrophs or for dispersal. The fungus completes it's life cycle on the host without the formation of any anamorphic structures. They are parasitic on members of approximately 11 insect orders, coleopteran insects being the most common targets. After decades of work this group remains incompletely explored. Being parasitic, they have the potential to be used in pest control strategies. They have been reported from all terrestrial ecosystems, especially from damp, humid soils. India being a tropical country has a lot of potential for such investigations having no dearth of insects and their parasites. This was even more important as it is the least studied group of fungi in India. Hosts were carefully screened for Laboulbeniales using a stereo microscope at 10-45x. A microscopic slide is then prepared using Hoyer's medium. The host is blocked with fine forceps and the thalli are removed by pushing the tip of a needle against the foot of the fungus. A large number of insects were screened and found to be infested with the fungi. This study reports the various genera discovered on a range of insects from the ants, cockroaches, earwigs, carabids and staphylinids. The fungal thalli isolated were monoecious or dioecious, and present on many parts of the body. All stages of the fungi could be seen, thereby elucidating the life cycle patterns.

Keywords: Laboulbeniales, India, ants, cockroaches, development.

BIOACTIVITY-GUIDED ISOLATION AND ANTIHYPERTENSIVE ACTIVITY OF *CITRULLUS COLOCYNTHIS* POLYPHENOLS IN RATS WITH GENETIC MODEL OF HYPERTENSION

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Abstract

Background and Objectives: Citrullus colocynthis, belongs to Cucurbitaceae family, is wildly used medicinal plant in folk literature to treat various diseases. The purpose of the current study was to explore the antihypertensive and antioxidant potentials of *Citrullus colocynthis* (CC) polyphenols rich fractions using spontaneous hypertensive rats (SHR) model. *Materials and Methods:* The concentrated aqueous ethanol extract of CC fruit was successively fractioned using solvents of increasing polarity, i.e. hexane, chloroform, ethyl acetate and n-butanol. Obtained extracts were analyzed for total phenolic contents (TPC), total flavonoid contents (TFC), total flavonol contents (TOF). Moreover, the CC extracts were further evaluated for radical scavenging capacity using 2, 2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2-azino-bis-3-ethylbenzothiazoline-6-sulfonic acid (ABTS) assays and antioxidant activity using inhibition of linoleic acid peroxidation and determination of reducing potential protocols. The phytochemical components were characterized by HPLC-MWD-ESI-MS in the positive ionization mode. *Results:* Results showed that ethyl acetate fraction (EAF) exhibited higher contents of phenolic compounds in term of TPC (289 mg/g), TFC (7.6 mg/g) and TOF (35.7 mg/g). EAF showed higher antioxidant and DPPH and ABTS scavenging activities with SC_{50} values 6.2 and 79.5 µg/mL, respectively. LCMS analysis revealed that twenty polyphenol compounds identified in the EAF, including phenolic acids and flavonoids mainly myricetin and quercetin derivatives. *In vivo* antihypertensive activity of EAF of CC on SHR revealed that it significantly decreased the mean arterial pressure (MAP), systolic blood pressure (SBP) and diastolic blood pressures (DBP), pulse pressure (PP) as compared to normal and hypertensive control groups. Moreover, EAF of CC significantly reduced the oxidative stress in the animals in dose dependent manner by normalizing the levels of superoxide dismutase (SOD), malondialdehyde (MDA), reduced glutathione (GSH), nitric oxide (NOx) and total antioxidant capacity (TAC). Furthermore, the treatment groups, especially 500 mg of EAF per kg body weight (EA-500) group significantly ($p \leq 0.05$) improved the electrocardiogram (ECG) pattern and pulse wave velocity (PWV). *Conclusion:* It was concluded that EAF of CC is rich source of polyphenols and showed best antioxidant activity and antihypertensive potential in SHR.

Keywords: Quercetin, Ferulic acid, gradient elusion, pulse wave velocity, SHR

PLANT BASED INNOVATIONS FOR SUSTAINABLE AQUACULTURE OUTPUT

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Abstract

The current talk will evaluate the use of innovative plant products in aqua-feeds to promote the sustainable production of multiple fish species in aquaculture. The development of sustainable protein sources to substitute fishmeal (FM) in aqua-feeds is critical to the continued growth and intensification of aquaculture productivity. Fish feed plays an important role in the growth of the aquaculture industry. FM has been employed as the principle protein element in aquaculture because of its beneficial essential amino acids, high digestibility, and palatability. FM prices are expected to rise by 20% between now and 2030 because of rising demand and increased output. This requires the search for better FM alternatives for long term aqua-feed production. In this light, much efforts have been conducted to seek the sustainable supplies of protein sources to substitute FM. Good nutrition in production systems is essential to economically produce a healthy and high product. The first consideration for formulation of feed is the quality of the feed ingredients. Use of plant protein source in the feed industry has been in practice for various advantages such as sustainability, availability, cost effectiveness etc. Because of their high protein content, excellent amino acid profile, low cost, and year-round availability, they are commonly utilized as a cost-effective alternative to high-quality fish meal in diets for many aquaculture fish species. Soy bean meal, *Moringa oleifera* leaf meal, *Moringa oleifera* seed meal, canola meal, sunflower meal, and cottonseed meal have all been studied extensively. Different supplements, such as enzymes, probiotics, organic acids, and nano-particles, are also given to fish diets in addition to plant by-products. All of these factors help fish species enhance their growth, nutrient digestibility and body composition.

Keywords: Plant by-products, replacement, feed formulation, cost effective, environment friendly

HERBAL NANOMATERIAL-BASED WOUND DRESSING FOR EFFECTIVE TREATMENT OF DIABETIC FOOT ULCERS

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Abstract

The prevalence and morbidity of diabetic foot ulcers (DFUs) have posed significant challenges due to the intricate pathophysiology of wound environments in individuals with diabetes. Finding effective treatments for these wounds has proven to be a difficult task. However, herbal dressings present a promising alternative to address these challenges. In this study, we developed a sodium alginate-based herbal dressing infused with nanoparticles containing active plant extracts known for their antimicrobial and wound healing properties. Initially, we screened a library of 53 plant extracts for their antimicrobial activity against *Escherichia coli* and *Staphylococcus aureus* using the well diffusion method. We then used the same library of plant extracts to identify potent extracts for wound healing through a migration assay. Among the 53 plant extracts tested, *Berberis vulgaris* emerged as the most active antibacterial agent, with minimum inhibitory concentrations (MIC) of 23.43 µg/mL and 46.87 µg/mL against *S. aureus* and *E. coli*, respectively. Similarly, *Eclipta alba* and *Moringa oleifera* demonstrated 100% wound closure after 48 hours. Subsequently, we prepared green nanoparticles of these potent plants by incorporating silver oxide and characterized them using X-ray diffraction (XRD), scanning electron microscopy (SEM), and Fourier-transform infrared (FTIR) analysis. To enhance the dressing's performance, we added charcoal as an absorbent and incorporated *Celastrus paniculatus* extract as a rubefacient in the final preparation. All these active ingredients were mixed with sodium alginate, and the dressing film was prepared using a solvent casting crosslinking method. The prepared films exhibited thickness ranging from 0.04 to 0.092 mm and flexibility with folding endurance of 190 to 200 folds, indicating good physical properties. The optimal formulation, labeled as T2, achieved the maximum zone of inhibition against *S. aureus* and *E. coli*, with diameters of 24 ± 0.1 mm and 23 ± 0.1 mm, respectively. Furthermore, this optimal formulation (T2) demonstrated the ability to achieve 98% wound contraction after 4 weeks of administration in a diabetic mice model. Histograms of the treated group with the optimized formulation also revealed complete reepithelization of wounds. In conclusion, this nanomaterial-based herbal dressing has shown great potential for treating diabetic foot ulcers and can be commercially used after preclinical and clinical studies.

Keywords: Nanoparticles, Wound Dresser, Diabetes, Antibacterial, Extracts, *In vivo*

ANTIOXIDANT AND IMMUNE RESPONSE OF TWO FISH SPECIES, *XYRICHTHYS NOVACULA* AND *CORIS JULIS*, RELATED TO A TREMATODE ECTOPARASITE IN IBIZA ISLAND (SPAIN)

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Abstract

Anthropic activities induce relevant alterations in the distribution and rhythm of the infection of diseases, contributing to the introduction of new pathogens. Recently, the presence of the black spot disease associated with a digenean fluke of the genus *Scaphanocephalus* has been observed in some specimens of wrasses, mainly *Xyrichthys novacula* but also *Coris julis*, in the Island of Ibiza (Balearic Islands). The aim of the present study was to evaluate response of the antioxidant and immune defences in the mucus and spleen of both species depending on the degree of infection by the ectoparasite. The specimens were captured in a control site without the presence of the parasite and in an affected area, categorizing the specimens as low infection (<15 spots) and high infection (>15 spots). A decrease in the body condition index was observed as the degree of infection increased. The activity of the antioxidant enzymes in the mucus - catalase, superoxide dismutase and glutathione peroxidase - progressively increased with the degree of infection. However, the antioxidant response was not enough to prevent the increase in malondialdehyde levels, as an indicator of lipid peroxidation, in the group with the highest infection. Also, an increase in immunological parameters - alkaline phosphatase, lysozyme, myeloperoxidase, and immunoglobulins - was evidenced in mucus as infection increased. Regarding the spleen, an increase in lysozyme activity and alkaline phosphatase was only observed in fish with high intensity of infection. In conclusion, the presence of *Scaphanocephalus* sp. induces an immune and an antioxidant response in the mucus of *X. novacula* and *C. julis* as the infection increases, together with a decrease in body condition. The potential effects that the ectoparasite can generate on affected fish populations require additional monitoring studies.

CONSUMERS BEHAVIORAL ASPECTS RELATED TO HALAL LABNEH PRODUCTION

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Abstract

The gelatin production is always remained a concern of great debate worldwide. The collagen found in animal bones, skins, and connective tissues is partially hydrolyzed to produce gelatin, a water-soluble protein. Gelatin has a wide range of uses in many different industries, including the food, pharmaceutical, and cosmetics industries. But in Halal and Kosher food industries, it is regarded as one of the most contentious components. The acceptability of items containing gelatin is determined by the animal from which it was derived and it is impossible to determine the source animal from which the gelatin originated after it is combined with food or pharmaceutical products. As a result, there is a chance of financially motivated adulteration or mislabeling. In labneh production, milk is incorporated with gelatin to counter the syeresis problem during storage but gelatin source is unknown which led to Halal or Haram ethical issues. This study focused on labneh production from transglutaminase enzyme extracted from plant source as gelatin replacer and to examine the rheological properties of yogurt. The effects of varied enzyme concentrations ranging from 1%, 2% and 4% with various setting temperatures of 35^{O}C and 45^{O}C with different time treatment of 60 and 90 minutes were evaluated. The enzymatic treatment of milk proved beneficial to retard the syneresis phenomenon during yogurt storage at 4^{O}C which improved water holding capacity during centrifugation. The post-acidification procedure and stability of yogurt samples were both effected by cross-linking of transglutaminase with milk protein that proved effective tool for improving functional properties of labneh. As consumer concerns about the authenticity of Halal and Kosher food and non-food products have grown. Therefore, Gelatin's species origin must be detected and quantified in order to ensure its integrity with regard to Halal and Kosher issues.

Keywords: Gelatin, Kosher, Labneh, Tranglutaminase enzyme, Halal source.

USE OF SYSTEMS BIOLOGY APPROACHES TO UNDERSTAND BETTER THE BIOLOGICAL EFFECTS OF IONIZING RADIATION

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Abstract

Ionizing radiation (IR) is a genuine genotoxic agent, carcinogen but also a major modality in cancer treatment used in Radiation therapy. A good understanding of the mechanisms governing its various biological effects at the cellular and organismal is important for radiation protection also. In the presentation we will focus on changes in the expression of mammalian genes induced after exposure to different absorbed doses of various radiation types with distinct biophysical characteristics. We will discuss our current experimental and integrative bioinformatics methodologies, including functional enrichment analysis and machine-learning techniques, employed to study commonly regulated, as well as characteristic biological pathways related to specific radiation types and their association with various diseases. Our results indicate that the effects of radiations with different quality impact in different ways cells and tissues. We will show that specific pathways are triggered like inflammation, oxidative stress responses and DNA Damage response. We suggest gene signatures for different types of radiation and exposure conditions.

Keywords: radiation response; bioinformatics; oxidative stress; transcriptomics; radiobiology data- base; gene signature.

UNRAVELING COLORECTAL CANCER RISK: GENETIC VARIANTS AND FAMILY HISTORY INSIGHTS

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Abstract

Colorectal cancer (CRC) ranks as the third most prevalent cancer globally in terms of incidence and the second leading cause of cancer-related deaths. In India, it's the fifth most common cancer with low survival rates. While lifestyle factors have been associated with CRC, none are confirmed as causative agents. This emphasizes the significance of genetic factors in CRC development. Family history of cancer (FHC) represents a prime example of the interplay between genetic and environmental risk. Xenobiotic-metabolizing genes (XMEs) are crucial in activating or detoxifying carcinogens. In high-risk CRC regions like Kashmir, genetic studies have yielded inconclusive results. This study seeks to link XME variants of CYP gene and GST gene, and family history to CRC risk, deepening our understanding of the complex etiology. To weigh up the association of various genotypes of xenobiotic-metabolizing enzymes (CYP2A13, CYP26a, CYP26b, CYP26c, GSTT1, and GSTM1) in CRC development in Kashmir To check the association of studied genotypes with CRC among subjects having a history of any cancer among blood relatives. In this study, a total of 246 CRC cases and 246 matched controls, from Jammu & Kashmir, India were recruited This hospital-based case-control study, approved by the Institutional Ethical Committee of SKIMS Srinagar, involved face-to-face interviews using questionnaires and collecting 5 ml of blood. Mutational analysis of CYP and GST genes was performed using PCR-RFLP. The study also gathered data on malignancies in relatives. Statistical analysis utilized STATA 16 software. A family history of cancer among relatives is found to be a statistically significant predictor of an increased risk of colorectal cancer ($p < 0.05$). Additionally, the mutational analysis of heterozygous and mutant variants of Cyp2A13, Cyp2A6a, Cyp26b, and Cyp26c revealed an inverse association with colorectal cancer risk. Conversely, null variants of GSTT1 and GSTM1 were associated with an elevated risk of colorectal cancer. Individuals who have a family history of cancer among their blood relatives are at a higher risk of developing colorectal cancer compared to those without such a family history. Moreover, the variant forms of the studied CYP genes were linked to a reduced risk of CRC, while the null variants of GST were associated with an increased risk of CRC.

Keyword: Colorectal cancer; Family history; Xenobiotic metabolizing genes, Kashmir

SOME ASPECTS OF THE INFLUENCE OF INTENSIVE AQUACULTURE IN FLOATING CAGES, ON SOME CHEMICAL PARAMETERS OF THE ACTUALLY SEDIMENTS IN IZVORU MUNTELUI-BICAZ RESERVOIR

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Abstract

The previous investigations focused on the influence on the mineral and organic matter resulted from the aquaculture activity represented by unconsumed feeds, faeces and excreta on the sediment composition from the floating cages area, have been made during 1979 – 1983 period, when the trout production was between 3 and 10 tons per year and the quantity of feeds administrated to the fishes was between 8.7 and 27 tons per year. In 2021 we have resumed the researches on the chemical parameters of the actually sediments in the aquaculture floating farm area and in other areas, uninfluenced by this activity. The influence of the trout aquaculture in floating cages upon the chemical characteristics of the actual sediments in the farms neighboring area is reduced by a series of factors which cause that just a part of the organic and mineral matter introduced in the ecosystem to arrive on the bottom, under the cages.

These effects appear on limited areas in the farms neighboring area and may be explained as forms of a limited eutrophication.

Keywords: intensive aquaculture, chemical parameters, Izvoru Muntelui-Bicaz reservoir

KRONİK ALKOLİZMDE HEMOSTAZ SİSTEMİNİN DURUMU

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Özet

Günümüzde insan sağlığıyla ilgili sorunların sayısı giderek artıyor. Bu sorunların biri, farklı yaştaki insanların aşırı alkol kullanımından kaynaklanmaktadır. Dünya Sağlık Örgütü'ne göre alkol kullanımı 200'den fazla hastalığın gelişmesine yol açıyor. Alkol kullanımı çeşitli iç organlarda hastalıklara neden olur (karaciğer, kalp, böbrek, pankreas hastalıkları). Alkolün etkisi altında, hemostaz sistemi göstergelerinin seviyelerindeki bir artış, hiper pıhtılaşma sendromu ve tromboembolik hastalıkların gelişmesine ve hipokoagülabilite sendromu, hemoroidal diyatezde azalmaya yol açar. Trombohemorajik sendrom, hemostaz sisteminin faz bozukluğunda gelişir. Kronik alkolizm sırasında ilk değişen pıhtılaşma, antikoagülasyon ve fibrinolitik sistemlerin aktivitesidir. Hemostaz sistemi, kan damarlarındaki kanın sıvı durumunu korumayı, kan damarı duvarlarının yapısal bütünlüğünü sağlamayı, ayrıca kan damarlarında hasar olması durumunda kanamayı önlemeyi ve kanamayı durdurmayı amaçlayan bir dizi fonksiyonel, morfolojik ve biyokimyasal mekanizmadır.

Alkolün Wistar deney farelerinin vücudu üzerindeki etkisi belirlendi. Çalışmanın amacı alkolün hemostaz sistemi parametreleri üzerindeki etkisini belirlemekti. Deney hayvanlarının adaptasyon yeteneklerinin olumsuz etkilendiği ve davranışlarının değiştiği gözlendi. Wistar farelerine günde iki kez 1,5 ml alkol verildikten 30 gün sonra, kan plazmasındaki kısmi aktive tromboplastin zamanı, protrombin zamanı, trombin zamanı, antitrombin III düzeylerinin kontrol grubuna göre arttığı ve protrombin indeksinin arttığı belirlendi. ve kan plazmasındaki fibrinojen tutulumu azaldı. Alkol zehirlenmesi karaciğer hasarına neden oldu. Makromorfolojik gözlem sırasında karaciğerin genişlediği ve bazı kısımlarının yağla kaplandığı, ayrıca kabarcıklar oluştuğu gözlendi ve karaciğerin detoksifikasyon sürecinin bozulduğu belirlenmiştir.

Anahtar Kelimeler: hemostaz, protrombin, trombin, antitrombin, fibrinojen.

STUDY OF THE EFFECT OF FATTY HEPATOSIS ON FAT METABOLISM

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Abstract

Hepatosis is a violation of the functional state of liver tissue associated with metabolic disorders. Fatty hepatosis-synonyms of the term obesity of the liver , steatosis, liver dystrophy. Even with excessive alcohol consumption, alcoholic hepatosis and non-alcoholic fatty liver disease develop. In this case, the liver tissue is damaged by excessive accumulation of fat droplets.

The liver enzyme system catalyzes the processes of fat metabolism: lipolysis of higher fatty acids, triglycerides, oxidation of fatty acids, synthesis of ketones, triglycerides, cholesterol.

The aim of the study was to experimentally determine the effect of alcohol and additional nutrients with a high fat content on lipid metabolism in rats in the Wistar line.

The object of the study is white mice with a body weight of 20-15g Wistar. The general condition of the experimental animals and the lipid spectrum were determined on the basis of blood infusion after administration of 3 ml of alcohol and fatty nutrients to Wistar rats for 30 days. It was found that the behavior of the experimental group changed dramatically. There was a slowdown in movement, accumulation in one place in groups, constant urine excretion, discoloration and weakening of the stool. Rats from the Wistar group in the experimental group had elevated levels of triglycerides and cholesterol in blood infusion. The effect of alcohol and fatty foods on the concentration of lipoproteins in the blood serum was bidirectional. After the experimental animals were fed alcohol and fed fatty foods for 30 days, their Low-density lipoprotein (LDL) concentration increased, and the LDL concentration in the blood tincture of white mice decreased. As the dose of alcohol and additional high-fat nutrients increases, Colesterol, Triglycerides, LDL levels increase and LDL levels decrease. Consequently, it was found that alcohol affects the body and at the same time affects lipid metabolism.

This means that alcohol and an additional fatty nutrient cause the accumulation of triglycerides in the cytoplasm of hepatocytes as a result of a violation of lipid metabolism in liver cells. It also stimulates the development of several pathologies in the body with changes in the function and structure of the liver.

Keywords: hepatosis, experimental animal, alcohol, liver tissue, fat metabolism, lipid spectrum.

MODAY DAY TECHNOLOGIES TO CONTROL INSECT PESTS OF CROPS; EFFICIENT IPM, BETTER FARM PRODUCTIVITY

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Abstract

The crop plants are constantly exposed to insect pests and disease threats from their emergence from soil to harvesting. The literature suggests that 37% overall losses are incurred to crop yield because of insect pests and diseases. Crop protection measures need special attention to address the yield concerns. The use of chemicals (insecticides, herbicides, and fungicides etc) has been used widely to control the losses from insect pests and diseases. The researchers are exploiting new crop protection technologies (like RNA interference and genome editing) for crop improvement against pests and diseases. The use of RNA interference and CRISPR (Clustered regularly interspaced short palindromic repeat)-Cas9 (Crispr associated nuclease 9) associated with bacterial immune system against viral attacks has been utilized recently in silencing and editing genes in association with the RNA-guided nucleases. In present case studies, dsRNAs from the the internal fragments of four crucial and vital dusky cotton bug and Colorado potato beetle (CPB) genes Actin, Serine Carboxypeptidase (SCP), Ecdysone Receptor (ECR) and Chitin Binding Peritrophin (CBP) were synthesized. The lab biotoxicity assays were performed using these dsRNAs against DCB and CPB. Besides that, chemical insecticide, clothianidin, was used in combination with dsRNAs to see the synergistic effect of both treatment on survival of insect pest. Interesting results were evident of the robustness of RNAi approach. I will present case studies of both insects with interesting data.

Keywords: RNA interference, genome editing, cotton dusky bug, plant protection

APPLICATION OF STRUCTURAL EQUATION MODELLING TO INFER TRANSCRIPTIONAL REGULATION IN *D.MELANOGASTER* EMBRYO

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Abstract

Revelation of the regulatory mechanism during embryogenesis is one of central tasks in systems biology. In this study, we applied a method based on Structural Equation Modelling (SEM), combined with factor analysis, to expression profiles for inferring intracellular regulatory network. The network model by SEM can include unobserved factor within the constructed model as latent variables. Furthermore, relationships between observed and unobserved variables can be inferred by SEM. To construct an initial model for SEM calculation, we developed a new method and applied our approach to estimate the regulatory network for embryogenesis in D. melanogaster early embryo. In this new approach, we combined cross-correlation and partial correlation to summarize the temporal information and to extract the direct interactions from the gene expression profiles. We selected 18 transcription factors, which are known to be related with embryogenesis, to infer the regulatory relationships among them. In the inferred model, the same type of genes was regulated by un-observed factor, which was estimated by factor analysis. Thus, the factors were considered to be involved in maternal effects or spatial morphogen distributions. The interpretation of the inferred network model revealed the regulatory mechanism for patterning along the head to tail axis in D. melanogaster.

Keywords: Structural Equation Modelling, Cross correlation coefficients, Partial correlation coefficients, D.melanogaster embryogenesis

EXPRESSION PROFILING OF NICKEL RESPONSIVE GENES IN SUNFLOWER UNDER STRESS CONDITIONS

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Abstract

Heavy metal contamination of soil and water causing toxicity/stress has become one important constraint to crop productivity and quality. The severe environmental problems/heavy metal contaminations especially nickel (Ni) toxicity adversely affect the sunflower by reducing the yield of the plant substantially. The counterbalancing toxicity due to Ni requires complex mechanisms at molecular, biochemical, physiological, cellular, tissue, and whole plant level, which might manifest in terms of improved crop productivity. One of the major adaptations to tolerate the Ni toxicity is the enhanced production of anti-oxidant enzymes in plants to prevent the oxidative damage and the expression of Ni responsive gene matters a lot in this regard. So, the expression of NRAMP metal transporter genes was studied under Ni stress in this research. The sunflower plants were grown in pots having 5kg of soil each. There were four treatments (0, 50, 100, 200ppm) of Ni dose where 0 is control having no Ni. The experiment was conducted in triplicate by using CRD experimental design. Total RNA was isolated of 30 and 60 days old plants. First strand cDNA was synthesized and expression of NRAMP genes was carried out by using Real Time PCR. Anti-oxidant enzyme activities, soluble protein contents and carbohydrate contents were also determined to correlate with gene expression data. The results indicated that the concentrations of Ni in roots and shoots were increased with increasing concentrations of Ni at both growth stages. Proline contents, ascorbic acid, protein, and total phenolics were reduced under Ni-stress, but with the application of CA, improvement was witnessed in their contents. The levels of malondialdehyde and hydrogen peroxide were enhanced with the increasing concentration of Ni, and after applying CA, they were reduced. The contents of antioxidants, i.e., catalase, peroxidase, superoxide dismutase, ascorbate peroxidase, dehydroascorbate reductase, and glutathione reductase, were increased at 50 ppm Ni concentration and decreased at higher concentrations of Ni. The application of CA significantly improved antioxidants at all concentrations of Ni. The expressions of *NRAMP1* and *NRAMP3* genes were enhanced under Ni-stress, and the addition of CA further increased their expression.

Keywords: Phytoremediation, Nickel, heavy metals, antioxidant activity, ROS activity, gene expression.

GROWTH CHARACTERISTICS AND FORAGE VALUES OF *Silphium perfoliatum* L IN KYRGYZSTAN

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Abstract

The studies conducted at Kyrgyzstan-Turkey "Manas" University during the 2021-2022 year in the plant growth laboratory of the Faculty of Science, Department of Biology. The seeds of *Silphium perfoliatum* L., widely used in biogas production and medicine in other countries, were used as the primary material for research. The growth dynamics of plant were examined under laboratory conditions. Basic statistical parameters and absolute and relative growth rates were calculated and analyzed. The introduction and adaptation of this plant in Kyrgyzstan were observed. Within the scope of this self-study, this plant was cultivated by private entrepreneurs in the Alamedin district. The nutritional value and essential mineral content were analyzed in the "Feed Laboratory" of "Atalyk" Tarim Holding. The analysis revealed that the *Silphium perfoliatum* L. plant contains 11.5% dry matter, 12.9% protein, 3.1% fat, 18.4% fiber, 3.8% sugar, and the following mineral content per kg of dry matter: Ca - 5.8 g/kg, P - 4.3 g/kg, Na - 2.3 g/kg, K - 36.6 g/kg, and Mg - 2.5 g/kg. This plant introduced for the first time in Kyrgyzstan, was found to have similar nutritional value and mineral content to Medicago sativa, a forage plant grown in the country. Additionally, *Silphium perfoliatum* L. exhibited 1.5-2 times higher biological productivity compared to other primary forage crops. These results demonstrate the successful cultivation in Kyrgyzstan, making it a potential alternative forage plant in relevant regions of the country.

Keywords: *Silphium perfoliatum* L., forage plant, introduction, adaptation, statistical parameters, chemical analysis.

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Özet

Microsporidialar omurgalı ve omurgasız geniş konak aralığına sahip, zorunlu hücre içi parazitlerdir. Günümüze kadar yaklaşık 200 cinse ait 1400'den fazla microsporidian parazit türü tanımlanmıştır. Tarih boyunca kürk hayvanları, ipek böceği, arı ve balık gibi canlılarda enfeksiyona neden olmuş, bu sektörlerde faaliyet gösteren ticari işletmelerde ekonomik kayıplara neden olmuşlardır. Microsporidiosis hızlı gelişen ve ihmal edilen bir hastalıktır. Özellikle HIV/AIDS hastaları, organ transplantasyonu veya kemoterapi alanlar gibi immun sistemi baskılanmış konaklarda fırsatçı patojen olarak ciddi komplikasyonlara yol açarken immun normal konaklarda asemptomatik olarak gözlenebilmektedir. Yapılan çalışmalarda 8 cinse ait 14 türün insanlarda enfeksiyona yol açtığı tespit edilmiştir. Bunlar arasında *Encephalitozoon* soyuna bağlı *E. cuniculi, E. intestinalis* ve *E. hellem* ile *Enterocytozoon* soyuna bağlı *E. bieneusi*, insan ve hayvanlarda enfeksiyon oluşturan ve zoonotik karaktere sahip dört önemli microsporidia türüdür. Epidemiyolojik çalışmalar özellikle *E. bieneusi*'nin insanlar, büyükbaş ve küçükbaş çiftlik hayvanları, kanatlılar, at, kedi, köpek ve kemirgenlerde semptomatik veya asemptomatik enfeksiyonlara neden olduğunu, zoonotik genotiplerin yanı sıra yaygın veya konak spesifik genotiplere de sahip olduğunu ortaya koymuştur. Enfeksiyonun genel olarak su/gıda kaynaklı, seksüel, respiratör, konjenital, oküler ve zoonotik bulaş yolu gibi çeşitli yollarla ortaya çıkabileceği belirlenmiştir. Microsporidiosis tanısı mikroskobik, serolojik, histolojik ve son yıllarda sıklıkla kullanılan moleküler yöntemler kullanılarak yapılmaktadır. Moleküler yöntemler parazitin genotipik varyasyonlarını ortaya koyması bakımından önemli epidemiyolojik veriler sağlamaktadır. Mikrosporidiosisin tedavisi genellikle ilaç ve destek tedavi ile sağlanmaktadır. Araştırmalar immun fonksiyonların iyileşmesinin klinik semptomların iyileşmesi ve patojen eleminasyonu ile sonuçlandığını göstermiştir. İlaç tedavisinde albendazol ve fumagilin yaygın biçimde kullanılmaktadır. Hijyen kurallarına uyum ve içme sularına atık suların karışmasının önlenmesi microsporidiosisin yaygınlığının önlenmesi bakımından önem arz etmektedir. Hayvan çiftliklerinde ise atık drenajlarının iyi yapılması, hasta veya şüpheli hayvanların sürüden ayrılması ile tedavilerinin yapılmasının hastalığın yayılmasını önleyici tedbirler olacaktır.

Anahtar Kelimeler: Microsporidiosis, *Encephalitozoon, Enterocytozoon,* fırsatçı patojen, zoonoz.

Abstract

Microsporidian parasites are obligate intracellular parasites with a wide range of vertebrate and invertebrate hosts. To date, more than 1400 species of microsporidian parasites have been described, belonging to about 200 genera. Throughout history, they have caused infections in

living creatures such as fur animals, silkworms, bees, and fish, resulting in economic losses for companies operating in these sectors. Microsporidiosis is a rapidly evolving and neglected disease. As an opportunistic pathogen, it can cause serious complications, especially in immunocompromised hosts such as HIV/AIDS patients, organ transplant patients, or chemotherapy recipients, while it can occur asymptomatically in immunocompetent hosts. Studies have shown that 14 species belonging to 8 genera cause infections in humans. These include *E. cuniculi, E. intestinalis*, and *E. hellem* from the genus *Encephalitozoon* and *E. bieneusi* from the genus *Enterocytozoon*, four important microsporidia species that cause infections in humans and animals and are zoonotic character. Epidemiologic studies have revealed that *E. bieneusi* causes symptomatic or asymptomatic infections in humans, in livestock, poultry, horses, cats, dogs and rodents, and has zoonotic genotypes as well as common or host-specific genotypes. It has been established that infection can occur via various routes, e.g., water, food, sexual, respiratory, congenital, ocular, and zoonotic transmission. Microsporidiosis is diagnosed by microscopic, serologic, histologic, and molecular methods, which have been widely used in recent years. Molecular methods provide important epidemiological data as they reveal the genotypic variations of the parasite. Microsporidiosis is usually treated with medication and supportive measures. Studies have shown that improved immune function leads to an improvement in clinical symptoms and the elimination of the pathogen. Albendazole and fumagillin are frequently used in drug treatment. Compliance with hygiene regulations and avoiding contamination of drinking water by sewage are important to prevent the prevalence of microsporidiosis. On livestock farms, good waste disposal, the separation of sick or suspected animals from the herd, and their treatment are measures to prevent the spread of the disease.

Keywords: Microsporidiosis, *Encephalitozoon*, *Enterocytozoon*, opportunistic pathogen, zoonosis

CURRENT CHALLENGES AND SUSTAINABLE SOLUTIONS IN PLANT PROTECTION IN UZBEKISTAN'S CLIMATIC CONDITIONS

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Abstract

This academic article addresses the pressing issues related to plant protection in the unique arid and semi-arid climatic conditions of Uzbekistan. The region faces significant challenges including water scarcity, soil degradation, pest infestations, and the impacts of climate change on agriculture. The study explores multifaceted approaches and sustainable solutions to mitigate these challenges, encompassing improved water management, soil enhancement, climate-resilient agricultural practices, adoption of modern technologies, and community engagement. The paper emphasizes the importance of research, education, and collaborative efforts among stakeholders to effectively protect plants and promote sustainable agriculture in Uzbekistan.

Keywords: Arid climate, plant protection, water management, soil degradation, pest management, climate-resilient agriculture, sustainable solutions.

Түйіндеме

Бұл академиялық мақала Өзбекстанның ерекше құрғақ және жартылай құрғақ климаттық жағдайында өсімдіктерді қорғаудың өзекті мәселелерін қарастырады. Аймақ су тапшылығы, топырақтың деградациясы, зиянкестердің зақымдануы және климаттың өзгеруінің ауыл шаруашылығына әсері сияқты елеулі қиындықтармен бетпе-бет келеді. Зерттеу жақсартылған суды басқаруды, топырақты жақсартуды, климатқа төзімді ауылшаруашылық тәжірибелерін, заманауи технологияларды қабылдауды және қоғамдастықтың қатысуын қамтитын осы қиындықтарды жеңілдету үшін көп қырлы тәсілдер мен тұрақты шешімдерді зерттейді. Бұл мақалада Өзбекстандағы өсімдіктерді тиімді қорғау және тұрақты ауыл шаруашылығын ілгерілету үшін зерттеу, білім беру және мүдделі тараптар арасындағы бірлескен күш-жігердің маңыздылығына баса назар аударылады.

Түйін сөздер: Аридті климат, өсімдіктерді қорғау, суды басқару, топырақтың деградациясы, зиянкестермен күрес, климатқа төзімді ауыл шаруашылығы, тұрақты шешімдер.

УЎК. 636.32/.38.081.(262.9)

CONSTITUTIONAL CHARACTERISTICS OF BLACK KARAKUL SHEEP IN THE CONDITIONS OF THE ARAL SEA REGION

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Annotatsya

Aralboyı shárayatında hár qıylı buyra turdegi qara Qarakŏl qoyları hám qozılardıń konstitutsiyalıq qásiyetlerin ŭyreniw boyınsha izertlewler nátiyjeleri keltirilgen. Qoshqarlar, qoylar hám olardan alınǵan náslller hám hár tŭrli genotiplerde bul ko'rsetkishtiń parıqları anıqlandı.

Keywords. Karakul sheep, rams, lambs, coloration, constitution, curl type, adaptation, viability, breeding conditions, Aral Sea region.

УДК 63.631.5

THE STATE OF PRIMARY SEEDING OF SHORTANBAY-1 VARIETY OF SOFT WINTER WHEAT IN THE CONDITIONS OF KARAKALPAKSTAN

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Аннотация

Мақалада Қарақалпақстан Республикасының топырақ ықлым шараятларына сай зүрәятлилик ҳәм нанбаплық қәсийетлери жоқары, кеселликлерге шыдамлы гүзги бийдайдың Шортанбай-1 сортының тухымгершилик системасын шөлкемлестириў тийкарында жоқары сапалы тухымлар жетистириў, тухымгершиликке қәнийгелескен фермер хожалықларына жеткизип берилиўин тәмийинлеў ҳәм республикамызды жергиликли бийдай сорты менен тәмийинлеў мәселеси сөз етиледи.

Калит сўзлар: Бахорги бўғдой, нав, уруғчилик, хосилдорлик, атроф-мухит омиллари, миқдор, вариант.

UO‘K: 633.41+633+631.4+551.31

RESTORE THE PRODUCTIVITY OF ABANDONED AND EROSIONED LAND

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Annatatsiya

Maqalada paydalanıwdan shıǵıp ketken hám eroziyaǵa ushıraǵan jerlerdiń topıraq ónimdarlıǵın tiklew agrotexnologiyasın islep shıǵıw boyınsha tájiriybe variantları soya eginlerinen keyin ǵawasha jetistirilgende, tárbiyalaw agrotexnikasın hám jergilikli tógin hám dástúriy emes agrorudalardan tayarlanǵan kompostlardı qollanıwdı eginler zúráátliginiń hám onıń talshıqtıń texnologiyalıq sapasına tásiri anıqlanadı.

Abstract

Experimental options for the development of agrotechnology for restoring the soil fertility of abandoned and eroded lands in the work of the station are determined when cotton is grown after soybeans, the use of maintenance agrotechnics and the use of composts made from local fertilizers and non-traditional agro-ores on the yield of crops and the technological quality of its fiber.

EFFECT OF HERBICIDES APPLICATION ON WINTER WHEAT GROWTH

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Abstract

In the article, when Serto Plus, 75% herbicide - 100 g/ha + Clodimex, 8% herbicide - 0.3 l/ha are used as a mixture in the fight against weeds spread in the saline winter wheat fields of Karakalpakstan, annuals and perennials in the winter wheat field are killed thus, the cultivated area is cleared of weeds, favorable conditions are created for the growth and development of wheat, and the opportunity to grow a high-quality and high-quality grain crop is brought out.

Annotaciya

Maqalada Qaraqalpaqstannıń shorlańan gúzlik biyday maydanlarında tarqalǵan jabayi shóplerge qarsı gúresiwde Serto Plus, 75 % gerbicidi - 100 g/ga + Klodimerks, 8% gerbicidi - 0,3 l/ga muǵdarında birgelikde aralaspa halında qollanılǵanda, gúzlik biyday maydanlarındaǵı bir hám kóp jıllıqlardı nabıt etip, egislik maydanlar jabayi shóplerden tazalanıp, biydaydıń ósiwi hám rawajlanıwı ushın qolaylı shárayat jaratılp, sapalı hám joqarı dán hasılın jetistiriw imkaniyatı jaratılıwı aytıp ótilgen.

BIOECOLOGICAL CHARACTERISTICS OF MALVA L. PLANTATION

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Аннотация

Тезисте мальваның биоэкологик өзгешелиги үйренилген. Мальва өсимлигиниң туқымынын көгериўшенлиги, жапырағы, гүли ҳәм туқымының медицинадағы әҳмийети көрсетилген.

Гилт сөзлер: көгериўшенлик, туқым, дәрилик қәсийети, биоэкология, медицина, өзгешелиги.

NETWORK FARMAKOLOJİSİ, MOLEKÜLER DOCKİNG VE BİYOİNFORMATİK ANALİZLERLE, GASTİRİT HASTALIĞINDA ETNOFARMAKOLOJİK OLARAK KULLANILAN AYNISAFA (*Calendula officinalis*) BİTKİSİNİN TERAPÖTİK ETKİNLİKLERİNİN BELİRLENMESİ

NETWORK PHARMACOLOGY, MOLECULAR DOCKING AND BIOINFORMATIC ANALYSIS TO DETERMINE THE THERAPTIC ACTIVITY OF THE HERB AYNISAFA (Calendula officinalis) USED ETHNOPHARMACOLOGICALLY IN GASTIRIT DISEASE

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Özet

Calendulla officinalis gastrit hastalığında etnofarmakolojik açıdan kullanılan ve potansiyel etkinliği olduğu düşünülen bir bitkidir. Bu çalışma ile başlangıç adımı olarak network farmakolojisi, moleküler docking ve biyoinformatik analiz teknikleriyle gastrit hastalığının tedavisinde *C. officinalis* bitkisinin potansiyel etki mekanizmasının açığa kavuşturulması amaçlanmaktadır. *C. officinalis* bitkisinin temel bileşenleri Pubmed, Google Scholar, ScienceDirect ve Nature indeksleri taranarak belirlenmiştir. Daha sonra TCMSP, IMPPAT, Dr. Duke's Phytochemical and Ethnobotanical Databases veri bankalarındaki ortak temel bileşenler derlenerek bileşik hedef ağı Cytoscape 3.10.0 ile oluşturulmuştur. Gastrit hedefleri GeneCards veri tabanında arandı. Bileşik hedef ve hastalık hedefinin kesişimi elde edilmiş bir PPI ağı oluşturmak için STRING veritabanına aktarılmıştır. Ayrıca hedefler üzerinde GO ve KEGG zenginleştirme analizi gerçekleştirilmiştir. Son olarak, moleküler docking çalışması ile çekirdek hedef ve aktif bileşik sonuçları elde edilmiştir. Bileşen hedef ağında 101 node 383 edge bulunmaktadır. PPI ağı analizi sonucunda toplam 10 tane derecesi yüksek gen belirlenmiştir (*EGFR, BCL 2, TNF, MTOR, HIF1A, MMP9, AKT1, SRC, KDR*). GO ve KEGG analizi ile gastritin tedavisinde *C. officinalis* bitkisinin pozitif yönde etkisi tespit edilmiştir. Moleküler docking sonuçlarına göre fitobileşenlerden bağlanma kapasitesi yüksek moleküller tespit edilmiştir. Bu çalışma, gastrit tedavisinde etkili *Calendulla officinalis* aktif bileşenlerini ve potansiyel moleküler mekanizmasını ortaya koymakta ve sonraki temel araştırmalar için bir referans sağlamaktadır.

Anahtar Kelimeler: *Calendulla officinalis*, gastrit, network farmakoloji, biyolojik fonksiyonel modül, moleküler docking.

Abstract

Calendulla officinalis is a plant that is used ethnopharmacologically in gastritis and is thought to have potential efficacy. This study aims to elucidate the potential mechanism of *C. officinalis* in the treatment of gastritis disease using network pharmacology, molecular docking and bioinformatics analysis techniques as an initial step. The main constituents of *C. officinalis* were identified by searching Pubmed, Google Scholar, ScienceDirect and Nature indexes. Then, the compound target network was created with Cytoscape 3.10.0 by compiling the common principal components in TCMSP, IMPPAT, Dr. Duke's Phytochemical and Ethnobotanical Databases. Gastritis targets were searched in the GeneCards database. The intersection of the composite target and the disease target was imported into the STRING database to create a resulting PPI network. GO and KEGG enrichment analysis was also performed on the targets. Finally, the core target and active compound results were obtained by molecular docking. There are 101 nodes and 383 edges in the component target network. As a result of PPI network analysis, a total of 10 highly ranked genes were identified (*EGFR, BCL 2, TNF, MTOR, HIF1A, MMP9, AKT1, SRC, KDR*). GO and KEGG analysis revealed a positive effect of *C. officinalis* in the treatment of gastritis. According to molecular docking results, molecules with high binding capacity were identified from phytocomponents. This study reveals active components and potential terapeutic molecular mechanism of *Calendulla officinalis* for gastritis and provides a reference for further basic research.

Keywords: *Calendulla officinalis,* gastritis, network pharmacology, biological functional module, molecular docking.

AZERBAYCAN'IN BAZI NEHİR SULARINDA MİKROSKOBİK FUNGUSLAR
MICROSCOPIC FUNGI IN SOME RIVER WATERS OF AZERBAIJAN

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Özet

Mikrofunguslar bakterilerle beraber sucul ekosistemlerdeki başlıca organik maddelerin parçalanmasında yer alırlar. Okyanusların ve göllerin pelajik bölgesinde bakteriler birincil mineralleştiriciler olarak kabul edilirken, akarsularda ve sulak alanlarda organik maddelerin parçalanmasında mikrofungusların rolü daha baskındır. Son bulgular, mantar topluluklarının göllerde de aktif olduğunu göstermektedir, ancak çeşitlilikleri ve bakterilerle etkileşimleri hakkında çok az şey bilinmektedir. Daha yüksek ipliksi su mantarları, su ekosistemlerindeki büyük vasküler bitki kalıntılarının ana ayrıştırıcıları olarak kabul edilir ve genellikle katkıda bulunan bakteriler üzerinde % 95'ten fazla baskınlık vardır. Su ekosisteminde funguslar organik materyallerin bozulmasında, gıda döngüsünde mühüm rol oynarlar. Funguslar akarsularda bulunan yaprak döküntülerinin başlıca mantar ayrıştırıcılarıdır ve çürüyen yapraklar ile akarsu omurgasızları arasında önemli bir trofik bağlantıdır. Mikrofungusların Azerbaycanın tatlı su ekosistemlerindeki ekolojik önemini öyrenmek için Lenkeran iline dahil olan bazı nehir sularında (Astaraçay, Lenkerançay, Vileşçay, Veravulçay, Boladıçay, Bolqarçay nehirleri) araştırma yapdık. Nehir sularında suda yaşayan mikrofungusların varlığını ve yayılmasını belirlemek için nehir sularında su ve organik atık maddeler örnek olarak kullanılmıştır. Mantar sporları su üzerindeki köpük ve bitki atıklarında bol miktarda bulunmaktadır. Bunlar su içerisinde hem mevsimsel hem de şaquli dağılım göstermektedirler. Nehir sularında fungusların yayılması suyun akışıyla olur. Ayrıca çürüyen organik materyallarının su akıntılarıyla yayılması da fungusların dağılımında mühüm rol oynayır. Mikrofunguslar su alanlarında yeterli gıda maddesi ve oksijen bulunduğu sürece yaşayabilirler. Bu nedenle de mikrofunguslara sonbahar döneminde yaprak dökümü zamanı daha çok rast gelinmişdir. Nehir sularında en çok rastlanan funguslar *Aspergillus, Penicillium, Mucor, Fusarium, Trichoderma, Alternaria, Cladosporium, Rhizopus* cinsine aitti. Araştırmamızın sonuçları, derin su katmanlarından alınan su örneklerinde ve bitki kalıntılarında bulunan mantar miktarının su yüzeyinden alınan örneklere göre daha az olduğunu göstermektedir. Çevresel faktörlerde mantar çeşitliliğini etkiler.

Anahtar Kelimeler: Mikrofungus, organik maddeler, su ekosistemi, ekoloji, tatlı sular.

Abstract

Microfungi, together with bacteria, are involved in the decomposition of major organic matter in aquatic ecosystems.While bacteria are considered the primary mineralizers in the pelagic zone of oceans and lakes, the role of microfungi in the breakdown of organic matter in streams and wetlands is more dominant. Recent findings show that fungal communities are also active in lakes, but little is known about their diversity and interactions with bacteria. Higher filamentous aquatic fungi are considered the main decomposers of large vascular plant debris in aquatic ecosystems, often with greater than 95% dominance over contributing bacteria. In the aquatic ecosystem, fungi play an important role in the degradation of organic materials and the food cycle. Fungi are the primary fungal decomposers of leaf litter in

streams and are an important trophic link between decaying leaves and stream invertebrates. To learn the ecological importance of microfungi in the freshwater ecosystems of Azerbaijan, we conducted research in some river waters of the Lankaran province (Astarachay, Lankaranchay, Vileshchay, Veravulchay, Boladichay, Bolqarchay rivers). Water and organic waste materials in river waters were used as samples to determine the presence and spread of aquatic microfungi in river waters. Fungal spores are abundant in foam and plant waste on water. These show both seasonal and irregular distribution in the water. The spread of fungi in river waters occurs with the flow of water. In addition, the spread of decaying organic materials by water currents also plays an important role in the distribution of fungi. Microfungi can survive in water areas as long as there are sufficient nutrients and oxygen. For this reason, microfungi are more common in autumn, during leaf fall. The most common fungi in river waters belonged to the genera Aspergillus, Penicillium, Mucor, Fusarium, Trichoderma, Alternaria, Cladosporium and Rhizopus. The results of our research show that the amount of fungi found in water samples and plant residues taken from deep water layers is less than in samples taken from the water surface. Environmental factors also affect fungal diversity.

Keywords: Microfungi, organic substances, aquatic ecosystem, ecology, fresh waters.

PHYTOCHEMICAL ANALYSIS OF *PIPER BETEL* EXTRACTS AND ITS EFFICACY AS FOOD PRESERVATIVE AGENT

Jini D

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Abstract

Food spoiling is incredible issues caused on by pathogenic organisms, which can be prevented by natural plant extracts that are becoming popular as food preservatives. This study was conducted to investigate the effect of different *Piper betel* (betelvine) leaf extracts (aqueous, ethanol and methanol) on the preservation of vegetables such as tomato, brinjal and ladies finger. The extracts of betelvine such as aqueous, ethanol and methanol were prepared by soxhlet extraction (ethanol and methanol) and homogenization (aqueous). The preliminary phytochemical analysis of the prepared extracts was done and showed the presence of major phytochemicals such as phenol, quinone, saponin, terpenoid, vitamin C, carbohydrate and glycosides. The falvonoid content was higher in the ethanol extract and phenol content was higher in the aqueous extract of betelvine. The volatile compound identification in the fresh leaves of betelvine by headspace Gas Chromatograph Mass Spectrometer showed the presence of twenty phytochemicals. The antimicrobial activity against six common pathogens (*Escherichia coli, Klebsiella, Pseudomonas, Streptococcus, Staphylococcus,* and *Salmonella*) were done and the result showed that the ethanol and methanol extracts were very effective. The prepared extracts were further investigated for biocontrol activity against spoilage-causing bacteria in selected vegetables such as Brinjal, Ladies finger and Tomato and the results revealed that the vegetables treated with the *Piper betel* leaf extracts showed lesser injury than the untreated control. The results of the present study suggested that the betel leaf extracts can be considered as natural food preservatives for vegetables to reduce the growth of spoilage causing microorganism and thus enhance the shelf life of fresh vegetables.

Keywords: Piper betel, Food preservative agent, Antimicrobial activity, Phytochemicals

ВИЗУАЛИЗАЦИЯНЫ КӘСІБИ ҚҰЗЫРЕТТІЛІКТІҢ БІР ТҮРІ РЕТІНДЕ БИОЛОГИЯ САБАҒЫНДА ПАЙДАЛАНУ

THE USE OF VISUALIZATION AS A FORM OF PROFESSIONAL COMPETENCE IN BIOLOGY LESSONS

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Аңдатпа

Мақалада биология пәнін оқытуда визуализацияны қолдану мүмкіндіктері қарастырылып, болашақ кәсіби биологтарды оқытуда бұл әдістің тиімділігі мен болашағы дәлелденген. Визуалды оқыту коммуникациялық маңызы бар құзыреттілік болып табылады. Теориялық – арнайы әдістемелік әдебиеттерді зерделеу, зерттеу нәтижелерін талдау, жалпылау және толық жүйелеу; эмпирикалық – педагогикалық эксперимент, білімалушылармен әңгімелесу, оларға сұрақ қою және тексеру, алынған диагностикалық материалдарды статистикалық өңдеу. «Визуализация» түсінігіне анықтама беріледі; бұл әдісті түсінудің әртүрлі тәсілдерінің мысалдары келтірілген; автордың бұл мәселені зерттеу тәжірибесі сипатталған, атап айтқанда, визуализациямен жұмыс жасау білім алушылар үшін маңызды болып табылады. Педагогикалық әдіс арқылы білімалушылардың мотивациясын арттыруға, кәсіби құзыреттіліктерді меңгеруге көмектеседі, кез келген проблеманы шешудің логикалық схемаларын құруды үйретеді. Біздің зерттеулеріміз визуализация әдісі тиімді және креативті екенін дәлелдейді. Визуализация - деректерді талдауда жақсы қолданылатын тәсілдер болып табылады. Бір жағынан, визуализация интуитивті визуалды бейнелеу және интерактивті зерттеу арқылы адамдарға деректерді түсінуді, жіктеу, шешімдерін қабылдау, болжауды жеңілдетеді. Екінші жағынан, жасанды интеллект деректерден сабақ алуға және адамдар үшін қиын тапсырмаларды орындауға қабілетті. Жасанды интеллект пен визуализация байланыстырса олар бір-бірін қалай толықтыра алатыны және деректерді талдау процестеріне қалай біріктірілетіні әлі белгісіз, мақала барысында осы мәселені шешуге талпыныс жасалды. Бұл мақалада визуалды интерфейстер арқылы адамдармен байланысуға мүмкіндік береді. Тиісті зерттеулерді қорытындылау үшін біз бірнеше мақаланы талдадық, оның ішінде Scopus сапалы шолу мақалалары да бар. Біз сондай-ақ тиісті зерттеулерді шабыттандыру үшін VIS+AI болашақ бағыттарын қорытындылаймыз.

Кілт сөздер: визуализация, интуитивті, зерттеу, бейнелеу, интерактивті

Abstract

The article discusses the possibilities of using visualization in teaching biology, proves the effectiveness and prospects of this method in teaching future professional biologists. Visual learning is a communicative competence. Theoretical-study of special methodological literature, analysis, generalization and complete systematization of research results; empirical – pedagogical experiment, conversation with students, questioning and checking them, statistical processing of the received diagnostic material. The concept of «visualization» is

defined; examples of various ways of understanding this method are given; the author's experience of studying this problem is described, in particular, working with visualization is important for students. Through the pedagogical method, it helps to increase the motivation of students, master professional competencies, teaches how to build logical schemes for solving any problem. Our research proves that the visualization method is effective and creative. Visualization is an approach that is best used in data analysis. On the one hand, visualization makes it easier for people to understand, classify, make decisions, and predict data through intuitive visual representation and interactive research. On the other hand, artificial intelligence is capable of learning from data and performing difficult tasks for humans. It is not yet known how they will be able to complement each other if artificial intelligence and visualization are connected, and how they will be integrated into the processes of data analysis, during the article an attempt was made to solve this problem. This article will allow you to communicate with people through visual interfaces. To summarize the relevant research, we analyzed several articles, including Scopus quality review articles. We also summarize the future directions of VIS+AI to inspire relevant research.

Keywords: visualization, intuitive, research, imaging, interactive

ALUÇDAĞI TABİAT PARKINDA (ÇAMLIDERE-ANKARA) BELİRLENEN YENİLEBİLİR MAKROMANTARLAR

EDIBLE MACROFUNGI DETERMINED IN ALUÇDAĞI NATURE PARK (ÇAMLIDERE-ANKARA)

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Özet

Makromantarlar, insanoğlunun diyetindeki yerini hep koruyagelmiştir. Günümüzde birçok türün kültürü yapılıyor olmasına karşın, doğal mantar tüketimi de güncelliğini muhafaza etmektedir. Milli Park, Tabiat Parkı gibi korunmakta olan alanlar mantar gelişimi için uygun habitat sunan önemli alanlardır. Bu çalışmada Çamlıdere (Ankara-Türkiye) ilçe sınırları içinde kalan Aluçdağı Tabiat Parkı'nda doğal olarak yetişen yenilebilir makromantarlar araştırılmıştır. Makromantar örnekleri park alanı ve yakın çevresinde yer alan uygun habitatlardan 2021-2023 yılları arasında toplanmıştır. Arazi ve laboratuvar çalışmaları sonucunda 2 sınıf, 5 takım, 16 familya ve 23 cins içinde dağılım gösteren 37 makromantar türü belirlenmiştir. Türlerden ikisi Ascomycota, 35 tanesi ise Basidiomycota bölümüne aittir. *Russula* Pers., *Suillus* Gray, *Tricholoma* (Fr.) Staude, *Agaricus* L., *Coprinus* Pers., *Macrolepiota* Singer, *Pleurotus* (Fr.) P. Kumm., ve *Lactarius* Pers. bölgede en fazla yenilebilir tür içeren cinslerdir. Dokuz tür, *Amanita vaginata* (Bull.) Lam., *Pleurotus ostreatus* (Jacq.) P. Kumm., *Coprinus comatus* (O.F. Müll.) Pers., *Suillus collinitus* (Fr.) Kuntze, *Lactarius deliciosus* (L.) Gray, *Morchella deliciosa* Fr., *Pleurotus ostreatus* (Jacq.) P. Kumm., *Russula adusta* (Pers.) Fr. ve *R. delica* Fr., yöre halkı tarafından toplanıp tüketilmektedir. İki tanesi, *L. deliciosus* ve *R. delica*, lokal ekonomik değere sahiptir.

Anahtar Kelimeler: Aluçdağı Tabiat Parkı, Çamlıdere, Yenen makromantarlar, Türkiye.

Abstract

Wild edible mushrooms have always maintained their place in the human diet. Though many species are cultivated today, natural mushroom consumption has not lost anything of its currentness. Protected areas such as National Parks and Nature Parks are important areas that provide suitable habitats for mushroom growth. In this study, edible macrofungi naturally groving in Aluçdağı Nature Park, located within the borders of Çamlıdere (Ankara-Turkey) district, were investigated. Macrofungi samples were collected from suitable habitats within the boundaries of Aluçdağı Nature Park (Çamlıdere-Ankara) and its close environs between 2021 and 2023. As a result of field and laboratory studies, 37 edible macrofungi taxa belonging to 2 division, 5 orders, 16 families and 23 genera were identified. Two of them belong to Ascomycota and 35 to Basidiomycota. *Russula* Pers., *Suillus* Gray, *Tricholoma* (Fr.) Staude, *Agaricus* L., *Coprinus* Pers., *Macrolepiota* Singer, *Pleurotus* (Fr.) P. Kumm., and *Lactarius* Pers. are found to be the most crowded genera to include edible species in the region. Nine species, *Amanita vaginata* (Bull.) Lam., *Pleurotus ostreatus* (Jacq.) P. Kumm.,

Coprinus comatus (O.F. Müll.) Pers., *Suillus collinitus* (Fr.) Kuntze, *Lactarius deliciosus* (L.) Gray, *Morchella deliciosa* Fr., *Pleurotus ostreatus* (Jacq.) P. Kumm., *Russula adusta* (Pers.) Fr.and *Russula delica* Fr., are collected and consumed by locals. Two of them *L. deliciosus* and *R. delica,* have local commercial value.

Keywords: Aluçdağı Nature Park, Çamlıdere, Edible mushrooms, Türkiye.

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РАЗНООБРАЗИЕ РАСТИТЕЛЬНЫХ СООБЩЕСТВ СЕВЕРО- ВОСТОЧНОГО ПРИКАСПИЯ

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Аннотация

В последние годы активно разрабатываются нефтяные месторождения на шельфе Каспийского моря. По запасам нефти и газа и их добыче Казахстан входит в число 15 ведущих стран мира и составляет 3% мировых запасов. Нефтяная зона Каспийского моря занимает 62% территории страны, здесь расположено 172 нефтяных месторождения, 90% запасов нефти добывается на пятнадцати крупных шахтах. Эти показатели положительно влияет на экономические развитие страны, но вместе с тем вызывают проблемы в сохранении биоразнообразия на региональных и местных уровнях. Отличительной чертой растительного покрова Прикаспия является его пространственная неоднородность, на которые влияют увлажнения, засоленность и механический состав грунта почвы, рельеф, а также климат. Например, в результате изменчивости климата в регионе почвенное покрытие различно так, как с увеличением засухи климата светлокаштановая почва, которое характерно пустынно-полупустынной степи переходит в серо-бурую пустынную почву. Как известно, растительные сообщества меняются в течение годичного и многолетнего циклов. Фенологические фазы включают сезонные развития высших растений, по мере прохождения которых происходят морфологические трансформации растений. Фенологические явления протекают под влиянием таких факторов, как биологические, экологические служат прекрасным показателем экоклиматических условий региона. Сезонный ритм развития растений определяется не только генетическими факторами,как и всякий наследственно закрепленный признак, но также находится в очень тесной зависимости от среды обитания, которые колеблются из года в год. Кроме климатических и эдафических условий обитания, он сопряжен с экологическими условиями в местах существование вида. Мониторинг биоразнообразия требует его измерения, а его можно измерить только тогда, когда качественные характеристики можно описать в количественных, сопоставимых количествах. Однако кажущаяся простота оценки разнообразия не позволяет довольствоваться качественными сравнениями: более разнообразные и менее разнообразные сообщества. Экология и математика разработали множество моделей и индексов для измерения разнообразия, которые требуют разных интерпретаций.

Ключевые слова: Прикаспий, растительный покров, сообщество, флора, площадка.

Abstract

In recent years, oil fields on the Caspian Sea shelf have been actively developed. In terms of oil and gas reserves and their production, Kazakhstan is among the 15 leading countries in the world and accounts for 3% of world reserves. The oil zone of the Caspian Sea occupies 62% of the country's territory, there are 172 oil fields, 90% of oil reserves are produced in fifteen large mines. These indicators have a positive impact on the economic development of the country, but at the same time they cause problems in the conservation of biodiversity at the regional and local levels.A distinctive feature of the vegetation cover of the Caspian region is its spatial heterogeneity, which is influenced by moisture, salinity and mechanical composition of the soil, topography, and climate. For example, as a result of climate variability in the region, the soil cover varies so that with increasing climate drought, light chestnut soil, which is characteristic of the desert-semi-desert steppe, turns into gray-brown desert soil. Plant communities are known to change during annual and multiannual cycles. Phenological phases include seasonal development of higher plants, during which morphological transformations of plants occur. Phenological phenomena occur under the influence of factors such as biological, environmental and serve as an excellent indicator of the ecoclimatic conditions of the region. The seasonal rhythm of plant development is determined not only by genetic factors, like any hereditary trait, but is also very closely dependent on the environment, which fluctuates from year to year. In addition to climatic and edaphic living conditions, it is associated with environmental conditions in the places where the species exists. Monitoring biodiversity requires its measurement, and it can only be measured when qualitative characteristics can be described in quantitative, comparable quantities. However, the apparent simplicity of assessing diversity does not allow us to be content with qualitative comparisons: more diverse and less diverse communities. Ecology and mathematics have developed many models and indices to measure diversity, which require different interpretations.

Keywords: Caspian region, vegetation cover, community, flora, site.

ÇEKİRDEK-KABUK YAPILI PARTİKÜLLERİN ANTİBAKTERİYEL ETKİLERİ
ANTIBACTERIAL EFFECTS of CORE-SHELL STRUCTURED PARTICLES

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Özet

Günümüzde nanopartikül ve nanokristal malzemelerin boyutlarının küçülmesi, benzersiz fiziksel ve kimyasal özelliklerin ortaya çıkmasına neden olmuştur. Bu nedenle çok bileşenli kompozit partiküller tek bileşenli olanlara göre daha yaygın kullanım potansiyeline sahiptir. Çekirdek ve kabuk yapıları, çeşitli kombinasyonlarda; çekirdeğin bir metal veya yarı metal ile kaplanması veya bezenmesi, çekirdeğin aynı veya farklı birkaç metal veya yarı metal ile bezenip kaplanması, metallerin bağlanması veya tuzlarla indirgenen atomlarla bezenmesi, kalsinasyonla içi boş yapıların oluşturulması gibi çeşitli yöntemlerle elde edilebilirler. Genellikle bu yapılar elde edilirken, pahalı bir çekirdek daha ekonomik bir malzeme olan bir kabukla kaplanır. Çevreyle dost olan antibakteriyel ve mikrobiyel etki gösteren bu partiküllerin; biyo ve kimyasal sensörler, çevre iyileştirme, yarı iletkenler ve tıp ta kullanılması daha yaygındır. Gümüş ve altın nanopartiküllerinin, özellikle antimikrobiyal etkileri nedeniyle dikkat çeken etkili bir kimyasal ajan olarak ön plana çıktığı belirtilmektedir. Mikropların büyümesini engelleyebilen veya öldürebilen özel yeteneklere sahiptirler ve bu nedenle antimikrobiyal uygulamalarda kullanılabilirler. Bu tür nanopartiküller; bakteriler, virüsler veya diğer mikroorganizmalarla etkili bir şekilde mücadele etmek için araştırma ve uygulama alanlarında ve yaygın olarak yaşam bilimlerinde incelenir. Bu çalışmada, Ag ve Au bezeli partiküllerle sentezlendirilenler karşılaştırılmıştır. Sentezlendirilen bu partiküllerin organik moleküller karşısındaki antibakteriyel özellikleri incelenmiştir. Bunun için genel olarak *Bacillus subtilis, Escherichia coli, Candida albicans, Staphylococcus aureus ve Pseudomonas aeruginosa* bakteri türleri kullanılmıştır. Ag bezeli partiküllerin, Au bezeli partiküllere göre daha fazla antibakteriyel etki gösterdiği literatürle uyumlu olarak doğrulanmıştır.

Anahtar Kelimeler: Nanopartikül, çekirdek-kabuk yapılar, Antibakteriyel etki, Ag, Au, *Bacillus subtilis*.

Abstract

In recent times, the reduction in the dimensions of nanoparticle and nanocrystal materials has led to the emergence of unique physical and chemical properties. Therefore, multicomponent composite particles exhibit a wider range of potential applications compared to their single-component counterparts. Core-shell structures can be obtained through various combinations, such as coating or doping the core with a metal or semimetal, adorning the core with the same or different metals or semimetals, bonding metals, or decorating with atoms reduced by salts through methods like calcination, allowing the creation of hollow structures. Generally, in the

synthesis of these structures, an expensive core is coated with a more economical material as a shell. These particles are environmentally friendly and have antibacterial and microbial effects; It is more common to use them in bio and chemical sensors, environmental remediation, semiconductors and medicine. It is noted that silver and gold nanoparticles have gained prominence as effective chemical agents, particularly due to their antimicrobial effects. They possess special capabilities to hinder or exterminate the growth of microbes, making them suitable for antimicrobial applications. Nanoparticles of this kind are extensively investigated in research and application fields, and widely studied in the life sciences, for effectively combating bacteria, viruses, or other microorganisms. In this study, those synthesized with Ag and Au decorated particles were compared. The antibacterial properties of these synthesized particles against organic molecules were examined. For this purpose, bacterial species Bacillus subtilis, Escherichia coli, Candida albicans, Staphylococcus aureus and Pseudomonas aeruginosa were generally used. Consistent with the literature, it has been confirmed that particles decorated with Ag exhibit a higher antibacterial effect compared to those decorated with Au.

Keywords: Nanoparticle, core-shell structures, Antibacterial effect, Ag, Au, *Bacillus subtilis*.

THE EFFECT of DIFFERENT PRESSURE APPLICATIONS ON THE EFFICIENCY of LEMON and ORANGE EXTRACTS OBTAINED by SUPERCRITICAL CO_2 EXTRACTION METHOD

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Abstract

Citrus production constitutes substantial amounts of waste and by-products containing valuable bioactive compounds like pectins, water-soluble and insoluble antioxidants, and essential oils. Although some of these by-products are currently utilized through different technologies, many are either discarded or used as animal feed. Implementing efficient, safe, and economically viable extraction methods could greatly enhance the utilization of these by-products, leading to increased profits and the extraction of high-quality bioactive compounds. *Citrus limon* and *Citrus sinensis* peels contain pectin, lignin, celluloses, and hemicellulose. Additionally, citrus peel extracts, particularly sweet orange peels, exhibit high contents of polyphenols and flavonoids with significant antioxidant and antimicrobial capacities. Recent studies have shown that sweet orange peel extracts contain more than 40 polyphenolic compounds and enhance the oxidative stability of vegetable oils and their antimicrobial activity against food-borne pathogens. These findings indicate the potential of citrus peels as natural antioxidants and antimicrobials for food preservation, emphasizing their high antioxidant and antimicrobial properties. In our study *Citrus limon* and *Citrus sinensis* fruits were purchased from local suppliers and peeled off. The peels were dried and extracted with supercritical CO2 extraction method which is novel, environmental friendly and toxic free method. Three different process conditions were applied to the samples and the yields were

determined and compared. The pressures were 300, 200, and 100 bar for the *Citrus limon* peels and the yields were found as 20.71-27.14-25.71% respectively. For the *Citrus sinensis* peel extractions, 500-400-200 bar was applied and the results were found to be 25.00-43.75-35.41% respectively. For the extraction process for Citrus limon peels 100 mL, and the orange peels 500 mL ethanol were used while the temperature (55°C) and time duration (150 min) were kept constant. The results showed that the highest productivity for lemon peels was 200 bar and for orange peels was 400 bar. Based on the results, more studies can be performed to be able to standardize the process conditions.

Keywords: Supercritical CO_2 extraction, *Citrus sinensis*, *Citrus limon*, yield

BİŞKEK'TEKİ İÇ MEKAN ÇİÇEK YETİŞTİRİCİLİĞİNDE STERNORRHYNCHA (HEMİPTERA) ALTTAKIMINA BAĞLI ZARARLILARIN ARAŞTIRILMASI

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Özet

Bişkek'teki İç Mekan Çiçek Yetiştiriciliğinde Sternorrhyncha (Hemiptera) Alttakımına Bağlı Zararlıların Araştırılması.

Süs bitkisi yetiştiriciliği, birçok yerde süs olarak kullanılmak üzere yetiştirilmekte olan bitkilerdir.

Çiçekler, bulunduğu ortama ayrı bir hava katarak daha güzel ve modern bir görünüme kavuşmasını sağlar. Ayrıca oda ortamında temiz hava olmasını sağlamasının yanı sıra, insanlarda stresi azaltır, yeşil renkleriyle göz yorgunluğunu azaltır ve odaklanmayı kolaylaştırır.

İç mekan süs bitkileri, dekorasyonun bir parçası olarak estetik bir görünüm sunar. Bitkiler, yaşam alanlarına doğal bir dokunuş katarak ferahlık ve canlılık hissi yaratır. Farklı şekil, büyüklük ve renklerdeki sün bitkileri, iç mekanları kişiselleştirebilir ve görsel olarak hoş bir ortam oluşturabilir.İç mekan sün bitkileri, sağlık, hava kalitesi, stres azaltma ve estetik gibi birçok farklı alanda önemli faydalar sağlar. Bu nedenle, yaşam alanlarımızda sün bitkilerine yer vermek, sağlıklı ve keyifli bir ortam yaratmamıza yardımcı olur.

Bu çalışmada, Bişkek şehrindeki iç mekan çiçek yetiştiriciliği alanlarında Sternorrhyncha (Hemiptera) alttakımına bağlı zararlıların incelenmesi amaçlanmıştır.

Çalışmalar, zararlı örnekleri Bişkek şehri ve çevresindeki ev, kafe, lokanta, ofis, KTMÜ kapalı alanları ve çiçek dükkanları gibi alanlarda yapılmıştır. Araştırma sonucunda süs bitkilerinde en yaygın görülen zararlılar olarak yaprak bitleri, beyazsinekler ve kabuklu bitler tespit edilmiştir.

BİYOLOJİK ÇEŞİTLİLİĞİN KORUNMASINDA ÖZEL KORUMA ALTINDAKİ DOĞAL ALANLARIN ROLÜ

THE ROLE OF SPECIALLY PROTECTED NATURAL AREAS IN PRESERVING BIODIVERSITY

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Özet

Doğa koruma, insan, hayvan ve bitkilerin yaşam esaslarının ve varlıklarının dengeli bir yapı içinde güvence altına alınması amacıyla doğal çevrenin ve öğelerinin geniş kapsamlı olarak korunmasıdır. Dünya nüfusunun hızlı artışı ve sanayi devrimi sonrasında artan çevre sorunları biyolojik çeşitlilik kaybını ve doğal alanlar ile doğal kaynaklar üzerinde tüketim baskısını artırmış, doğanın korunması öncelikli bir gereklilik olarak doğmuştur. Doğal sistemlerin ve içinde barındırdığı varlıklarının (flora ve faunanın) fiziksel sınırlarının belirgin olmamasından dolayı doğayı korumak için gerçekleştirilecek eylemlerde sınır ötesi bütüncül bir yaklaşımın benimsenmesi gerektiği ortaya çıkmıştır. Biyolojik çeşitliliğin korunması için Kırgızistan, 1992 yılında Brezilya'nın Rio de Janeiro'da kabul edilen Biyolojik Çeşitlilik Sözleşmesine katılan ülke olarak bir çok işler yapıyor. Kırgız Cumhuriyeti'nde 6 devlet doğa rezervi, 5 milli ve tabiat parkı ve 40'a yakın geçici koruma alanı düzenlenmiştir. Toplam alanı 5151km2'dir. Kırgızistan yüzölçümünün %2,6'sını kaplar. Kırgızistan'daki tabiat koruma alanlarının içinden Sarı-Çelek, Padış-Ata ve Beş -Aral UNESCO'nun tarihi miras listesine eklendi. Issık-Köl devlet rezervi. Bu rezerv Kırgız Cumhuriyeti'ndeki ilk organize koruma alanıdır. 1948 yılında sularda yaşayan kuşları ve kıyı kuşlarını ve onların yaşam alanlarını korumak amacıyla kurulmuştur. Rezerv 24 memeli türü, 232 kuş türü ve 300'den fazla bitki türü koruma altındadır. Sarı-Çelek devlet rezervi ana amaç, eşsiz ceviz ormanlarının doğal kompleksini korumaktır. Rezervde 32 memeli türü, 8 sürüngen türü, 4 balık türü ve 157 kuş türü koruma altındadır. Hayvanların yanı sıra 32 tür odunsu bitki, 80 tür çalı ve 86 tür otsu bitki yetişmekte ve tamamı koruma altına alınmaktadır. Narın rezervi. Burada 21 memeli türü, 100'e yakın kuş türü ve 500'e yakın bitki türü koruma altındadır .Karatal – Yapırık devlet koruma alanı. Tabiatı koruma alanının temel amacı dağ yamaçlarındaki eşsiz çam ormanını, yüksek kayalıklarda büyük memelileri ve dağ keçisi, leopar gibi büyük hayvanları korumaktır.

Anahtar Kelimeler: doğa, Kırgız Cumhuriyeti'nde koruma alanı, Issık-Köl rezervi, Sarı – Çelek rezervi, Narın rezervi.

Abstract

Nature conservation is the comprehensive protection of the natural environment and its elements to ensure the balanced existence of human, animal, and plant life. The rapid increase in global population and environmental issues following the industrial revolution has escalated biodiversity loss and the pressure on natural areas and resources, making the preservation of nature a paramount necessity. Due to the indistinct physical boundaries of

natural systems and their components (flora and fauna), a transboundary holistic approach is deemed necessary for effective conservation efforts. Kyrgyzstan, having joined the Convention on Biological Diversity adopted in Rio de Janeiro in 1992, actively engages in various initiatives for the preservation of biological diversity. The country has established six state nature reserves, five national and nature parks, and around 40 temporary protection areas, covering a total area of 5151 km², which constitutes 2.6% of Kyrgyzstan's territory. Several of Kyrgyzstan's nature conservation areas, including Sary-Chelek, Padysh-Ata, and Bes-Aral, have been added to UNESCO's World Heritage List. The Issyk-Kul State Reserve, the first organized conservation area in Kyrgyzstan, was established in 1948 to protect the aquatic and coastal habitats of birds. The reserve safeguards 24 mammal species, 232 bird species, and over 300 plant species. Sary-Chelek State Reserve primarily aims to preserve the natural complex of unique walnut forests, housing 32 mammal species, 8 reptile species, 4 fish species, and 157 bird species. Additionally, 32 species of woody plants, 80 species of shrubs, and 86 species of herbaceous plants thrive within the reserve, all under protection. The Naryn Reserve is home to 21 mammal species, nearly 100 bird species, and around 500 plant species, all under conservation efforts. Karatal – Yapyryk state protected area. The main purpose of the nature reserve is to protect the unique pine forest on the mountain slopes, large mammals on the high cliffs, and large animals such as mountain goats and leopards.

Keywords: nature, protected area in Kyrgyz Republic, Issyk-Kyl reserve Sary-Chelek reserve, reserv reserve.

PARAZİTLERDE EKSOZOM BAZLI ÇALIŞMALARA GENEL BAKIŞ

OVERVIEW OF EXOSOME-BASED STUDIES IN PARASITES

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Özet

Eksozomlar ilk olarak 1983 yılında retikülositlerde keşfedilmiş multiveziküler cisimlerin ekzositik füzyonu ile üretilen keseciklerdir. Karakteristik olarak çukur formda ve 30-100 nm çapa sahiptir. Son on yılda özellikle bağışıklık sistemi olmak üzere hücreler arası iletişimde yer almaları nedeniyle ilgi çekmektedir. Trombositler, mast hücreleri, nöronlar ve lenfositler gibi çeşitli hücreler tarafından salgılanmaktadır. Ayrıca birçok organizmanın süt, idrar, tükürük ve amniyotik sıvılarında da tespit edilmiştir. Eksozomların yapısında kolesterol, fosfolipitler ve bifosfatlar gibi lipitler tanımlanmıştır. Hsp70, tetraspanin, Hsp90, anneksin, enolaz, elongation faktör ve alix gibi proteinler açısından da zengindir ve bu proteinler eksozomların fonksiyonunda önemli rol oynamaktadır. Eksozomlarda lipit ve proteinlerin yanı sıra miRNA'ların varlığı bu veziküllerin genetik bilgi taşıyıcısı olabileceğini göstermektedir.

Parazitlerin genellikle, daha önce proteinler, lipitler, karbonhidratlar ve genomik içeriğe sahip olan boşaltım salgı ürünleri ürettikleri bilinmektedir. Bu salgı ürünlerinden eksozomların keşfi son birkaç yıldır ilgi odağı haline gelmiştir. Eksozomların *Fasciola hepatica, Echinostoma caproni, Heligmosomoides polygyrus, Dicrocoelium dendriticum, Schistosoma mansoni, Trypnosoma cruzi, Leishmania infantum* ve *Ixodes scapularis* gibi bir çok parazit tarafından salgılandığı yapılan çalışmalarla ortaya konmuştur.

Giderek artan sayıda çalışma, eksozomların konakçı hücrelere moleküller veya içerikler iletebileceğini ve bunların parazitler tarafından konağın bağışıklık tepkisini veya hayatta kalmaları için faydalı diğer faaliyetleri modüle etmek için kullanılabileceğini ortaya koymuştur. Ayrıca parazitik eksozomlarda belirli miRNA, lipitler ve protein türleri de tanımlanmıştır. Parazitler tarafından salgılanan miRNA'lar parazitlerin büyümesi, çoğalması ve doku gelişimi açısından önemlidir. Parazitik eksozomlarda bulunan miR-71 ve miR-277, konaktaki parazitin hayatta kalmasını ve metabolizmasını destekler. Parazitik eksozomlar içinde bu tür moleküllerin varlığı, eksozomların, konak hücre fonksiyonlarını düzenlemek için bu antijenleri aktarabileceğini düşündürmektedir. Bununla birlikte, parazitik eksozomlar içindeki proteinlerin ve miRNA'nın tanımlanması üzerine daha fazla çalışmaya ihtiyaç duyulmaktadır.

Anahtar Kelimeler: Eksozom, mikroRNA, Parazit, Salgı, Vezikül.

Abstract

Exosomes are vesicles first discovered in 1983 through the exocytosis of multivesicular bodies in reticulocytes. They are characterized by a cup-shaped form and have a diameter of 30-100 nm. In the last decade, they have attracted attention, especially for their involvement in intercellular communication, including the immune system. They are secreted by various cells such as platelets, mast cells, neurons, and lymphocytes. Moreover, they have been detected in the milk, urine, saliva, and amniotic fluids of many organisms. The structure of

exosomes includes lipids such as cholesterol, phospholipids, and bisphosphates. They are also rich in proteins like Hsp70, tetraspanin, Hsp90, annexin, enolase, elongation factor, and alix, playing significant roles in the function of exosomes. The presence of miRNAs in exosomes suggests that these vesicles may serve as carriers of genetic information.

It is known that parasites typically produce excretory-secretory products containing proteins, lipids, carbohydrates, and genomic content. The discovery of exosomes from these secretory products has become a focus of interest in the last few years. Studies have revealed that exosomes are secreted by various parasites, including *Fasciola hepatica*, *Echinostoma caproni*, *Heligmosomoides polygyrus*, *Dicrocoelium dendriticum*, *Schistosoma mansoni*, *Trypanosoma cruzi*, *Leishmania infantum*, and *Ixodes scapularis*.

An increasing number of studies have demonstrated that exosomes can transmit molecules or contents to host cells, and these can be utilized by parasites to modulate the host's immune response or other beneficial activities for their survival. Specific miRNAs, lipids, and protein types have also been identified in parasitic exosomes. The miRNAs secreted by parasites are crucial for the growth, reproduction, and tissue development of the parasites. miR-71 and miR-277 found in parasitic exosomes, for instance, support the survival and metabolism of the parasite in the host. The presence of such molecules in parasitic exosomes suggests that these exosomes may transfer these antigens to regulate host cell functions. However, further research is needed to identify the proteins and miRNAs within parasitic exosomes.

Keywords: Exosome, microRNA, Parasite, Secretion, Vesicle.

İKLİM DEĞİŞİKLİĞİNİN TOHUM TAŞINIM MEKANİZMALARI ÜZERİNDEKİ ETKİLERİ

EFFECTS OF CLIMATE CHANGE ON SEED DISPERSAL MECHANISMS

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Özet

İklim değişikliği, artan atmosferik CO_2 konsantrasyonları, ısınan iklim ve değişen yağış rejimlerinden dolayı canlıların değişen şartlara ayak uydurması gerekmektedir. Çok sayıda canlı türünün, tolere edebilecekleri sıcaklık ve yağış aralıklarının dışında olan bölgelerde yaşamsal faaliyetlerini sürdürebilmeleri, hayatta kalabilmeleri ve nesillerini devam ettirebilmeleri belli bir süre sonra imkânsız bir hal alabilir. Bu sebeple tüm canlılar yaşamlarının devamlılığı için yeni habitatlara hareket etmek zorundadır. Sesil canlılar olan bitkilerde, bulundukları bölgenin iklimsel ve temel gereksinimlerinin optimum yaşamsal koşulların altına düşmesi ya da elverişsiz hale gelmesiyle yeni bölgelere taşınma yeteneğine sahiptir. Bitkilerin yer değiştirerek soylarının devamlılığı için orijinlerinin dışındaki bölgelerde görülmesi "tohum dağılımı" adı verilen bir mekanizma ile gerçekleşir. Tohumların, ana bitkiden uzağa taşınması olarak tanımlanan bu mekanizma, ekoloji ve biyolojik çeşitliliğin korunmasındaki temel süreçlerden birisidir. Bitkiler için bu süreç çoğu zaman, ana bitkinin yakın çevresini terk eden tohumların daha uygun iklim şartlarına taşınması ya da yoğun rekabetten kaçınmalarını sağlamaktadır. Bitkilerin sahip olduğu bu dağılım mekanizmaları daima pasiftir, yani tohumlar nereye gidecekleri hakkında kontrole sahip değildir. Çok büyük çeşitlilik gösteren tohum dağılım mekanizmaları; hayvanlar aracılığıyla ya da çevresel etmenler aracılığıyla (su, rüzgâr vb.) olmak üzere iki grupta toplanabilir. Tüm bitki tohum taşınım mekanizmasında tohum yapısı büyük bir önem arz etmektedir. Son yıllarda tohum taşınım mekanizmalarında gözlemlenen azalma ve değişiklikler büyük bir tehlike arz etmektedir. Taşınım mekanizmaları ya hayvan davranışlarında gözlemlenen değişikliklerden ya da iklim şartlarındaki değişikliklerden kaynaklanmaktadır. Hayvanların avlanması, habitatlarının değişmesi ya da nesillerinin tükenmesi ya da iklim değişikliği ile değişen iklim koşulları bu mekanizmaların kaybolmasının ana nedenlerinden sayılmaktadır. Bu bildiri kapsamında tohum dağılım mekanizmaları açıklanarak ve iklim değişikliğinin bitki tohum taşınım mekanizmaları üzerindeki etkilerine değinilmiştir.

Anahtar Kelimeler: biyoçeşitlilik, iklim değişikliği, flora, tohum dağılımı, biyoçeşitliliğin korunması

Abstract

Due to climate change, increasing atmospheric CO_2 concentrations, warming climate and changes on precipitation regimes, all lives have to adapt to changing conditions. After a certain period of time, it might become nearly impossible for many living species to continue their vital activities, such as; surviving and keeping their generation going in specific regions which are outside of the temperature and rainfall ranges that they can tolerate. For these reasons, all living things have to move to new habitats for the continuity of their lives. Plants,

which are sessile creatures, have the ability to move to new regions when the climatic and basic requirements of their habitat go down below optimum vital conditions or become unfavourable for them. The displacement of plants and their appearance in different regions other than their origin, for the continuity of their lineage occurs through a mechanism called "seed dispersal". This mechanism, defined as the transportation of seeds away from the parent plant, is one of the basic processes in protecting ecology and biodiversity. For plants, this process often enables seeds that leave the habitat of the parent plant to move to more suitable climatic conditions or to avoid intense competition. These dispersal mechanisms are always passive, meaning the seeds have no control over the direction that they are moving to. Seed dispersal mechanisms vary greatly; they can be divided into two groups: through animals or through environmental factors (water, wind, etc.). Seed structure plays a great role in the seed dispersal mechanism. In the recent years, the decreases and changes which were observed in seed transport mechanisms pose a great danger. The decrease in dispersal mechanisms is due to either changes in animal behaviour or changes in climatic conditions. Hunting of animals, changing habitats, extinction, and climatic conditions due to climate change are among the main reasons for the loss of these dispersal mechanisms. Within the scope of this paper, seed dispersal mechanisms are explained and the effects of climate change on plant seed dispersal mechanisms are mentioned.

Keywords: Biodiversity, climate change, flora, seed dispersal, conservation of biodiversity

THE BIRDS OF JAGODINA REGION (SERBIA): STATUS AND CHECKLIST

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Abstract

The paper presents a survey of bird species recorded by the group of authors in the period from 1900-2020. The year has been divided into four phenological periods as follows: the spring migration, the breeding season, the autumn migration and the winter season. All species are determined faunistic status in the study area, as follows: breeder (resident or migrant), passage migrant, winter visitor and vagrant. Also are given information about abundance - occurring or breeding categories, as follows: very rare, rare, scarce, uncommon, fairly common, common and abundant. For most common species are given records with maximum abundance during migration and wintering. Then, records for rare species and vagrants. A total of 190 species of birds, from 47 familia and 16 orders, were registered in the Jagodina region (Central Serbia) from 1900 to 2020. The most represented orders in the total number of species are: Passeriformes 91 species (47,9 %), Charadriiformes 24 (12,6 %), Falconiformes 13 (6,8 %), Ciconiiformes 12 (6,3 %) and Anseriformes 11 (5,8 %). From the total number of species, about 103 (54,2 %) are considered to breed. Of the breeding birds, 60 (58,2 %) species are Passeriformes and 43 (41,8 %) non-Passeriformes.

Keywords: Jagodina, bird survey, faunistic status, abundance, Passeriformes.

FTIR SPEKTROSKOPİ TEKNİĞİ KULLANILARAK *Laccophilus* (Coleoptera, Dytiscidae) CİNSİNE AİT TÜRLERİN ERKEK BİREYLERİNİN SINIFLANDIRILMASI

CLASSIFICATION OF MALE INDIVIDUALS OF SPECIES BELONGING TO THE GENUS *Laccophilus* (Coleoptera, Dytiscidae) USING FTIR SPECTROSCOPY TECHNIQUE

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Özet

Arthropoda filumunun önde gelen bir sınıfı olan böcekler, çeşitli habitatları işgal ederek her yerde küresel bir dağılım sergiler. Önemli bir çeşitlilikle karakterize edilen bu sınıftaki bireylerin taksonomik olarak tanımlanması ve kategorize edilmesi, geleneksel olarak morfolojik parametrelere dayanır ve bu süreç, doğası gereği zaman alıcı olmasıyla bilinir. Ayrıca, morfolojik sınıflandırmaların yorumlanması alan içinde uzmanlık gerektirmektedir. Morfoloji temelli sınıflandırmadaki dezavantajleri elimine etmek için, gaz ve sıvı kromatografi-kütle spektrometrisi ve DNA tabanlı barkodlama gibi çeşitli metodolojiler geliştirilmiştir. Bu yaklaşımlar maliyeti yüksek ve fazla miktarda taze örnek gerektiren yöntemlerdir. Bu nedenle, örnek hazırlama gereksinimi olmayan ve verimli hızlı, düşük maliyetli alternatif metotlara ihtiyaç duyulmaktadır.. Fourier transform infrared (FTIR) spektroskopisi bu kriterleri karşılayan umut verici bir çözüm olarak ortaya çıkmaktadır. Özellikle, FTIR spektroskopi- zayıflatılmış toplam yansıma (ATR) modülüile örneklerden doğrudan spektrum almak mümkündür. Bu nedenle biyolojik spektroskopi araştırmalarında bu yöntem yaygın olarak kullanılmaktadır. Son yıllarda yapılan araştırmalar, FTIR spektroskopisinin hem bitkilerin hem de böceklerin biyokimyasal bileşenlerini (ör. lipidler, proteinler, hücresel süreçler) ayırt etmedeki etkinliğini kanıtlamaktadır. FTIR spektrumları aracılığıyla ayırt edilen biyokimyasal bileşenlerdeki varyasyonlara ilişkin bilgiler, türlerin spektral özelliklerine göre ayırt edilmesini kolaylaştırır. Her türün kütikulasının kendine özgü bir biyokimyasal bileşime sahip olduğu göz önüne alındığında, FTIR spektrumları bu bileşimin etkili bir şekilde parmak izini almak için bir araç görevi görür. Bu çalışmada, *Laccophilus* cinsi içindeki üç farklı türe ait erkek bireylerin tanımlanması için FTIR spektrumlarına dayanan ve çok değişkenli analiz tekniklerini kullanan bir metodoloji geliştirilmiştir. Spektral verilerden elde edilen kemometrik bulgular, her üç türün de %100 duyarlılık ve özgüllükle ayırt edilebileceğini göstermektedir.

Anahtar Kelimeler: Böcekler, Dytiscidae, *Laccophilus*, Classification, FTIR.

Abstract

Insects, a leading class of the phylum Arthropoda, exhibit a ubiquitous global distribution, occupying a variety of habitats. Characterized by considerable diversity, taxonomic identification and categorization of individuals in this class has traditionally relied on morphological parameters, a process known to be time-consuming in nature. Furthermore, the interpretation of morphological classifications requires expertise within the field. To overcome the drawbacks of morphology-based classification, various methodologies have been developed, such as gas and liquid chromatography-mass spectrometry and DNA-based barcoding. These approaches are costly and require large amounts of fresh samples. Therefore, there is a need for fast, efficient, low-cost alternative methods that do not require sample preparation. Fourier transform infrared (FTIR) spectroscopy is emerging as a promising solution that meets these criteria. In particular, the attenuated total reflectance (ATR) module of FTIR spectroscopy makes it possible to obtain spectra directly from samples. Therefore, this method is widely used in biological spectroscopy research. Recent studies prove the effectiveness of FTIR spectroscopy in distinguishing biochemical components (e.g. lipids, proteins, cellular processes) of both plants and insects. Information on variations in biochemical components distinguished through FTIR spectra facilitates the discrimination of species based on their spectral characteristics. Given that the cuticle of each species has a unique biochemical composition, FTIR spectra serve as a tool to effectively fingerprint this composition. In this study, a methodology based on FTIR spectra and using multivariate analysis techniques was developed for the identification of male individuals belonging to three different species within the genus *Laccophilus*. Chemometric findings from spectral data show that all three species can be distinguished with 100% sensitivity and specificity.

Keywords: Insect, Dytiscidae, *Laccophilus*, Classification, FTIR.

MALUS SIEVERSII VE *MALUS NIEDZWETZKYANA*'NIN BESINSEL ÖZELLIKLERI, KIMYASAL BILEŞIMI, GELENEKSEL VE TIBBI DEĞERI ÜZERINE BIR INCELEME

MALUS SIEVERSII and *MALUS NIEDZWETZKYANA* A REVIEW ON NUTRITIONAL FEATURES, CHEMICAL COMPOSITION, TRADITIONAL and MEDICINAL VALUE

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Özet

Elma, dünyanın birçok bölgesinde büyük beğeni toplayan elma ağacının meyvesidir. Elma ağacı olan *Malus* günümüzde dünya çapında en yaygın olarak yetiştirilen ve meyvesi tüketilen türdür. Elmanın menşe merkezleri olarak Doğu Asya, Orta Asya, Batı Asya, Avrupa ve Kuzey Amerika bildirilmektedir. Kazakistan, Kırgızistan, Özbekistan, Türkmenistan ve Tacikistan ülkelerini kapsayan Türkistan, Orta Asya coğrafyası elmanın yaşamsal bir gen merkezi ve dağıtım alanıdır. Elma ağacının ata türleri olan *Malus sieversii* ve *Malus niedzwetzkyana* günümüzde de bu ülkelerin doğal ormanlarında yetişmektedir. *Malus niedzwekyana*, Kazakistan Kırmızı Kitabı, Kırgızistan Kırmızı Kitabı ve Uluslararası Nesli Tehlike Altındaki Türler Kırmızı Listesi'nde yer alan yabani bir elma türüdür. Kazakistan'da (Karatau ve Zailijskei Alatau), Kırgızistan'da (Celal-Abad bölgesi) ve Batı Çin'de (Sincan bölgesi) doğal olarak yetişmektedir. Kırmızı etli elma *Malus Niedzwetzkyana*, olağanüstü antosiyanin içeriği nedeniyle giderek daha fazla ilgi çekmektedir. Günümüzde bu tür elma ağacının birçok çeşidi farklı iklim koşullarında yetişmektedir. Elma besin değeri yüksek meyveler arasından yer alır. Bununla birlikte fitokimyasal olarak elmaların triterpenoidler, flavonoidler, organik asitler ve steroller içerdiği bildirilmektedir. Farmakolojik olarak bu meyve antioksidanlar, antiobezite, antikolesterol, antikanser, enzim inhibitörleri ve antimikrobiyal bileşenler içerir. Mevcut derleme, doğal elma türleri olan *Malus sieversii* ve *Malus Niedzwetzkyana*'nın kimyasal bileşenlerini, besinsel, farmakolojik ve tedavi edici özelliklerini vurgulamaktadır.

Anahtar Kelimeler: Elma ağacı**,** *Malus sieversii, Malus Niedzwetzkyana, genel özellikler*

Abstract

Apple is the apple tree's fruit, which is highly appreciated in many parts of the world. The apple tree is cultivated worldwide; today, *Malus* is the most common species grown and consumed. East Asia, Central Asia, West Asia, Europe, and North America are reported as the centers of origin of apples. Turkestan geography, Central Asia, which includes the countries of Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, and Tajikistan, is a vital gene center and distribution area of apple. In these countries, the wild ancestor of the domestic apple tree, Malus sieversii and Malus niedzwetzkyana, is still growing. Malus niedzwekyana is a wild apple species listed in the Red Book of Kazakhstan, the Red Book of Kyrgyzstan, and the International Red List of Endangered Species. It grows naturally in Kazakhstan (Karatau and Zailijskei Alatau), Kyrgyzstan (Jalal-Abad region), and Western China (Xinjiang region). Malus Niedzwetzkyana, the red-fleshed apple, is attracting increasing attention due to its remarkable anthocyanin content. Today, many varieties of this type of apple tree grow in different climatic conditions. Apple is among the fruits with high nutritional value. However, phytochemically, apples are reported to contain triterpenoids, flavonoids, organic acids, and sterols. Pharmacologically, this fruit contains antioxidants, antiobesity, anticholesterol, anticancer, enzyme inhibitors, and antimicrobial ingredients. This review emphasizes the chemical components, nutritional, pharmacological, and therapeutic properties of the natural apple species *Malus sieversii* and *Malus Niedzwetzkyana*.

Keywords: Apple-tree**,** *Malus sieversii, Malus Niedzwetzkyana,* general features

PIRINÇ KABUĞUNUN EMICI ÖZELLIKLERININ INCELENMESI VE PORTATIF SU ARITMA CIHAZI TASARIMI

INVESTIGATION OF ABSORBENT PROPERTIES OF RICE HUSK AND DESIGN OF A PORTABLE WATER PURIFIER

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Özet

Ağır metaller canlı organizmaların sağlığı için oldukça zararlıdır ve insanlar için büyük bir tehdit oluşturmaktadır. Bu nedenle ağır metallerin sudan uzaklaştırılması, ekosistemi ve insan sağlığını korumak için önemlidir. Su kirliliği kontrolü için mevcut çeşitli teknolojiler arasında adsorpsiyon işlemi, tasarımının kolaylığı ve basitliği nedeniyle diğer işlemlerden üstün kabul edilmektedir.

Bitkiler çeşitli kimyasalların kaynağıdır. Ancak bitki bileşenlerinin kimyasal bileşimi ile ilgili bilgi bolluğuna rağmen tarımsal atıkların büyük bir kısmı tarlada yakılmaktadır. Bu nedenle son yıllarda mısır artıkları, narenciye kabukları, buğday kepeği, kayısı, ceviz, badem ve pirinç kabukları kirleticilerin arıtımında doğal bir sorbent olarak kullanılmıştır. Doğal sorbentlerin avantajı bolluk, mevcudiyet, ucuzluk ve yüksek sorpsiyon kapasiteleridir.

Bu çalışmada, pirinç kabuğunun sorpsiyon özellikleri üzerine bir araştırma yapılmış ve portatif su arıtma cihazı tasarlanmıştır. Su ve alkali ile modifiye edilmiş pirinç kabuğunun emici özellikleri incelenmiş, pirinç kabuğunun ağır metalleri metilen mavisi, nikel (Ni), krom (Cr) ve bakır (Cu) adsorpsiyonu ve maksimum adsorpsiyon kapasitesi belirlenmiştir.Pirinç kabuğunun sudaki ağır metalleri adsorplama kapasitesini belirlemek için Langmuir ve Freundlich adsorpsiyon izotermi ve adsorpsiyon kinetiği yöntemleri kullanılmıştır. Adsorbent ile adsorbat arasında oluşan güçlü bağ, yani kimyasal adsorpsiyon Langmuir izotermi ile, basit fiziksel adsorpsiyon ise Freundlich izotermi ile tanımlanır. Adsorban yüzeyinin heterojenliği Freundlich izotermine göre ifade edilir. Adsorpsiyon kinetiğini incelemek için entegre hız kanunu yöntemi kullanılmıştır ve reaksiyon derecesi ve reaksiyon hız sabiti bulunmuştur.Pirinç kabuğunun emici özellikleri incelendikten sonra, portatif su arıtma cihazının tasarımında kullanılmıştır.Bu cihazın temel amacı, su arıtma için kullanımı kolay portatif bir kamp filtresi oluşturmak ve yüksek düzeyde kirliliğe sahip suyların güvenilir bir şekilde arıtılmasını sağlamaktır.

Abstract

Heavy metals are very harmful to the health of living organisms and pose a great threat to humans. Therefore, removal of heavy metals from water is important to protect the ecosystem and human health. Among the various technologies available for water pollution control, the adsorption process is considered superior to other processes due to the ease and simplicity of its design.

Plants are a source of various chemicals. However, despite the abundance of information on the chemical composition of plant components, most of the agricultural waste is burned in the field. Therefore, in recent years, corn residues, citrus peels, wheat bran, apricots, walnuts, almonds and rice husks have been used as a natural sorbent in the treatment of pollutants. The advantage of natural sorbents is their abundance, availability, cheapness and high sorption capacity.

In this study, a research was conducted on the sorption properties of rice husk and a portable water purification device was designed. The absorbent properties of rice husk modified with water and alkali were examined, and the adsorption and maximum adsorption capacity of heavy metals methylene blue, nickel (Ni), chromium (Cr) and copper (Cu) of rice husk were determined. To determine the capacity of rice husk to adsorb heavy metals in water, Langmuir and Freundlich adsorption isotherm and adsorption kinetics methods were used. The strong bond formed between the adsorbent and the adsorbate, that is, chemical adsorption, is defined by the Langmuir isotherm, and simple physical adsorption is defined by the Freundlich isotherm. The heterogeneity of the adsorbent surface is expressed according to the Freundlich isotherm. The integrated rate law method was used to study the adsorption kinetics, and the degree of reaction and reaction rate constant were found. After examining the absorbent properties of rice husk, it was used in the design of a portable water purification device. The main purpose of this device is to create an easy-to-use portable camping filter for water purification and to provide high To ensure reliable purification of polluted water.

THIOL HOMEOSTASIS IN THE CRYSTALLINE EYE AND INFLUENCE ON IT IRRADIATION BY DECIMETER ELECTROMAGNETIC RADIATION (EXPERIMENTS ON RATS)

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Abstract

This work is devoted to the study of the mechanism of realization of the EMR effect in the eye lens at the level of redox state elements, based on the fact that this organ is the most suitable model: it functions semiautonomously and has a well-organized system of antioxidant protectionOur experiments were performed on rats using 460 MHz EMR for exposure at non-thermal intensities (power flux density between 10 and 30 μW/cm2). It has been shown that chronic exposure to EMR for up to two weeks caused changes in the redox state of the lens, which manifested in changes in the level of lipid peroxidation processes and the content of thiols of various natures. The substructures of the lens (cortical and nuclear regions) reacted to EMR exposure in different ways. Depending on the EMR intensity, pro- and antioxidant characters were revealed in their reactions. The dynamics of the oxidative reaction of lens substructures were also different under high- and low-intensity exposure. The character of the kinetics of changes in the products of oxidative reactions (malondialdehyde and lipid hydroperoxides) and reducing agents (non-protein and protein SH groups) in the lens of the irradiated organism suggested the role of the enzymatic thiolation-dethiolation system to preserve the redox balance in the substructures of the lens. In addition, the results on changes (kinetics) in the content of various protein SH-groups, i.e., hidden inside the protein molecule and exposed on its surface, during EMR exposure, as well as the data available in the literature, allow us to put forward suggestions about the supramolecular mechanism of homeostasis regulation, in particular, thiol homeostasis regulation in such high-protein structures as the lens, which can be realized by aggregation-disaggregation of protein molecules (crystallins in the case of the lens

Keywords: electromagnetic radiation, eye lens, thiols, cataract.

ТҮРКІСТАН ОБЛЫСЫНДА ТҰРАТЫН МЕКТЕП ОҚУШЫЛАРЫНЫҢ ФИЗИКАЛЫҚ ДАМУЫНЫҢ АНТРОПОМЕТРИЯЛЫҚ ЕРЕКШЕЛІКТЕРІ

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Аңдатпа

Өсіп келе жатқан ағзаның айрықша ерекшелігі - морфофункционалды көрсеткіштердің жасына байланысты өзгергіштігі. Бұл, ең алдымен, дамудың жүйелік процесінің көрінісі болып табылатын дене ұзындығына және ағзадағы зат алмасу мен энергетикалық үдерістердің бағасын білдіретін дене салмағына қатысты. Бала мен жасөспірімнің болашақтағы денсаулығы оның қалай өсіп, дамитынына байланысты. Баланың ағзасы, ересек адамнан айырмашылығы, сыртқы ортаның (биологиялық, әлеуметтік) әсеріне ерекше әсер етеді. Көбінесе физикалық дамудың нормасынан ауытқу функционалдық жағдайдың да, ағзадағы бар аурудың да алғашқы маңызды көрінісі болып табылады. Физикалық даму туу, аурушаңдық және өлім-жітіммен қатар халықтың денсаулығының деңгейінің көрсеткіштерінің бірі болып табылады. Баланың физикалық дамуындағы бұзылулар неғұрлым көп болса, оның әртүрлі ауруларға шалдығу ықтималдығы соғұрлым жоғары болады. Осыған байланысты, осы жастағы ағзаның физикалық дамуы денсаулықтың жетекші белгілерінің бірі болып табылады.

Зерттеу жұмысының мақсаты – Түркістан облысындағы 12-14 жастағы жасөспірім мектеп оқушыларының антропометриялық көрсеткіштерін зерттеу және салыстырмалы бағалау.

Түркістан облысында тұратын жасөспірім мектеп оқушыларының антропометриялық көрсеткіштері (бой және салмақ) зерттелді. Зерттеу жүргізу үшін 6,7,8 сыныпта оқитын 12-14 жас аралығындағы 476 мектеп оқушыларының антропометриялық көрсеткіштері алынды. Бойды өлшеу өлшегіш құралмен, дене салмағын электронды еден таразыларымен өлшеу жүргізілді. Жүргізілген өлшеулер негізінде статистикалық есептеулер және Кетле индексі (дене салмағының индексі) есептелді. Зерттеу нәтижелері бойынша 6 сынып ұлдарының бой ұзындығының көрсеткіштері қыздардың бой ұзындығының көрсеткіштерінен жоғары болды, ал дене салмағы бойынша екі топтың көрсеткіштері сәйкес келді. 7 сынып және 8 сынып ұлдарының бой ұзындығының, дене салмағының көрсеткіштері қыздардың бой ұзындығының, дене

салмағының көрсеткіштерінен жоғары болды. Алынған негізгі соматометриялық көрсеткіштердің орта мәндері біздің елдің балаларының мәліметтер базасын толтырады және оқушыларды диспансерлеу жүргізу кезінде бағдар ретінде пайдалануға болады.

Кілт сөздер: антропометрия, жасөспірімдер, бой, салмақ, физикалық даму**.**

GREEN SYNTHESIS OF SILVER NANOPARTICLES USING MEDICINAL PLANTS

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Abstract

This study highlights the global demand for novel, biocompatible, and eco-friendly resources to fight various diseases through the use of medicinal plants in nanotechnology applications, especially in biomedical applications. This work aims in this context to explain the synthesis of silver nanoparticles (AgNPs) based on a simple and non-toxic method applying the green synthesis technique, using extremophile plant extract.

The biosynthesis of AgNPs was immediately confirmed by a color change from yellow to brown and by a surface plasmon resonance peak using UV-Vis spectroscopy at 420 nm. The presence of functional groups of phyto-constituents (polyphenols, flavonoids, phenolic acids...) may have acted as the reducing and capping agents in the synthesis process.

To further characterize the biosynthesized AgNPs (size, shape, etc), techniques such as UV-visible spectroscopy, front-face fluorescence spectroscopy, FTIR, and XRD analyses can be employed. Additionally, the biological potential of these AgNPs can be evaluated through tests for antioxidant activity, antidiabetic capacities, and antimicrobial and anticancer activities.

Such a study can encourage the use of these novel silver nanoparticles in the development of natural antimicrobial and antidiabetic agents.

Keywords: biosynthesis silver nanoparticles; medicinal plants; characterization; theurapeutic applications

IN VITRO REGENERATION OF *ACACIA HOLOSERICEA* A. CUNN EX G. DON THROUGH COTYLEDONARY NODES

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Abstract

Cotyledonary node explants were excised from 15-day-old seedlings of *Acacia holosericea* A. Cunn ex G. Don and cultured *in vitro* on B_5 medium supplemented with different growth regulators. Caulogenesis was observed both directly and indirectly via callus in different cytokinin adjuvanted media. Of all the cytokinins tested, zeatin supported maximum multiple shoot differentiation. Friable to compact nodular green calluses developed at cut ends of explants and on their surface within 15-20 days of inoculation. Caulogenesis was observed after 10-15 days of initial culture, and an average of 3.0±1.0 shoots per explant were formed on 2.5 mg/l zeatin containing B_5 medium in only 16% of explants. As observed earlier in the cotuledons, leaflets and leaf rachis earlier, medium adjuvanted with Ad.S. showed a good response. The addition of 50 mg/l Ad.S enhanced the percentage of explants forming shoot buds to 50 and raised the number of shoot buds per explant to 7.0±3.8. Cent percent of the *in vitro* raised shoots when excised and subcultured on B_5 basal medium, developed roots directly at their base.

Keywords: Ad.S.-Adenine sulfate, B_5 basal medium- Gamborg's basal medium

POLİFENOL OKSİDAZ ENZİMİNİN BİYOTEKNOLOJİDE KULLANIMI

APPLICATION OF POLYPHENOL OXIDASE ENZYME IN BIOTECHNOLOGY

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Özet

Polifenol oksidazlar (PPO) olarak bilinen bir bakır protein sınıfı neredeyse tüm prokaryotik ve ökaryotik hücrelerde bulunur. PPO'lar ilaç, kimya ve tıp endüstrilerinin yanı sıra analitik cihazlarda (biyosensör üretimi) ve gıda endüstrisinde çok çeşitli biyoteknolojik uygulamalara sahiptir. PPO'lar ilaç endüstrisinde lösemi, fenilketonüri, Parkinson hastalığını tedavi etmek ve melanin üretimini düzenlemek için yaygın olarak kullanılmaktadır. Gıda sektöründe, genellikle çay, kakao ve kahve üretiminde gıda kalitesi değerlendirmesi, renk geliştirme ve lezzet artırma için kullanılırlar. PPO'lar ayrıca meyve suyu işleme, bira ve şarap stabilitesi, şeker pancarı pektin jel dönüşümü (jelleşme) ve buğday ürünü (hamur) geliştirilmesinde de kullanılır. Çevre teknolojisinde, kömür geri dönüşümü, petrol arıtma, ahşap koruma, tekstil, kağıt, gıda ve kimya endüstrilerinde endüstriyel atık suları toksik fenolik bileşiklerin ve türevlerinin varlığından arındırmak için kullanılır.

Anahtar Kelimeler: Enzim, polifenol oksidaz, biyoteknolojik uygulama, fenolik bileşik.

Abstract

A class of copper proteins known as polyphenol oxidases (PPOs) is present in almost all prokaryotic and eukaryotic cells. PPOs have a wide range of biotechnological applications in the pharmaceutical, chemical, and medical industries, as well as in analytical instruments (biosensor production) and in the food industry. PPOs are widely utilized in the pharmaceutical industry to treat leukemia, phenylketonuria, Parkinson's disease, and to regulate the manufacture of melanin. In the food enterprise, they are typically utilized for food quality assessment, color development, and flavor enhancement in the manufacturing of tea, cocoa, and coffee. PPOs are also used in fruit juice processing, beer and wine stability, sugar beet pectin gel transition (gelation), and wheat product (paste) enhancement. In environmental technology, it is used in coal recycling, oil refining, wood preservation, textile, paper, food

and chemical industries to purify industrial wastewater from the presence of toxic phenolic compounds and their derivatives.

Keywords: Enzyme, polyphenol oxidase, biotechnological application, phenolic compound.

UDC 372.857

EXTRACURRICULAR WORK IN BIOLOGY AND ITS IMPORTANCE

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Abstract

The article is devoted to the problems of biological education in extracurricular work and its importance in the formation of research skills of students. The purpose of this study was to investigate the methodology of research skills in extracurricular activities in school biology. In order to achieve the set goals, tasks such as studying the general description of extracurricular work in school biology, considering the forms and types of extracurricular work such as individual, episodic group lessons, circle clubs, etc. Depending on the specific tasks, the following methods of theoretical research were used: analysis and synthesis of psychological, pedagogical, methodological literature, educational program and methodological documents, textbooks, generalization of the best practices of teachers.An important task of the school is to form in students a conscious attitude to work, to form the necessary practical skills, to strive to acquire knowledge on their own, to be interested in scientific research, etc. School biological disciplines are of great importance in the formation of a comprehensively developed personality.. Biology classes, laboratory classes, and practical work allow students to be armed with a deep and permanent knowledge of living nature, as well as to form their scientific and materialistic views of nature. In the course of teaching the subject of biology, patriotic feelings and aesthetic tastes are formed in schoolchildren, love for nature and the desire to protect it develop. The article reveals the relevance, main concepts and features of each form of extracurricular activities. The advantages of forming research activities in extracurricular work have been proven. The results of the methods of conducting various extracurricular activities using innovative technologies are presented. It also shows the effectiveness of using innovative technologies to develop research and cognitive abilities of students. In the conclusion, the methods and forms of extracurricular activities in the subject of biology and the educational value of extracurricular activities in biological education were analyzed, and the features of using innovative technologies in this teaching methodology were determined.

Keywords: extracurricular work, research skills, clubs, individual lessons, episodic lessons, innovative technologies.

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«СЫРДАРИЯ - ТҮРКІСТАН » ӨҢІРЛІК ТАБИҒИ САЯБАҒЫНДА БҰҚАР БҰҒЫНЫҢ (CERVUS ELAPHUS BACTRIANUS) ПОПУЛЯЦИЯСЫН ЖАҢҒЫРТУДЫҢ КЕЙБІР МӘСЕЛЕЛЕРІ

SOME ISSUES OF POPULATION RENEWAL OF BUKHARA DEER (CERVUS ELAPHUS BACTRIANUS) IN THE REGIONAL NATURE PARK «SYRDARYA – TURKESTAN»

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Түйіндеме

Бұл мақалада Сырдария - Түркістан өңірінің биоалуантүрлілігін арттыру мақсатында экологиялық тор концепциясының негізі ережелері қарастырылған. Биосфераның тұрақты даму проблеманың алдында тұрған басты міндеттердің бірі- әр аймақтың табиғи- климаттық , экологиялық ерекшеліктерін еске ала отырған жөн. Флора мен фаунаның ,сапасын жақсарту, және сан динамикасын арттыру мақсатында, ерекше қорғалатын территорияларға құрылымдық өзгерістерді енгізу қажет. Табиғаттың эталондық бөліктерінің барлық жүйелері, қаншалықты құндыллыққа ие болуына қарамай, флора мен фаунаның әртүрліліктің ұзақ мерзімде сақталуының кепілі бола алмайды және оптималды жағдайларын қамтамасыз етпейді. Биологиялық тепетеңдікті орнату барысында, «Сырдария - Түркістан » мемлекеттік өңірлік табиғи саябағында келешекке бағытталған «экологиялық тор » бағдарламасы ұсынылуы қажет.

Түйін сөздер: Биоалуантүрлік, ұлттық саябақ, экологиялық тор, гельминттер, тоғышарлар,рекреация, патология, инвазия

Abstract

This article discusses the problems of improving biodiversity in the state regional park "Syrdaria-Turkistan". Despite the existing advantages, the existing systems of specially protected areas do not guarantee long-term preservation of the natural balance. Sustainable development of ecosystems, biodiversity of flora and fauna, should be accompanied not only by the organization of specially protected areas, but it is also necessary to take into account the specifics of the natural and climatic conditions of a particular region, by introducing some elements of the concept of an "ecological network", including the creation of an ecological framework of regions as a whole natural and anthropogenic objects that ensure the stability of the environment.

Keywords: Biodiversity, national park, ecological network, helminths, larvae, recreation, pathology, invasion

БИОЛОГИЯ САБАҒЫНДА ЗЕРТХАНАЛЫҚ ЖҰМЫСТАРДЫ ҰЙЫМДАСТЫРУ

ORGANIZING LABORATORY WORKS IN BIOLOGY LESSONS

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Аңдатпа

Бұл мақалада биология сабағын зерделеу кезінде жалпы білім беретін мекеменің 7-сынып оқушыларының оқу-зерттеу қызметін жүзеге асыру үшін педагогикалық жағдайлар кешені (ұйымдастырушылық, белгіленген-нысаналы, логикалық - құрылымдық, дидактикалық, диагностикалық-нәтижелі) әзірлеу. Биология сабақтарын зерделеу кезінде 7-сынып оқушыларының оқу-зерттеу қызметіне дайындығының құрылымдық компоненттерін әзірлеу, эмоционалды-ерікті, интеллектуалды-танымдық, практикалық және олардың құзыреттіліктерімен көрсетілген көрсеткіштерін айқындау.

Кілт сөздер: зерттеу, құзыреттілік, сынып, оқу, педагогика, инновация, сабақ, экология, қоршаған орта, биология, технология, бақылау, сипаттау, өлшеу, эксперимент.

Abstract

This article describes the development of a set of pedagogical conditions (organizational, established - target, logical-structural, didactic, diagnostic-productive) for the implementation of educational and research activities of students of the 7th grade of a general education institution when studying a biology lesson. Development of structural components of the readiness of 7th grade students for educational and research activities in the study of biology lessons, identification of emotional - volitional, intellectual-cognitive, practical and indicators expressed by their competencies.

Keywords: research, competencies, classroom, teaching, pedagogy, innovation, lessons, ecology, environment, biology, technology, observation, description, measurement, experiment.

BIOLOGICAL PROPERTIES OF RUTHENIUM COMPLEXES

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Abstract

The thiosemicarbazone based Schiff base compounds are having variable coordination number along with structural flexibility. In addition, the metal complexes of thiosemicarbazones have shown broad range of biological activities. In this fore front investigation, We prepared the Salal based thiosemicarbazone compounds having ONS coordination sites and carried out ligand substitution reaction with the ruthenium metal precursors. Structural characterizations of the complexes were studied using various physico-chemical techniques. The Schiff bases act as bidentate ligands. In order to analyse the biological properties, the complexes were subjected to binding affinity with DNA. Further, the cytotoxic properties of the complexes were evaluated against a panel of bacteria and cancer cells under in vitro conditions. In addition, the antioxidative properties were also examined against DPPH and OH radicals. The results of the biological studies showed a dose dependent cytotoxic effect which indicates the pharmacological significance of ruthenium complexes.

Keywords: Ruthenium, Salal derivatives, Biological properties.

BİBERİYE BİTKİSİNİN (ROSMARINUS OFFICINALIS) ANTİOKSİDAN ETKİNLİĞİNİN GÖZDEN GEÇİRİLMESİ

REVIEW OF ANTIOXIDANT EFFECTIVENESS OF ROSEMARY (ROSMARINUS OFFICINALIS)

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Özet

İnsan vücuduna giren toksik maddeler ve iyileşmek için alınan yararlı ilaçlar da dahil olmak üzere birçok kimyasal, reaktif ürün artışını tetikleyerek çeşitli organlarda ciddi hücresel hasara sebep olabilmektedir. Son yıllarda oksidatif strese bağlı oluşan patolojik süreçler antioksidanlara olan ilgiyi arttırmıştır. Özellikle ilaç yerine doğal ürünler aracılığı ile antioksidan desteği talebi artmaktadır. Bu sebeple birçok bitki ve bileşen araştırmaların ilgi odağı haline gelmiştir. Yüksek antioksidan özelliği nedeniyle biberiye bitkisiyle yapılan çalışmalar oldukça popüler hale gelmiştir. Araştırmamızda biberiye bitkisinin antioksidan etkisi hakkında yapılan çalışmaları incelemeyi amaçladık. Araştırmada 'Pubmed' veri tabanına "rosmarinus officinalis antioxidant' yazarak 2019-2023 yılları arasında yayınlanan 267 makaleler incelendiğinde makalelerin %10 derleme ve %90 araştırma makalesiydi ve %30 deneysel çalışmaydı. Çalışmalar incelendiğinde ağırlıklı olarak biberiye bitkisinin antioksidan içeriğinin etkilerini ortaya koymaya yönelikteydi. Biberiye molekülleri ile organik sistemler arasındaki etkileşime bağlı olarak çeşitli farmakolojik etkileri bildirilse de özellikle biberiyenin yapısındaki antioksidan özelliği sayesinde oksidatif stres üzerindeki etkilerinin oldukça önemli olduğunu birçok çalışma vurgulamıştır.

Anahtar Kelimeler: Biberiye, antioksidan, rosmarinus officialis.

Abstract

Many chemicals, including toxic substances entering the human body and useful drugs taken for healing, can cause serious cellular damage in various organs by triggering an increase in reactive products. In recent years, pathological processes caused by oxidative stress have increased interest in antioxidants. The demand for antioxidant support, especially through natural products instead of drugs, is increasing. For this reason, many plants and components have become the focus of research. Studies with rosemary have become very popular due to its high antioxidant properties. In our research, we aimed to examine the studies on the antioxidant effect of rosemary plant. When 267 articles published between 2019 and 2023 were examined by typing "rosmarinus officinalis antioxidant" in the 'Pubmed' database, 10% of the articles were review articles, 90% were research articles, and 30% were experimental studies. When the studies were examined, they were mainly aimed at revealing the effects of the antioxidant content of the rosemary plant. Although various pharmacological effects have been reported depending on the interaction between rosemary molecules and organic systems, many studies have emphasized that the effects on oxidative stress are quite important, especially thanks to the antioxidant properties of rosemary in its structure.

Keywords: Rosemary, antioxidant, rosmarinus officinalis

SÜTLEĞEN (*EUPHORBİA* SP.) BİTKİSİ ÖZÜTLERİNİN BAZI BİYOLOJİK AKTİVİTELERİNİN DEĞERLENDİRİLMESİ

EVALUATION OF SOME BIOLOGICAL ACTIVITIES OF *EUPHORBIA* SP. PLANT EXTRACTS

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Özet

Türkiye doğal bitki örtüsünün çeşitliliği ve endemik bitki çeşitliliği bakımından oldukça zengindir. Ülkemizdeki farklı bitki çeşitleriyle yapılmış çeşitli önemli bilimsel çalışmalar literatürde mevcuttur. Koruyucu sağlık önlemlerinin alınması, henüz hasta olunmadan sağlık halinin sürdürülebilirliği günümüzde tıp alanındaki önemli alanlardan birisidir. Bu yüzden insanlık tarihinin başlangıcından itibaren gerek besin ihtiyacının karşılanmasında gerekse de, sağlık durumunun korunmasında ve iyileştirilmesinde insanoğlu sürekli bitkilerden ve bitkisel tedavi yaklaşımlarından yararlanmıştır. Bu çalışmada Sivas ilinden toplanmış olan *Euphorbia* sp. bitkisinin farklı bitki kısımlarının farklı çözgenlerle elde edilmiş özütlerinin DNA'yı oksidatif molekül ve uygulamaların vereceği hasardan koruyucu etkinliğinin belirlenmesi gerçekleştirilmiştir. Farklı yöntemlerle elde edilen bitki ekstraktlarının toplam antioksidan durumu DPPH yöntemi ile spektrofotometrik olarak değerlendirilmiştir. Sütleğen bitkisi özütlerinin, DNA'yı UV ve H_2O_2 radikalinin oluşturduğu oksidatif kaynaklı hasarlardan koruma etkinliklerinin tespiti için pBR322 plazmid DNA'sı kullanılarak, % 1.5'lik agaroz jel üzerinde görüntüleme gerçekleştirilmiştir. İn vitro antioksidan aktivitenin ve özütlerin DNA koruyucu özelliğinin tüm bitki kısımlarında genel olarak etanol ekstresinde ve etil asetat ekstresinde daha güçlü olduğu tespit edilmiştir. Yapılan in vitro biyolojik aktivite temelli analizlerin, *Euphorbia* sp. bitkisinin tıbbi uygulamalarda, gıda, ilaç ve kozmetik endüstrisinde kullanımı için temel olacak çalışmaların yapılmasına yol gösterici olacağı beklenmektedir. Genel olarak bitki ekstrelerinin içerisinde yüzlerce bileşiğe sahip oldukları bilinmektedir ve bu bileşenlerden hangisinin gerçek terapotik nitelikte biyolojik aktivitelere sebep olduğunun anlaşılabilmesi farmakognozik çalışmalar için çok önemlidir. İleriye dönük olarak başka çalışmalarla bitkinin daha ayrıntılı olarak çalışılması faydalı olacaktır.

Anahtar Kelimeler: Antioksidan, *DNA koruyucu aktivite, DPPH, Euphorbia sp., extrakt.*

Abstract

Türkiye is very rich in terms of natural vegetation diversity and endemic plant diversity. Various important scientific studies conducted with different plant varieties in our country are available in the literature. Taking preventive health measures and maintaining health before getting sick is one of the important areas in the field of medicine today. Therefore, since the beginning of human history, human beings have constantly benefited from plants and herbal treatment approaches both in meeting their nutritional needs and in protecting and improving their health. In this study, *Euphorbia* sp. collected from Sivas province. The effectiveness of extracts of different plant parts of the *Euphorbia* sp. plant obtained with different solvents in protecting DNA from damage caused by oxidative molecules and applications was determined. The total antioxidant status of plant extracts obtained by different methods was evaluated spectrophotometrically using the DPPH method. To determine the effectiveness of Euphorbia plant extracts in protecting DNA from oxidative damage caused by UV and H_2O_2 radical, imaging was performed on 1.5% agarose gel using pBR322 plasmid DNA. It has been determined that in vitro antioxidant activity and DNA protective properties of the extracts are generally stronger in ethanol extract and ethyl acetate extract in all plant parts. In vitro biological activity based analyzes showed that it is expected that it will guide the conduct of studies that will be fundamental for the use of the plant in medical applications, food, pharmaceutical and cosmetic industries. It is generally known that plant extracts contain hundreds of compounds, and understanding which of these components causes real therapeutic biological activities is very important for pharmacognosic studies. It would be beneficial to study the plant in more detail with other studies in the future.

Keywords: Antioxidant, DNA protective activity, DPPH, *Euphorbia* sp., extract.

ЗАМАНАУИ МОЛЕКУЛАЛЫҚ-ГЕНЕТИКАЛЫҚ ДИАГНОСТИКА ӘДІСТЕРІ
MODERN METHODS OF MOLECULAR GENETIC DIAGNOSTICS

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Аңдатпа

Берілген мақалада молекулярлық-генетикалық диагностикаға шолуды және қазіргі кездегі пайдалынып жүрген әдістерді сипаттайды. Молекулярлық-генетикалық әдістер әдетте бір гендегі өзгерістерді анықтау үшін қолданылады және тікелей тізбекті талдауды қамтиды, сонымен қатар гендегі қайталауларды анықтайды. Кейде бұл талдаулар ген белгісіз болған кезде қолданылады. Мутациялардың тікелей талдауы бұзылуға жауапты ген анықталған жағдайда мүмкін болады. Генетикалық байланысты талдау ауру генімен тығыз байланысты, бірақ геннің өзі клондалмаған полиморфты маркерлер болған кезде немесе гендегі мутацияларды анықтау қиын немесе мүмкін емес болғанда қолданылады. Тікелей мутацияны талдау үшін бөлімді анықтауға болатын мутация түрлерін және оларды анықтау үшін қолдануға болатын стратегияларды шолуды ұсынады. Содан кейін бөлім байланысқа негізделген талдау үшін ең қолайлы бұзылулардың түрлерін сипаттайды және деректерді интерпретациялау бойынша нұсқауларды ұсынады. Сондай-ақ мұндай әдістер жоғары өнімді секвенирлеу жүйесіндегі соңғы жетістіктерді және оның клиникалық қолдану мүмкіндігін қарастырады.

Кілтті сөздер: молекулалық генетика, диагностика, әдістер, ДНҚ, ПТР.

Abstract

This article provides an overview of molecular genetic diagnostics and currently used methods. Molecular genetic methods are typically used to detect changes in a single gene and include direct sequence analysis as well as the detection of duplications in a gene. Sometimes these tests are used when the gene is unknown. Direct mutation analysis is possible if the gene responsible for the disease is identified. Genetic linkage analysis is used when there are polymorphic markers that are closely associated with a disease gene but the gene itself has not been cloned, or when mutations in the gene are difficult or impossible to detect. The section on direct mutation analysis provides an overview of the types of mutations that can be detected and the strategies that can be used to detect them. The section then describes the types of disorders most suitable for association-based analysis and provides guidelines for interpreting the data. Such methods also review recent advances in high-throughput sequencing and its potential clinical applications.

Keywords: molecular genetics, diagnostics, methods, DNA, PCR.

СТУДЕНТТЕРДІҢ ЭКОЛОГИЯЛЫҚ ҚҰЗЫРЕТТІЛІГІН ҚАЛЫПТАСТЫРУДАҒЫ ИННОВАЦИЯЛЫҚ ТЕХНОЛОГИЯЛАРДЫ ПАЙДАЛАНУДЫҢ ТЕОРИЯЛЫҚ НЕГІЗДЕРІ

THEORETICAL FOUNDATIONS OF THE USE OF INNOVATIVE TECHNOLOGIES IN THE FORMATION OF ENVIRONMENTAL COMPETENCE OF STUDENTS

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Аңдатпа

Қазіргі кездегі экологиялық мәселелер бүкіл адамзатты ойландырып отыр. Болашақ биолог мұғалімдерді экологиялық білімге тәрбиелеу мақсатында адам-табиғат жүйесіндегі қарым-қатынасты жақсарту және қоршаған ортаға бағдарланған тұлғаны дамыту, яғни экологиялық құзыреттілік экологиялық мәдениетті жүзеге асыру үшін қажет. Экологиялық білім мен білікті қалыптастыру, жалпы адамзаттың рухани мәдениет үлгілерін үйрету білім алушылардың экологиялық білімдерін жаңа деңгейге көтереді. Студенттердің танымдық белсенділігін, ақыл-ой қабілеттерін дамытуда, оқуға қажетті біліктер мен дағдылар, алған білімнің саналылығы және біліктілігін қамтамасыз етуде көрнекіліктер мен инновациялық технологиялардың маңызы зор Мақала қазіргі кезде ЖОО студенттермен оқу - тәрбие жұмыстарында қолдануға болатын әлеуметтік маңызы бар инновациялық педагогикалық технологияның бірі жобалау әдісі негізінде студенттердің экологиялық құзыреттілігін қалыптастыру және дамыту мәселесін қарастыруға бағытталған. Жобалық оқыту студенттердің алған білімдерін тереңдетіп қана қоймай, әртүрлі құзыреттерді қалыптастырады. Ол студенттерге құндылық, мақсат қою, өзін-өзі тәрбиелеу және өзін-өзі ұйымдастыру, синтездеу, саралау, гипотеза жасау, интеллектуалды дағдыларды көрсету, таңдау және шешім қабылдауға үйретеді. Қазіргі заманғы талаптарға жауап беретін әрбір болашақ маман осындай құзыреттерге ие болуы керек. Егер біз үнемі жобалық оқытуды жүзеге асыратын болсақ, студенттер университетті бітіргенге дейін біраз тәжірибе жинайды.

Кілт сөздер: инновациялық ойлау, педагогикалық технология, экологиялық құзыреттілік, экологиялық мәдениет, интеграция, модульдік технология, интерактивті оқыту.

Abstract

The environmental problems that exist today are making all of humanity think. In order to educate future teachers of biologists in environmental education, it is necessary to improve relations in the human-nature system and develop an environmentally oriented personality, that is, environmental competence is necessary for the implementation of environmental culture. The formation of environmental knowledge and skills, teaching examples of the spiritual culture of humanity as a whole will raise students ' environmental knowledge to a new level. The article is aimed at considering the problem of the formation and development

of environmental competence of students on the basis of the design method, one of the socially significant innovative pedagogical technologies that can be used in educational work with university students today. Project-based learning not only deepens the knowledge gained by students, but also forms various competencies. It teaches students value, goal-setting, self-education and self-organization, synthesis, differentiation, hypothesis-making, demonstration of intellectual skills, choice and decision-making. Every future specialist who meets modern requirements should have such competencies. If we regularly carry out project-based training, students will gain some experience before graduating from the University.

Keywords: innovative thinking, pedagogical technology, environmental competence, environmental culture, integration, modular technology, interactive learning.

БАКТЕРИЯЛЫҚ ОБЫРДАН ЗАҚЫМДАЛҒАН СҮЙЕЛДІ ҚАЙЫҢ *(BETULLA PENDULLA)* ҚҰРЫЛЫСЫ МЕН ӨСІП ДАМУЫНДАҒЫ ӨЗГЕРІСТЕР

CHANGES IN THE STRUCTURE AND GROWTH DEVELOPMENT OF WART BIRCH *(BETULLA PENDULLA)* DAMAGED BY BACTERIAL CANCER

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Аңдатпа

Бактериялық аурулар ағаш отырғызылымдар патологиясының аз зерттелген бөлігі болып табылады. Бактериоздар сүректілерді, орман отырғызылымдарын, саябақ екпелерін, қалалық екпелерді зақымдайды. Бактериялық обыр – ағаш отырғызылымдарының арасында кең тараған жүйелі (системный) бактериоз. Бұл фитоауру өсімдіктің тек бір ғана бөлігін зақымдамайды, ол өсімдіктің онтогенез барысында дамитын бүкіл организмнің ауруы, өсімдіктің ұлпаларын, яғни флоэма, ксилема, камбий, діңін, бұтағын, тамырын, өсімдіктің генеративті мүшелерін зақымдайды. Мақалада Тараз қаласының ішкі аймағында өсетін сүйелді қайың мен көктерек ағаштарында кездесетін бакериялық обыр фитоауруын, оның ағаштың сыртқы морфологиялық құрылымына әсер ету белгілеріне сипаттама берілді.

Кілт сөздер: бактериялық обыр, некроз, фитоауру.

Abstract

Bacterial diseases are a little studied part of the pathology of tree plantings. Bacterioses damage wood, forest plantings, Park plantings, urban plantings. Bacterial wet wood is a systemic (systemic) bacteriosis that is common among tree plantings. This phyto disease does not damage only one part of the plant, it is a disease of the entire organism that develops during the ontogenesis of the plant, infects the tissues of the plant, that is, the phloem, xylem, cambium, trunk, branch, root, generative organs of the plant. The article describes the phytois of bacerian cancer, which is found in warty birch and aspen trees growing in the inner region of Taraz, the signs of its influence on the external morphological structure of the tree.

Keywords: bacterial cancer, necrosis, phyto disease.

SOCIO-DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF PERSONS WITH SUICIDE ATTEMPTS

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Abstract

Death by suicide is a behavioral event that reflects a complex heritable phenotype with a variety of deleterious and environmental risk factors. According to the World Health Organization (WHO), more than 700 thousand people worldwide commit suicide every year, and each completed suicide occurs significantly more than suicide.

According to the WHO (World Health Organization) report for 2021, our country is among the countries with a high suicide rate in the world ranking, ranking 20th. In our country, 4.5 thousand people attempted suicide in 2021, and 3.7 thousand people in 2022. Thus, suicide has been considered a major public health problem, which has stimulated research into its etiology and prognosis.

This article discusses the results of an analysis of the medical history of 35 people with unfinished suicide, who, from May to July 2023, were admitted to the Multidisciplinary City Hospital No. 1, in the toxicology department of Astana. Of all observed patients, 27% were men, 73% were women. Kazakhs make up the largest share among all nationality groups - 60%. Russians were in second place with 20%, followed by all other representatives of nationalities (Uzbeks, Armenians, Tatars, etc.), which amounted to about 20%. The data obtained in the age category indicate a greater degree of perfection of suicidal states in persons of legal age (20-45 years). 25 out of 35 people presented themselves as unemployed, with 70% included. Family conflicts are the largest percentage of all causes of suicidal phenomena - 55%. In addition, stress, depression, and withdrawal from life become reasons for committing suicide. 70% of the drugs used for suicidal purposes included analgesics, salicylates, antipyretics, and anti-inflammatory drugs. The second category of categories - sleeping pills, sedatives, psychotropic drugs, as well as antidepressants - 20%.

Suicidal behavior is a complex and multifaceted problem that requires attention, implementation and implementation from society, medicine and psychology.

Keywords: suicide, suicide attempt, age category, intentional self-poisoning, risk factors.

THE USE OF THE PLANT FUNCTIONAL TRAITS (PFTs) FOR THE EVALUATION AND MONITORING OF THE HEALTH STATUS OF OAK FORESTS IN CENTRAL ITALY UNDER THE NATIONAL RECOVERY AND RESILIENCE PLAN TASK 2.2.

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Abstract

Urban forests are an irreplaceable heritage for capitals and metropolitan cities. By providing ecosystem services, forests are a fundamental resource in the fight against global warming and air pollution, which puts people's health at risk. Assessing of the health status of plant species becomes essential in order to preserve green areas within cities, identifying any causes of stress and possible remedies. In this context, the National Recovery and Resilience Plan - PNRR aims to recreate natural environments in urban contexts, usable by the community. The study of the aerial part of plants was carried out in synergy with TASK 2.2 which provides for the monitoring of the roots of plant species in urban reforestation. The sampling area includes three populations in the municipality of Campobasso with different naturalness identified on the basis of a gradient of fragmentation and extension of the areas. Named Bosco Fajete, San Giovanni in Golfo e Villino Correra.

All the measurements were taken three times in the seasonal period: June – July/August – September/October periods. The study involves the characterization of the sites through phytosociological surveys, which are also useful for defining the species them abundance. In each stand, 5 species are chosen that make up the tree and shrub layer of the forest and 2 species for the herbaceous layer. For each species, 10 leaves are collected from 7 individuals. For each leaf, the following traits are measured: fresh weight (FW), leaf area (LA), dry weight (DW), Chloropyll content (SPAD, CCI, ATLEAF), Anthocian content (AC), Flavonols content (FC), leaf thickness (Lth), Specific leaf area (SLA), Leaf dry matter content (LDMC), leaf mass per area (LMA), Leaf water content (LWC). The analysis of these Plant Functional Traits can provide useful data on the health status of the analysed species but also data on the ecological adaptation of species in urban contest and finally provide a robust dataset for the implementation of machine-learning algorithms, useful for predicting and monitoring the species examined over time. This study can help to identify possible critical issues for their survival and identify possible interventions for the protection of urban forests.

Keywords: Plant functional traits, urban forests, plant health assessment.

DÜŞÜK DOZ GAMA RADYASYON ÖN UYGULAMASININ *Lupinus albus* L. DA ÇİMLENME VE ERKEN DÖNEM FİDE GELİŞİMİ ÜZERİNE ETKİSİ

IMPACT OF LOW DOSE GAMMA RADIATION PRE-TREATMENT ON GERMINATION AND INITIAL SEEDLING GROWTH IN *Lupinus albus* L.

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Özet

Beyaz acı bakla olarakta bilinen *Lupinus albus* L. sert tohum kabuğu nedeniyle tohumlarında fiziksel dormansi görülen önemli bir baklagildir. Sert tohum kabuğu, özellikle olumsuz çevre koşullarında tohumların toprakta hayatta kalma oranını arttırsa ve doğadaki türlerin yok olmasını engellemeye yardımcı olsa da, bitki çeşitlerinin veya yabani tür akrabalarının tarım veya ıslah amacıyla kullanılmasını önleyebilir. Dolayısıyla, *L. albus* da sert tohum kabuğundan kaynaklı görülen bu fiziksel dormansi bir problem olarak karşımıza çıkmaktadır. Bitki tohumlarında görülen bu gibi çeşitli dormansi tiplerinin kırılması için farklı priming metodları kullanılmaktadır. Düşük doz gamma radyasyonu en yaygın ve etkili olarak kullanılan fiziksel priming metodlarından birsidir.

Bu araştırma, düşük doz gamma radyasyonu ön-uygulamasının *L. albus*'un tohumlarında görülen dormansi ile *L. albus*'un erken fide gelişimi üzerine etkisinin incelenmesi amacıyla yürütülmüştür Bu amaç için, tohumlar Sezyum-137 gamma ışın kaynağında (820 Gy/h) düşük doz (0, 25, 50, 75, 100 ve 200 (Gy)-Gray-) gamma radyasyon ışınları ile ışınlanmıştır. Araştırmada, çimlenme yüzdesi, ortalama çimlenme süresi, çimlenme indeksi, sürgün uzunluğu, kök uzunluğu, kök/sürgün oranı, sürgün taze ağırlığı, kök taze ağırlığı, sürgün kuru ağırlığı, kök kuru ağırlığı, sürgün kuru maddesi, kök kuru maddesi, kökten/sürgün kuru madde oranı, sürgün su içeriği, kök su içeriği ve fide güç indeksi parametreleri incelenmiştir. Araştırma sonucunda, düşük doz gamma radyasyon ön-uygulamasının, çimlenme yüzdesini (%11.11) ve çimlenme indeksini (%32.92) istatistiki açıdan önemli derecede (P<0.05) artırdığı, ek olarak, ortalama çimlenme süresini istatistiki açıdan önemli derecede (P<0.01) kısalttığı (%6.35) tespit edilmiştir. Büyüme parametrelerine göre sürgün gelişimi olumlu yönde, kök gelişimi ise azda olsa negatif yönde etkilenmiştir. Fide güç indeksinde 100 Gy'e kadar bir artış, 200 Gy de ise bir azalış meydana gelmiştir. Dormansinin kırılmasında ve büyümenin en az olumsuz yönde etkilenmesinde en iyi sonuçlar 50 ve 75 Gy'den elde edilmiştir. Sonuç olarak, *L. albus*'ta düşük doz gamma radyasyonu ön uygulamasının erken dönem fide gelişiminde çok fazla olumsuz bir etki yaratmaksızın, çimlenmeyi pozitif yönde etkilediği tespit edilmiştir.

Anahtar Kelimeler: *Lupinus albus* L., gama radyasyonu, dormansi, tohum çimlenmesi, erken dönem fide geilşimi.

Abstract

Lupinus albus L., also known as white lupine, is an important legume with physical dormancy in its seeds due to its hard seed coat. Although the hard seed coat increases the survival rate of seeds in soil, especially in adverse environmental conditions, and helps prevent species

extinction in nature, it may prevent plant varieties or their wild species relatives from being used for agricultural or breeding purposes. Therefore, this physical dormancy caused by the hard seed coat in *L. albus* appears as a problem. Different priming methods are used to break such dormancy types seen in plant seeds. Low dose gamma radiation is one of the most widely and effectively used physical priming methods.

This research was carried out to examine the effect of low-dose gamma radiation pre-treatment on the dormancy observed in the seeds of *L. albus* and the initial seedling growth of *L. albus*. For this purpose, the seeds were treated with low-dose gamma radiation source (820 Gy/h). dose (0, 25, 50, 75, 100 and 200 (Gy)-Gray-) gamma radiation beams. In the research, germination percentage, mean germination time, germination index, shoot length, root length, root/shoot ratio, shoot fresh weight, root fresh weight, shoot dry weight, root dry weight, shoot dry matter, root dry matter, root/shoot dry matter ratio, shoot water content, root water content and seedling strength index parameters were examined. As a result of the research, low-dose gamma radiation pre-treatment increased the germination percentage (11.11%) and germination index (32.92%) statistically significantly ($P<0.05$), in addition, the mean germination time was statistically significantly increased ($P<0.01$). It was determined that it shortened (6.35%). According to growth parameters, shoot growth was affected positively and root growth was affected negatively, albeit slightly. There was an increase in the seedling power index up to 100 Gy and a decrease at 200 Gy. The best results in breaking dormancy and affecting growth least negatively were obtained from 50 and 75 Gy. As a result, it was determined that pre-treatmen of low dose gamma radiation in *L. albus* positively affected germination without causing much negative effect on initial seedling growth.

Keywords: *Lupinus albus* L., gamma radiation, dormancy, seed germination, initial seedling growth.

БИОЛОГИЯЛЫҚ КОНЦЕПЦИЯЛАРҒА НЕГІЗДЕЛГЕН ЖАРАТЫЛЫСТАНУ-ҒЫЛЫМИ КӨЗҚАРАСТЫ ҚАЛЫПТАСТЫРУ ЖӘНЕ ДАМЫТУ ЖҮЙЕСІ

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Аңдатпа

Мақалада студенттердің жаратылыстану ғылыми дүниетанымын қалыптастыру және дамыту, биологияның негізгі заңдылықтары мен ұғымдарымен таныстыру, оның биологиялық білімді меңгерудің, адамның табиғат пен қоғамға саналы көзқарсын қалыптастырудың маңыздылығы, сонымен қатар болашақта кәсіби іс әрекетпен тығыз байланысты тәрбие жүйесін құрудың маңызыдылығы қарастырылады.

Түйін сөздер: эволюция, ғылыми дүниетаным, жаратылыстану ғылымы, биологиялық білім беру.

Abstract

The article deals with the formation and development of students' scientific worldview of natural science, introduction to the basic laws and concepts of biology, the importance of acquiring biological knowledge, forming a conscious view of man towards nature and society, as well as the importance of creating an educational system closely related to professional activity in the future.

Keywords: evolution, scientific worldview, natural science, biological education.

БИОЛОГИЯНЫ ОҚЫТУДА *“FIELD LAB”* ӘДІСІ НЕГІЗІНДЕ ТӘЖІРИБЕЛІК ЖҰМЫСТАРЫН ҰЙЫМДАСТЫРУ ЖӘНЕ ӨТКІЗУ

ORGANIZATION AND CONDUCT OF EXPERIMENTAL WORK BASED ON THE “FIELD LABORATORY” METHOD IN TEACHING BIOLOGY

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Түйіндеме

Мақалада биологиялық білім беру барысында білімгерлерді ғылымға және жаңашылдыққа баулу мақсатында далалық іс-тәжірибе жұмыстарын жүргізудің әдістемесі берілген. Field lab әдісін ғылыми зерттеулер мен іс-тәжірибе барысында қолданудың жолдары мен жұмыстың ұйымдастырылу барысы көрсетілген. Field Lab әдісін сабақтан тыс, жазғы немесе көктемгі далалық, практикалық зерттеу сабақтарында қолданудың әдістері, оның нәтижелерін алу, Field lab әдісін қолданудың артықшылықтары мен кемшіліктері анықталған. Биологиялық білім берудегі Field lab әдісін қолданудың тиімділігі мен білімгерлердің ізденіс-зерттеушілік іс-әрекеттер жүйесі нақтыланып, белгілі бір мақсатта әрекет жасау қабілеттерін анықтау жұмыстары жетілдірілген. Жобалық зерттеулер мен тәжірибелік жұмыстар жүргізудегі Field lab әдісінің артықшылықтары анықталған. Биологиялық білім беру барысында field lab әдісін қолдану арқылы далалық іс-тәжірибелерді ұйымдастыру, білім беру мекемесінің ботаникалық бақ оқу-эксперименттік алаңын зерделеп, танымдық далалық іс тәжірибе әдісі арқылы онда өсірілген өсімдіктердің түрлерін зерттеу, бақылау, анатомиялық және физиологиялық түсініктерін қалыптастыру заңдылықтары бойынша әдістемелік ерекшелігі жасалған. Field lab әдісін қолданудың ерекшелітері мен әдістемесі, бағалау критерийлері берілген.

Кілт сөздер: field lab әдісі, ғылыми – зерттеу жұмысы, жаңа технологиялар, өсімдіктер физиологиясы мен анатомиясы, жаратылыстану ғылымдары.

Abstract

The article presents the methodology of conducting field practical work in order to introduce students to science and innovation in the course of biological education. Ways and methods of using the field lab method during scientific research and practice the organization process is shown. Methods of using the Field Lab method in extracurricular, summer or spring field, practical research classes, obtaining its results, advantages and disadvantages of using the Field Lab method are determined. The efficiency of using the Field lab method in biological education and the system of research-research activities of educators have been clarified, and the work of determining the abilities to act for a specific purpose has been improved. The advantages of the Field lab method in conducting project studies and experimental work are

determined. In the course of biological education, using the field lab method, organizing field experiments, studying the educational and experimental site of the botanical garden of the educational institution, and using the cognitive field experiment method, researching, controlling, and forming anatomical and physiological concepts of the types of plants grown there have been made a methodological feature. . Features and methodology of using field lab method, evaluation criteria are given.

Keywords: field lab method, scientific research work, new technologies, plant physiology and anatomy, natural sciences.

ANTIOXIDANT POTENTIALS OF ARACHIS HYPOGAEA

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Abstract

Plants have always been in close contact with human beings from past to present. Due to this situation, it has been used for many different purposes. In this study, the biological activities of *Arachis hypogaea* L. reported in the literature were compiled. *A. hypogaea* is in the Fabaceae family. It is known as "Peanut, groundnut, goober, pindar, monkey nut" in the sources. Peanut is a legume plant grown for its edible seeds. It is widely grown in tropical and subtropical regions, where it is important for both small and large commercial producers. It is grown both as a grain legume and as an oil crop due to its high oil content. In literature research, *A. hypogaea* has been observed to have activities such as antioxidant, antimicrobial, antihypertensive, cytotoxic, anticancer and anti-inflammatory. As a result, it has been seen through different activity studies that *A. hypogaea* has pharmacological value in addition to nutritional and vegetable oil.

Keywords: Antioxidant, Antimicrobial, Biological activities, Peanut, *Arachis hypogaea*

THE ANTIOXIDANT ACTIVITIES OF ASPARAGUS OFFICINALIS

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Abstract

Plants have been used for many different purposes from ancient times to the present. Among these areas of use, the pharmaceutical industry is one of the most notable. In this study, the biological activities of *Asparagus officinalis* L. reported in the literature were compiled. *A. officinalis* is in the Asparagaceae family. Asparagus grows best in nutrient-rich, sandy and loose soil. It is a perennial herbaceous plant, 50-150 cm tall, with greenish-yellow flowers blooming between June and July. It grows in wet, sandy and clayey, strong soils and in forested areas. Their trunks are upright, green, smooth-faced and widely branched. The branches are divided into branches and are thin and green in color. The leaves are small and membranous. The flowers are located singly or in pairs in the axils of the leaves. Male flowers have 6 parts. The fruits are red or black in color. *Asparagus* is produced from seed or pawpaw. In literature studies, *A. officinalis* has been reported to have activities such as antioxidant, cytotoxic, anti-inflammatory, anti-arthritic, analgesic, anticancer, antitumor and antimicrobial. As a result, it has been observed that *A. officinalis* has many biological activities important for health, apart from its nutritional use.

Keywords: Antioxidant, Antimicrobial, Asparagus, Biological activities

THE BIOLOGICAL ACTIVITIES OF DAUCUS CAROTA

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Abstract

Plants have been used for many different purposes in different communities since ancient times. Their nutritional properties have made plants indispensable elements of diet lists. Plants have become the subject of research in the field of medicine, especially after the 19th century, with the development of technology and research. In this study, the biological activities of *Daucus carota* L. reported in the literature were compiled. *D. carota* is in the Apiaceae family. In the sources, it has names such as "wild carrot, European wild carrot, bird's nest, bishop's lace, Queen Anne's lace". It is an herbaceous biennial plant that grows between 30 and 120 cm tall and has a roughly hairy, hard, sturdy stem. The leaves are tripartite, finely divided and lacy, and generally triangular in shape. The flowers are small and white, clustered in flat, dense umbels. As a result of literature research, it has been observed that *D. carota* has activities such as antioxidant, antinociceptive, anti-inflammatory, cytotoxic, antimicrobial, anticancer and hepatoprotective. As a result, it has been observed that *D. carota* has important biological activities in addition to its nutritional importance.

Keywords: Antioxidant, Antimicrobial, Biological activities, Carrot, *Daucus carota*

THE MEDICINAL PROFILE OF ERUCA VESICARIA

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Abstract

Plants were initially preferred for their nutritional properties. Later, its use in the field of health increased thanks to the biochemical compounds it contains. In this study, the biological activities of *Eruca vesicaria* (L.) Cav. reported in the literature were compiled. *E. vesicaria* is in the Brassicaceae family. It is known as "Rocket, eruca, arugula" in the sources. It is an annual plant growing to 20 to 100 cm in height. Pinnate leaves are deeply lobed, with four to ten small, lateral lobes and a large terminal lobe. The flowers are 2 to 4 cm in diameter. It has the typical Brassicaceae flower structure and is arranged in a corymb shape. The leaves are creamy white with purple veins and the stamens are yellow. The fruit is a siliqua (pod) 12 to 25 mm long, with an apical beak and containing several seeds (edible). As a result of literature research, it has been observed that *E. vesicaria* has activities such as antioxidant, antimicrobial, cytotoxic, anticancer, DNA protective activity, analgesic, anti-inflammatory and antidiabetic. As a result, it has been seen that *E. vesicaria* plant has important activities in the field of pharmacology, apart from being used in the kitchen.

Keywords: Antioxidant, Antimicrobial, Biological activities, Eruca, Medicinal plants

THE MEDICINAL PROPERTIES OF MEDICAGO SATIVA L.

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Abstract

Plants are used for many different purposes such as cosmetics, textile dyes, pharmaceutical active ingredients. In this study, the biological activities of *Medicago sativa* L. reported in the literature were compiled. *M. sativa* is known as "Clover". It has also been named as "alfalfa, oriental clover, rough clover" in literature research. It is in the Fabaceae family. Clover is a perennial herbaceous plant. When the clover plant finds suitable conditions, its root system extends to a depth of 8-10 m. It is a plant rich in vitamins and minerals. As a result of literature research, it has been observed that *M. sativa* has activities such as antioxidant, antimicrobial, cytotoxic, acetylcholinesterase inhibitory activity, allelopathic, anticancer and anti-inflammatory. As a result, it has been observed that *M. sativa* has important biological activities in addition to its important biological functions in the fields.

Keywords: Antioxidant, Antimicrobial, Biological activities, Clover, Medicinal plants

THE PHARMACOLOGICAL PROPERTIES OF RUMEX ACETOSELLA

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Abstract

Plants have been preferred in many different areas since the existence of mankind. Among these different fields, the fastest rise in recent years has been seen in pharmacology. In this study, the biological activities of *Rumex acetosella* L. reported in the literature were compiled. Rumex acetosella is in the Polygonaceae family. It is known as "lamb's ear" in the literature. It is also a perennial herbaceous plant species. It has arrow-shaped hairless leaves, and its length varies between 20-50 cm. It should be boiled to remove the oxalic acid in young leaves. Or it can be used in low amounts. The ripe form is too bitter to be consumed. Dock leaves are a very important source of both vitamin A and vitamin C, as well as iron and potassium. As a result of literature research, *R. acetosella* has been shown to have activities such as antioxidant, antimicrobial, antiviral, anticancer, anti-inflammatory and cytotoxic. As a result, *R. acetosella* is thought to have important biological activities.

Keywords: Antioxidant, Antimicrobial, Biological activities, Medicinal plants, Lamb's ear

SOLANUM MELONGENA: A HEALTHY PLANT

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Abstract

Thanks to many different components such as phenolic compounds and essential oils contained in plants, they have recently been widely used in health and applications. In this study, the biological activities of *Solanum melongena* L. reported in the literature were compiled. *S. melongena* is in the Solanaceae family. It is known as "Eggplant aubergine, brinjal, baigan" in the sources. It is an annual cultivated plant that grows as an annual in warm climates and as a small tree in tropical climates. In literature studies, *S. melongena* has been reported to have activities such as antioxidant, antidiabetic, antiviral, anticancer, anti-inflammatory cytotoxic, thrombolytic and antimicrobial. As a result, it has been seen that *S. melongena* is used in many different areas in terms of biological activity in addition to its nutritional value.

Keywords: Antioxidant, Antimicrobial, Biological activities, Eggplant, Medicinal plants

SOLANUM TUBEROSUM AS HEALTHY AND NUTRITIONAL PLANT

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Abstract

Plants have been used for many different purposes such as shelter, nutrition, therapeutic and cosmetic. In this study, the biological activities of *Solanum tuberosum* L. reported in the literature were compiled. *S. tuberosum* is in the Solanaceae family. *S. tuberosum* is a type of herbaceous plant whose tubers are edible. It is a plant with poisonous roots, reaching up to 70–80 cm in height, blooming with whitish-pinkish flowers, except for its tubers. The most important feature that distinguishes potatoes from other vegetables is that they reproduce vegetatively rather than by seeds. Potato consumption is beneficial for diabetics and quenches thirst. It is useful in stomach and duodenal ulcers. It is also known to relieve liver swelling. It also helps reduce intestinal worms. It is useful for vascular swelling. It is known that when something hard is swallowed, it allows the foreign substance to be removed without harming the body. It has been reported in the literature that *S. tuberosum* has activities such as antioxidant, anti-inflammatory, cytotoxic, anti-nociceptive, ACE-inhibitory and anticancer. As a result, it has been observed that *S. tuberosum* has important biological activities in addition to its nutritional value and diversity.

Keywords: Antioxidant, Antimicrobial, Biological activities, Medicinal plants, Potato

A RESEARCH ON BIOLOGICAL ACTIVITIES OF TURKEY TAIL (*Trametes versicolor*)

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Abstract

Mushrooms have many different functions in nature. Apart from these functions, edible species are evaluated nutritionally. In addition, mushroom species have recently been used in the field of pharmacology. In this study, the biological activities of *Trametes versicolor* reported in the literature were compiled. *Trametes versicolor* (L.) Lloyd, also known as *Coriolus versicolor* and *Polyporus versicolor*, is a polyporous fungus that is widespread throughout the world. It means 'of several colours'. The upper surface of the cap shows typical concentric zones of different colours. The margin is always the lightest. Under the tomentum layer there is a black layer over the whitish flesh. The flesh itself is 1-3 mm thick and has a leathery texture. In literature studies, *T. versicolor* has been reported to have activities such as antioxidant, anti-inflammatory, antimicrobial, cytotoxic, antiproliferative, anticancer and DNA-protective. As a result, it has been observed that *T. versicolor* has important biological activities in addition to its nutritional value.

Keywords: Antioxidant, Antimicrobial, Medicinal mushrooms, Turkey Tail, Trametes versicolor

PHARMACOLOGICAL POTENTIAL OF MATSUTAKE MUSHROOM

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Abstract

Mushrooms, like plants, are evaluated nutritionally by humans. Recently, its use has become widespread in the field of pharmacology. In this study, the biological activities of *Tricholoma matsutake* (S. Ito & S. Imai) Singer reported in the literature were compiled. *T. matsutake* is a type of mushroom that grows on pine trees. It grows in Asia, Europe and North America and is used in Japanese, Korean and Chinese cuisines with its distinctive spicy aroma. Matsutake has been used since the 19th century, derived from the Japanese words matsu (pine tree) and take (mushroom). It has a very serious market in Far Eastern countries such as Japan. In this study, the biological activities of *T. matsutake* reported in the literature were compiled. According to the findings, it has been reported that it has activities such as antioxidant, antitumour, antifatigue, hypoglycemic, antimicrobial, anticancer, cytotoxic and anti-inflammatory. As a result, it has been observed that *T. matsutake* has important biological activities.

Keywords: Antioxidant, Antimicrobial, Medicinal mushrooms, Matsutake, Tricholoma matsutake

БИОЛОГИЯ ПӘНІНЕН СЫНЫПТАН ТЫС САБАҚТАРДА ОҚУШЫЛАРДЫҢ ТАНЫМ ӘЛЕУЕТІН ДАМЫТУ ӘДІСТЕМЕСІ

METHODS OF DEVELOPING THE COGNITIVE POTENTIAL OF STUDENTS IN EXTRACURRICULAR BIOLOGY CLASSES

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Аңдатпа

Бұл мақалада биология пәнінен сыныптан тыс жүргізілетін сабақтардың маңызы, түрлері мен оны өткізу формалары келтірілген. Оқушылардың оқу танымының артуы мен өз бетінше жұмыс жасауға, өз өлкесін танып білуге және практикалық жұмыстарды ұйымдастырудың ерекшеліктерін меңгерудегі маңызы айтылған. Студенттердің топтық, жеке және эпизодтық жасаған іс шаралары нәтижелерімен бекітілген.

Кілт сөздер: сыныптан тыс, тәрбие, таным, конференция, іс- шара

Abstract

This article presents the meaning, types and forms of extracurricular activities in biology. The importance of increasing the learning ability and independent work of students, knowledge of their region and assimilation of the features of practical work organizations is emphasized. Group, individual and episodic activities of students are consolidated by the results.

Keywords: extracurricular, educational, cognitive, conference, event

МЕКТЕП ОҚУ ТӘЖІРИБЕ АЛАҢЫ -ОҚУШЫЛАРДЫҢ ЗЕРТТЕУШІЛІК ҚҰЗЫРЕТТІЛІКТІ ҚАЛЫПТАСТЫРУ КӨЗІ

THE SCHOOL IS A PLATFORM FOR EDUCATIONAL PRACTICE-A SOURCE OF FORMATION OF STUDENTS ' RESEARCH COMPETENCE

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Аңдатпа

Біздің зерттеу жұмысымызда мектеп жанындағы оқу-тәжірибе алаңындағы эксперименттің түрлері мен оны қою әдістері және зерттеушілік жұмыстарды ұйымдастыру ерекшеліктері жайлы баяндалған. Алаңның бөлімдерінің табиғатқа, туған өлкеге деген көзқарас, дүниетанымның қалыптасуындағы маңызы анықталған.

Мұнда жүргізілетін зерттеу жұмысының бағыттары оқушыларды: егістікке топырақты дайындау, тұқымдарды себу мерзімдері мен күту ерекшеліктерін білуге, фенологиялық бақылау, өскіншенің биометриялық талдауын жүргізу сияқты білім, білік және дағды қалыптастырады.

Кілт сөздер: тәжірибе алаңы, эксперимент, бақылау, күтім, зерттеу

Abstract

Our research paper contains information about the types of experiments of work at the school educational and experimental site, methods of its formulation and features of the organization of research work.

The importance of land plots in the formation of a worldview, attitude to nature, native land is revealed. The directions of the research work carried out here form students' knowledge, skills and abilities such as: preparing the soil for sowing, knowledge of the specifics of timing and seed care, conducting phenological control, biometric analysis of seedlings.

Keywords: experiment site, experiment, observation, care, research

БИОЛОГИЯ САБАҚТАРЫНДА ПРОБЛЕМЕЛЫҚ ОҚЫТУ ӘДІСІН ҚОЛДАНУДЫҢ ТИІМДІЛІГІ

THE EFFECTIVENESS OF USING THE METHOD OF PROBLEM-BASED LEARNING IN BIOLOGY LESSONS

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Аңдатпа

Мақалада проблемалық оқыту әдістерін биология сабақтарында қолданудың ұтымдылығы көрсетілген. Қазіргі таңда мектеп оқушыларының білімді де білікті болуында проблемалық оқыту әдісінің алатын орны ерекше екені белгілі. Жаңа білім беру технологияларын биология сабақтарында қолдану, оқушының шығармашылығының дамуына, білімін өмірде пайдалана және меңгеру дағдыларының қалыптасуына әкелетіндігі қарастырылған. Биология сабақтарында проблемалық оқыту элементтерін пайдалану оң үрдіске ие. Оқушылардың танымдық өз бетінше әрекет ету дағдылары және оқу міндеттерін стандартты емес, шығармашылықпен шешу қабілеті қалыптасады. Мақалада биология сабақтарында проблемалық сұрақтар мен тапсырмаларды қолдану мысалдары келтірілген.

Мақалада биология сабақтарында проблемалық сұрақтар мен тапсырмаларды қолдану мысалдары келтірілген. Бұл мақалада проблемалық оқыту технологиясын қолданудың қазіргі білім беру тәжірибесі үшін өзектілігі көрсетілген. Мақалада сонымен қатар биология сабағында проблемалық тапсырмалардың көмегімен оқу мәселесін шешудің кезеңі жан-жақты қарастырылған. Зерттеу жұмысының мақсаты - оқушылардың танымдық, коммуникативті, практикалық, шығармашылық іс-әрекетін дамытуға, оқушының жеке басының қалыптасуына, мектеп түлектерінің практикалық мәселелерді шешу үшін үйренген білімдерін нақты өмірдегі жағдайларда пайдалануға дайын болуына ықпал ететін проблемалық оқыту технологиясының тиімділігін көрсету.

Проблемалық оқыту технологиясы деп мұғалімнің жетекшілігімен проблемалық жағдаяттар құруды және шешу үшін оқушылардың белсенді өз бетінше әрекетін көздейтін дамыта оқыту процесінде қолданылатын ғылыми негізделген әдістер мен құралдар жүйесі айтылады. Ол оқушылардың интеллектуалдық және шығармашылық дамуын, сондай-ақ олардың білімін, іскерлігін, дағдысын және тану жолдарын меңгеруін көздейді. Проблемалық оқытуда мұғалім үнемі оқушылардың өзіндік жұмыс формасына жүгінеді. Тыңдалушылардың өздері жаңа білім алады, оларда ақыл-ой операциялары мен әрекеттерінің дағдылары қалыптасады, зейін, шығармашылық қиял, интуиция дамиды. Демек, жан-жақты дамыған оқушы тұлғасын қалыптастыруда проблемалық оқытудың мүмкіндігі зор. «Биология» мектеп курсының мазмұнын және оны оқытуға қойылатын әдістемелік талаптарды ескере отырып, жұмыста осы оқу пәні шеңберінде проблемалық оқыту технологиясын қолданудың мүмкіндіктері көрсетілген.

Кілтті сөздер: проблемалық оқыту, эвристика, технология, проблемалық жағдаят, репродуктивті баяндау.

Abstract

The article discusses the effectiveness of problem-based learning and the rationality of their use in biology lessons. Currently, it is known that the problem method of teaching occupies a special place in the education and competence of secondary school students. It is envisaged that the use of new educational technologies in biology lessons leads to the development of student creativity, the formation of skills for the use and assimilation of knowledge in life. The use of elements of problem-based learning in biology lessons has a positive trend. Students develop the skills of cognitive independent activity and the ability to non-standard, creative solution of educational tasks. The article provides examples of the use of problematic questions and tasks in biology lessons.

This article emphasizes the relevance of the application of problem-based learning technology for modern educational practice. The article also discusses in detail the stage of solving an educational task with the help of problem tasks in a biology lesson. The purpose of the research work is to show the effectiveness of problem-based learning technology, which contributes to the development of cognitive, communicative, creative activity of students, the formation of a student's personality, the readiness of school graduates to use their knowledge in real life situations to solve practical problems.

The technology of problem-based learning is understood as a system of scientifically based methods and tools used in the process of developing learning, which provides for active independent activity of students under the guidance of a teacher to create and resolve problem situations. It provides for the intellectual and creative development of students, as well as their mastery of knowledge, skills, skills and ways of cognition. In problem-based learning, the teacher constantly turns to the form of independent work of students. The students themselves gain new knowledge, they form the skills of mental operations and actions, develop attention, creative imagination, intuition. Consequently, in the formation of a comprehensively developed personality of a student, the possibility of problem-based learning is great. Taking into account the content of the school course "Biology" and the methodological requirements for its teaching, the paper shows the possibilities of using problem-based learning technology within the framework of this academic subject.

Keywords: problem-based learning, heuristics, technology, problem situation, reproductive narrativ.

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ПРИМЕНЕНИЕ НОВОГО БИОПРЕПАРАТА ПРОТИВ ГОММОЗА ХЛОПЧАТНИКА

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Аннотация

В работе изучено действие биопрепарата «Bactvaipe 2%» в.р. в норме расхода 5,0 л/га против гоммоза по биологической эффективности, урожайности, образовании рабочей суспензии и проявлении фитотоксичности на хлопчатнике.

Ключевые слова: Биологический препарат, биологическая эффективность, урожайность, хлопчатник, *Xanthomonas malvacearum, Pseudomonas fluorescens,* мелкоделяночные опыты, полевые опыты.

БИОЛОГИЯЛЫҚ БІЛІМ БЕРУДЕ ИННОВАЦИЯЛЫҚ ТЕХНОЛОГИЯ ҚҰРАЛДАРЫН КІРІКТІРУ САБАҚТАРЫНЫҢ ӘДІСТЕМЕСІ

METHODOLOGY OF LESSONS FOR INCORPORATING INNOVATIVE TECHNOLOGY TOOLS IN BIOLOGICAL EDUCATION

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Аңдатпа

Мақалада озық технологияларды меңгеруге қойылатын талаптарға сай оқу үдерісін ұйымдастыру мәселелері қарастырылған. Қоғамымыздың қазіргі даму кезеңі білім беру жүйесіндегі оқу-тәрбие процесін технологияландыру мәселесін қойып отыр. Осы себептерге байланысты оқу-тәрбие үрдісінде қолданылмаған жаңашыл әдіс-тәсілдерді пайдалану оқу-тәрбие процесінің негізі болуы керек.

Жаңа оқыту технологияларын пайдалану студенттің оқуға деген құштарлығын арттырып, пәнге деген қызығушылығын арттырады. Интерактивті құралдарды орынды қолдану оқыту сапасын жетілдіруге көмектеседі. Интерактивті құралдарды қолдану негізінде университетте биологиялық пәндерді оқытудың сапасын үнемі арттырып, білім беруді ақпараттандыру жүйелі түрде жүргізілуде. Зерттеу жұмысының мақсаты білім беру үрдісінде инновациялық технология құралдарын кіріктіру арқылы студенттерді белсенді іс-әрекетке дайындау болып табылады. Жоғарғы оқу орындарындағы оқытуды ұйымдастырудың негізгі формасы дәріс. Білім алушылардың белсенділігін арттыруға мүмкіндік жасайтын әдістемелік амалды интерактивті деп атайды. Интерактивті дәрістің мақсаты студенттерді курс бойынша тиісті теориялық біліммен қаруландыру. Дәріс студенттерге жаңадан ашылған ғылымдар, оқу дисциплинасындағы негізгі қалыптарын, әрбір тақырыптың негізін ашып көрсетеді және ғылымдағы талқыланған немесе қазіргі кезде талқыланып жатқан проблемамен таныстырып өтеді. Студенттердің білім-білік дағдыларын жетілдіру үшін интербелсенді оқыту технологиясының элементтерін оқушылардың физиологиялық дамуы пәні бойынша өз тәжірибемізге енгізудеміз.

Қазіргі кезеңдегі кез-келген педагогикалық технология студенттердің белсенді ойлау қабілеттерін дамытуға бағытталған. Интерактивті дәрісті ұйымдастырудың өзіне лайық ережелері қарастырылған: аудиторияны жұмысқа дайындау, мақсаттарды және күтілетін нәтижелерді айқындау, жұмыс ережелерін қабылдау, сенім және жұмыс атмосферасын қалыптастыру, барлық студенттер жұмысқа қатысуы керек, барлық пікірлер тыңдалуы керек, жазбаша жұмыстар, кері байланыс. Студенттер өз білімдерін өздері бағалап, өз деңгейлерін анықтауға мүмкіндік алатындықтан, білім алуға деген жауапкершілікті сезінеді. Кері байланыс парағы арқылы студенттердің барлығын сабаққа қатысуға қызықтырып, әр студенттің білім деңгейін анықтауға мүмкіндік туады, дәріске қатысқанын құжат жүзінде ашық көруге болады, әр дәрісте студенттерді тексеруге жұмсалатын уақыт үнемделеді.

Кілт сөздер: инновация, интерактивті, педагогика, технология, рефлексия.

Abstract

The article discusses the implementation of the educational process in line with the demand for advanced technologies. The current societal developments prompt the need for technological integration in the educational system. Therefore, innovative techniques must form the foundation of the educational system, distinct from the existing methods.The incorporation of new teaching technologies enhances students' motivation and interest in subjects. Implementing interactive tools effectively contributes towards elevating the quality of education. Consequently, the quality of teaching biological subjects at the university continually improves, and education information is systematically disseminated. The aim of the research is to enable students to engage actively with innovative technology tools integrated into the educational process. The primary mode of education in higher educational institutions is the lecture format. One systematic approach that fosters student engagement is the interactive method. This approach aims to equip students with the latest theoretical knowledge relevant to the course. The lecture presents to students the primary categories of recently discovered science, their respective fields of study, fundamental concepts, and currently debated issues in the scientific community.

To enhance students' knowledge and skillset, we integrate interactive learning technology in our teaching methodologies for the subject of physiological development. At present, the aim is to develop students' active thinking skills in all pedagogical technologies. The guidelines for effectively organizing an interactive lecture are outlined below: audience preparation, goal and expected result definition, adoption of work protocols, building trust and fostering a collaborative atmosphere, mandatory participation from all students, active listening to all opinions, written assignments, and feedback provision.

Students are empowered to take responsibility for their own learning. They can assess their knowledge and determine their own level. The feedback sheet encourages participation and allows for the assessment of each student's knowledge and engagement in lectures. This saves time on attendance checks.

Keywords: innovation, interactive, pedagogy, technology, reflection.

ГЕЛЬМИНТЫ ДИКИХ КОПЫТНЫХ ЖИВОТНЫХ КАЗАХСТАНА
HELMINTHES OF WILD AND DOMESTIC ANIMALS IN KAZAKHSTAN

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Анотация

Гельминтофауна диких и домашних копытных; экологические основы их обмена с паразитами; факторы формирования паразитофауны животных; воздействие гельминтозов на популяции диких животных.

Ключевые слова: Гельминт, биоценоз, антилоп, фауна, природная очаговость.

Abstract

Are the fauna of helminthes of wild and domestic animals and factors of its developing; ecological bases of changing by parasites between wild and domestic mammalia; pressing of helminthiases to populations of wild animals.

Keywords: Helminth, biocenosis, antelope, fauna, natural focality.

ALTERNATİF VE TAMAMLAYICI TEDAVİDE LİKENLERİN YERİ VE ÖNEMİ

THE ROLE AND IMPORTANCE OF LICHENS IN ALTERNATIVE AND COMPLEMENTARY TREATMENT

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Özet

Yüzyıllardır insanoğlu hayatını sağlıklı bir şekilde sürdürme gayreti içerisinde olmuştur. Bu süreçte, elinde var olan imkânları değerlendirmek suretiyle farklı tedavi yöntemleri geliştirmeye çalışmıştır. Özellikle modern tıbbın oluşmaya başlamadığı dönemlerde, farklı bitki türleri kullanılarak geleneksel tedavi yöntemleri oluşturulmuştur. Bitkilerin kendisine benzediği organa iyi geldiği düşünülerek özütler meydana getirilmiş ve birçok denemede başarılı sonuçlar elde edilmiştir. Bu noktada, likenler adı verilen simbiyotik organizmalar kendisinden çok fazla yararlanılan bir tür olmuştur. Varlığının milyonlarca yıl öncesine dayandığı bilinen likenlerin eski çağlarda tek bir bitki olduğu sanılmasına rağmen, yapılan çalışmalar ile likenler, mantarlar ve alglerin birleşmesi sonucu morfolojik ve fizyolojik bir bütün halinde meydana gelen simbiyotik organizmalar olarak tanımlanmışlardır. Türkiye'nin her bölgesinde karşılaşabileceğimiz likenler günümüzde popüler bilimsel çalışmaların temelini oluşturmaktadır. Likenlerin tıbbi kullanımı çok eski dönemlere dayanmaktadır. Eski çağlarda, morfolojisi likenlere benzeyen vücut bölümlerine tedavi yöntemleri geliştirilmiştir. Saça, akciğere, siğile, kafatasına benzediği için ilgili bölgelerin tedavisinde yararlanılan sayısız liken türü olmuştur. Günümüze geldikçe, yıllardır geleneksel tedavide kullanılan likenlerin farklı hastalık türlerine karşı alternatif tıpta veya temel tedavi yöntemlerine tamamlayıcı olarak kullanılabileceği öngörülmüştür. Likenlerin yapılarında bulunan farklı özellikteki sayısız kimyasal bileşen aracılığı ile gerçekleştirilen çok sayıda bilimsel araştırma bilim dünyasına katkı sağlamıştır. Özellikle farklı kanserli hücre hatları üzerinde gerçekleştirilen ve olumlu sonuçlar elde edilen birçok çalışma, likenlerin alternatif tedavi sürecinde yararlanılabilecek türler olduğunu kanıtlamıştır. Bunun yanında, likenlerin genotoksik, immünolojik, antialerjen, antiviral, antienflamatuar, antimikrobiyal ve antioksidan gibi farklı aktivite gösterdiklerine dair çalışmalar, yapılabilecek daha kapsamlı çalışmalara temel oluşturma açısından büyük önem taşımaktadır. Bu denli önemli kimyasal bileşenleri yapısında barındıran likenler üzerinde daha ayrıntılı çalışmalar yapılarak, tamamlayıcı ve alternatif tedavi yöntemlerine likenler tarafından sağlanacak katkı göz ardı edilemez bir gerçektir.

Anahtar Kelimeler: Alternatif tedavi, Geleneksel tedavi, Kimyasal bileşen, Liken, Tıbbi kullanım

Abstract

For centuries, human beings have endeavored to maintain a healthy life. In this process, they tried to develop different treatment methods by evaluating the available means. Especially in the periods when modern medicine did not start to form, traditional treatment methods were created by using different plant species. The extracts were thought to be good for the organ that the plants resembled, and successful results were obtained in many trials. At this point, the symbiotic organisms called lichens have become a species that has benefited a lot. Although it is believed that lichens, whose existence is known to be millions of years ago, were thought to be a single plant in ancient times, lichens were defined as symbiotic organisms formed as a result of the combination of fungi and algae as a morphological and physiological whole. Lichens which can be encountered in every region of Turkey are the basis of scientific studies popular today. The medical use of lichens dates back to ancient times. In ancient times, treatment methods have been developed for body parts whose morphology resembles lichens. Since it resembles hair, lungs, warts and skulls, there have been numerous types of lichen used in the treatment of related areas. Today, it has been envisaged that lichens, which have been used in traditional treatment for many years, can be used in alternative medicine against different types of diseases or as a complement to basic treatment methods. Numerous scientific researches carried out by means of numerous chemical compounds of different properties in the structures of lichens contributed to the scientific world. Many studies, especially on different cancer cell lines and with positive results, have proven that lichens are the species that can be utilized in the alternative treatment process. In addition, studies showing that lichens exhibit different activities such as genotoxic, immunological, antiallergenic, antiviral, anti-inflammatory, antimicrobial and antioxidant are of great importance as a basis for further studies. It is a fact that the contribution of lichens to complementary and alternative treatment methods cannot be ignored by making more detailed studies on lichens containing such important chemical components.

Keywords: Alternative therapy, Traditional therapy, Chemical component, Lichen, Medical use

INTERCALATION OF BIOACTIVE MOLECULE IN HDL MATRIX: BIOTECHNOLOGY APPLICATION

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Abstract

Hydrotalcites are noted lamellar double hydroxides (HDL) that are the subject of growing interest for their structural, textural and anion exchange properties. Recently, in the field of biotechnology, the intercalation of bioactive molecules in the hydrotalcite framework has been the focus of much research work, with the aim of improving their conditions through the process of controlled distribution and administration in the human body. In this context, this study focuses on the incorporation of the active molecule paracetamol into the hydrotalcite host framework the so-called "memory effect" of hydrotalcite phases. The HDL/paracetamol biohybrid compound was characterised by X-ray diffraction (XRD) analysis and Fourier transform infrared (FTIR) spectroscopy. The results of the characterisation reveal the formation of HDL/paracetamol biohybrid phases.

Keywords: hydrotaclite, biohybrid molecule, biotechnology, intercalation, adsorption.

A SHORT REVIEW OF MEDICINAL PLANTS EFFECTIVE IN THE TREATMENT AND CONTROL OF FEVER IN CHILDREN

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ABSTRACT

Fever is a very common important disease in children. Fever occurs in the body. The response to the spread of internal febrile agents throughout infection, malignancy, and Inflammatory and rheumatic processes, as well as external febrile agents, including microbes and poisons, in this article, we examined some of the sharp medicinal plants of Iran, Effective in controlling and reducing fever, such as Matricariarecutita (chamomile) drink. Tea is antipyretic and antipyretic due to its antimicrobial and diuretic properties. Sambucosnigra (Aghti) salicin, flavonoids and tannins can be mentioned among the effective ones. The compounds of this plant in the control of fever and inflammation of TiliaCordata flavonoids (Zirfion), tannins (with anti-pyretic and anti-inflammatory properties) and sterols (sedating compounds) and soothing effects) that help control fever in children. The evaluation of some mentioned cases has provided the general view that the use of medicinal plants is beneficial traditional use highlights promising plant species and focuses on validation studies highlight future research areas.

Keywords: Medicinal plants, Children, Fever, Traditional medicine, Iran.

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CHILDREN'S DEVELOPMENT OF APPLE VARIETIES BY INTEGRATING THEM INTO THE SCHOOL CURRICULUM WITH GAME TECHNOLOGY

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Түйіндеме

Мақалада Кіріктірілген білім бағдарламасының алға қойған мақсаты айқын, бағдары жүйелі. Зиялы азаматты – сана әлеуеті жоғары дамыған, сын тұрғысынан және жаңашыл ойлай білетін, рухы мықты, өз білімін қоғамның алға басуына жұмсай алатын адамды тәрбиелеуге ұмтылады. Аталмыш білім беру бағдарламасында тәрбие мен оқыту ажырамас байланыста болатыны баяндалған.

Кілт сөздер: Зияткерлік, өсімдік, алма ағашы, тыңайтқыш, әдіс, тәсіл, шеберлік, бағалау, топқа бөлу, топ серуент, эксперимент.

Abstract

The purpose of the Integrated educational program in the article is clear and systematic. It aims to educate an intelligent citizen - a person with a high level of consciousness, critical and innovative thinking, a strong spirit, and the ability to use their knowledge for the benefit of society. This educational program States that education and training are inextricably linked.

Keywords: intelligence, plant, Apple tree, fertilizer, method, technique, skill, assessment, grouping, group walk, experiment.

ШАРАП ПЕН СЫРА ҚҰРАМЫНДАҒЫ СІРКЕ ҚЫШҚЫЛДЫ БАКТЕРИЯЛАР БИОЛОГИЯСЫН ЗЕРТТЕУ

STUDY OF THE BIOLOGY OF ACETIC ACID BACTERIA IN WINE AND BEER

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АҢДАТПА

Мақалада шарап пен сыра құрамындағы сірке қышқылды бактериялар биологиясы зерттеліп қарастырылды. Шарап пен сыраның құрамында кездесетін сірке қышқыл бактерияларының мөлшері тәжірибе күндерінің ұзақтығына, сондай-ақ шарап пен сыраның түріне байланысты болатындығы, яғни тәжірибе күндері ұзарған сайын микроорганизмдер саны да артатындығы анықталды. Сонымен бірге шараптың қызыл түрінде ақ, құрғақ түріне қарағанда, ал сыраның қоңыр түрінде сары түріне қарағанда сірке қышқыл бактериялары жасушалары саны көбірек болатындығы белгілі болды. Бұл шарап пен сыраның бұл түрлерінің қышқылдылығына байланысты деп тұжырымдалды.

Кілт сөздер: шарап, сыра, сірке қышқылы бактериялар, зең саңырауқұлақтары, ашытқы сағырауқұлақтары.

ABSTRACT

The article reviewed the results of a study of the biology of acetic acid bacteria in wine and beer. It was found that the amount of acetic acid bacteria contained in wine and beer depends on the length of the days of experience, as well as on the type of wine and beer, which means that as the days of experience increase, the number of microorganisms also increases. At the same time, it turned out that in the red form of wine there are more cells of acetic acid bacteria than in white, dry, and in brown beer than in yellow. It has been suggested that this is due to the acidity of these types of wine and beer.

Keywords: wine, beer, acetic acid bacteria, mold fungi, yeast fungi.

ЖЕМШӨПТІ СҮРЛЕУДЕ ҚОЛДАНЫЛАТЫН МИКРОАҒЗАЛАРДЫҢ БИОЛОГИЯСЫН ЗЕРТТЕУ

INVESTIGATION OF THE BIOLOGY OF MICROORGANISMS USED IN FEED SILAGE

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АҢДАТПА

Мақалада жоңышқа және жүгері өсімдіктерінен дайындалған жемшөп сүрлемі микрофлорасы қарастырылды. Жемшөпті сүрлеуде қолданылатын микроағзалардың морфологиясы және сандық көрсеткіштері зерттелді. Сүрлеудің әр түрлі кезеңдеріндегі микроағзалардың түрлері анықталып, олардың морфологиясы зерттелді. Сондай-ақ әр түрлі сападағы сүрлемдердің құрамындағы органикалық қышқылдардың пайыздық мөлшері, pH-ы анықталды. Сүрлем дайындаудағы сүт қышқыл бактерияларының түрлері, олардың рөлі, маңызы анықталды.

Кілт сөздер: сүрлем, микроағзалар, жемшөп дақылдары, сүтқышқыл бактериялары, зең саңырауқұлақтары.

ABSTRACT

The article considers the microflora of feed silage prepared from alfalfa and corn plants. Morphology and quantitative indicators of microorganisms used in feed silage have been studied. The types of microorganisms at different stages of silage were identified, their morphology was studied. The percentages of organic acids in silos of various quality and pH were also determined. The types of lactic acid bacteria in the silage preparation, their role and significance were determined.

Keywords: silage, microorganisms, feed crops, lactic acid bacteria, mold fungi.

БИОЛОГИЯЛЫҚ ЖҮЙЕЛЕРДІҢ (МОЛЕКУЛАЛЫҚ-ПОПУЛЯЦИЯЛЫҚ) ҰЙЫМДАСТЫРЫЛУЫ МЕН ҚЫЗМЕТІН ЗЕРТТЕУДЕ АРНАЙЫ БИОИНФОРМАТИКАЛЫҚ БАҒДАРЛАМАНЫ ӘЗІРЛЕУ ЖӘНЕ ҚОЛДАНУДЫҢ МАҢЫЗЫ

THE IMPORTANCE OF DEVELOPING AND APPLYING A SPECIAL BIOINFORMATIC PROGRAM IN THE STUDY OF THE ORGANIZATION AND FUNCTIONING OF BIOLOGICAL SYSTEMS (MOLECULAR-POPULATION)

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АҢДАТПА

Биоинформатика - биологиялық жүйелерді зерттеу кезінде ақпараттар және ақпараттық технологияларды қолдануға бағытталған, биология, информатика және математиканы бір пәнге біріктіретін ғылым саласы. Биоинформатика- биологиялық жүйелерді модельдеуде сандық талдау әдістерін және биологиялық ақпаратты басқару үшін ақпараттық технологияларды қолдана отырып зерттейді. Әр түрлі ағзалардың геномдарын зерттеу қарқындылығы артып, нәтижесінде алынған ақпараттарды сақтайтын жаңа мәліметтер базалары пайда болып, ал қолданыстағы мәліметтер базалары олардың мүмкіндіктерін үздіксіз арттырады. Биологиялық жүйелерді зерттеуден алынған мәліметтер мен негізгі түсініктерді жетік меңгерту үшін биоинформатикалық бағдарламаларды әзірлеу және оларды оқытуда, зерттеу жұмыстарында қолдана білу бүгінгі күннің маңызды бағыты.

Кілт сөздер: Биоинформатика, геномика, биологиялық жүйе, интернет, генетикалық ақпарат.

ABSTRACT

Bioinformatics is a field of science that focuses on the use of information and information technology in the study of biological systems, combining biology, computer science and mathematics into one discipline. Bioinformatics-studies biological systems in modeling using quantitative analysis methods and information technologies for biological information management. The intensity of studying the genomes of various organisms is increasing, new databases are appearing in which the information obtained is stored, and existing databases are constantly increasing their capabilities. The development of bioinformatic programs for

mastering the data and basic concepts obtained as a result of studying biological systems, and the ability to apply them in teaching, research work is an important area of today.

Keywords: Bioinformatics, genomics, biological system, Internet, genetic information.

ТҮРКІСТАН ОБЛЫСЫНДАҒЫ ЖЕМІС АҒАШТАРЫ ЗИЯНКЕСТЕРІНІҢ БИОЛОГИЯЛЫҚ ЕРЕКШЕЛІКТЕРІ

BIOLOGICAL CHARACTERISTICS OF PESTS OF FRUIT TREES IN TURKESTAN REGION

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Аңдатпа

Зиянды насекомдар мен кенелер жеміс ағаштарының барлық мүшелерін (бүршігін, жапырағын, бітеу гүлін, бұтағын, діңін, тамырын) зақымдайды. Қатты зақымданған жеміс ағаштары әлсіреп, дұрыс өспейді, өнімі төмендейді. Көптеген зиянкестер (бітелер, кандалар, цикадалар, зауза қоңыздарының личинкалары, егеушілер, жеміс жемірлері) жеміс ағаштарына вирус және саңырауқұлақ ауруларын жұқтырушы да болып есептеледі.

Ғылыми зерттеу нәтижелері бойынша бір адамға бір жылғы жеміс-жидектің үлесі 110-115 кг. Дүние жүзінде бір адамның үлесі 35 кг жеміс екені анықталған. Оның ішінде бірінші орында — цитрустар, екінші — банандар, үшінші - жүзім, төртінші - алма.

Мақалада негізгі жеміс ағаштарының биологиялық ерекшеліктері, олардың фенофазасы сипатталады және оларға зиян келтіретін негізгі фитофагтарды жоюдың тиімді тәсілдері зерттеледі.

Мақалада айтылған зиянкестерге қарсы күресті жүйелі түрде енгізу мақсатында қолданылатын шаралар келтірілген. Олар агротехникалық жүйе, механикалық және биофизикалық әдіс, ауыл шаруашылығы дақылдарының жыртқыш және паразитті зиянкестері энтомофагтардың зиянкестерді жоюда үлесі мол екендігі айтылып отыр.

Түйін сөздер: зиянды насекомдар, зияндылығы, фенофаза, фитофаг, дернәсіл,энтомофаг.

Abstract

Harmful nasecoms and mites damage all organs (buds, leaves, clogging Flower, Branch, trunk, root) of fruit trees. Fruit trees with severe damage weaken, do not grow properly, and the yield decreases.Many pests (clogs, Canda, cicadas, larvae of zauza beetles, planters, fruit feeders) are also considered to be carriers of virus and fungal diseases on fruit trees.

According to the results of a scientific study, the proportion of one year's fruit per person is 110-115 kg. It is established that the share of one person in the world is 35 kg of fruit. Of these, in the first place — citruses, in the second — bananas, in the third - grapes, in the fourth - apples.

The article describes the biological features of the main fruit trees, their phenophase and examines the main effective ways to destroy the main phytophages that harm them.

The article presents measures taken for the purpose of systematic implementation of the fight against the mentioned pests. They say that the agrotechnical system, mechanical and biophysical method, entomophages, predatory and parasitic pests of agricultural crops, have a large share in the destruction of pests.

Keywords: harmful nasecomes, harmfulness, phenophase, phytophage,larva, entomophage.

CHARACTERISTICS OF THE GROWTH AND DEVELOPMENT OF SOY VARIETIES IN LOW-SALINITY SOILS OF THE ARAL SEA

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Аннотация

Арал бойы кем шорланган топырақларда соя сортларынын егиў мүддетлерин анықлаў, өсип раўажланыў қәсийетлерин үйрениў, фенологиялық бақлаўлар өткериў нәзерде тутылады.

THE SCIENTIFIC BASIS OF MEASURES TO CONTROL SUCKING PESTS ON CUCURBITS CROPS IN THE CONDITIONS OF KARAKALPAKSTAN

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шырынжа кушли тарқалған атызларға ислеў берилген биологиялық натийжеликти көрсетип, 3, 7 ҳәм 14-кунлерде 72,1-93,3% тен 66,2-96,3% шекем болған.

ҚҰРМА *DIOSPYROS* ТУЫСЫ АҒАШТАРЫНЫҢ МОРФОЛОГИЯЛЫҚ ЕРЕКШЕЛІКТЕРІ

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Аңдатпа

Мақалада Зенджи-Мару, Хиакуме және Рохо бриллианте сұрыптарының көшеттерінің морфологиялық сипаттамасына: өсу деңгейіне, тамыр жүйесінің, сабақтары мен жапырақтарының дамуы ерекшеліктеріне талдау жасалынды. Құрманың Зенджи-Мару, Хиакуме және Рохо Бриллианте сұрыптарына зерттеу жүргізу барысында құрма көшеттерінің қалыңдауы тамыз және қыркүйек айларына сәйкес келеді. Осы уақытта ұзындығына қарай өсуі баяулап, пластикалық заттардың ұзындыққа өсетін ұлпаларының құрылысына жұмсалуы азаяды және қоректік заттар қорының жиналуы басталды.

Зенджи-Мару құрмасында бірінші реттік өркендер екінші жылдары пайда болады. Хиакуме құрмасының сабақтары екінші жылы 135см-ге дейін өсіп, 76 жапыраққа дейін жаяды және өзіне тән, шоғырлы бұтақтанады. Жанама өркендер үш көршілес жапырақтарының қолтық бүршіктерінен 60^0 бұрыштан шығып, жан-жаққа қарай тарамдалады. Қат-қабаттарға орналасқан қолтық бүршіктері белгілі кезеңдерде пайда болған сияқты. Әрбір қабатта үш жанама бүршік болады. Бұл бүршіктер тез өскіш келеді, ұзындығы 10 см дейін жетеді. Күзге дейін пісіп жетіп үлгермей көбінесе алғашқы суықтарда үсік шалады.

Хиакуме құрмасы бірінші жылға қарағанда бұтақтар екінші жылы жылдамырақ өседі. Вегетациялық кезеңнің соңында өсімі 85-130 см-ды құрады. Мұнан құрма көшеттерінің төмен температураға тұрақтылығы өскендігін байқауға болады.

Зенджи-Мару құрмасы көшеттерінің бірінші жылы өсу қарқыны төмен, орташа есеппен вегетациялық кезеңнің соңына қарай 95-128 см биіктікке жетеді. Рохо бриллианте сұрыпының вегетациялық кезеңнің соңында олар 90-117см ғана өсіп, бірінші реттік жанама тамырлардан екінші ретті тамырлар тарап, ал олардың көп бөлігі үшінші реттік тамырларға бастау береді. Мұндай құрманың көшеттерінің тамырлары (шамамен 70%) 30-42см тереңдікте шоғырланған. Жоғарыда аталған Зенджи-Мару, Хиакуме және Рохо Бриллианте құрма ағаштарының морфологиялық көрсеткіштерін сараптай келе, Хиакуме құрмасының ағашы оңтүстіктің қуаңшылық континенттік климатына төзімділігін көрсетіп отыр.

Кілт сөздер: құрма, Зенджи-Мару, Хиакуме, Рохо бриллианте сұрыптары, вегетациялық кезеңі, тамыр жүйесі, өсу деңгейі

Abstract

The article analyzes the morphological characteristics of seedlings of the Zenji-Maru, Hiakume and Roho Brilliante varieties: the level of growth, the features of the development of the root system, stems and leaves. In the process of conducting a study of the varieties of Persimmon Zenji-Maru, Hiakume and Roho brilliant, the thickening of Persimmon seedlings

falls on August and September. At this time, growth in length slowed down, the expenditure of plastic substances on the construction of tissues growing to length decreased, and the accumulation of nutrient reserves began.

First-Order shoots appear on the Zenji-Maru date in the second year. The stems of hiakume dates grow up to 135cm in the second year, spreading up to 76 leaves and branching characteristic, clumpy. Lateral shoots branch out from the axillary buds of three adjacent leaves at an angle of 600 and branch out to the sides. It seems that the armpit buds, arranged in layers, were formed in certain periods. Each layer has three side buds. These buds are rapidly growing, reaching up to 10 cm in length. Often frostbite in the first cold before it has time to ripen by autumn.

Hiakume dates tend to grow branches faster in the second year than in the first year. At the end of the growing season, the growth was 85-130 CM. From this it can be seen that the resistance of Persimmon seedlings to low temperatures has increased. Zenji-Maru date seedlings have a low growth rate in the first year, on average reaching a height of 95-128 cm by the end of the growing season. At the end of the growing season of the Rojo brilliant variety, they grow only 90-117cm, spreading from the first-order lateral roots to the second-order roots, and most of them give the beginning to the third-order roots. The roots of seedlings of such dates (about 70%) are concentrated at a depth of 30-42cm. After analyzing the morphological indicators of the above-mentioned date trees Zenji Maru, Hiakume and Roho brilliant, the Hiakume date tree shows resistance to the arid continental climate of the South.

Keywords: persimmon varieties, Zenji Maru, Hiakume, Rojo brilliante, growing season, root system, growth level

FABACEAE ТҰҚЫМДАСЫ ӨСІМДІКТЕРІН ТҰЗДАНҒАН ЖЕРЛЕРГЕ ФИТОМЕЛИОРАНТ РЕТІНДЕ ҚОЛДАНУ МӘСЕЛЕЛЕРІ

PROBLEMS OF USING *FABACEAE* PLANTS AS A PHYTOMELIORANT IN SALINIZED LAND

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Аңдатпа

Өркениеттің үдемелі дамуына байланысты ауыл шаруашылығына қажетті көптеген жерлер басқа мақсатқа пайдаланылуда. Ауыл шаруашылығы жерлерін дұрыс пайдаланбау, мелиоративтік шараларды жүргізбеу салдарынан олар тозып, топырақ құнарлылығын жоғалтады.

Жаңа заман талабына сай биологиялық факторларды кеңінен қолдану туындап отырған мәселелерді шешудің бір жолы болып табылады. Ол экологиялық тепе-теңдікті сақтай отырып, егістік алқаптарының топырақ құрылымын жақсарту жұмыстарымен тығыз байланысты. Мұнда бірінші кезекте биологиялық заттар ретінде биомелиоранттар (көң, сабан, көк тыңайтқыш, қатардағы дақылдар және т.б.) қолданылуы мүмкін. Мелиорация саласындағы ғылыми-зерттеу жұмыстары ғылыми-зерттеу, топырақтану, су институттарында, республикалық академияларда, тәжірибелік-мелиоративтік станцияларда жүргізіледі. Ауылшаруашылығының барлық ландшафтты-бейімделу элементтері (қайта отырғызу, жер өңдеу, тыңайтқыштар және т.б.) топырақтың биологиялық, агрофизикалық және агрохимиялық қасиеттеріне жақсы әсер етеді. Сондықтан жергілікті фиторесурстарды пайдалана отырып, биомелиорацияны кеңінен қолдану ғылыми тұрғыдан өзекті және практикалық маңызы зор.

Нұртас елді-мекені топырақ жамылғысының тұздану дәрежесі Қаратөбе елді-мекені тұздану дәрежесінен жоғары – зерттелетін объектілер үшін орташа сортаң топырақ. Өсімдіктерді отырғызу кезінде топырақ ерітіндісінің ортасы қышқыл, өсімдік өскеннен кейін топырақ ортасы бейтарап және аздап сілтіліге ауысты. Бұл жағдай зерттелген шөптесін бұршақ тұқымдастар топырақтың физика-химиялық құрылымына ғана емес, сонымен қатар оны қоршаған ортаның pH деңгейіне де оң әсер ететінін көрсетті. Өсімдік тұқымдарының ішінде ең жоғары өну көрсеткіші кәдімгі жоңышқада байқалды. Өсімдікті өсіргеннен кейін екі бақылау орнында топырақтың тұздану дәрежесі төмендеді. Көң қоспаған топырақ үлгілерінің тұздану дәрежесі бойынша Нұртас елді-мекеніндегі жоңышқа егілген топырақтың тұздану дәрежесі Қаратөбе учаскесімен салыстырғанда айтарлықтай төмен. Бақылау топырақтарының тұздылығы өсімдіктер өскен барлық үлгілерде бірдей деңгейде болды. Оңтүстік Қазақстан

облысын мысалға ала отырып, деградацияланған суармалы жерлердің тұзденуын фитомелиорация арқылы жақсарту экологиялық және экономикалық тұрғыдан тиімді.

Кілт сөздер: ауылшаруашылығы, фиторесурс, деградация, фитомелиорация, тұздану, ерітінді.

Abstract

Due to the progressive development of civilization, many lands necessary for agriculture are used for other purposes. Due to improper use of agricultural lands, lack of reclamation and reclamation measures, they are degraded and lose soil fertility.

One of the ways to solve emerging problems is the widespread use of biological factors in accordance with modern requirements. It is closely related to work to improve the soil structure of crop areas while maintaining ecological balance. Here, first of all, bioameliorants (manure, straw, green manure, row crops, etc.) can be used as biological substances. Research work in the field of land reclamation is carried out in research, soil science, water institutes, republican academies, and experimental reclamation stations. All landscape-adaptive elements of agriculture (replanting, tillage, fertilizers, etc.) have a positive effect on the biological, agrophysical and agrochemical properties of the soil. Therefore, the widespread use of bioreclamation using local phytoresources is scientifically relevant and has great practical importance.

The level of soil salinity in the village of Nurtas is higher than the level of salinity in the village of Karatobe - moderately saline soil for the studied objects. When planting plants, the soil solution environment was acidic; after plant growth, the soil environment changed to neutral and slightly alkaline. This situation showed that the studied herbaceous legumes have a positive effect not only on the physicochemical structure of the soil, but also on the pH of its environment. Among plant seeds, the highest germination rate was observed in common alfalfa. After growing the plant, the level of soil salinity in the two observation sites decreased. In terms of the degree of salinity of soil samples without the addition of manure, the degree of salinity of soil sown with alfalfa in the village of Nurtas is significantly lower compared to the Karatobe site. The salinity of control soils showed the same level in all samples where plants grew. Using the example of the South Kazakhstan region, improving the salinization of degraded irrigated lands by phytomelioration is effective from an environmental and economic point of view.

Keywords: agriculture, phytoresource, degradation, phytomelioration, salinization, solution.

ОҢТҮСТІК ҚАЗАҚСТАН АУМАҒЫНДАҒЫ СҰР ТОПЫРАҚТАРДЫҢ СІҢІРУ КЕШЕНІ ЖӘНЕ ТРАНСЛОКАЦИЯ КОЭФФИЦИЕНТІН ЗЕРТТЕУ

STUDY OF ABSORPTION COMPLEX AND TRANSLOCATION COEFFICIENT OF GRAY SOILS IN SOUTHERN KAZAKHSTAN TERRITORY

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Аңдатпа

Топырақтың қайтара тұзденуі су және жер ресурстарын ортақ пайдаланатын елдер арасындағы үйлестіруді қажет ететін маңызды мәселе. Инвестиция тарту және басқару үшін де халықаралық ынтымақтастық қажет. Бір қызығы, тұздылық ауылшаруашылығын-дағы басқа да мәселелердің себебі де, салдары да топырақтың қайтара тұзденуын ауыл шаруашылығын тұрақты интенсификациялауға бағытталған басқа да шаралармен бірге азық-түлік қауіпсіздігінің тіректерінің бірі ретінде қарастырған жөн.

Сазды, қарашірікке бай топырақтарды өсімдіктерге қажетті мөлшерде қоректік заттармен (мысалы, суперфосфатпен) қанықтыруға болады, өйткені артық мөлшерде олар топыраққа сіңіп, өсімдіктерге зиян келтірмейді және сумен шайылмайды. Бірақ селитраны көп мөлшерде қолдануға болмайтынын атап өткен жөн, өйткені ол тіпті сазды топырақта нашар сіңеді. Сондықтан іс жүзінде топырақтың беткі қабатына екі кезеңде енгізу керек: бірінші - тұқым себу кезінде және екінші - өсімдіктер жақсы дамып, толық өскенде.

Құмды топырақтардың қасиеттері мүлдем басқаша. Олардың құрамында саз бөлшектері мен қарашіріктері аз, сіңіру қабілеті шамалы, қоректік заттар сумен оңай шайылып, өсімдіктер үшін ізсіз жоғалады.

Құрғақшылық болып, топырақ ерітіндісінің концентрациясы жоғарылағанда құмды топырақ артық тұздарды сіңіре алмайды. Сондықтан топырақ суда еритін заттармен тыңайтылған болса, өсімдіктер өлуі мүмкін. Осыған байланысты топырақ ерітіндісінің оңтайлылығы, әсіресе жоғары және қоректік заттарды орынсыз жоғалтпау үшін құмды топырақтарды біршама бірнеше рет тыңайтады.

Нұртас, Қаратөбе елді-мекендерінің топырақ жамылғысындағы катиондар мен аниондардың мөлшері, сондай-ақ байқалған өсімдіктердің тұздану дәрежесі мен фитомелиоративті қасиеттері анықталды.

Өсімдіктер отырғызылған топырақтың химиялық құрамына талдау жасалып, зерттелетін топырақтың тұздану дәрежесінің төмендеуі байқалды. Өсімдіктердің мелиоративтік қабілеті бар екені анықталып, пайдалану мүмкіндігі көрсетілді.

Бақыланатын және тыңайтылған топырақтағы иондардың мөлшері және тұздылықтың азаюы анықталды.

Зерттеу объектілері үшін топырақ үлгілерінің сіңіру кешені және биологиялық транслокация коэффициенті есептелді.

Кілт сөздер: сұр топырақ, сіңіру кешені, транслокация коэффициенті, қайтара тұздану, топырақ ерітіндісі, тұздану дәрежесі, қарашірік.

Abstract

Soil salinization is an important issue that requires coordination between countries that share water and land resources. International cooperation is also needed to attract and manage investments in land and water resources. Interestingly, salinity is both a cause and a consequence of other problems in agriculture. Soil salinization should be considered as one of the pillars of food security, together with other measures aimed at sustainable intensification of agriculture.

Clayey, humus-rich soils can be fertilized with nutrients (for example, superphosphate) in the amount necessary for plants, since in excess they will not harm the plants by being absorbed into the soil and will not be washed off with water. But it should be noted that saltpeter should not be used in large quantities, since it is poorly absorbed even in clay soils. That is why, in practice, it should be applied to the surface layer of soil in two parts: the first time - when sowing seeds, and the second time - when the plants have really developed well and fully grown.

The properties of sandy soils are completely different. They contain few clay particles and humus, the absorption capacity is insignificant, nutrients are easily washed out by water and disappear without a trace for plants.

When drought occurs and the concentration of the soil solution increases, sandy soil cannot absorb excess salts. Therefore, if the soil is fertilized with water-soluble substances, the plants may die. In this regard, the optimality of the soil solution is especially high, and in order not to lose nutrients unnecessarily, sandy soils are fertilized little by little, several times.

The amount of cations and anions in the soils of the villages of Nurtas and Karatobe, as well as the degree of salinity and phytomeliorative properties of the observed plants were determined.

The chemical composition of the soil in which the plants were planted was analyzed, and a decrease in the degree of salinity of the studied soil was noted. It has been established that plants have ameliorative ability, and the possibility of use has been shown. The amount of ions in control and fertilized soils and the reduction in salinity were determined.

For the objects of study, the absorption complex and the coefficient of biological translocation of soil samples were calculated.

Keywords: gray soil, absorption complex, translocation coefficient, return salinization, soil solution, degree of salinization, humus.

«БОТАНИКАЛЫҚ БАҚ» БАУЫНДАҒЫ АЛМА ЗИЯНКЕСТЕРІНЕ БИОПРЕПАРАТТАРДЫ ҚОЛДАНУДЫҢ ТИІМДІЛІГІ

THE EFFECTIVENESS OF THE USE OF BIO PREPARATIONS AGAINST APPLE PESTS IN THE "BOTANICAL GARDEN"

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Аңдатпа

Түркістан аумағында орналасқан Қожа Ахмет Ясауи атындығы Халықаралық қазақ-түрік университетінің ботаникалық бағында өсіп тұрған алма ағаштарының зиянкестеріне қарсы биопрепараттарды қолданудың тиімділігін анықтаған. Алма ағашының зиянкестеріне қарсы кешенді күрес жолдарын пайдаланған тиімді болады деп есептейміз. Яғни, зиянкеске түрде төзімді сорттарды қолдану, минералдық және органикалық қоректену жағдайын дұрыстау (жақсы дамыған өсімдіктердің зиянкеске қарсы тұру қабілеті жоғарылайды), биологиялық әдістерді пайдалану және химиялық препараттармен алма ағашының алқаптарын өңдеу.Зерттелу аумағындағы ауа температурасына байланысты алма жемірі мен алманың даму сатыларының тойқаласуы расталды. Жұлдызқұрттардың қуыршаққа айналуы мамырдың екінші,үшінші онкүндігінде басталатындығы анықталды сонымен қатар, алма ағаштарын зиянкестерден қорғауда экологиялық және биологиялық жағынан тиімді интеграциялық жүйе жасалып, биологиялық препарат Фитоферм алмаларды алма жемірден (биологиялық тиімділігі жоғары, жеміс зақымдалуы төмен) сақтап қалатындығы және, сапалы өнім алуға мүмкіндік бар екені дәлелденді.

Кілітті сөздер: биологиялық препарат, алма жемірі, зиянкестер, ботаникалық бақ, жұлдызқұрт

Abstract

Curriculum vitae. Kozha Ahmet Yasawi, located in the territory of Turkestan, determined the effectiveness of using biological preparations against pests of apple trees growing in the botanical garden of the International Kazakh-Turkish University. We believe that it will be effective to use complex control methods against apple tree pests. That is, the use of pest-resistant varieties, mineral and organic nutrition

correcting the condition (the ability of well-developed plants to resist pests increases), the use of biological methods and processing of apple tree fields with chemical preparations. The overlap of apple rot and apple development stages depending on the air temperature in the study area was confirmed. It was determined that the transformation of starworms into pupae begins in the second and third decade of May.

An ecologically and biologically effective integrated system was created to protect apple trees from pests, and it was proven that the biological preparation Fitoferm protects apples from apple rot (high biological efficiency, low fruit damage) and it is possible to obtain quality products.

Keywords: biological preparation, apple rot, pests, botanical garden, starling

АЗОТ ЖӘНЕ ФОСФОР ТЫҢАЙТҚЫШТАРЫНЫҢ ЖОҢЫШҚАНЫҢ ФОТОСИНТЕТИКАЛЫҚ БЕЛСЕНДІЛІГІНЕ ӘСЕРІ

THE EFFECT OF NITROGEN AND PHOSPHORUS FERTILIZERS ON THE PHOTOSYNTHETIC ACTIVITY OF ALFARM

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Аңдатпа

Мақалада Қазақстанның оңтүстік батыс бөлігінің техногенді ластанған аймағында фосфор мен азот тыңайтқышының әрекеті қарастырылған. Зерттеу жұмысының мақсаты экологиялық қауіпті аймақта ластанған топырақты биологизациялау арқылы оны қорғаудың жолын анықтау болды және минералды тынайтқыштардың құрамын жеке қаралып, оның әсер ету механизмі алғашқы рет, егістік жоңышқа мен түйежоңышқаның фотосинтетикалық қызметіне әсерін бірінші рет ашық сұр топырақ пен шалғынды батпақты топырақта зерттелгені баяндалады.

Бұл зерттеулерде, сонымен қатар, азот тыңайтқышының мөлшері жоғарлаған сайын жоңышқалардың селбесу қызметі жоғарлағанымен, азот тыңайтқышының аз мөлшеріне қарағанда, азот тыңайтқышының көп мөлшері селбесу қызметіне кері әсерін тигізді. Азот тыңайтқышының аз және орта мөлшерлері бақылауқа қарағанда жоңышқалардың бактерия түйнектерінің санын, салмағын және леггемоглобин мөлшерін де арттырды.

Азот тыңайтқышы түйежоңышқаның селбесу қызметіне егістік жоңышқаға қарағанда, оң әсер етті.

Азот тыңайтқышының аз және орта мөлшерлерінде жоңышқаның өнімі қарағанда бактериалды препаратты қосқан ңұсқада жоңышқаның өнімі болғандығы анықталды.

Кілт сөздер: азот, фосфор, фотосинтетикалық қызмет, селбесу, өнім, леггемоглобин

Abstract

The article examines the action of phosphorus and nitrogen fertilizers in the technogenically polluted area of the southwestern part of Kazakhstan. The purpose of the research work was to determine the way to protect contaminated soil by biologizing it in an ecologically dangerous area, and it is reported that the composition of mineral fertilizers was examined individually, the mechanism of its action was studied for the first time, the effect on the photosynthetic activity of field alfalfa and camellia was studied for the first time in light gray soil and meadow swamp soil.

In these studies, in addition, although the tillering activity of alfalfa increased with increasing amounts of nitrogen fertilizer, high nitrogen fertilization had a negative effect on tillering activity compared to low nitrogen fertilization. Low and medium doses of nitrogen fertilizer

also increased the number, weight and leghemoglobin of alfalfa bacterial nodules compared to the control.

Nitrogen fertilization had a positive effect on the tillering activity of camellia compared to field alfalfa.

It was found that alfalfa products were more abundant in samples with bacterial preparation than alfalfa products at low and medium amounts of nitrogen fertilizer.

Keywords: nitrogen, phosphorus, photosynthetic activity, metabolism, product, leghemoglobin.

ХҚТУ БОТАНИКАЛЫҚ БАҒЫНЫҢ ЖЕМІС АҒАШТАРЫНЫҢ ӨНІМДІЛІГІНЕ АЗОТ, ФОСФОР, КАЛИЙ МИНЕРАЛДЫ ТЫҢАЙТҚЫШТАРЫНЫҢ ӘСЕРІ

THE EFFECT OF NITROGEN, PHOSPHORUS, POTASSIUM MINERAL FERTILIZERS ON THE PRODUCTIVITY OF FRUIT TREES OF THE BOTANICAL GARDEN OF IKTU

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Аңдатпа

Мақалада егіншіліктің агротехникалық системасының аса жауапты бөлігі - дақылдарды дұрыс тыңайту болатындығы және тыңайтқыштарды қолданудың түрлері, мөлшері және мерзімдері әртүрлі дақыл үшін әртүрлі екендігі туралы мәліметтер келтірілген. Тыңайтқыштарды ұтымды және тиімді пайдалану үшін, ең алдымен өсімдіктің биологиялық ерекшеліктерін, соның ішінде қоректік элементтерді пайдалану деңгейін, екіншіден өсімдіктен алынатын өнім мөлшерін, оның ішіндегі элементтердің мөлшерін алдын-ала болжау қажет болатындығын айқындап көрсеткен. Қазақстанда егілетін саналуан ауылшаруашылық дақылдарының өнімі және сапасы, олардың топырақ-климат жағдайларының ерекшеліктеріне, оларға қолданылатын агротехникалық шараларға тікелей байланысты, сондықтан еліміздің ауыл шаруашылығы өндірісінің маңызды салаларына жеміс шаруашылығы жатады және жеміс шаруашылығының негізгі міндеті – халықтың азық-түлігі және өңдеу өнеркәсібінің шикізаты саналатын жемістерді өндіру екендігіне кең түрде тоқталған.

Кілт сөздер: тыңайтқыш, агротехника, элементтер, топырақ, климат.

Abstract

The article provides information that the most important part of the agrotechnical system of agriculture is the correct fertilization of crops and that the types, sizes and timing of fertilizer application are different for different crops. For the rational and effective use of fertilizers, it is necessary, first of all, to predict in advance the biological characteristics of the plant, including the level of use of nutrients, and secondly, the amount of product obtained by the plant, the amount of elements contained in it. The production and quality of agricultural crops grown in Kazakhstan directly depend on the characteristics of soil and climatic conditions, agrotechnical measures applied to them, therefore fruit growing belongs to the most important branches of agricultural production in the country, and it is widely emphasized that the main task of fruit growing is the production of fruits, which are the raw materials of the food and processing industry of the population.

Keywords: fertilizers, agrotechnics, elements, soil, climate.

ТҮРКІСТАН ӨҢІРІНДЕГІ ТОПЫРАҚ МИКРОАҒЗАЛАРЫНЫҢ ФИЗИОЛОГИЯЛЫҚ ЕРЕКШЕЛІКТЕРІН АНЫҚТАУ

DETERMINATION OF PHYSIOLOGICAL CHARACTERISTICS OF SOIL MICROORGANISMS OF TURKESTAN REGION

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Аңдатпа

Мақалада топырақ микроорганизмдері бірлестігінің физиологиялық әртүрлілігін зерттеудің әдістемелік тәсілдері талқыланып, сонымен қатар, топырақ микрофлорасына микроорганизмдердің барлық белгілі топтары: спора түзетін және спора түзбейтін бактериялар, актиномицеттер, саңырауқұлақтар, спирохеталар, архебактериялар, қарапайымдылар, көк-жасыл балдырлар, микоплазмалар және вирустар кіретіні туралы мәліметтер келтірілген. Топырақ микрофлорасының сапалық және сандық құрамына топырақтың түрі, оның құнарлылығы, ылғалдылығы, аэрация және физика-химиялық қасиеттері әсер етеді. Топырақ микробиоценозына адамның шаруашылық әрекеті болған топырақты өңдеу, тыңайту, мелиорациялау, өндіріс қалдықтарымен ластану айтарлықтай әсер етеді.

Кілт сөздер: бактериялар, актиномицеттер, саңырауқұлақтар, спирохеталар, архебактериялар.

Abstract

The article discusses methodological approaches to the study of the physiological diversity of the association of soil microorganisms, and also provides data that the soil microflora includes all known groups of microorganisms: spore and spore-forming bacteria, actinomycetes, fungi, spirochaetes, archaebacteria, protozoa, blue-green algae, mycoplasmas and viruses. The qualitative and quantitative composition of the soil microflora is influenced by the type of soil, its fertility, humidity, aeration and physico–chemical properties. The microbiocenosis of the soil is significantly affected by human activity: tillage, fertilization, land reclamation, industrial waste pollution.

The microflora of the soil varies significantly in quantitative and species composition depending on the chemical composition of the soil, its physical properties, reaction (pH), moisture capacity, and degree of aeration. Climatic conditions, the time of year, methods of agricultural tillage, the nature of vegetation cover and other factors also significantly affect.

Soil as a habitat and a product of the vital activity of microorganisms is a complex system, including species diverse in physiology, providing a biological cycle of substances, soil formation processes and their resistance to natural and anthropogenic factors. This determines the theoretical and applied importance of environmental studies of microbial communities.

The key factors of the ecology of microorganisms are the taxonomic and functional diversity of the microbial community and the nature of the interaction of members of this community, ensuring the formation of soil and mineral nutrition of plants.

Keywords: bacteria, actinomycetes, fungi, spirochetes, archebacteria.

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THE PLACE OF INNOVATIVE TECHNOLOGY IN THE ACCELERATED PRODUCTION OF QUALITY GRAPE PLANTING MATERIAL IN LABORATORY CONDITIONS

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Abstract

This article was carried out using an innovative technology in the accelerated production of high-quality grape planting material in laboratory conditions. One of the most effective ways to obtain healthy virus - free planting material for grapes is based on the introduction of post-apocalyptic meristems into a sterile crop in vitro, followed by microclonal reproduction, which ensured a high reproduction rate. The importance of scientific and laboratory work was also explained to schoolchildren.

Keywords: in vitro, experience, critical thinking, competence, skill, action, experiment, control, modeling.

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БИОРАЗНООБРАЗИЕ РАСТИТЕЛЬНОГО ПОКРОВА ЕРТЫССКОГО ФЛОРИСТИЧЕСКОГО ОКРУГА

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Флора, как и любое другое природное явление, обладает определенными признаками, характеризующими каждую флору как таковую и могущими сопоставляться друг с другом при сравнительном изучении флор. Важнейшим признаком, каждой флоры, является ее видовой состав. Учет видов, произрастающих на определенной территории.

Таким образом, охрана природы и расточительное использование её богатств, в том числе фитобиоты, в нашей стране, являются неотъемлемой составной частью программы развития молодого государства, и имеют важнейшее научное, социальное и экономическое значение.

Разработка научных основ, наиболее оптимального и рационального использования природных ресурсов и действенной охраны окружающей среды невозможна без всестороннего изучения растительного мира, который является базово-функциональной основой существования биосферы, как в планетарном, так и в региональном масштабах.

В связи с этим, изучение фитобиоты, в том числе углубленные флористические исследования отдельных природных регионов, очень актуально. Оно дает возможность глубже познать все разнообразие видового состава, раскрыть индивидуальные особенности флоры, путем разностороннего анализа ее элементов, выявить особенности эндемизма и генезиса, научно обосновать пути рационального использования естественных богатств данной флоры, определить необходимые мероприятия в области охраны редких растений.

Такие исследования предполагают также дальнейшее определенное развитие и разработку научно-технических вопросов флористики, флорогенетики, фитогеографии и прикладной ботаники.

Учет видового состава флоры дает представление об общей численности видов и о их распределении между родами и другими вышестоящими систематическими категориями. Количество, слагающих флору видов непосредственно отражает ее богатство.

Одним из очень интересных и своеобразных во флористическом отношении регионов является: Ертысский флористический округ, расположенный на северо-востоке Казахстана, который разделяет на две половины долины реки Ертыс. Округ складывают очень древние степи, на севере Барабинская степь, вся восточная Кулундинская и долина реки, очень богата биоразнообразием флоры.

Каждой флоре свойственны соотношения между количествами видов, относящихся к различным систематическим группам. Существенные черты каждой флоры связаны с экологической природой слагающих ее видов. Разным флорам свойственны различные соотношения между деревянными и травянистыми растениями.

Сбалансированное природопользование, т.е. хозяйственное освоение и охрана природных ресурсов, является самой актуальной проблемой современности. В этом свете разработка эффективных научных программ, важных при природоохранных задачах невозможна, без комплексного изучения региональных флор, а также растительности.

Таким образом, изучение флоры отдельных географических районов является неотъемлемыми и первостепенными вопросами. Детальная инвентаризация видового состава, в частности многочисленных полезных дикорастущих растений представляет практический интерес.

Результаты изучения таксонометрических структур Ертысского флористического округа показывает подтвержденность локальных флор серьезным измерениям сопряженных процессами ксерофитизации. Самым богатым по видовому разнообразию и имеющим наиболее сложную структуру является группа локальных флор каштановых почв (40,3%). Далее в убывающем порядке за ним следует группа локальных флор: черноземов (30,2%) и южных черноземов (18%). Остепненные степи занимают среднюю и южную части округа.

Ведущая роль *Asteraceae, Poaceae, Faryophyllaceae* и *Rosaceae* доказывает, что процесс деградации растительного покрова постоянно идет, этот процесс сопряжен с будущим опутыванием и связанный с ним миграцией «южных» видов не только в песков, а также в специфические интразональные группы локальных флор.

В составе флоры Ертысского флористического округа выявлены 29 видов редких и исчезающих растений, относящихся к 14 семействам. Дана краткая характеристика 9 видов и меняющих статус остро нуждающихся, 10 видов относящихся к категории редких и 10 видов нуждающихся в контроле над состоянием популяции с указанием лимитирующих факторов и мер по охране.

ЖҮЗІМ ШАРАБЫН ЕКІНШІЛІК ҚАЙТА ПАЙДАЛАНУ ЖОЛДАРЫ МЕН ЕРЕКШЕЛІКТЕРІ

WAYS AND FEATURES OF SECONDARY REUSE OF GRAPE WINE

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Аңдатпа

Ғылыми мақалада зерттелген обьект ретінде шарап өндірісі алынды. Шарап өндірісімен ерте кезеңнен бері айналысып келеді, бірақ оның танымалдылығы тек 2012-2018 жылдардан бастап арта бастады.

Республикамыздың мақтанышы болған «Arba wine» шарап зауыты, Қазақстандық шарап экспортының лидері. Зауыт ашылғалы бері әлемдік сомельелер жыл сайын келіп отандық өнімімізге жоғары баға беріп кетуде.

Шарап өндірісінің ең үлкен кемшілігі ол өнделген жүзімнің қалдықтарының іске асырылмауы. Өнеркәсіптік шарап өндірісінің дамуы өндірушінің дайын өнім сапасына көбірек көңіл бөлуіне әкеледі. Бұл фактор көбінесе шарап жасауда қолданылытын материалдарға, сондай-ақ техникалық құрамдас бөліктеріне байланысты болады. Шарап өндірісінен қалған қалдық заттар ақуызды заттарға, минералды заттарға бай болып келеді. Екінші реттік шарап жасау процесстерінің ең басты маңыздылығы ол алғашқы өңдеу нәтижесінде алынған материалдарды (мезга) өңдеу болып табылады. Сапалы жасалған екіншілік шарап өнімі МемСТ (ГОСТ) талаптарына сай шарап болып шығады. Екіншілік шарапты хош иісімен, тәтті дәмімен, мөлдірлігімен ажыратуға болады.

Екіншілік шарап өндірісіне сұраныс шарап өндірушілердің жүзім тапшылығына ұшырағанынан бері пайда болды. Екіншілік шараптың екі түрі бар: питео және пикет. Питео шарабы француз шарапшысының атына орай қойылған. Ол шарап өндірісінің қалдықтарын екіншілік шарап өндірісіне қолданып, сапалы тек білікті сомельелер ажырата алатын шарап алды. Ол кезде екіншілік шараптар өте бағалы өнім ретінде сатылған және де спирті аз болғандықтан күнделікті қолданысқа алынған. Питео шарабы алынған мезгаға су және қант қосып жасалынады. Жәй шараптан бұл шараптың айырмашылығы экстарктының аздығы.

Пикет ол да екіншілік шараптың бір түрі. Питеодан айырмашылығы ол қант қосылмайтындығында. Дәмі жай су мен шарап араластырғандай болады.

Уақыт өте келе екіншілік шарап жасау мүлдем өндірістен шығып кетті. Германия, Италия, Франция елдерінде екіншілік шарап өндіру технологиялық картаға қосылған және қалдықтың мөлшерін азайтқан. Ендігі біздің қойған мақсатымыз екіншілік шарапты жасап, сапасын тексеріп өндіріс орындарына ұсыныс жіберіп, елімізде аз қалдықты технологияны жетілдіру.

Кілт сөздер: шарап, технология, жүзім, екіншілік қайта өңдеу, өндіріс.

Abstract

Wine production was taken as the studied object in the scientific article. It has been engaged in wine production since early times, but its popularity began to increase only from 2012-2018.

"Arba wine" winery, the pride of our republic, the leader of Kazakhstan's wine export. Since the opening of the factory, world sommeliers come every year and praise our domestic products.

The biggest disadvantage of wine production is the lack of utilization of the waste of harvested grapes. The development of industrial wine production leads the producer to pay more attention to the quality of the finished product. This factor often depends on the materials used in winemaking, as well as technical components. Waste products from wine production are rich in proteins and minerals. The main importance of the secondary winemaking process is the processing of the materials (must) obtained as a result of the primary processing.

A quality secondary wine product is a wine that meets the requirements of MemST (GOST). Secondary wine can be distinguished by its aroma, sweet taste, and transparency.

The demand for secondary wine production has arisen since wine producers faced a shortage of grapes. There are two types of secondary wine: piteo and piquet. Piteau wine is named after the French winemaker. He used the waste of wine production for secondary wine production, obtaining a quality wine that only qualified sommeliers can distinguish.

At that time, secondary wines were sold as a very valuable product, and because of their low alcohol content, they were used on a daily basis. Piteo wine is made by adding water and sugar to the obtained juice. The difference of this wine from ordinary wine is that it has less extract.

Piquet is a type of secondary wine. Unlike Piteo, it does not contain sugar. It tastes like water and wine mixed together.

Over time, secondary winemaking has completely gone out of production. In Germany, Italy, France, secondary wine production has been added to the technological map and reduced the amount of waste. Our goal now is to make secondary wine, check its quality and send proposals to production facilities, to improve low-waste technology in the country.

Keywords: wine, technology, grapes, secondary processing, production.

БИОЛОГИЯ БОЙЫНША ОҚУ-ӘДІСТЕМЕЛІК ӘДЕБИЕТ ОҚУШЫЛАРДЫҢ АҚПАРАТТЫҚ-КОММУНИКАТИВТІК ДАҒДЫЛАРЫН ҚАЛЫПТАСТЫРУ ҚҰРАЛЫ РЕТІНДЕ

EDUCATIONAL AND METHODOLOGICAL LITERATURE ON BIOLOGY AS A MEANS OF FORMING INFORMATION AND COMMUNICATIVE SKILLS OF STUDENTS

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Аңдатпа

Мақалада орта мектептің 6-сыныбына арналған оқулықтар, оқу құралдары және басқа материалдарды дайындау кезінде ескерілуі керек оқушылардың ақпараттық-коммуникативтік дағдыларына талдау жасалады. Оқу-әдістемелік құралдарды талдау бірыңғай схема бойынша жүзеге асырылды. Бастапқыда оқулыққа талдау жасалды. Біздің зерттеуіміз үшін оқулықтардың компоненттерін, мысалы, игеруді ұйымдастыру аппаратын (сұрақтар мен тапсырмалар, зертханалық жұмыстар, терминдермен жұмыс), кіріспе мақаланы талдау маңызды. Оқулықтың бұл компоненттері ақпараттық-коммуникативтік дағдылардың құрамына кіретін іс-әрекеттерге байланысты таңдалды. 6-сыныпқа арналған биология оқулықтары (соның ішінде жұмыс дәптерлері) біздің зерттеуіміздің орталығы болды . Сондай - ақ, биология сабақтарында биологиялық мазмұнды ұйымдастыру және АКД қолдану бойынша әдістемелік ұсыныстарға ерекше назар аударылған сабақтарға арналған оқу-тақырыптық жоспарлар талдау объектісіне айналды. Биология бойынша нормативтік құжаттарды талдау оларда арнайы топқа ақпараттық-коммуникативтік дағдылар бөлінбегенін және сәйкесінше оларды қалыптастыру тәсілдері белгіленбегенін көрсетті. Талдау объектісі параграфтардан кейін мәтіннің мағынасын түсінуге, дербес тапсырмалар мен жоғары қиындықтағы тапсырмаларды орындауға бағытталған сұрақтар болды. Өз бетінше жұмыс істеуге арналған сұрақтар мен тапсырмалар параграфтан кейінгі сұрақтардан ерекшеленеді, өйткені олар көбінесе оқушылардан жалпыланған білімді және оларды орындауға көбірек уақытты қажет етеді. Өздік жұмыстарға арналған тапсырмалардың сандық талдауы 38,2% биологиялық білімді тексеруге және ақпараттық-коммуникативтік дағдыларды қалыптастыруға бағытталғанын көрсетті. Қиындықты арттырған тапсырмалардың ішінде тек бірнешеуі ғана ақпараттық-коммуникативтік дағдыларды қалыптастыруға бағытталған. Оқулықтағы барлық сұрақтар мен тапсырмаларды талдау олардың АКД сериясын жаттықтыру үшін пайдаланылуы мүмкін екенін көрсетті. Алайда, оларды дағдыларды алғашқы оқытуда қолдану көбінесе мүмкін емес, өйткені оларды орындау тәсілі жоқ және білім деңгейіне өте тәуелді.

Кілт сөздер: ақпараттық-коммуникативтік дағдылар, өздік жұмыс, қиындатылған тапсырмалар, оқулықтар компоненттері

Abstract

The article analyzes the information and communication skills of schoolchildren, which should be taken into account when compiling textbooks, textbooks and other materials for the

6th grade of secondary school. The analysis of teaching aids was carried out according to a single scheme. Initially, the textbook was analyzed. For our research, it is important to analyze such components of textbooks as the apparatus for organizing learning (questions and assignments, laboratory work, working with terms), an introductory article. These components of the textbook were chosen because they contain actions that are part of information and communication skills. Biology textbooks for the 6th grade (including workbooks of these program lines) became the center of our research . Also, the object of the analysis was the educational and thematic lesson plans, which paid special attention to methodological recommendations on the organization of biological content and the use of ICU in biology lessons. The analysis of normative documents on biology showed that they did not allocate information and communication skills to a special group and, accordingly, did not prescribe ways to form them. The object of the analysis was the questions after the paragraphs aimed at understanding the meaning of the text, at performing independent tasks and tasks of increased difficulty. Questions and tasks for independent work differ from the questions after the paragraph in that they often require students to have more generalized knowledge and more time to complete them. A quantitative analysis of tasks for independent work showed that 38.2% are aimed at testing biological knowledge and at the formation of information and communication skills. Among the tasks of increased difficulty, only a few are aimed at the formation of information and communication skills. An analysis of all the questions and tasks in the textbook showed that they can be used to work out a number of ICS. However, using them in the initial training of a skill is often impossible, since they lack a way to perform them and strongly depend on the level of knowledge.

Keywords: information and communication skills, independent work, complex tasks, textbook components

ТҰҚЫТӘРІЗДІ БАЛЫҚТАРДЫҢ БИОЛОГИЯЛЫҚ КӨРСЕТКІШТЕРІН АНЫҚТАУ

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Андатпа

Мақалада кейінгі жылдары ең бағалы кәсіпшілік маңызы бар (қорытпа, бекіре, албырт туыстастары) балықтардың қоры күрт азаюда. Балықтар қорының азаюына әсерін тигізетін көптеген факторлардың ішінде мыналарды атауға болады: Есепсіз аулау — бұл құбылыс көпшілік теңіздер мен ішкі су көздерінде кеңінен таралған. Есепсіз аулау салдарынан есеймеген жас балықтарды аулап, олардың популяциясына әсерін тигізіп, сандарының өсуіне кедергі жасап, тіпті сол түрдің құрып кетуіне себепші болып отыр. Қазіргі уақыттағы балық шаруашылығының ең басты міндеті есепсіз аулаумен күрес жүргізу және олардың популяциясын қайтадан қалпына келтіру. Зерттеу жұмыстары бойынша Сырдария өзенінде тіршілік ететін балықтардың 6 түрі зерттелді. Олар: сазан, жыланбас, ақ амур, бозша мөңке, теңге балық, қарабалық, Балықтардың биологиялық ерекшеліктері, жыныстық ара-қатынасы анықталды. Олардың жалпы ұзындығы, жалпы және кіші салмағы жастық құрылымы, Фультон және Кларк бойынша қондылық коэффициенті анықталды. Сырдария озенінің тұқы тәріздес балықтар 2-4 жылда жыныстық пісіп-жетіледі. Ареалының оңтүстігінде солтүстікке қарағанда тезірек пісіп жетіледі. Балқаш көлінде, Бұқтырма су қоймасында Арал сазанның пісіп-жетілуіне 4-6 жыл қажет. Соңғы су қоймаларында аталық балықтар дене ұзындығы 16-30 см болғанда 3-4 жылда пісіп-жетіледі, ал аналықтары ұзындығы 34 см болғанда 5 жылда пісіп-жетілетіндігі анықталған. Көптеген сүйекті балықтардың өсуін қабыршақтарының жылдық сақиналануына қарай анықтауға болады. Мұндай заңдылық қабыршақтың өсуі балық ұзындығының өсуіне тура пропорционал екендігіне негізделген. Барлық ауқымдағы қабыршақтарының ұзындығы мен балықтың ұзындығын біле отырып, оның өсу деңгейі анықталды.

Кілт сөздер: тұқытәріздес балықтар, жалпы ұзындығы, жалпы және кіші салмағы жастық құрылымы, Фультон және Кларк бойынша қондылық коэффициенті

Abstract

In the following years, the stock of fish of the most valuable commercial value (alloy, Sturgeon, salmon relatives) has sharply decreased. Among the many factors that affect the reduction of fish stocks, the following can be mentioned: unaccounted catch — this phenomenon is widespread in most seas and inland water sources. Due to incalculable catch, it catches young fish that have not grown up, affects their population, hinders the growth of numbers and even causes the extinction of this species. The most important task of Fisheries at the present time is to combat incalculable catch and restore their populations again. According to the research work, 6 species of fish living in the Syrdarya River were studied. These are: carp, eel, White Amur, bozsha crucian carp, tenge fish, karabalyk, biological characteristics of fish, sex ratio. Their total length, total and small weight were determined by the pillow structure, the superstructure coefficient according to Fulton and Clark. Carp-like

fish of the Syrdarya Ozen reach sexual maturity in 2-4 years. In the south of the region, it matures faster than in the North. In Lake Balkhash, in the Bukhtarma reservoir, Aral carp takes 4-6 years to mature. It has been established that in the last reservoirs, male fish mature in 3-4 years with a body length of 16-30 CM, and Females Mature in 5 years with a length of 34 cm. The growth of many bony fish can be determined by the annual rounding of their scales.

Such a pattern is based on the fact that the growth of the scales is directly proportional to the growth of the length of the fish. Knowing the length of the scales of the entire range and the length of the fish, the level of its growth was determined.

Keywords: carp-like fish, total length, total and small weight cushion structure, superstructure ratio according to Fulton and Clark

БАТЫС ТӘҢІРТАУ ДЕНДРОФЛОРАСЫНА СИСТЕМАТИКАЛЫҚ ТАЛДАУ
WESTERN TANIRTAU-DENDROFLORA SYSTEMATIC ANALYSIS

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Аңдатпа

Батыс Тәңіртау дендрофлорасын систематикалық талдау барысында Батыс Тәңіртаудың қазақстандық бөлігі шегінде Алматы қ., Шымкент қ. (Қазақстан), Ташкент қ. (Өзбекстан) гербарий қорларын зерттеу, әдеби деректер мен өзіндік зерттеулер негізінде 130 туыс пен 50 тұқымдастан тұратын ағаш - бұта өсімдіктерінің 395 түрі тіркелген. В. Н.Павловтың деректері бойынша Батыс Тәңіртаудың бүкіл флорасының 2844 түр бар. Егер осы саннан шығатын болсақ, дендрофлора Батыс Тәңіртаудың барлық флорасының 13,92% - ін құрайды, яғни аймақтың флорасында әрбір 7 түр тіршілік формасында ағаштар, бұталар мен жартылай бұталар, ал С. Раункиер жүйесі бойынша фанерофиттер мен хамефиттер болып саналады. Е. П. Коровиннің деректері бойынша бүкіл Орта Азия дендрофлорасының 500 түрі бар. Осылайша, Батыс Тәңіртау дендрофлорасы Орта Азияның ағаш-бұта өсімдіктерінің барлық түрлік құрамының 79,20% - ін құрайды, бұл өңірді Орта Азияның, сондай-ақ Қазақстанның фитогенофондының маңызды және негізгі орталықтарының бірі ретінде сипаттайды. Айта кету керек, 395 түрдің 205-і немесе олардың 51,89% - і антропогендік ықпалдың әсерінен өзгертілген оазистерге, агрофитоценоздарға, урбанизацияланған экожүйелерге, яғни антропофитонға тән.

Флораның сандық сипаттамалары, ең алдымен, туыстардың, тұқымдастардың түрлерінің байлығын, аумақтың гетерогенділігінің дәрежесін, физикалық-географиялық жағдайлардың әртүрлілігін және флораның генезисінің ерекшеліктерін анықтайтын маңызды көрсеткіштер болып табылады. Флораның негізгі сипаттамаларының бірі - флора спектрі, систематикалық құрамның негізгі ерекшеліктерін, сондай-ақ ботаникалық-географиялық заңдылықтарды білдіреді.

Кілт сөздер: дендрофлора, гербарий, антропогендік әсер, фанерофит, фитогенофонд, хамефит, урбанизация, оазис, агрофитоценоз.

Abstract

In the course of systematic analysis of dendroflora of Western Tanirtau Almaty, Shymkent (Kazakhstan)within the Kazakh part of Western Tan irtau, research of herbarium funds in Tashkent (Uzbekistan), literary data and original research 395 species of tree - shrub plants, consisting of 130 relatives and 50 genera registered. According to V. N. Pavlov, 2844 of the entire flora of the Western Tanirtau here is a species. If we proceed from this number, the dendroflora is all of the Western Tanirtau it make up 13.92% of the flora, that I, every 7 pecie live in the flora of the region. In the form of trees, shrubs and semi-shrubs, and according to the system of S. Rounkier phanerophytes and chamophytes are considered. According to the

data of E. P. Korovin there are 500 species of dendroflora throughout Central Asia. Thus, Western Tengri dendroflora of all species composition of Woody and shrub plants of Central Asia 79.20% - this region is represented by the phytogenophon of Central Asia, as well as Kazakhstan it is characterized as one of the most important and main centers. It should be noted that 395 205 of the species, or 51.89% of them, have been modified by anthropogenic influences to oases, agrophytocenoses, urbanized ecosystems, i.e. anthropophytone typical.

The quantitative characteristics of the flora are primarily those of relatives, families physical and geographical characteristics of the species, the degree of heterogeneity of the territory, determining the diversity of conditions and features of the genesis of flora important indicators are. One of the main characteristics of flora is Flora spectrum, the main features of the systematic composition, as well as botanical it represents geographical patterns.

Keywords: dendroflora, herbarium, anthropogenic impact, phanerophyte, phytogenophond, chamephite, urbanization, oasis, agrophytocenosis.

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*ROBINIA L.*ТУЫСЫ ТҮРЛЕРІН ИНТРОДУКЦИЯЛАУДЫҢ БИОЛОГИЯЛЫҚ ЕРЕКШЕЛІКТЕРІ

BIOLOGICAL CHARACTERISTICS OF INTRODUCING *ROBINIA L.* RELATED SPECIES

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Аңдатпа

Robinia L қазіргі уақытта аридті зоналарды көгалдандыру және орманды алқаптардың генофондын сақтауда үлкен қызығушылық тудыруда. Осы мақсатта еліміздің көгалдандыру жұмыстары үшін *Robinia L* туысы түрлері ішінде кең таралғандары: - *Robinia pseudoacacia L. (R. pseudoacacia* немесе ақ акация),. *R. viscosa Vent.; R. luxurians.*

Жұмыстың мақсаты - *Robinia L* туысының түрлері мен формаларын жерсіндіру барысында экологиялық факторларға әсерін, өсу және даму ерекшеліктерін зерттеу. Туыстың түрлері мен формаларының бейімделу процестерін шектейтін негізгі факторлар анықталды. Робинияның барлық зерттелген түрлері аязға төзімділіктің салыстырмалы түрде жоғары дәрежесіне ие. Интродукцияланған түрлердің маусымдық даму ырғақтарын зерттеу фенологиялық әдісті қолдану арқылы жүргізілді. Өскіннің дамуы үшін қажетті тиімді температура анықталды. Бұтақтардың өсуі әр 5 күн сайын бүйірлік өркендердің өсуін өлшеу арқылы жүзеге асырылды. Жылдық өсу қарқыны салыстырылды. Гидротермиялық режиміне өсу тәуелділігі анықталды. Түрлер мен формалардың құрғақшылыққа төзімділігі мен қысқы төзімділік дәрежесін анықтау үшін салыстырмалы бағалау жұмыстары жүргізілді. Нәтижесінде жазғы құрғақшылық және ылғалды кезеңнің ұзақтығы; күздің ұзақтығы мен температуралық режимдік кезең; қысқы кезеңнің максималды және ең төменгі температурасы, температураның күрт төмендеуі; ерте көктемгі аяздардың әсері бағаланды. Су режимін зерттеу жалпы қабылданған әдістер бойынша вегетациялық кезеңде (маусым -тамыз) динамикалық түрде жүргізілді.

Жүргізілген зерттеулер нәтиже қорытындысы бойынша аридты зоналардағы максималды температура анықталды. Зерттеу нәтижесінінің қорытындысы бойынша *Robinia* туысының интродукция жағдайында өсу мен даму ерекшеліктері белгіленді және экологиялық заңдылықтары, жемістер мен тұқымдардың қалыптасуы, климаттық факторлардың шекті мәндері анықталды. Зерттеулер кезінде түрлер арасындағы аязға төзімділік дәрежесінің айырмашылығы біртіндеп бейімделуі төмендеді. Бұрын *Robinia pseudoacacia* аязға төзімді деп есептелген болса қазір *Robinia luxurians* түрінен төмен. Бақылаулар қорытындысы бойынша, бұл максималды және минималды мән акклиматизация процесінде айтарлықтай төмендеді.

Кілт сөздер: *Robinia L.*, бейімделу ерекшеліктері, интродукция, төзімділік, стресс факторлар.

Abstract

Robinia L is currently of great interest in arid zone afforestation and forest gene pool conservation. For this purpose, the most common types of Robinia L. for landscaping in the country are: - Robinia pseudoacacia L. (R. pseudoacacia or white acacia). R. viscosa Vent.; R. luxurians.

The purpose of the work is to study the influence of environmental factors, growth and development features of the species and forms of Robinia L. The main factors limiting the processes of adaptation of types and forms of relatives have been identified. All studied species of Robinia have a relatively high degree of frost resistance. The study of seasonal development rhythms of introduced species was conducted using the phenological method. The effective temperature required for sprout development was determined. Branch growth was measured every 5 days by measuring the growth of lateral shoots. Annual growth rates were compared. The dependence of growth on the hydrothermal regime was determined.

Comparative assessment work was carried out to determine the degree of drought resistance and winter resistance of species and forms. As a result, the summer drought and the duration of the wet period; duration of autumn and temperature regime period; the maximum and minimum temperature of the winter period, a sharp drop in temperature; The impact of early spring frosts was evaluated. The study of the water regime was carried out dynamically during the growing season (June-August) according to generally accepted methods.

Based on the results of the conducted research, the maximum temperature in arid zones was determined. According to the results of the study, the features of growth and development of the Robinia genus under the conditions of introduction were determined, and ecological laws, the formation of fruits and seeds, and the threshold values of climatic factors were determined. Previously, Robinia pseudoacacia was considered frost-resistant, but now it is inferior to Robinia luxurians. According to the results of observations, this maximum and minimum value significantly decreased during the acclimatization process.

Keywords: Robinia L., features of adaptation, introduction, endurance, stress factors.

TULIPA L. ТҮРЛЕРІН IN VITRO ЖАҒДАЙЫНДА ЖЕДЕЛДЕТІП КӨБЕЙТУДІҢ ТЕХНОЛОГИЯЛЫҚ ҰСЫНЫСТАРЫ

TECHNOLOGICAL RECOMMENDATIONS FOR ACCELERATED REPRODUCTION OF L. SPECIES IN VITRO

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АҢДАТПА

Мақалада *Tulipa* L. in vitro жағдайында өсірудің биотехнологиялық ерекшеліктері қарастырылды. Қызғалдақты микроклондық жолмен көбейтудің тиімді биотехнологиялық әдістерін игерудің жолдары талданды. Осы әдісті қолданудың өсімдіктердің сирек және құнды генотиптерінің *in vitro* банктерін құру мүмкіндігі қарастырылды. Қызғалдақты микроклональды көбею әдісінің модификациясы мен бейімделуі морфогенетикалық потенциалды жүзеге асыруға ықпал ететіндігі, бастапқы материалдың түрлік ерекшеліктерін, эксплант түрін, оның физиологиялық жағдайын, қоректік ортаның құрамын және өсіру жағдайларына байланыстылығы талданды. Сонымен қатар, микроклондық көбейту құнды ауылшаруашылық өнімдерінің шығымдылығын және сауықтыру өсімдіктерінің жоғары бейімделу қасиеттерін едәуір арттыруға мүмкіндік береді, бұл оларды химиялық заттардың аз шығынымен өсіруге мүмкіндік береді, бұл олардың биологиялық құндылығын арттырады және жоғары сапалы материал алуға үлкен мүмкіндік береді. Сонымен қатар, аталған зерттеулерді жүргізуде ғылыми зерттеу жұмыстары барысында қызғалдақтың эксплантық материалын алу бойынша жобалық іс-шараларды әзірлеу ұсынылды.

Түйінді сөздер: undergraduate research, ғылыми зерттеу, биотехнология, фитогормондар, жоғары сатыдағы өсімдіктер, қоректік орталар.

ABSTRACT

The article discusses issues related to the development of a student botanical experiment on the in vitro cultivation of Tulipa L. Particular attention is paid to the development of students' theoretical knowledge by viewing and touching plants in a practical way, as well as the development of skills in working with laboratory equipment. Using the example of a tulip flower, which can be carried out during scientific research in the field of botany, it is

recommended to develop project activities to study the development of the resulting regenerated plants.

Keywords: undergraduate research, scientific research, biotechnology, phytohormones, higher plants, nutrient media.

EVALUATING THE WATER QUALITY OF WELLS UTILIZED FOR POTABLE WATER IN KOSOVO

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Abstract

Water quality is an essential factor to consider when planning its usage. The evaluation and acknowledgment of water quality hold significant importance. This study focuses on assessing the well water quality in Pristina city. To achieve this objective, water samples were collected from four wells during the months of August and September 2022, and their physical, chemical, and microbiological parameters were analyzed. The research findings indicated that the water samples from the four wells exhibited no signs of turbidity and chlorine presence. The values for temperature, pH, total hardness, dissolved oxygen, nitrites, nitrates, sulfates, manganese, and ammonia fell within the limits set by Administrative Instruction No. 10/2021. However, iron levels exceeded the permissible values. Elevated parameter values render the water unfit for consumption, posing health risks to the community. Hence, continuous monitoring of water quality and quantity for public use should be a top priority for policymakers and water service providers.

Keywords: Water quality, physicochemical characteristics, Kosovo, biological factors