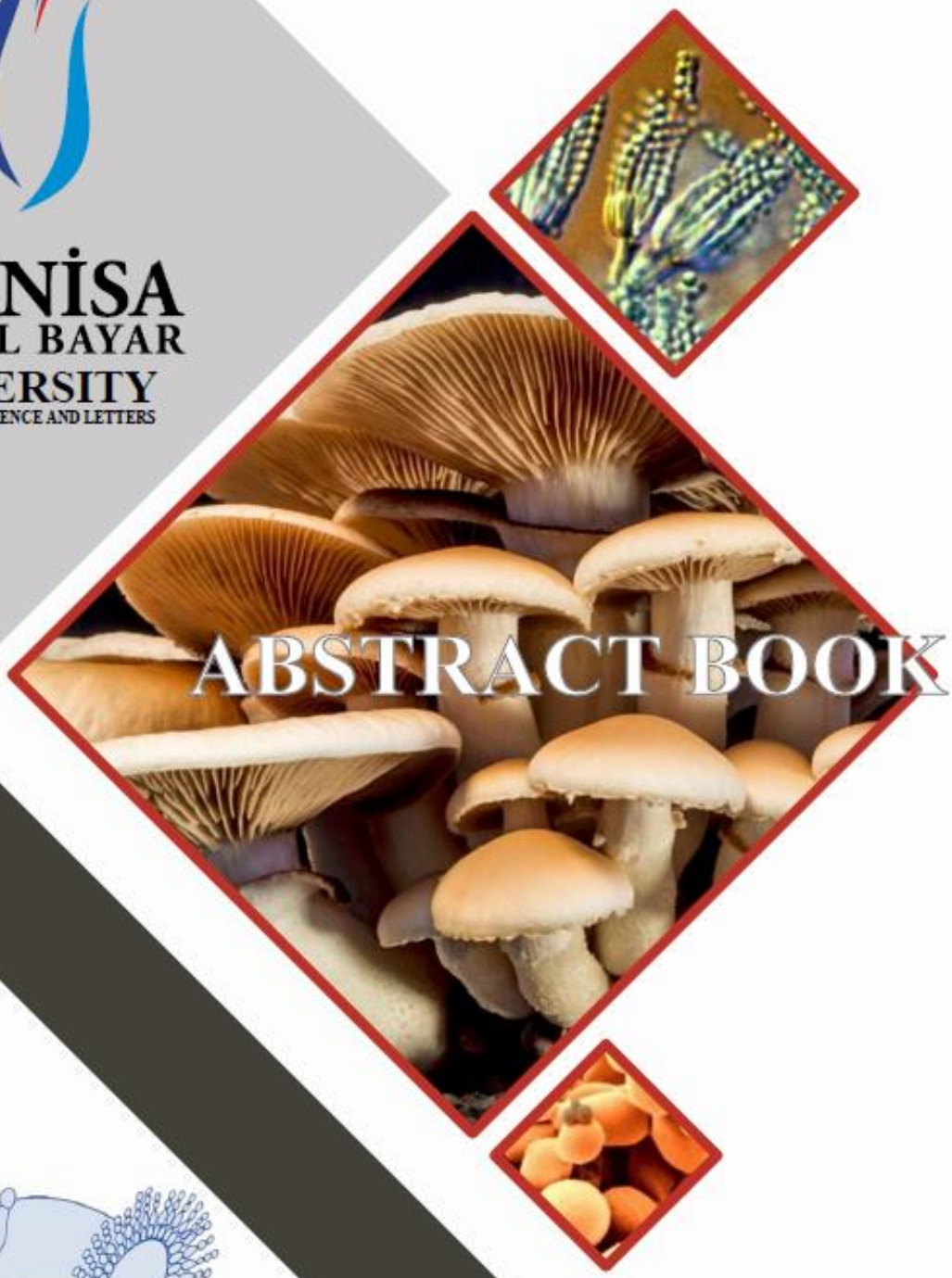
1. International Eurasia MYCOLOGY CONGRESS

MANİSA
CELAL BAYAR
UNIVERSITY
FACULTY OF SCIENCE AND LETTERS



ABSTRACT BOOK

EMC'17

3 - 5 JULY 2017

Manisa Anemon Hotel
MANİSA / TURKEY

1ST INTERNATIONAL EURASIA MYCOLOGY CONGRESS

03-05 July 2017

MANISA CELAL BAYAR UNIVERSITY

TURKEY

PROGRAM AND ABSTRACT BOOK

The responsibility of the abstracts contained in this book belongs to their authors.

1ST INTERNATIONAL EURASIA MYCOLOGY CONGRESS

03-05 July 2017

Manisa

TURKEY

Design

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July 2017

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Dear Colleague,

As organizing committee, we are pleased to invite you to participate ‘1st International Eurasian Mycology Congress ‘ EMC2017.

EMC2017 will be held at Manisa Celal Bayar University, Anemon Hotel in Manisa, TURKEY during 3-5th July, 2017 with the prominent experts in the relevant field of Mycology, that will highligth the congress.

Papers can be submitted in Turkish or English languages will be evaluated by the review committees of the congress. All accepted papers/abstracts of the congress will be published in the conference proceedings with valid ISBN number.

We look forward to see you and for your participation in Manisa, July 2017.

On Behalf Organizing Committee

Assoc. Prof. Dr. Evrim ÖZKALE

Chairman of Congress

PROGRAM

HOUR	SESSIONS (DAY1)	MONDAY (03-07-17)
08:30		REGISTRATION
09:00-09:15		
09:15-09:30		
09:30-09:45		WELCOME SPEECH
09:45-10:15		Reception Talk & Honorary Award Presentation / Prof. Dr. SANVER EKMEKÇİ
10-15:10:30	SESSION 1	Keynote Speaker/ Dr. S. HELFER
10:30- 10:45	Chair: Prof. Dr. A. ASAN	The Mycological Exploration of Turkey
10:45-11:00		O-1/ Yields and enzyme activities of local *Pleurotus ostreatus* isolates on different wastes / A.Pekşen, A.B.Karaduman
11:00- 11:30	COFFEE BREAK	COFFEE BREAK
11:30- 11:45	SESSION 2	Invited Speaker/ Dr. Alev Haliki UZTAN
11:45-12:00	Chair: Prof. Dr. E. SESLİ	Fıstıkçamı Ormanlarında Verimi Etkileyen Böcek-Fungus İlişkileri Nedeniyle Ortaya Çıkan Epidemik Sorunlar ve Çözüm Önerileri
12:00-12:15		O-2/ Antimicrobial activity of various formulations from *Fomes fomentarius* (L.) Gillet / G.Gedik et al.
12:15- 12:30		O-3/ Edible Macrofungi Determined in Tonya (Trabzon) District / Y.Uzun et al.
12:30- 12:45		O-4/ Misidentified *Usnea* (Parmeliaceae, lichenized Ascomycota) records from Turkey / A.Şenkardeşler
12:45- 13:00		O-5/ *Candida parapsilosis* in domestic laundry machines / A.Döğen et al.
13:00- 14:00	LUNCH, POSTER VIEWING (P1-P30), VISIT EXHIBITON	LUNCH, POSTER VIEWING (P1-P30), VISIT EXHIBITION

14:00- 14:15	**SESSION 3**	**Invited Speaker/ Dr. Emel TÜMBAY**
14:15-14:30	**Chair: Prof. Dr. S. KIRBAĞ**	**Dünya tarihini değiştiren bir mantar: *Phytophthora infestans***
14:30-14:45		**O-6/ Comparison of the Sensititre YeastOne colorimetric antifungal method with the CLSI M27-A3 method to determine the activity of antifungal againsts clinical isolates of Candida spp. / R.Altınbaş et al.**
14:45-15:00		**O-7/ Comparison of photosynthetic pigment contents in lichen samples were collected from different localities in Bursa / V.E.Karakaş et al.**
15:00-15:15		**O-8/ The mating type (MAT) locus and possible sexuality of the opportunistic pathogen *Exophiala dermatitidis* / B.Metin et al.**
15:15-15:30		**O-9/ Determining the potential of *Trichoderma atroviride* and *Trichoderma citrinoviride* as biocontrol agent and biofertilizer / Y.Gezgin et al.**
15:30-15:45		**O-10/ Antimicrobial and antibiofilm effects of cinnamaldehyde on clinical *Candida* isolates / B.Y.Gürsu**
15:45-16:00		**O-11/ The isolation and molecular characterization of uv-protectant pigment producing fungi for using in commercial formulations of fungal biopreparats / A.Yenilmez et al.**
16:00-16:30	**COFFEE BREAK**	**COFFEE BREAK**

16:30-16:45	SESSION 4	Invited Speaker/ Dr. S. HELFER
16:45-17:00	Chair: Prof. Dr. M. YAMAÇ	Parasitic Fungi for Ecosystem Health
17-00:17:15		O-12/ Atmospheric fungus content of Yalova Province, Turkey, 2004-2005 / D.Yılmazkaya et al.
17:15-17:30		O-13/ Inhibition of *Propinibacterium acnes* quorum sensing and biofilm formation by acetone extracts of *Platismatia glauca* from Alaçam-Bursa / D.Berber et al.
17:30-17:45-		O-14/ Determination of molds isolated from man-made water systems to produce primary and secondary metabolites / R.Demirel et al.
17:45-18:00		O-15/ Determination of Protosteliomycetes Group Organisms Isolated from Forestry and Wildlife Saving Area of Uludag University Campus, Bursa-Turkey / E.Sert et al.
18:00-18:15		O-16/ The Analyse of Geographical Elements of Xylotroph Microfungi from Black Sea Forest / F.Selçuk, E.Hüseyin
18:15-18:30		O-17/ Isolation, macroscopic, microscopic and molecular identification of native fungi for the production of native alpha-amylase enzyme in order to increase bread quality using biotechnological processes / İ.Ocak et al.
18:30-18:45		O-18/ Distribution of *Candida* species isolated from vaginal swab samples and their antifungal susceptibilities / S.Pelit et al.
18:45-19:00		O-19/ Antimicrobial activity screening of *Astraeus hygrometricus* / K.Canlı et al.
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SESSIONS (DAY2)	TUESDAY (04-07-17)
SESSION 5 **Chair: Prof. Dr. H. H. DOĞAN**	**O-20/ Micropropagule production from *Trichoderma citrinoviride* using solid state fermentation / S.Sözer et al.** **O-21/ Epidemiology of dermatophytoses according to the samples which / M.Tikveşli, Ş.Gürcan** **O-22/ Lichens are potential anti-cancer drug source / F.Arı**
	Invited Speaker / Dr. I. DRUZHININA / Comparative genomics sheds light on the evolution of nutritional expansions in Trichoderma
	O-23/ Myxomycets of Central, Kazımkarabekir and Ayrancı (Karaman) district / G.Eroğlu et al. **O-24/ Coconut Oil Encapsulated Chitosan Nanoparticles: Cytotoxicity, Anticandidal and Antibiofim Activity Against Multi-Species *Candida* Biofilms / B.Berber et al.** **O-25/**
COFFEE BREAK	**COFFEE BREAK**
SESSION 6 **Chair: Prof. Dr. Ş. A. KARAOĞLU**	**Invited Speaker/ Dr. J. S. HUR** **Production of cristazarin by culturing an isolated mycobiont of lichen *Cladonia metacorallifera*** **O-26/ The amino acid, fatty acid and element contents of the *Terfezia* and *Picoa* species from Eastern Turkey / S.Kırbağ, M.Akyüz** **O-27/ New Genus Record for Turkey Mycobiota: *Sirococcus conigenus* / F.Selçuk, T.Gündoğan** **O-28/ Additions to the Turkish Entolomas / K.Demirel et al.** **O-29/ The effect of immobilization methods for plant growth regulator production by *Inonotus hispidus* and *Stereum hirsutum* / S.Yüzüak et al.**
LUNCH, POSTER VİEWING (P31-P60), VISIT EXHIBITION	**LUNCH, POSTER VİEWING (P31-P60), VISIT EXHIBITION**

SESSION 7	**Invited Speaker / Dr. S. İLHAN**
Chair: Prof. Dr. G. KAŞIK	**Halofilik ve Halotolerant Funguslar**
	O-30/ A common but rarely reported calcicole lichen: *Candelariella plumbea* and its ecological, morphological and anatomical differences with *Candelariella aurella* / Z.Kocakaya, M.G.Halıcı
	O-31/ The effect of some local plantal wastes on yield and protein value's of Pleurotus ostreatus (Jacq.) Kumm./ N.Gürsoy et al.
	O-32/ Halotolerance and thermotolerance enable *Candida parapsilosis* to reside and persist in dishwashers and washing machines / E.Kaplan et al.
	O-33/ Molecular Identification of Fungal Trunk Pathogens Associated With Wood Decay of Grapevines on Aegean Region / N.G.Savas et al.
	O-34/ The purification of Trichoderma viride NRRL 6418 Xylan 1,4-β-Xylosidase by hydrophobic interaction chromatography and investigation of its kinetic and electrophoretic properties / H.A.İrtem et al.
	O-35/ Biosorption of Remazol Red from aqueous solution by nonviable *Aspergillus terreus* / S.Malkoç
COFFEE BREAK	**COFFEE BREAK**

SESSION 8 **Chair: Prof. Dr. S. KIRBAĞ**	**Invited Speaker / Dr. G. BAYRAM AKÇAPINAR** ***Trichoderma* Hydrophobins: from engineering to surface modulation**
	O-36/ Lichenicolous fungus developing on the Candelariella genus in Turkey / M.Kocakaya, M.G.Halıcı **Company Presentation**
	MANISA ŞİFAHANE TOUR (17:30-19:30)
	GALA DINNER

SESSIONS (DAY3)	WEDNESDAY (05-07-17)
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	Invited Speaker / Dr. Celaleddin ÖZTÜRK / Türkiye'deki Makrofungus Çalışmaları ile İlglili Değerlendirmeler
	O-40/ Macrofungal biodiversity of İztuzu Province (Muğla) / H.Allı, D.Altuntaş **O-41/ Three New Records of Cortinarius Genus for Turkish Mycobiota / İ.Acar et al.** **O-42/ Antioxidant Activity of Tricholoma anatolicum Collected from Feke-Adana Province of Turkey / F.Bozok et al.**
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SESSION 10 **Chair: Prof. Dr. C. ÖZTÜRK**	**O-43/ Wood Decaying Fungi In The Yenice Forests (Karabük) / G.Kaşık et al.** **O-44/ Antimicrobial activity and biochemical composition screening of *Hericium coralloides* / A.Yetgin et al.** **O-45/ The Effects of the Pigments of Sporobolomyces roseus on Biofilm structure / A.Yazıcı et al.** **O-46/ Edible Mushrooms of Yenice District (Karabük) / C.Öztürk et al.** **O-47/ Additions to the Turkish Psathyrellaceae / Y.Uzun et al.** **O-48/ Isolation and Identification of Keratinophilic Fungi from Stratonikeia Archeological Area and Determining Their Enzyme Production Potential / Ö.Abacı et al.**
LUNCH, POSTER VİEWING (P61-P90), VISIT EXHIBITION	**LUNCH, POSTER VİEWING (P61-P90), VISIT EXHIBITION**

SESSION 11	**Company Presentation**
Chair: Prof. Dr. M. Macit İLKİT	**O-49/ New Genus Record for Turkey Mycobiota: *Sarcostroma insidens* / F.Selçuk, T.Gündoğan** **O-50/ A new corticolous Myxomycetes record for the Myxobiota of Turkey / H.Baba, Ç.Arslan** **O-51/ Antibacterial and Anti-candidal Activity of Trcihaptum biforme, Inonotus hispidus, Fuscosporia torulosa and Trametes versicolor Against Human Pathogens / G.Dülger** **O-52/ An Ethnomycological Approach to the Pleurotus eryngii complex species from Bitlis: local names, cooking techniques, commercial value, ecology and vegetation periods etc / M.Akyüz, S.Kırbağ** **O-53/ Determination of genotoxic-antigenotoxic effects of wild-grown Ganoderma lucidum (Reishi) from Turkey with the hen's egg test for analysis of micronucleus induction (HET–MN) / H.Özparlak, B.Çelik** **O-54/ The production, purification and characterization of β-glycosidase from Trichoderma harzianum NRRL 13019 by solid state fermentation and hydrophobic interaction chromatography / S.Ç.Yücetürk et al.** **O-55/ Anti-respiratory syncytial virus (anti-RSV) activities of the macrofungi of Fomes fomentarius (L.) Fr. and Morchella conica (Pers.) Boudier / H.H.Doğan et al.**
COFFEE BREAK	**COFFEE BREAK**

SESSION 12

Chair: Prof. Dr. S. KIRBAĞ

O-56/ Viruses of Fungi: Perspectives on Macrofungal Virology / E.Şahin, I.Akata

O-57/ Characterization of metalloprotease genes in anthropophilic *Trichophyton rubrum* / A.Döğen et al.

O-58/ Genome Wide Analysis of Immunity against Fungal Pathogens in Brassica napus / H.A.Yalçın et al.

O-59/ Analysis of segregation and expression of transgenes in the progenies of AFPCHI transgenic melon plants / İ.Bezirganoğlu

O-60/ Production of Ochratoxin A (OTA) by Aspergillus section Nigri strains on various natural substrate based media / Z Akbal et al.

O-61/ Investigation of presence of endofungal bacteria in *Rhizopus* spp. isolated from the different sources on market / Ö.A.Günyar, D.Birol

O-62/ Effects of Light and Temperature Stress on Polyketide Gene Expression Levels of *Hypogymnia tubulosa* (Schaer.) Hav. Mycobiont / B.Açıkgöz et al.

O-63/ Galactomannan Antigen Test In Diagnosis Of Invasive Fungal Infections In Neutropenic Patients / İ.Karaltı

CLOSING CEREMONY / Award Presentation for the First of Oral/Poster Presentations / Announcement of the owner of next congress

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IS-01

The Mycological Exploration of Turkey

Stephan HELFER

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Far from presenting an exhaustive account of all the research on fungi that goes on in 21st century Turkey, this paper is an attempt to tell selected stories of the past efforts in the field of mycology to achieve an account of the diversity of fungi occurring in Turkey, where they occur and what their roles are in the environment. Inspired by the Flora of Turkey, published in 1965 in Edinburgh, Scotland by the eminent Botanist Professor Peter Davis and co-workers, my aim is to encourage mycologists in Turkey and elsewhere to work together on a comparable work of the "Mycota of Turkey". How this will look and whether it will achieve similar prominence will be seen in future years.

Undoubtedly, fungi have been explored by humans in what is now Turkey since times immemorial. Early settlers in the territory have used yeasts and cheeses, suffered from fungal ailments and pondered about plant diseases, gathered mushrooms and explored their gastronomic as well as sometimes poisonous qualities not in dissimilar ways as we do today, though without scientific methodology. Greek, Persian and other influences have shaped this exploration in the classical period. With the introduction of modern methods in the past 150 years or so, and up to the present, mycology has made huge advances and there is no sign of any slow down in the mycological exploration of Turkey.

Keywords: Science history, ethno-mycology, collaboration, networking

IS-02

Fıstıkçamı Ormanlarında Verimi Etkileyen BöcekFungus İlişkileri Nedeniyle Ortaya Çıkan Epidemik Sorunlar ve Çözüm Önerileri

Alev HALİKİ UZTAN

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Son yıllarda uluslararası ticaretimizin artması ülkemizde yeni böcek türlerinin görülmesine sebep olmuştur. Bu türlerden biri de Leptoglossus occidentalis 'dir. Çam fıstığı ithalatıyla ülkemize girmiştir. Leptoglossus occidentalis Kuzey Amerika orijinli istilacı yabancı bir böcek türüdür. Bu tür kesin olarak ticari ormancılık için de potansiyel zararlı olarak kabul edilmektedir. Uluslararası ticaret ile tüm dünyada hızla yayılmaktadır. 2009 yılında ülkemiz faunasına giren bu böcek tüm iğne yapraklı ağaç türlerimiz için tehlike oluşturmaktadır.

Ortalama 8000 – 9500 nüfusun yaşadığı Kozak yaylasında 17 köy bulunmaktadır. Bu köylerde rekoltenin en yüksek olduğu dönemlerde Türkiye'de 2500 ton/yıl çam fıstığı elde edilirken, bunun ortalama 1600 tonu Kozak'tan elde edilmektedir. Bergama Kozak Yaylası Türkiye çam fıstığı üretiminin % 80'ini karşılamaktadır. Ancak bu miktar son 5 yılda 100 ton/yıl'a kadar gerilemiştir. 2005 yılında ihracat 50 milyon dolar ve iç piyasa ticareti 15 milyon dolar iken son yıllarda yaşanan tohum kayıplarının ekonomik karşılığı 58 milyon dolar civarındadır. Bu düşüşün birçok nedeni olabilmektedir ancak başlıca sebeplerinden biri de Leptoglossus occidentalis' dir. Bu nedenle önce Ticaret Odası ve üreticiler, daha sonra da Orman ve Su İşleri Bakanlığı Ege ve Marmara Orman Bölge Müdürlükleri Ege Üniversitesine başvurmuştur; halen işbirliği ve projeler kapsamında yapılmasını önerdikleri geniş çaplı bir araştırma içerisinde bizim çalışmamız da yer almaktadır.

Kozak havzasında yaptığımız çalışmalar sonucunda tohum zararlısı Leptoglossus occidentalis'in beslenme sırasında saprofit mantarları bulaştırdığı ve bitkinin bağışıklık sistemine organik bileşiklerinden terpenlere olan talebi nedeniyle önemli miktarda zarar vererek kozalak gelişimini etkilediği görülmüştür.

Taranan makalelerde biyolojik mücadele yapılacak bölgeye uygulanacak entomopatojen fungusların o ülkenin veya bölgenin doğal koşullarına uyum sağlamış türler ve strainler olmasının, farklı bir ülke veya bölgeden izole edilmiş preparatlara

göre daha iyi sonuçlar verdiği belirtilmiştir. Bu nedenle biyolojik mücadele amacıyla yapılan çalışmaların ilk basamağı ilgili bölgede doğada mevcut olan mikrofungal biyotanın tespit edilmesidir. Bu amaçla Kozak yaylasında 17 köyden alınan örneklerde toprak mikobiyotasının tespiti ve havada mikobiyota tespiti amacıyla örneklemeler yapılmıştır. Toprak örnekleri seyreltme dökme plaka yöntemiyle yapılmıştır. Her bir seyreltmeden içinde DG18 bulunan petrilere ekim yapılmış, 27°C'de 5-7gün inkübasyona bırakılmıştır. Hava örneklerinden fungus tespiti için de daha önceden DG18 besiyeri hazırlanmış ve Merck Mass Air Sampler cihazı ile 17 köyden alınan örnekler aynı gün içinde laboratuvara ulaştırılarak 27°C'de 5-7gün inkübasyona bırakılmıştır. Hava ve toprak örnekleri için inkübasyondan sonra sayım işlemi gerçekleştirilip her bir koloni PDA, MEA ve CYA bulunan petrilere ekilip saflaştırma işlemi gerçekleştirilmiştir. Daha sonra saf üreyen koloniler PDA tüplerine aktarılmış ve stoklanarak toprak izolatlarının fenotipik tanıları yapılmıştır.

Türkiye'deki doğal fıstık çamı ormanlarında, şahıslara ait kültüre edilmiş fıstık çamı ağaçlarında ve diğer yerli kozalaklılarda potansiyel Leptoglossus spp hasarını değerlendiren henüz hiçbir çalışma yoktur, ancak planlama dahilindedir. Biyolojik mücadelenin önemli bir noktası olan yerli ajanların tespiti, tespit edilen yerli ajanların patojenitelerinin saptanması, başarılı olanların sektöre tanıtılması ve kullanılmasını içeren çalışmalara da çok büyük ihtiyaç vardır. Araştırmamız bu yönde Ege Üniversitesi, Ege Orman Bölge Müdürlüğü ve Ege Ormancılık Araştırma Enstitüsü ile işbirliği içinde proje temelinde geliştirilmekte ve sürdürülmektedir.

Bu projede yer alan Ege Üniversitesi Fen ve Ziraat Fakültelerinin konu ile ilgili değerli akademisyenleri ile Ege Orman Bölge Müdürlüğü ve Ege Ormancılık Araştırma Enstitüsü elemanlarına ülkemizin ivedilikle çözüm üretmesi gereken bu sorunda yapılan ortak değerlendirme ve çalışmalarda gösterdikleri yaklaşım ve özveri için teşekkür ederiz.

Keywords: *Leptoglossus occidentalis*, fıstık çamı, mikrofungus

IS-03

Dünya tarihini değiştiren bir mantar: *Phytophtora infestans*

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Phytophtora infestans adlı bir küf mantarı 19. yüzyılın ortalarında bugünki İrlanda topraklarında patates bitkisini infekte ederek ülkede byük bir kıtlığa neden olmuştur. İngiliz idaresi altında bulunan İrlanda'da köylüler ve işçiler ana besin olan patates ürününün tarlada çürümesi nedeniyle aç kalmışlar ve bu büyük açlık sonucu 1.5 milyona yakın insan ölmüş ve çaresiz kalanlardan 2 milyonu da Amerika Birleşik Devletleri ve Avustralya'ya göç etmişlerdir.

İngilizlerin ilgi göstermediği Büyük Açlık, İrlanda'nın özgürlüğünü kazanmasını ve İrlanda Cumhuriyeti'nin kurulmasını tetikleyen önemli bir olaydır.

Amerika'ya göç eden aileler arasında Kennedy Ailesi de bulunmaktadır. John Kennedy ABD Başkanı seçilmiş, Domuzlar Körfezi'ndeki yenilgisi sonucu Sovyetlerin gücünü kabul etmek zorunda kalmıştır.

Osmanlıların Büyük Açlık zamanında İrlandalılara gönderdikleri beş gemi dolusu yiyecek maddesi ve tohum unutulmamış ve bugünki Türkiye-İrlanda dostluğunun temelini oluşturmuştur.

Keywords: *Phytophthora infestans*, potato infestation, great hunger, Irish people, change of history

IS-04

Parasitic Fungi for Ecosysytem Health

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Ecosystems are dynamic, interactive communities of living organisms, established, maintained and limited by their abiotic environments and their constituent species' contributions, and influenced by adjoining ecosystems and the global Biosphere. Healthy ecosystems are resilient, diverse and sustainable. Their functioning and the services they provide are essential to life on planet earth. Ecosystems can become compromised by natural disasters and by changes to the abiotic envelope, biotic invasions or the catastrophic ascendancy or extinction of members of the community. Disease organisms (pathogens) are key components in the dynamics of ecosystems because of their ability to affect the relative fitness of constituent species, by promoting diversification and by contributing significantly to the overall diversity. This paper investigates both positive and negative aspects of parasitic fungi, causing plant diseases and their impact on ecosystem health.

Keywords: plant disease, community distribution, ecosystem effects

IS-05

Production of cristazarin by culturing an isolated mycobiont of lichen *Cladonia metacorallifera*

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A rare lichen *Cladonia metacorallifera* var. *reagens* KoLRI002260 has been known to produce rhodocladonic, thamnolic, and didymic acid. However, these metabolites were not detected in the isolated mycobiont of the lichen. Instead, cristazarin and 6-methylcristazarin were produced by culturing a free-living lichen-forming fungus (mycobiont) isolated from the lichen. In this study, we have investigated the effect of six different carbon sources on the biosynthesis of cristazarin and 6-methylcristazarin in the *C. metacorallifera* mycobiont. Only fructose was observed to have an inducing effect and light was essential factor on the production of these compounds. We have confirmed the cristazarin by NMR analysis after purification of the compound by prep-HPLC. Moreover, production of cristazarin was induced after 2 weeks and exponentially increased until 6 weeks on liquid or solid culture under light. The results suggest that different carbon sources may induce the specific polyketide biosynthetic pathway in culture of the *C. metacorallifera* mycobiont. A total of 30 genes encoding putative polyketide synthesis (PKS) genes were identified from the *C. metacorallifera* genome. Expression profiles showed that majority of them are induced under the medium. Phylogenetic reconstruction placed the PKS genes into five clades. Biological activity of the cristazarin showed inhibitory activity against AGS (gastric cancer cell), CT26 (colon cancer cell), and B16F1 (melanoma cancer cell) cells. The

results will make it feasible to product cristazarin in an industrial scale by culturing mycobiont of *C. metacorallifera*.

Keywords: Anti-canser activity, Heterologues expression, Lichen-forming fungi, polyketide synthesis (PKS) genes, Secondary metabolites

IS-06

Halotolerant ve Halofilik Funguslar

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Halotolerant ve halofilik funguslar uzun süre sadece yüksek tuz ya da şeker konsantrasyonu ile korunan gıdaların kontaminantları olarak ele alınmıştır. İlk olarak 2000 yılında, Slovenya'daki insan yapımı solar tuzlalarda bulunduklarında hipersalin ortamların halotolerant ve halofilik funguslara ev sahipliği yaptığı bildirilmiştir. O zamandan beri yapılan çalışmalarla Dünya çapında farklı tuzlalardan ve tuz göllerinden izole edilmiş ve tanımlanmıştır. Bu doğal hipersalin ortamlarda yaşayan mikobiyota daha önce tanımlananlara ilaveten yeni ve ender türlerle temsil edilmekte olup filogenetik olarak ilişkili olmayan ılımlı halotolerant, aşırı derecede halotolant ve halofilik funguslardan oluşur. Tüm tuzluluk aralıklarını sağlayan çok havuzlu solar tuzlalar halotolerant ve halofilik fungusların izolasyonu için popüler çevreler olmuştur. Bu hipersalin çevreler deniz suyundan kaynaklanıp kaynaklanmadığına bağlı olarak talassohalin ve atalassohalin çevreler olarak iki gruba ayrılır. ABD'de Utah eyaletinde bulunan Great Salt Lake ve İsrail'de bulunan Dead Sea'ye ilaveten Adriyatik kıyıları, Akdeniz kıyıları, Kızıl Deniz ve Atlantik kıyılarında yer alan tuzlalar ayrıntılı bir şekilde incelenmiş ve tuzla mikobiyotası ortaya çıkarılmıştır. Baskın temsilciler, *Cladosporium* cinsi siyah maya benzeri ve ilgili melanize fungusların farklı türleri, anamorfik *Aspergillus* ve *Penicillium* ve teleomorfik *Emericella* ve *Eurotium* cinslerine ait farklı türler, melanize olmayan bazı türler ve Wallemia spp. Aşırı halotolerant *H. werneckii* ve zorunlu halofilik *Wallemia iichyophaga* ile ilgili bu tür çalışmalar, bu mikroorganizmaların iyon toksisitesi ve düşük su aktivitesi sorunlarıyla baş edebilmek için kullanabilecekleri farklı stratejileri ortaya çıkarmak üzere model organizmalar olarak önerilmiş ve bu konuda çalışmalar devam etmektedir. Bu derlemede, başta solar tuzlalar olmak üzere hipersalin ekstrem çevrelerde yaşayan başlıca fungus türlerini sunmak ve biyoteknolojik önemlerini tartışmaktır.

Keywords: Fungi, ekstremofil, saltern, *Cladosporium*, *Aspergillus* ve *Penicillium*.

IS-07

Trichoderma Hydrophobins: From Engineering to Surface Modulation

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Hydrophobins (HFBs) are the small, secreted cysteine rich proteins which exhibit high surface activities owing to their amphiphilicity. They are produced and secreted by fungi. They have the capability to self-assemble at hydrophobic/hydrophilic interfaces which makes them ideal candidates for a diversity of industrial applications. In this study, two complementary approaches were used for the construction of a library of HFB4 proteins from a diverse array of *Trichoderma* species. For this purpose two complementary approaches were used. Firstly, positive evolution and structure guided rational design was employed to generate five mutants of HFB4 from *T. virens* ($HFB4_{vir}$) ($HFB4_{vir\text{-}V19I}$, $HFB4_{vir\text{-}V19Q}$, $HFB4_{vir\text{-}V19R}$, $HFB4_{vir\text{-}L64Q}$, $HFB4_{vir\text{-}L64R}$) using a newly identified repertoire of 160 orthologous genes encoding a novel HFB4 in different species of *Trichoderma*. Molecular Dynamics simulations were performed to find the functionally important residues and to study the effects of proposed mutations. Secondly, eight different natural HFB4 orthologues showing diverse properties in terms of pI and hydrophobicity were selected from the newly identified repertoire of *Trichoderma* species via bioinformatics methods. Natural and tailor-made HFB4s were heterologously expressed in *Pichia pastoris*. A collection of biochemical and biophysical techniques were employed to verify the expression and surface activity of these proteins and to analyse the differences in the surface activity. All recombinant HFB4 orthologues and mutants were found to modulate the surface properties of glass and different

polyesters to different extents. Rational design of HFB4 resulted in HFB4 mutants with the capacity to fine-tune surface properties of glass and polyester surfaces.

Keywords: Fungal biotechnology, protein engineering, hydrophobins, Trichoderma

IS-08

Türkiye'deki Makrofungus Çalışmalarıyla İlgili Değerlendirmeler

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Türkiye'deki makrofungus çalışmaları ile ilgili kısa bir değerlendirme yapmak istiyorum. Geriye dönüp baktığımızda 1970'li yıllara kadar bu konuda hemen hemen hiçbir çalışma olmadığını görüyoruz. Neden diye baktığımızda ise, öncelikle mantarlarla çalışmanın zorluğundan bahsedebiliriz. Bilim adamları kendi alanlarına uygun çalışmalar yaptırmayı daha çok tercih ettikleri için, makrofunguslarla ilgili de uzun bir süre fazla bir gelişme olmamıştır. O dönemde benim ve birçok arkadaşımın da danışmanlığını üstlenmiş olan rahmetli hocamız Prof.Dr.Nasuh ÖDER'in çalışmaları dışında sadece birkaç makaleye rastlayabiliyoruz. Öder, topladığı örneklerin teşhisini yurt dışında yaptırmış (doktora ve doçentlik tezi), döndükten sonra da çalışmalarını sürdürmüştür. Genç yaşta vefat etmiş olsa da, kendinden sonraki çalışmalar için önemli katkıları olduğu muhakkaktır. 1986'da üniversitede göreve başladığım dönemle günümüzü kıyasladığımda, imkan bakımından çok büyük farklılıkların olduğunu söyleyebilirim. Sadece bilgisayar ve internet kullanımının yaygınlaşması bile başlı başına bir çığır açmıştır. Kaynağa ulaşmada büyük zorluklar varken, birkaç teşhis kitabına bile ulaşmak çok zorken, kısa sürede her türlü kaynağa erişim mümkün hale gelmiştir. Maddi bakımdan birçok destek alma imkanı doğmuş (Üniversiteler, Tübitak, Avrupa Birliği v.d……), iletişimin yanısıra ulaşımda da büyük gelişmeler olmuş, günübirlik birçok yere(yurt dışına bile) kolayca gidilebilir hale gelmiştir. Makrofungus sistematiği ile ilgili birkaç kişi ile çalışmalar başlamışken, özellikle son 10 senede farklı üniversitelerden 20'ye yakın yetişmiş akademisyenin olması, "Türkiye Mantar Listesi"ni yazabilecek konuma gelmemizi sağlamıştır. Prof.Dr.Ertuğrul SESLİ editörlüğünde çalışmalar devam etmektedir. Makrofunguslarda yeni tür bulma zorluğu ortadayken, son senelerde birçok yeni tür yayınlanması, gelinen noktayı göstermesi açısından oldukça önemlidir.

Türkiye'deki çalışmaların ne durumda olduğunu anlamak açısından ülke genelinde baktığımızda ise, farklı üniversitelerde makrofunguslarla çalışanların sayısında hızlı bir artış olduğunu söylemek mümkündür(Konya, Ankara,

Van,Trabzon, Muğla, Çukurova…). Genç arkadaşlarımızın bundan sonra yapacakları çalışmalarla çok daha hızlı bir ilerlemenin olacağı da açıktır. Şimdiye kadar daha çok mantar listesi verilen çalışmalar yapılırken, bundan sonra daha spesifik çalışmalar yapılabileceği görülmektedir. Son olarak; Selçuk Üniversitesi Mantarcılık Uygulama ve Araştırma Merkezi bünyesinde önemli faaliyetler gerçekleştirilmektedir. 2016'da Mikoloji Enstitüsü kurulması için gerekli müracaatlar yapılmış, halen süreç devam etmektedir. Enstitü kurulduğu taktirde çalışmaların çok daha ileri seviyelere geleceği muhakkaktır.

Keywords: Turkey, Macrofungi, Systematic.

ORAL

PRESENTATION

O-01

Yields and enzyme activities of local *Pleurotus ostreatus* isolates on different wastes

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Aims of this study were to determine the mycelial growth of the commercial and local *Pleurotus ostreatus* isolates on different agricultural and industrial wastes, and to compare them in terms of yield and ligninolytic enzyme activity on selected substrates. Totally 7 local *P. ostreatus* isolates from Eskişehir, Samsun and İzmit, and 2 commercial strains were used.

In the first phase of the study, mycelial growth rates, colony diameter and mycelium density of *Pleurotus* cultures were determined on different wastes such as wheat bran, wheat straw, fermented and nonfermented hazelnut husk, cowpea straw, tea waste, cotton waste and rice husk. HK35 commercial variety was the best among strains based on the mycelium growth on the different wastes. This was followed by isolates from Samsun and Eskisehir (OBCC 1015) provinces. Among the substrates, the best mycelium growth was obtained from cotton substrate.

In the second phase of the study, the isolates were produced on 3 different substrates (cotton, 80% wheatstraw + 20% wheatbran and 80% ricestraw + 20% ricebran). During mycelial growth, first and second harvest period; initial pH, moisture, C, N and mineral contents and C:N ratios of the substrate components, yield and enzyme activity were determined on different substrates. In the second phase, significant differences were determined for yield and enzyme activity among *Pleurotus* isolates, substrates and isolate - substrate interactions. The highest yield was obtained from 80% ricestraw + 20% ricebran substrate.

As a result of the study, it was determined that some local isolates gave better results than commercial varieties. To obtain these kind of isolates and the releasing of new varieties are of great importance in terms of commercial mushroom production in Turkey.

Keywords: *Pleurotus ostreatus,* mushroom, yield, enzyme activity

O-02

Antimicrobial activity of various formulations from *Fomes fomentarius* (L.) Gillet

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The antimicrobial activity of various extracts of *Fomes fomentarius* (L.) Gillet was investigated. Formulations for antimicrobial tests**:** 1 and 2. 15 g of dried powder of fungus material was extracted with 150 mL water/ethanol for 12h using a Soxhlet and filtered, evaporated using an evaporator at 55°C (yield: 9.2%(ethanol); 10.4%(aqueous). The extracts(2 g) were dissolved in DMSO. 3. The aqueous extracts were obtained by extraction of the 5 g fungal powder with 100 ml distilled water at 80°C for 30 min. using a water bath, and filtered. Then the filtrate were used to prepare 3.,4.,5.,6. and 7 formulations instead of water. The carboxymethyl cellulose powder(0,8 g) and castor oil(8 g) were added to the fitrate(20 g). 4. Filtrate (3 g), sodium lauryl sulphate(SLS)(0.2 g) and dimeticon(8 g), cethylalcohol(3g) were heated above 75°C and mixed.5. The gelatine powder(3 g) was added to the fitrate(7 g). Glycerine(8 g) was added and mixed. 6. Filtrate(40 ml); borax (1 g) and cetacehum(15 g), cera alba(14 g), liquid paraffin(66 g) were heated above 75°C and mixed.7. The carbomer 940 powder(1 g) and triethanolamine(q.s.) were added to the fitrate(50 mL). Samples were impregnated into the discs (50µL), and the antimicrobial activity were determined by using the disc diffusion method. As the comparison, some standard antibiotics were used. The formulation 4 showed a good antimicrobial effect on bacteria as compared to antibiotics. Extracts were found to be more effective to *Candida* species than antibiotics. The antimicrobial effects of SLS and cetylalcohol doses were not determinated. We think that formulation 4 is more effective because of the protective nature of cetyl alcohol and SLS. Formulation 1,2 and 7 shown similar activity. But other formulations generally more effective from

them due to the stabilizing effects of the polymer, oil and alcohols present in the formulation.

Keywords: *Fomes fomentarius*, antimicrobial activity, anti-Candidal activity

O-03

Edible macrofungi determined in Tonya (Trabzon) District

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Macrofungi are an important group of organisms which produce ascocarps or basidiocarps of sufficient size to be seen by naked eye. The fleshy, spore-bearing fruiting bodies of macrofungi are generally known as mushrooms. They have long been regarded all over the world as the most delectable and succulent of foods.There are plenty of mushrooms and current literature indicates that almost 2000 of them are known to be beneficial for human. And it is also known that it is necessary to study their biology, ecology and diversity to provide a sustainable consumption. This study was carried out to determine the edible mushrooms growing in Tonya district of Trabzon province (Turkey).

Macrofungi samples were collected from suitable habitats within the boundaries of Tonya district between 2015 and 2016, and they were identified by using the data obtained from field and laboratory studies.

Twenty three edible macrofungi taxa belonging to 2 division, 7 orders, 15 families and 20 genera were identified. Three of them belong to Ascomycota and 20 to Basidiomycota. *Coprinus* Pers., *Macrolepiota* Singer, *Pleurotus* (Fr.) P. Kumm., *Cantharellus* Adans. ex Fr., *Craterellus* Pers. and *Lactarius* Pers. are found to be the most crowded genera to include edible taxa in the region. *Macrolepiota procera* (Scop.) Singer is known as “Turnabacağı”, *Pleurotus ostreatus* (Jacq.) P. Kumm. as “Kayın mantarı”, *Cantharellus cibarius* Fr. as “Tavuk mantarı” and *Sarcodon imbricatus* (L.) P. Karst. as “Sakallı mantar”, and consumed as food by local people.

Keywords: Mushrooms, Edible macrofungi, Tonya, Turkey.

Acknowledgement: The authors would like to thank Karamanoğlu Mehmetbey University Research Fund, (02-M-15) for its financial support.

O-04

Misidentified Usnea (Parmeliaceae, lichenized Ascomycota) records from Turkey

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222 *Usnea* specimens deposited in seven herbaria were examined, and many misidentifications have been recorded: The most misidentified species was *U. intermedia*, which was often confused with *U. florida*. In addition, specimens of *U. barbata* and *U. dasopoga* with apothecia were usually misidentified as *U. florida* or *U. intermedia*. Not infrequently, *U. barbata* and *U. dasopoga* were confused with each other, whereas some *U. barbata* specimens were also misidentified as *U. longissima*. Many specimens identified as *U. hirta* belonged actually to *U. dasopoga* and *U. substerilis*. *Usnea fulvoreagens* were often confused either with *U. dasopoga*, *U. hirta*, *U. lapponica* or *U. substerilis*. Many *U. subfloridana* records were turned out as *U. barbata*, *U. dasopoga*, *U. hirta* or *U. substerilis*. Although *U. glabrescens* was rarely reported from Turkey, they were usually misidentifications of *U. lapponica*, *U. substerilis* and *U. wasmuthii*. All specimens identified as *U. dalmatica*, *U. flammea* and *U. subscabrosa* were recognized as misidentification. Some other rarely misidentifications were also noted. As result, among the 222 specimens, 89 were correctly identified, whereas 133 were recognized as misidentifications. These misidentifications of *Usnea* specimens collected from Turkey stems from three main reasons: (1) The applied identification key may include misinterpreted characters such as 'fish-born like appearance of fibrils', or do not include all species known from Turkey. (2) Specimens collected from suboptimal conditions may present morphological variations that led the researcher to misidentifications. (3) Most importantly, almost none of the identifications were supported with an identification of their secondary lichen compounds; especially the latter point is the most important character for identification of species with similar morphology, or ecophenotypes of extreme variable species that look more or less radically different. This study was supported by TUBITAK, project no 210T022.

Keywords: Chromatography, herbarium, revision, taxonomy, TLC

O-05

Candida parapsilosis in domestic laundry machines

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Candida parapsilosis, although a human commensal, acts as an opportunistic pathogen associated with nosocomial infections, with a rising incidence worldwide. Its ecological characteristics are poorly understood. Human-made environments within dwellings, such as dishwashers and water distribution systems, represent major sources of fungi such as *C*. *parapsilosis*. Here, we investigated the presence of members of the *C*. *parapsilosis* complex in 99 washing machines in various dwellings in the city of Mersin, Turkey. We sampled three sites in each washing machine: (i) the washing powder drawers, (ii) fabric softener drawers, and (iii) rubber seals around the washing machine doors. Additionally, we recorded the type of cleanser used by each customer. Of note, 25.3% of sampled washing machines harbored *C*. *parapsilosis* strains, later identified as the members of the *C*. *parapsilosis sensu stricto* via internal transcribed spacer (ITS) sequencing. Out of the 29 isolates obtained, biofilm-forming ability and proteinase and esterase activities were recorded in 14, 11, and 4 of the isolates, respectively. Our results suggest that the washing machines investigated abundantly harbored *C*. *parapsilosis sensu stricto*; however, no single preferred isolation site or association with cleanser type was observed (*P* >

0.05). Furthermore, *C*. *parapsilosis* isolates grew at temperatures ranging from 10ºC to 37ºC, at pH values ranging from 4-10, and were found to tolerate 5-10% NaCl. Domestic laundry appliances as a potential source of *C*. *parapsilosis* infections are discussed.

Keywords: Biofilms, ecology halophiles opportunistic infections proteinase

O-06

Comparison of the Sensititre YeastOne colorimetric antifungal method with the CLSI M27-A3 method to determine the activity of antifungal againsts clinical isolates of *Candida spp*.

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Candidiasis is an important cause of morbidity and mortality in patients with serious underlying conditions. It is related to high health care costs.

The infections caused by Candida genus are remarkable increase today. Increasing frequency of albicans and non-albicans is important of epidemiologic and antifungal susceptibility.

CLSI (The Clinical and Laboratory Standards Institute) broth microdilution method M27-A3 is approved (reference) for testing *Candida* species. The Sensititre YeastOne (SYO) colorimetric yeast susceptibility test is a commercial broth microdilution method that produces MIC data for *Candida spp*. This method is widely used in clinical laboratories.

Our study was designed to compare MIC results for Micafungin, Caspofungin, Voriconazole, Fluconazole, Amphotericin B obtained by the Sensititre YeastOne system to those obtained by the CLSI M27-A3 broth microdilution method.

Isolates were recovered from January 2012 to December 2015. A total of 129 *Candida* clinical isolates, comprising 42 isolates of *Candida albicans*, 37 *C.parapsilosis*, 19 *C.tropicalis,* 15 *C.glabrata*, six *Candida lusitenia*, five *Candida krusei* and five *Candida kefyr* were used in this study.

The isolates were identified with standard procedures (morphology on cornmeal agar plates, germ-tube production in serum) and biochemical analysis (API 20C AUX). In vitro susceptibility measured to five antifungal drugs (Micafungin, Caspofungin, Vorikonazol, Flukonazol, Amfoterisin B) as determined by two methods.The results were considered to be in essential agreement when the test result was within two dilutions of the reference value.

Table 1 summarizes the in vitro susceptibilities and essential agreement by species between YeastOne colorimetric and reference microdilution MIC results for five agents tested against 129 isolates of *Candida* spp.

Regarding individual species of *Candida*, the agreement in the MIC endpoints for all drugs and all species was >90%, with the exception of Candida glabrata; Fluconazole and Amphotericin B (87% and 87%), C. lusitaniae; Micafungin (83%).

Our study showed the colorimetric method has potential value for the performance of susceptibility tests in yeast.

Key words: *Candida spp*, susceptibility testing, antifungals

O-07

Comparison of Photosynthetic Pigment Contents in Lichen Samples were Collected from Different Localities in Bursa

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In this study, contents of photosynthetic pigment in foliose *Hypogymnia physodes* (L.) Nyl. and fruticose *Pseudevernia furfuracea* (L.) Zopf were compared. Lichen species were collected from five localities at Osmangazi and İznik districts in Bursa. Firstly, 20 mg of lichen samples were rinsed three times in 1 ml acetone saturated with $CaCO_3$ to remove lichen substances. For the preparation of lichen extracts were used 5 ml pure DMSO (Dimethylsulfoxide). Concentrations of chlorophyll-a, chlorophyll-b and total carotenoids in the extracts were measured with spectrophotometer at 665, 649, 480, 435 and 415 nm. Chlorophyll-a, chlorophyll-b, total carotenoid contents (mg/g), chlorophyll-a /chlorophyll-b ratio, total carotenoid / total chlorophyll ratio and OD435 / OD415 ratio in the lichen extracts were differently determined between localities. These changes were found statistically significant ($p < 0.001$). The highest chlorophyll-a contents were measured in Osmangazi-Soğukpınar (2,79±0,17 mg/g), İznik-İhsaniye (2,37±0,24 mg/g), the lowest contents of chlorophyll-a were measured in İznik-Sağırhisar (2,02±0,21mg/g), İznik-Nüzhetiye (2,22±0,19 mg/g). These results has been observed that Soğukpınar and İhsaniye localities were less affected by anthropogenic effects due to their presence in the rural areas. Whereas, the localities of Sağırhisar and Nüzhetiye were affected by agricultural activities. Only, the difference between total carotenoids / total chlorophyll ratio was not statistically significant. In addition, it has been found between the lichen species. The changes in the content of photosynthetic pigments of *Pseudevernia furfuracea* are much more than *Hypogymnia physodes*. These results showed that negative atmospheric conditions are more effective at fruticose lichens than at foliose lichens.

Keywords: Bursa, content of photosenthetic pigment, epiphytic, lichen

O-08

The mating type (MAT) locus and possible sexuality of the opportunistic pathogen *Exophiala dermatitidis*

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The aim of this study was to characterize the mating type locusa (*MAT*) and thereby gain insights into the reproduction mode of the opportunistic black yeast, *Exophiala dermatitidis*. In ascomycetous fungi, mating is controlled by a single mating type locus called *MAT* that involves two different sequences (idiomorphs) in the two mating types. In fungi belonging to the Pezizomycotina subphyllum, each *MAT* idiomorph encodes either an alpha-box or an HMG domain transcription factor. Although these genes are required components of the *MAT* locus, the *MAT* locus structure of each fungus is unique. In the genome of the sequenced strain of *E. dermatitidis*, an HMG domain gene is flanked by the *SLA2* and *APN2* genes, as in other members of the Pezizomycotina. The *MAT* loci of 72 (11 clinical and 61 environmental) *E. dermatitidis* isolates were screened with HMG primers and the region surrounding the HMG gene was amplified by long-range PCR. The 11.9 kb-long PCR product of an HMG (-) isolate was sequenced and found to harbor an alpha-box gene. The *MAT* locus was characterized by comparing the locus bearing the alpha-box gene (*MAT1-1*) and the genomic sequence harboring the HMG gene (*MAT1-2*). As a result, the *MAT1-1* locus is 3544 bp long and includes the *MAT1-1-4* and alpha-box genes while the *MAT1-2* locus harbors only the HMG domain gene and is 3771 bp long. The percentages of *MAT1-1* and *MAT1-2* isolates were found to be 54% and 46%, respectively. The mating types of environmental isolates were distributed roughly equally, while clinical isolates have a distribution favoring *MAT1-1*

(64%). *E. dermatitidis* is the first pathogenic black fungus in which both *MAT* idiomorphs have been characterized. In addition, the mating types of 72 isolates were determined and these findings suggest that *E. dermatitidis* might reproduce sexually.

Keywords: black fungi, *Exophiala dermatitidis*, mating type, *MAT* locus, sexual reproduction.

O-09

Determining the potential of *Trichoderma atroviride* and *Trichoderma citrinoviride* as biocontrol agent and biofertilizer

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Trichoderma species are known as industrial workhorses for biotechnological productions of lytic enzymes such as chitinases, β-1,3-glucanases and various proteases. They also have different commercially important applications such as biocontrol agents and biofertilizers.

In present study, *Trichoderma atroviride* (n=3) and *Trichoderma citrinoviride* (n=5) strains were evaluated for their characteristics as biological control agent and biofertilizer under *in vitro* conditions.

Trichoderma strains have shown mycoparasitic activity and lytic enzymes production capabilities which established them as potential biocontrol agents. All *Trichoderma* strains produced lytic enzymes such as chitinase, protease and β-1,3-glucanase and they demonstrated considerable mycoparasitic activity against *Verticillium* sp, *Rhizoctonia solani* and *Fusarium oxysporium*. Indole-3-acetic acid production and phosphate solubilization capabilities of tested *Trichoderma* strains proved them as biofertilizers and *T. citrinoviride* strains had shown drastically higher capability of indole-3-acetic acid production and phosphate solubilisation as compare to *Trichoderma atroviride* strains.

In conclusion, this work has shown that *T.citrinoviride* strains have great potential for *Trichoderma*-based commercial biological control and biofertilizer formulations.

Keywords:*Trichoderma atroviride*, *Trichoderma citrinoviride,* biological control agent, biofertilizer

O-10

Antimicrobial and antibiofilm effects of cinnamaldehyde on clinical *Candida* isolates

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Candida species are ubiquitous fungal pathogens and are the most common cause of mucosal and invasive fungal infections in humans. Their biofilms have become an increasingly important problem for hospital-acquired and device-associated infections. In last years, the antimicrobial and antibiofilm activity of natural products such as essential oils have drawn attention. The essential oil components cinnamaldehyde is a broad range, natural antimicrobial compounds that can be isolated from cinnamon. The aim of our study is to investigate the effects of cinnamaldehyde on planktonic and biofilm forms of clinical *Candida* strains by microbiological and electron microscopic methods.

In this study, 32 clinical and reference strain (*Candida albicans* ATCC 4476) were used for assessment of biofilm formation. Biofilms were formed microtiter plates. Results were analyzed by using plate reader and the optical density (OD) of each well was measured at 492 nm. According to the values of optical density, the strains were classified as follows: Absorbance/COV(cut off value)<1.125 non-produced; 1.125<Abs/COV<2.00 weak; 2.00<Abs/COV<3.00 modarete; 3.00<Abs/COV<6.00 high, biofilm producers. All tests were carried out in triplicate and the results were averaged.

The minimum inhibitory concentration (MIC) of cinnamaldehyde was determined using the broth micro dilution method according to the CLSI. Amphotericin B was used as a standard drug against *C. albicans* ATCC 7644. MIC results showed a MIC⩽0.031%(vol/vol) for all isolates tested. For Scanning and Transmission electron microscopic studies, isolates were also exposured to the cinnamaldehyde at concentration of ½MIC and results were compared with the control. Effect of cinnamaldehyde at concentrations of ½MIC for 48th hours biofilm formation was studied. According to our results, cinnamaldehyde showed a high

antibacterial potential with very low MIC values on planktonic cells of *Candida* isolates. Electron microscopically, no growth was observed at the MIC value and the higher concentrations; cellular damage was also determined at sub MIC concentrations.

Keywords: *Candida*, biofilm, cinnamaldehyde , antimicrobial

O-11

The Isolation and Molecular Characterization of Uv-Protectant Pigment Producing Fungi for Using in Commercial Formulations of Fungal Biopreparats

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The ultraviolet radiation (UV) derived from sunlight is the most important factor affecting the viability of entomopathogenic fungi. The UV protectants are added to the formulated conidia in most applications to increase the persistence of microbial agents in the environment. However, the field efficiency of the formulated conidia in many cases is still not sufficient to control the pests. So, there is a need for the discovery of new UV protectant products such as pigments. To obtain pigment producing microbial isolates, 20 different soil samples, were collected from 1800 m and above altitude in Erzurum. After isolation studies in the laboratory, 2 filamentous fungi and 6 yeasts were determined as pigment producer. In this preliminary selection, only the A2 and A3-coded yeast isolates were selected because of their susceptibility to pigment extraction and the pigments purified. The pigment samples of these two isolates were then added to *Beauveria bassiana* spore suspensions as 0.5 mg/ml, 1 mg/ml and 2.5 mg /ml. The suspensions added with pigment were exposed to UV rays for 15, 30 and 60 minutes. In the light of the results obtained, the addition of pigments increased the conidial germination by providing protection against UV rays in all experiments. The best results were obtained by the addition of pigment, which is belonged to the A2 isolate. As a result of exposed to the UV light for 30 minutes of *B. bassiana* isolate, which is coded PaF04, the conidia germination rate decreased to 39.58%, while the addition of A2 pigment at a concentration of 0.5 mg/ml was recorded as 99.16%. In addition, the antimicrobial and antioxidant activities of the A2 pigment, and the molecular characterization of the producer yeast isolate have been performed. As a result of the studies, it was concluded that the pigment exhibits antioxidant activity as well as UV protective properties. In addition, while showing antibacterial activity against Gram negative (G-) and positive (G+)

bacteria, it has not present antifungal activity. According to the results of ITS sequence analysis, A2-coded yeast isolate was identified as *Sporobolomyces roseus* and deposited with the GenBank database under the accession number KY705066.

Keywords: UV protectant, pigment, *Beauveria bassiana, Sporobolomyces roseus*

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O-12

Fungal spore calendar of Yalova Province, Turkey (2004)

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Aerobiology is a field of biology that investigates the presence of biologically important substances, their uptake, translocation and distribution. Aerobiology studies are important due to transport of organisms in a certain area to other areas (countries and intercontinental) through air may adversely affect plant, animal and human life. Airborne concentrations of certain fungal species have been linked with detrimental effects on human health. The aim of this study was to determine fungal taxa and spore types, their counts and distributions in Yalova Province atmosphere in 2004 and to construct fungal spore calendar of the year.

Airborne fungal spores were recorded by use of a Hirst-type seven day volumetric spore trap, which situated on the roof of a building in Yalova during 2004. The fungal spores were counted and identified by light microscopy. Analyses were performed on the slides and the data were expressed as spore average daily concentrations per cubic meter of air. The spore calendar construction was based on Spieksma's model.

A total of 348.514 s belongs to 47 fungal taxa and 4 fungal groups were recorded during the study period. One-year spore calendar of Yalova was prepared by evaluating the data.

The prepared spore calendar can help allergy, immune system and dermatology specialists to put complete and accurate diagnosis. In addition, it is thought that it can be helped to agronomists and farmers to determine using time of fungicides and solving the problems in suitable times with using less fungicides.

Keywords: Aerobiology, volumetric method, spore calendar, Yalova

O-13

Inhıbıtıon Of *Propınıbacterıum Acnes* Quorum Sensıng And Bıofılm Formatıon By Acetone Extracts Of *Platısmatıa Glauca* From Alaçam-Bursa

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Acne vulgaris, a common skin disorder of the pilosebaceous follicles, is the eighth most prevalent disease in worldwide.It has been reported that 9.4% of the global population are affected. Also, the prevalence of acne has been documented as 85% during adolescence.In the U.S.A., 12 billion dollars per year is spent for the treatment. *Propionibacterium acnes* plays an important role in the development of acne by biofilm formation. It has been showed that biofilm forming *P. acnes* are resistant to commonly used anti-acne agents. The development of antidrug resistance of *P.acnes* may be prevented by the usage of quorum sensing inhibitors (QSIs).In this way, lichens are believed to be possible candidates for QSIs.

In our study,the three-dimensional chemical structures of lichen secondary metabolites were determined using molecular modelling techniques and these secondary metabolites were docked with proteins involved in biofilm mechanism (molecular docking). *Platismatia glauca* was found to have secondary metabolites with high scores *in silico* and they were collected from Alaçam-Bursa. The acetone extracts of *P. glauca* thalli samples were obtained.The biofilm tests were carried out by a serial dilution method in 96 well plates. The wells were filled with the bacteria culture (diluted at 1:100 v/v, in LB broth) and the extracts were added to the each well at the diluted doses.The plates were incubated at 37 ^{0}C and they were stained with 0.1% crystal violet for the determination of biofilm formation and optical density at 590 nm were measured by microplate reader (Cytation 3 – BioTek).

Results indicate that *P. glauca* acetone extracts inhibited the biofilm formation successfully at the certain concentrations of 40 and 80 µg/ml whereas the biofilm forms of the bacteria were increased at the 160 µg/ml.Consequently, the secondary

metabolites of *P. glauca* were found to be considerably effective to control the biofilm formation of *P. acnes.*

Keywords: Acne vulgaris, biofilm, Quorum sensing, *Platismatia glauca*, *Propionibacterium acnes*

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O-14

Determination of molds isolated from man-made water systems to produce primary and secondary metabolites

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Molds, although having many hazardous effects to living bodies, can be an important industrial source of enzymes, which are impressive during their lives. Developing enzyme technologies, diversity of applications of the products, and due to their very high economic values, researches of amylase, lipase, protease, etc. are important in biotechnology. Along with primary metabolite enzymes, another important metabolite group comprises secondary metabolites which are used highly in medicine, textiles, food, etc. that are produced by fungi. In this study, 43 molds were isolated from public and industrial water systems and molecular diagnoses performed to produce amylase, lipase, protease enzymes and their antimicrobial activities. In this context, diffusion technique and zone control techniques were used to assess amylase activities, while for lipase, deep diffusion method in cultured medium and for protease, opacity capacity of deep culture method was used. In addition, agar disk diffusion method was used to determine the antimicrobial activities against *Bacilus subtilis* (NRS-744), *Staphylococcus aureus* (NRRL B-767), *Escherichia coli* (ATCC-25922), *Listeria monocytogenes* (ATCC-7644), *Salmonella typhimurium* (NRRL B-4420), *Candida albicans* (ATCC-90028), *C. glabrata* (NRRL-Y-17815), *C. zeylanoides* (NRRL-Y-1774), *Aspergillus flavus* (NRRL-980), *A. fumigatus* (NRRL 163), *Fusarium solani* (NRRL-13414), and *Penicillium citrinum* (NRRL 1841). As a result, the molds investigated were revealed to produce amylase (76.7%), lipase (93%), and protease (83.7%). Additionally, molds investigated in this study possessed antibacterial activity against *E. coli*, *Listeria monocytogenes* and *S. typhimurium* (9.52%), *S. aureus* and *B. subtilis* (28.52%), The activity of metabolites from isolates of *Aspergillus* and *Penicillium* spp. is significant.

Keywords: Mold, primary metabolite, secondary metabolite.

O-15

Determination of *Protosteliomycetes* group organisms ısolated from forestry and wildlife saving area of Uludag University campus, Bursa-Turkey

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Protostelids are microscopic slime molds that are located in Amoebozoa group, which includes Eumycetozoa. They are disruptive microbivores that feed upon decomposers like bacteria and filamentous fungi. Their role in regulating the populations of bacteria, fungi and yeast in soil and in other microhabitats as well, is thought to be important. Their pathogenic effects on plants and animals are unknown. The purpose of our study is to determine the protostelid organisms isolated from research area and therefore, to contribute to the biodiversity of Turkey. This research has been carried out by collecting potential samples from the research area at random periods between September 2013 – May 2014 from the forestry and wildlife protection area of Uludag University Campus. Aerial litter, bark, decomposing shell and ground substance have been obtained from *Quercus* spp. for isolations. Collected samples have been subjected to a set of laboratory applications. For this purpose, primer isolation plate containing materials gathered from different localities have been formed and incubated at room temperature, thus the process has been started. Mature sporocarps which appeared during 3-4 weeks followed by light microscope, have been photographed. İdentification and description of samples have been done by comparing the information gathered from microscopic observation and diagnostic characteristics. Thirteen taxa have been identified in the research area. These are; *Protostelium mycophaga*, *Clastostelium recurvatum, Planoprotostelium aurantium*, *Echinosteliopsis oligospora*, *Schizoplasmodiopsis pseudoendospora*, *Protosporangium articulatum*, *Schizoplasmodiopsis amoeboidea*, *Schizoplasmodiopsis vulgare*, *Soliformovum expulsum*, *Endostelium zonatum*, *Protosteliopsis fimicola*, *Protostelium pyriformis* and *Echinostelium bisporum*. Some of them such as *Clastostelium recurvatum, Planoprotostelium aurantium,*

Protosporangium articulatum, Soliformovum expulsum, Endostelium zonatum, Protosteliopsis fimicola and *Protostelium pyriformis* are new records for Turkey.

Keywords: Bursa, Eumycetozoa, Mycetozoa, Protostelid, Turkey

O-16

The analyse of geographical elements of Xylotroph microfungi from Black Sea Forest

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The analyse of geographical elements was given by us as about Phyllotrophes first time last year in Turkey. This study interested with analyse of geographical elements that Xylotrophes from this region. One hundred thirty-nine Xylotroph microfungi species have been evaluated to reveal the analyse of their geographical elements. As a result: Boreal type 122 species (For example: *Aplosporella tiliacea*, *Aposphaeria collabascens*, *Asterosporium asterospermum*, *Coniothyrium lignorum*, *Diaporthe carpini*, *Macrophoma macrospora*, *Melanconium apiocarpum*, *Metasphaeria coryli*, *Microdiplodia frangulae*, *Monodictys spinosa*, *Neoheteroceras flageoletii*, *Phoma desolationis*, *Rosellinia buxi*, *Septomyxa carpini*, *Sporidesmium coronatum*, and *Sporidesmium eupatoriicola* etc.), Cosmopolite type 11 species (e.g. *Helminthosporium velutinum*, *Monodictys putredinis*, *Periconia atra*, *P. cookei*, and *Volutella ciliata* etc.). Adventive and Xerophyte types have been represent by threes species respectively that are: *Chalara kendrickii*, *Oidiodendron truncatum*, *Stilbella byssiseda*, *Aposphaeria epicorticalis*, *Botryosphaeria castanea*, and *Stigmina obtecta.* All species that given were evaluated according to in sub-categories classified.

Keywords: Analyse, Geographical element, Microfungi, Xylotroph

O-17

Isolation, macroscopic, microscopic and molecular identification of native fungi for the production of native alpha-amylase enzyme in order to increase bread quality using biotechnological processes

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The aim of this study is isolation, macroscopic, microscopic and molecular identification of thermophilic and mesophilic fungi which produce commercial alpha-amylase enzyme in bread making. The use of alpha-amylase enzyme obtained from mesophilic fungi which are important in the fermentation process in bread production and thermostable alpha-amylase enzyme resistant to baking temperature is recommended. Alpha-amylase is increasing the quality of bread in many ways, such as the shelf life of the bread, the increase of taste. Water and soil samples were taken from the areas where thermal water sources varying in temperature between 55-90 °C on Eskişehir and Haymana districts of Ankara and Uşak-Afyon highway. The collected soil and water samples were diluted and kept for 3 hours in a water bath at 40-45 ºC for pre-enrichment and the prepared dilutions were placed in 1-liter petri dishes and Starch Yeast Extract Agar medium was added on them. After the incubation, iodine solution was dropped and the fungal colonies forming the transparent zone were evaluated as amylase (+). The fungal isolates were inoculated in Malt Extract Agar, Czapek's Yeast Extract Agar and Oatmeal Agar plates. The plates were incubated at 40°C for 7 days. and identified macroscopically and microscopically. 23 thermophilic and mesophilic isolates were obtained from thermal areas of Afyon, Usak, Eskişehir and Ankara. As a result of the macroscopic and

microscopic observation of the isolates, six isolates of amylase producing *Aspergillus niger*, *Aspergillus terreus* and *Trichoderma atroviride* were identificated. PCR amplification of 18S rDNA and ITS regions of isolates of *Aspergillus niger* and *Aspergillus terreus* using fungus specific primers and molecular identification were performed and compared with web based BLAST analyzes. As a result of the molecular characterization study, it has been seen that the molecular identification supports the classical identification.

Key words: alpha-amylase, enzyme, fungi, thermophilic, mesophilic

This study is part of the project "Investigation of the Utilization Potential of Thermal Native Fungal Alpha-Amylase Enzyme for Enhancing The Quality of Bread Using Biotechnological Processes" by TAGEM / HSGYAD / 16 / A05 / P01 / 103, conducted by the GTHB TAGEM-Biotechnology Research Center

O-18

Distribution of Candida species isolated from vaginal swab samples and their antifungal susceptibilities

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Vulvovaginal candidozis is the second most common cause of vaginitis after bacterial vaginozis.This study was aimed to determine the species distribution and antifungal susceptibility of *Candida* species in women with vulvovaginal candidosis. In this study, 889 vaginal swab samples that were sent to laboratory between May 2015-October 2015, were inoculated onto blood agar, chocolate agar, Sabouraud dextrose agar (Salubris,Turkey). From all those samples only 128 *Candida* isolates whose blastospores and hyphal structures were seen with Gram staining were included for the study. Germ tube test, Chromogenic *Candida* agar (RTA,Turkey) and MALDI TOF-MS(Bruker Daltonics, Germany) were used for determination of species. Susceptibility for fluconazole (FLU), voriconazole (VCZ), itraconazole (ITZ), miconazole (MCZ), caspofungin (CAS) were studied and evaluated according to CLSI M27A3-S4 susggestions with broth microdilution method. *Candida albicans* ATCC 10231 ve *C. krusei* ATCC 6258 were used as quality control strains. The most common strain was *C. albicans* 70.3%, followed by *C. glabrata* 21.8 %. For FLU, VCZ, ITZ, MCZ, CAS antifungals, MIC50-MIC90 values were determined as (0,125-2),(0,06-0,125), (0,5-2), (0,06-1), (0,06-0,06) µg/ml for *C. albicans*, and as (2-4), (0,125-0,25), (4-16), (0,06-0,06), (0,06-0,06) µg/ml for *C. glabrata*. In *C. albicans* isolates, for FLU, five isolates were resistant, one isolate dose-dependant-susceptible (SDD), and for VOR three isolates were resistant and two isolates were dose-dependant-susceptible. All *C. glabrata* isolates for FLU, and one of *C. krusei* isolates for VOR were detected as dose-dependant-susceptible. All *C. albicans, C. tropicalis, C. glabrata, C. krusei* and *C. parapsilosis* isolates were susceptible for CAS.

Although *C. albicans* is the most common vaginal candidosis agent, species with low azole susceptibility like *C. glabrata*, appear to be growing. Also, FLU resistance (%5.5) between *C. albicans* isolates was remarkable.

Keywords: Candida, susceptibility, vaginitis

O-19

Antimicrobial activity screening of *Astraeus hygrometricus*

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Mushrooms are economical source for commercial, industrial and medical bases and they can be obtained with cultivation or wild harvesting in forest. They include nutrition component, vitamins and minerals, therefore they are used in regular diet in most of the country. Their medicinal and nutritional properties provide immense potential against human health problem. Pathogen infection is one of them and it is becoming significant for multidrug resistance microorganisms. Novel antimicrobial drug development is became crucial, so mushrooms large range screening must be done. *Astraeus hygrometricus* is edible mushroom, but it must be uniquely collected from specific region. In this research, *A. hygrometricus* was collected from Yomra, Trabzon and ethanol extract was prepared for determination of antimicrobial activity. 1.08, 2.16 and 5.40 mg samples were obtained and this activity was investigated against 17 bacteria and 1 fungi by using disk diffusion method. Twelve of them are standard species and they are important for exact determination of broad range antimicrobial potential. These species include Bacillus, Enterobacter, Enterococcus, Escherichia, Klebsiella, Listeria, Pseudomonas, Salmonella, Staphylococcus and Candida geniuses. The results were presented that *A. hygrometricus* has antimicrobial potential against eight of them.

Keywords: *Astraeus hygrometricus*, mushroom, antimicrobial activity, disk diffusion method, ethanol extract

O-20

Optimization of micropropagule production by *Trichoderma citrinoviride* in solid state fermentation using response surface methodology

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Growth optimization and large scale production of *Trichoderma* spp. is a major concern for the commercialization of *Trichoderma*-based Biocontrol Agents (BCAs). This study was aimed to optimize production conditions for *Trichoderma citrinoviride* P25 strain in solid state fermentation (SSF) using wheat bran as a substrate. Initially, for the production of *Trichoderma* micropropagule nitrogen source, initial pH of the medium and inoculum size were optimized. Among various nitrogen sources (yeast extract, peptone, soya bean flour, corn steep solid and malt sprout) tested at different concentrations (1-20%) and 5% malt sprout was selected as the best nitrogen source on the basis of highest micropropagule count ($1.76x10^{10}$ cfu/g dry substrate). Similarly, among different pH ranges (3-7) pH 4.5 has shown maximum micropropagule count ($2.08x10^{10}$ cfu/g dry substrate) and among different inoculum sizes ($1x10^{5}$–$1x10^{9}$ spor/ml) inoculum size of $1x10^{8}$ spore/ml was found as optimal to produce maximum micropropagule count ($8.12x10^{9}$ cfu/g dry substrate). Further, the optimization of temperature, initial moisture content, and incubation time was performed by statistical optimization technique using response surface methodology (RSM). According to the results optimal values for temperature, initial moisture content, and incubation time were 27.5°C, 68% and 7 days, respectively. With the use of optimized conditions micropropagule count was increased up-to three fold as compared to the count obtained under un-optimized conditions. Optimized conditions were also applied for large scale production of *Trichoderma* micropropagule in stainless steel trays and maximum micropropagule count ($1.13x10^{10}$ cfu/g dry substrate) was achieved. Concluding, SSF can be considered as an effective technique for large scale production of *Trichoderma* micropropagule and statistical

optimization method is a useful tool to optimize multiple parameters at a time by performing a minimum number of experiments.

Keywords: *Trichoderma citrinoviride,* solid state fermentation, response surface methodology, micropropagule

O-21

Epidemiology of dermatophytoses according to the samples which are sent for mycological examination between January 2012 and December 2016

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This study was conducted retrospectively for purpose of examining the epidemiology of dermatophytoses among the patients who have applied to Trakya University Hospital between the years of 2012 and 2016. The samples which were sent for mycological examination from policlinics, clinics and the other outer centers were included in the study. The samples were microscopically examined (DM) and incubated 3 weeks within fungal media. Fungi were identified according to macroscopic and microscopic features, urease enzyme, hair perforation test and reproduction on dermatophyte test medium. The dermatophytes were isolated in 133 of 1045 samples obtained from 905 patients. Of 125 culture positive patients, 68(%54.4) were men. Fungal elements were detected in DM of 123(%92.48) of 133 patients with dermatophytoses. Dermatophytes were not isolated, in the culture despite DM positivity in 189(%18.1) of 1045 samples. Of the dermatophytes, 107(%80.5) were *Trichophyton*, 25(%18.8) were *Microsporum* and 1(%0.7) was *Epidermophyton*. *T.rubrum*, *M.canis*, *T.mentagrophytes*, *T.tonsurans*, *T.verrucosum* and the other species was 65(%48.87), 24(%18.04), 14(%10.52), 14(%10.52), (%3.75) and %3, respectively. They were mostly isolated from skin (corporis) (47(%35.3)), toenail (32(%24.1)), feet skin (17(%12.8)), scalp (15(%11.3)), hand skin (10(%7.5)), face skin (9(%6.7)), and inguinal skin (3(%2.3)). They were mostly diagnosed in May (22(%16.5)), December (18(%13.5)) and March (14(%10.5)). When the years between 1993 and 2003 in our hospital was compared with the last 5 years. While the *T.rubrum* was been following by the *T.mentagrophytes* in previous years, then *T.mentagrophytes* was replaced *M.canis*; dermatophytoses were higher in male in recent years. While the feet were been following by the hand in previous years, then the handwere replaced other corporal zones (corporis). While dermatophytes were mostly isolated on January in previous years, then on May. As a

result, it was observed that a change was happened in the dermatophytoses epidemiology over the years in the same zone.

Keywords: Dermatophytes, Trichophyton, *T. rubrum*, *T. Mentagrophytes*

O-22

Lichens as potential anti-cancer drug source

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Successful cancer treatment still requires more compounds isolated from natural sources. Lichens are complex organisms living in symbiotic relationship with fungi and algae (and/or Cyanobacteria). These associations lead to the synthesis of a great number of secondary metabolites. Cytotoxic activities of these metabolites are attracting much interest. Several investigations were conducted related to cytotoxic activity and anti-proliferative effects of lichen extracts or secondary metabolites. In previous trials we searched for anti-cancer activity of different lichen extracts. We showed that the methanol extracts of *Parmelia sulcata, Hypogymnia physodes and* and *Usnea filipendula* have anti-growth effects on breast cancer cell lines (MCF-7, MDA-MB-231). We also exhibited the methanol extracts from *Parmelia sulcata* and *Usnea filipendula* induced apoptosis-like cell death through DNA damage in human lung cancer (A549, PC3), liver cancer (Hep3B) and rat glioma (C6) cells. We recently investigated anti-growth/apoptotic effects of methanol extracts of *Xanthoparmelia somloensis*, *Usnea intermedia*, *Bryoria capillaris* and *Lobaria pulmonaria* on human lung cancer (A549, H1299) and breast cancer (MCF-7, MDA-MB-231) cell lines. Among these lichen extracts, *Usnea intermedia* resulted in a relatively stronger anti-growth and apoptotic effect in cancer cells.

Our data and previous studies demonstrate that lichen extracts and their secondary metabolites are potential sources of anticancer drugs and deserve further analysis in vivo and in vitro.

Keywords: Lichen extract, cancer, cell death, apoptosis.

O-23

Myxomycets of Central, Kazımkarabekir and Ayrancı (Karaman) district

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The aim of this study is to contribute to the Turkish myxobiota with the myxomycets obtained from Central, Kazımkarabekir and Ayrancı (Karaman) districts in 2013-2014. *Myxomycetes* are known the true slime moulds or plasmodial slime moulds. It was included in the *Protozoa* with cellular structures and amoeboid forms. Because they produce aerial spore-bearing structures and typically occur in some of the same types of ecological situations as fungi, they have traditionally been studied by mycologists.

During this study, barks of living trees, barks and woods of log, decayed materials of trees which are likely to be spores or plasmodium were collected on the field trips. The collected materials was applied the moist chamber technique and the myxomycets sporocarps were developed. As a result of field and laboratory studies, 31 myxomycet taxa belonging to 12 genera were determined. The developing samples were glued together on cardboard with the substrates and placed in cardboard boxes of the same size. These samples are currently kept at Selçuk University Fungarium, Mushroom Research and Application Centre (Konya).

As a result of field and laboratory work, 31 taxa of *myxomycetes* belonging to 7 families and 12 genera were determined. Distribution of these taxa as the families is *Physaraceae* 32% (10), *Stemonitidaceae* 22% (7), *Trichiaceae* 16% (5), *Didymiaceae* 10% (3), *Arcyriaceae* 10% (3), *Cribrariaceae* 7% (2) and *Liceaeceae* 3% (1).

Keywords: Karaman, *Myxomycetes*, slime moulds, taxonomy, Turkey.

O-24

Coconut Oil Encapsulated Chitosan Nanoparticles: Cytotoxicity, Anticandidal and Antibiofim Activity Against Multi-Species *Candida* Biofilms

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Candida species are opportunistic pathogens, with the ability to cause infections in immunocompromised patients. Most cases of candidiasis have been attributed to *Candida albicans*, but recently, an increasing number of infections caused by non-albicans *Candida* species has been reported specifically *Candida tropicalis, Candida krusei* and *Candida glabrata*. Candida within biofilms was found to be 1000-fold less susceptible to diverse antifungals than planktonic ones.

Coconut oil is one of the antimicrobial herbal oil which was tested against *Pseudomonas aeruginosa, Esherichia. coli, Proteus vulgaris* and *Candida albicans*. Therefore, antibiofilm activities of coconut oil encapsulated chitosan nanoparticles upon distinct non-albicans *Candida* species were evaluated in this study.

Coconut oil encapsulated chitosan nanoparticles was prepared with ionic gelation interaction between positively charged chitosan and coconut oil at room temperature and sizes were analyzed with Zeta Sizer. Empty chitosan nanoparticles was also synthesized for comparison of anticandidal and antibiofilm effects on *Candida tropicalis, Candida krusei Candida glabrata* and mix culture. Toxicity of developed formulations was studies with XTT method on L929 Fibroblast cells.

As a result, this novel chitosan encapsulated coconut nanoparticles indicate it to be a simple and practical agent for *Candida* biofilm control with great anticandidal and antibiofilm effects. This effective and non-toxic concentrations may be used directly on medical applications, devices and equipments.

Keywords: Chitosan, microencapsulation, coconut oil, multi-species biofilm, Non-albicans Candida

O-26

The amino acid, fatty acid and element contents of the *Terfezia* and *Picoa* species from Eastern Turkey

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In this study, it was aimed to determine the amino acid, fatty acid and element contents of the arid and semi-arid truffles (*Terfezia* and *Picoa* species) from the vicinity of the Elazığ and Malatya regions. The amino acid, fatty acid and element content analyses of the truffles were conducted at Tübitak Marmara Research Center Food Institute. The results for the *Terfezia* species in terms of amino acid contents was *T. olbiensis* < *T. boudieri* < *T. claveryi,* and it was seen that Val, Leu, Ile, Pro, Arg, Met, Phe, Lys, Tyr contents in *P. juniperi* was higher than in the *P. lefebvrei*, but Ala, Gly, Thr, Ser, Trp, Asp, Glu, His were lower. Besides that, it was determined amino acid contents in *Picoa species were* higher that the amount found in *Terfezia* species. The results showed that the *Terfezia* and *Picoa* species are rich in term of unsaturated fatty acid contents whereas they are poor in terms of saturated fatty acid. The amount of palmitic acid, stearic acid, oleic acid and linoleic acid in *Picoa* ve *Terfezia* species were higher than other fatty acids. The amount of palmitic (9.07-9.49%) and stearic acid (3.87-4.38%) contents in *Picoa* species were observed to be lower than the *Terfezia* species (26.03-32.70% and 4.64-9.48%) but higher for oleic acid contents (20.51-29.67% for *Terfezia*, 53.81-58.45% for *Picoa* species). On the other hand, other fatty acid types were understood to show minimal variety (0.00-2.34%). It was also determined that Al, Cr, Mn, Co, Ni, Cu, As, Sr and Pb exists in the soil from the growth area, host plant and in the truffles at varying levels. Our study has also shown that *T. boudieri*, *T. claveryi*, *T. olbiensis*, *P. juniperi* and *P. lefebvrei* species are nutritious in terms of amino acid, fatty acid and element levels.

Keywords: *Terfezia, Picoa*, truffle, amino acids, fatty acids, element contents

Acknowledgements: We are grateful to the Scientific and Technical Research Council of Turkey for supporting this project (TÜBİTAK-3001-114O065).

O-27

New Genus Record for Turkey Mycobiota: *Sirococcus conigenus*

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To contribute to mycobiota of Turkey was aimed in this study. The microfungus sample was collected during periodic mycological excursion from the Kırşehir Province in May 2013. It was transferred to the laboratory and microscopic investigations were carried out. The collections were examined in distilled water and for microphotographs Olympus BX 53 with Olympus DP 22 digi–CAM (Japan) research microscope (Axio imager 2 equipped with Nomarski differential interference contrast optics) was used. The specimen was identified with the help of Grove (1935), Kirisits et al. (2007) and Kowalski (2010). As a result: ***Sirococcus conigenus*** (Pers.) P.F. Cannon & Minter has been identified on fallen cones of *Pinus nigra*. Although it has been well known in the World as a pathogen, it has been recorded for the first time in genus level in Turkey. The sample is deposited at the Ahi Evran University, Arts and Sciences Faculty, Department of Biology, Mycology Laboratory.

Keywords: Biodiversity, New record, Pathogen, *Pinus nigra*, *Sirococcus*

O-28

Additions to the Turkish Entolomas

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The name is derived from the Greek entos (ἐντός) meaning inner and lóma (λῶμα) meaning fringe from the in-rolled margin. *Entoloma* is a large genus of terrestrial pink-gilled mushrooms, with about 1000 species. They have a drab appearance, pink gills which are attached to the stem, a smooth thick cap, and angular spores. Most species are saprobic, though some may form mycorrhizal relationships. Although some of the spring entolomas, such as *E. clypeatum*, are consumed, especially in Europe, edibility is unknown for many species, and some are definitely poisonous and dangerous. *E. rhodopolium* has been found to contain significant quantities of the mycotoxin muscarine. According to the literature on Turkish mycobiota, 49 *Entoloma* species have previously been reported from Turkey. With this study, two *Entoloma* species (*Entoloma caccabus* (Kühner) Noordel. and *Entoloma kervernii* (De Guern.) M.M. Moser) are reported for the first time from Turkey and species number of the genus will increase to 51.

Keywords: *Entoloma*, new records, Turkey.

O-29

The effect of immobilization methods for plant growth regulator production by *Inonotus hispidus* and *Stereum hirsutum*

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In this study, the plant growth regulators (PGR) production performanceof two mushroom isolates, *Inonotus hispidus* 5009 and *Stereum hirsutum* 5028, was compared using free and immobilized mycelium on different supporting materials such as polyurethane foam (PUF), Ca-alginate beads (AB) and commercial scouring pad (CSP) were used as grown in PMP medium.Gibberellic acid, indole acetic acid and absisic acid was selected as PGR.

To immobilize the mycelia on PUF and CSP, mycelial suspensions of the isolates were inoculated 4% into 250 mL Erlenmayer flask containing 100 mL Czapek–Dox medium and support materials. The mycelia immobilized cubes were obtained after incubation at 100 rpm at 30 °C for 10 days. To immobilize the mycelia on AB, mycelial suspensions of the isolates was mixed with 100 ml of sodium alginate 2% (w/v). This mixture was dropped into 100 ml 0.2 M $CaCl_2$ with a syringe under shaking condition. After the beads were washed with sterile distilled water, the mycelia immobilized beads were obtained. The free and immobilized mycelia were compared withtheir gibberellic acid, indole acetic acid, and absisic acid production values after 15 days of incubation period.Immobilization was confirmed by scanning electron microscopy (JEOL JSM-5600 LV).

Any of the immobilization methods has an increasing activity on the PGR production by *Stereum hirsutum* 5028according to free cells. On the contrary, all of the immobilization methods had a distinct activity on production of PGR by *Inonotushispidus* 5009. The most important increase in production of PGR was obtained with CSP conditions*Inonotushispidus* 5009 with the ratio of 25-35%

according to free cells. The obtained PGR increasing ratio with CA and PUF were 5-8% and 21-27%, respectively.

Keywords: *Inonotus hispidus, Stereum hirsutum*, immobilization, gibberellicacid, absisicacid, indoleacetic acid.

Acknowledgement: This study has been supported by The Scientific and Technological Research Council of Turkey (TUBITAK) with the project No: 112T061.

O-30

A common but rarely reported calcicole lichen: *Candelariella plumbea* and its ecological, morphological and anatomical differences with *Candelariella aurella*

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The number of *Candelariella* species of known in the world is approximately 50 and in Turkey is 17. It has been determined that *C. aurella* is common in floristic studies in Turkey. Although *C. plumbea* which resembles this species is widespread in the world, it has not been found in the floristic studies made in our country. These two species are thought to be mixed because of their ecological and morphological similarities. In this study, the ecological, morphological and anatomical characteristics of *C. plumbea* collected from 8 different localities were determined and the characteristic features from *C. aurella* are given.

Keywords: Lichen, *Candelariella plumbea*, *C. aurella,* ecology, morphology

O-31

The effect of some local plantal wastes on yield and protein value's of *Pleurotus ostreatus* (Jacq.) Kumm.

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In this study it is aimed to analyze the relation between different culture medium's yield where *P.ostreatus* produced and raw protein value.

In this study as raw material wheat straw (WS), cotton straw (CS), as additives wheat bran (WB) ,rice bran (RB) and cotton seed crust (CSC) were used. The effect of this materials on *P. ostreatus*' yield was analyzed.

As compost in *P.ostreatus* culture as raw material pure and 1.1 mixtures were used. In raw material as additive in 100 gr rice bran and dosage of 10,15 and 20 of cotton seed crust was added for preparing compost.

In evaluating yield, the quantity of product obtained from 100 g averagely %73 moisture included compost was considered.also dehyrated 100 g air dried straw and protein rate in basidium was observed.

In experimental study, in the 1.harvest in BS 14.08 g, in the 2.harvest in BS+%10PTK 14.95 g, in the 3.harvest in K+%20PK 10.82 g was observed as the highest yield rate. After 3. harvest, in the evaluations the highest yield rate in the 4. harvest from 20.35 g and K+%15PK, in the 5. harvest from 5.42 g and K(BS+PS), in the 6. harvest from 6.83 g and PS+%10PK and in the 7. harvest from 3.07 g and K+%20PK was observed.

According to results of 7. harvests, the lowest total yield rate was observed in PS+%15PK with 27.88 g and the highest was observed in K+%20PK as %58.00.

As a result, the highest protein contained product was obtained from the compost medium with the highest yield with K+ %20PK.

Keywords: *P. ostreatus*, Yield, Protein, Harvest Periods.

O-32

Halotolerance and thermotolerance enable *Candida parapsilosis* to reside and persist in dishwashers and washing machines

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The *Candida parapsilosis* species group includes three phenotypically close species: *Candida parapsilosis*, *Candida orthopsilosis*, and *Candida metapsilosis*. The former species is frequently found in human commensal flora, natural environments, and inexplicably, in extreme indoor environments, such as certain electrical domestic appliances. The aim of this study was to understand the prevalence of *C. parapsilosis* in domestic dishwashers and washing machines. We investigated the physiological characteristics of 21 reference strains of *C. parapsilosis* (*n* = 8), *C. orthopsilosis* (*n* = 7), and *C. metapsilosis* (*n* = 6). Notably, all the studied isolates of the *C*. *parapsilosis* species group tolerated at least 10% NaCl, pH 2.5–10, and 0.01% cycloheximide. However, even though *C. parapsilosis* isolates were relatively tolerant to 45°C and 17% NaCl, *C. metapsilosis* and *C. orthopsilosis* isolates could not tolerate such growth conditions. Although the mechanisms underlying the origin and dissemination of *C. parapsilosis* isolates in domestic dishwashers and washing machines remains unknown, the thermophilic and halophilic characteristics underpin the tolerance of this fungus to these relatively harsh environments.

Keywords: Ecology, environment, halophilic, thermophilic, tolerance

O-33

Molecular identification of fungal trunk pathogens associated with wood decay of grapevines on Aegean Region

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Wood canker and dieback diseases, caused by Botryosphaeriaceae fungi, are among the most important fungal trunk diseases of grapevines. In recent years, the symptoms of local dead arm, shoot dieback and V-shaped discolorations in woody tissues have dramatically increased in vines of Turkey. During the 2015 growing season, symptomatic wood samples from Manisa city were taken and standard mycological isolations were done to determine the fungal agents of disease. A high proportion (60,1%) of Botryosphaeriaceae fungi was isolated from these samples. In the first stage of the isolate identification, fungal DNA was extracted and amplified in Real-Time thermocycler. In this way, the members of Botryosphaeriaceae species were distinguished from other similar species. In molecular identification of the isolates, ITS 1 and ITS 2 ribosomal DNA fragments were sequenced and the gene sequences were compared with those deposited in NCBI Gene Bank database. Colony morphology on PDA media and picniospore shapes on woody tissues were examined in morphological/microscopic identification. Several fungi, all of which are wood-inhabiting, were found to be associated with the disease. The taxa thought to act as main causal agents are the basidiomycete, *Diplodia seriata*, *Lasiodiplodia theobromae, Neofusicoccum parvum, Phomopsis viticola, Botryosphaeria dothidea, Fomitiporia mediterranea* and less frequently, the deuteromycetes, *Phaeomoniella chlamydospora* and *Phaeoacremonium aleophilum*.

Keywords: Molecular identification, Botryosphaeriaceae, grapevine, trunk diseases

O-34

The purification of *Trichoderma viride* NRRL 6418 Xylan 1,4-β-Xylosidase by hydrophobic interaction chromatography and investigation of its kinetic and electrophoretic properties

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Nowadays, the microbial enzymes have widespread uses in industries and medicine because of they are more active and stable than other enzyme sources. Also, the microorganisms represent an alternative source of enzymes because they can be cultured in large quantities in a short time by fermentation.

For the production of enzyme, solid state fermentation system was used to cultivate *Trichoderma viride* NRRL 6418 on moistening with citrate buffer pH 8.5 wheat bran as a medium. The obtained enzyme conditions were determined 25 °C and 7 days by solid state fermentation.

Xylan 1,4-β-Xylosidase was purified to apparent homogeneity by salting out with ammonium sulfate and using Sepharose-4B-L-Tirozin-1-Naphtylamine hydrophobic interaction chromatography. The purification was 92.39 fold an overall enzyme yield of 33.43%. The purified enzyme was migrated as a single band on native and SDS-PAGE. The molecular weight of the purified enzyme was estimated to be 25kDa. Optimum Xylan 1,4-*β*-Xylosidase activity as a function of pH and temperature were determined 6.0 and 6 ^{o} C using *p*-nitrophenyl-*β*-D-xylopyranoside (*p*-NPX) as substrate. The Km and Vmax values of the purified enzyme were determined 0.5 mM and 2500EU, respectively. The enzyme was a competitive type inhibited by D(+)Xylose against *p*-NPX as substrate. The IC50 and Ki values of D(+)Xylose were determined as 0.071mM and 0.000264±0.00001.

As a result, because of the Xylanase originated from microorganism has a great importance for industrial enzymes in many fields such as paper industry, feed industry, food industry and textile industry. It is thought that the data obtained from purifying of Xylan 1,4-β-Xylosidase from *Trichoderma viride* NRRL 6418 in Solid

Substrate Fermentation and the specifying its biochemical, kinetic and electrophoretic properties will contribute to the studies in scientific and industrial fields.

Keywords: *Trichoderma harzianum*, xylanase, solid substrate fermentation, hydrophobic interaction chromatography, production, purification

O-35

Biosorption of Remazol Red from aqueous solution by nonviable *Aspergillus terreus*

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The main objective of this work was to study the possibility improving the biosorption of remazol red (RR) by dead fungal biomass, *Aspergillus terreus*. An experimental design was applied to study the effects of temperature, pH, biomass dose, and stirring speed on remazol red removal from aqueous solutions by *Aspergillus terreus* in a biosorption. In order to determine optimum efficiency, the optimal pH (4-5-6), temperature (30-40-50 °C), biomass (0.5-1-2 g/L) and rotational speed (75-100-125 rpm) was used.

The best conditions for remazol red biosorption in the present study were pH 4, biosorbent dose of 2 g/L, stirring speed of 125 rpm and temperature of 50 °C. Under these conditions, the maximum remazol red removal efficiency was 90.02 % (adsorption capacity of 22.99 mg/g). As a conclusion, the use of *Aspergillus terreus* for remazol red removal from aqueous solutions is important for wastewater treatment.

Key words: *Aspergillus terreus*, Biosorption, Remazol Red, Water pollution.

O-36

Lichenicolous fungus developing on the *Candelariella* genus in Turkey

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Studies of lichenicolous fungus in Turkey has short history. The number of recent studies has increased rapidly. In the World, the number of lichenicolous fungus known to develop on the genus *Candelariella* is 16. *Carbonea vitellinaria, Henfellra muriformis* and *Phoma candelariellae* species have been identified in previous studies in Turkey. With this study, *Intralichen christiansenii* and *Muellerella lichenicola* were identified and the number of lichenicol fungi growing on the *Candelariella* genus increased to 5.

Keywords: *Candelariella*, lichenicolous fungus, Turkey

O-37

Antibiofilm activities of *Sarcosphaera crassa* against five opportunistic pathogens

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Mushrooms are used as food sources with a rich content that is consumed lovingly by people. In addition to consuming fungi as nutrients, it is also very important from a medical point of view. The use of natural products has been extremely successful in the discovery of new medicine, and mushrooms could be a source of natural antimicrobials. *Sarcosphaera crassa* (Santi) Pouzar, although it is poisonous, has been consumed especially in our country and in different parts of the world for many years. The aim of this study was to perform the biofilm inhibitory effect and devastating efficacy of *S.crassa* extract. The microdilution method was used to evaluate the minimum inhibitory concentration (MIC) of this extract on total five opportunistic pathogens, including *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Bacillus cereus, Candida albicans*, and biofilm inhibition was assayed. Minimum inhibitory concentrations (MIC), minimum bactericidal concentration (MBC) were determined on planktonic microbial cells and crystal violet methods carried out to detect the biofilm inhibition and amount of destruction.

The present results showed that *S.crassa* exhibited antibiyofilm properties to all the bacteria and yeast tested. *S.crassa* extract is an effective antimicrobial and antibiofilm agent on important opportunistic pathogens and has a possible therapeutic potential as an clinical antibiofilm agent.

Keywords: Antibiofilm activity, Mushroom, Opportunistic pathogens, *Sarcosphaera crassa*

O-38

Antioxidant activity of culture fluid extract of *Hypomyces chrysospermus*

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The aims of the presented study were to determine the potential antioxidant activity of fermentation broth obtained after submerged cultivation of *Hypomyces chrysospermus* isolate and to investigate the effect of fermentation conditions on the antioxidant activity of culture fluid extract of *H. chrysospermus*.

The studied isolate was selected among 132 fungus isolates for its scavenging ability on 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals. After the selection of the isolate, scavenging effect on the DPPH and ABTS radicals, reducing power, chelating effect on ferrous ions, β- carotene – linoleic acid, and inhibition of lipid peroxidation were also evaluated. As a second aim, the effect of growth (culture type, medium composition) and environmental factors (initial pH, incubation temperature) on antioxidant activity was evaluated. The phenolic acid content of the culture fluid extract of *H. chrysospermus* was also evaluated by HPLC.

As a result, the EC_{50} values of the culture fluid extract of the *H. chrysospermus* for reducing power, ABTS radical, and chelating effect on ferrous ions were 0,97 mg/ml, 1,47 mg/ml and 0,34 µg/ml, respectively. The phenolic content of the culture fluid was well correlated with the antioxidant activity of the culture fluid extract of the *H. chrysospermus*. In the condition of static culture, PMP medium, 4.5-6.0 initial pH and 30 °C incubation temperature, obtained antioxidant activity from *H. chrysospermus* culture fluid was the highest.

In conclusion, our results show that the culture fluid extract of *H. chrysospermus* can be valuable sources of natural antioxidant compounds.

Keywords: *Hypomyces chrysospermus,* antioxidant activity, Submerged culture

Acknowledgement: This study has been supported by The Scientific and Technological Research Council of Turkey (TUBITAK) with the project No: 113Z746.

O-39

Macrofungal Diversity of Çekerek and Kadışehri (Yozgat) Districts

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Studies on determining the diversity of macrofungi in Turkey are increasing in recent years. Çekerek and Kadışehri province is located in the middle of Turkey surrounded by Akdağmadeni in the south; Zile and Aydıncık in the north; Sulusaray and Yeşilyurt in the east, and Sorgun in the west. Çekerek and Kadışehri are generally under the influence of the semidry terrestrial climate. In general stepe vegetation is dominant through the province with local forest areas. Some of the plants common in the region are: *Pinus sylvestris* L., *Crataegus oxyacantha* L., *Populus tremula* L., *Pyrus elaeagnifolia* Pall., *Quercus cerris* L. The purpose of this study is to determine macrofungi species in the research area and thus obtain more data on the macromycota of Turkey.

Macrofungi samples were collected from the research area between 2010 and 2015. Morphological and ecological characteristics of the specimens were recorded and they were photographed at their natural habitats. The samples were removed without damaging and wrapped seperately. After mushrooms were brought to the laboratory their spore prints were obtained and they were dried. Species identifications were performed by measuring macroscopic and microscopic features of the specimens.

As a result of field and laboratory studies, 56 species belonging to 2 divisions and 29 families were identified. Among them, 4 species belong to Ascomycota and 52 species belong to Basidiomycota. Twenty six of the 55 macrofungus species found in the area are edible, but local people consume very little as percentage. Types of macrofungus eaten by local residents were seen to be *Agaricus bisporus Agaricus campestris, Macrolepiota procera*, *Lactarius deliciosus, Marasmius oreades*. Twenty four of the identified macrofungus species are inedible and six are poisonous.

Keywords: Macrofungi, Taxonomy, Çekerek, Kadışehri (Yozgat)

O-40

Macrofungal Biodiversity of Iztuzu Province (Muğla)

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The fungal specimens were collected from suitable habitats between 2015 and 2016 Iztuzu district. Necessary morphological and ecological characteristics of the samples were recorded and they were photographed in natural habitats. In the laboratory, macroscopic and microscopic investigations and micro-chemical reactions were carried out. As a result of this study, 33 macrofungi taxa were determined. Taxa are given in alphabetical order and are listed together with locality.

Keywords: Iztuzu, macrofungal biodiversity, taxonomy

O-41

Three New Records of *Cortinarius* Genus for Turkish Mycobiota

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The *Cortinariaceae* are a large family of gilled mushrooms found worldwide, containing over 2100 species. The family takes its name from its largest genus, the varied species of the genus *Cortinarius* (Pers.) Gray. This is a family of mushrooms which has a hymenium on gills, a pileipellis which is a cutis, and spores which are brown in deposit. For most the genera in this family the spores will also be ornamented. *Cortinarius* are mushrooms with warted spores, which are rusty-brown in deposit. Mushrooms in this genus have a partial veil which is a cortina. These mushrooms are terrestrial and mycorrhizal, and can range from small to large and fleshy. *Cortinarius* is one of the largest mushroom families, but due to the large amount of inedible and toxic species, most authors recommend not eating any *Cortinarius*.

According to the literature on Turkish mycobiota, 110 *Cortinarius* species have previously been reported from Turkey. With this study, three *Cortinarius* species (*Cortinarius armeniacus* (Schaeffer: Fries) Fries, *Cortinarius stemmatus* Fr. and *Cortinarius caerulescens* (Schaeff.) Fr) are reported for the first time from Turkey and species number of the genus will increase to 113.

Keywords: *Cortinarius*, new records, Turkey.

O-42

Antioxidant Activity of *Tricholoma anatolicum* Collected from Feke-Adana Province of Turkey

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Tricholoma anatolicum is known as the most prized mushroom species in Feke region of Turkey. This mushroom species is collected from Cedar (*Cedrus libani*) forests and therefore is named as Cedar mushroom in this region. It is collected and consumed by local collectors and also exported to Far East countries such as Japan by exporting companies. Therefore, it is important to investigate the nutritional and medical importance of this species. The aim of this study is to reveal the antioxidant activity of methanolic extract in different concentrations (1, 2, 4 mg/ml) of *Tricholoma anatolicum* collected from Feke-Adana province of Turkey in 2015. It was determined that total phenolic content of this mushroom was 56 mg/kg. 2,2-diphenyl-1-picrylhydrazyl (DPPH), nitric oxide (NO) and reducing power (RP) activities given in torolox (µM) and ferric-reducing antioxidant power (FRAP, absorbance value) given in $FeSO_4$ (µM) were found as 449 µM, 180 µM, 337 µM and 2 Abs at the highest concentration (4 mg/ml), respectively. As a result, it could be suggested that methanolic extract of *T. anatolicum* has significantly antioxidant activity. And also, this study is the first report on antioxidant activity of *T. anatolicum* collected from Feke-Adana province of Turkey.

Keywords: *Tricholoma anatolicum*, antioxidant, DPPH, NO, FRAP

O-43

Wood decaying fungi in the Yenice Forests (Karabük)

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Due to its location, flora and climate conditions, Turkey is quite rich in terms of natural fungi. Macrofungi have an important role in the cycle of matter in nature, because they can destroy cellulose and lignin in there.

During the field trips, in Yenice district (Karabük) between 2012 and 2014, fruiting bodies were photographed in their natural habitats. After collecting the materials were brought to the laboratory, dried, identified and kept as fungarium materials for future usage.

As a result, 79 taxa belonging to 30 families and 57 genus were determined within *Ascomycota* and *Basidiomycota*. The aim of this study was to determine the wood decaying fungi in Yenice District. Studied macrofungi samples are kept in the Fungarium of Selçuk University Directorate of Fungi Application and Research Center.

Keywords: Systematic, Macrofungi, Tree, Brown and white rotten, Yenice, Karabük, Turkey

O-44

Antimicrobial activity and biochemical composition screening of *Hericium coralloides*

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Mushroom has beneficial health effect because of its active biological component. Pharmacological feature of it hasn't been completely determined and many mushroom species antimicrobial potential and biochemical compositions weren't analyzed. *Hericium coralloides* is edible mushroom species collected from Yomra, Trabzon and it was analyzed against 17 bacteria and a fungus. 4.15, 8.30 and 16.61 mg samples were prepared with ethanol extraction process and broad range antimicrobial potential was investigated by disk diffusion method. These microbial strains include Bacillus, Enterobacter, Enterococcus, Escherichia, Klebsiella, Listeria, Pseudomonas, Salmonella, Staphylococcus and Candida genera. Bioactive composition of this sample was also determined by Gas Chromatography-Mass Spectroscopy and National Institute of Standards and Technology (NIST) library was used for mass spectra analysis. The results were presented that *H. coralloides* has antibacterial potential against all of them except *C. albicans*, *S. epidermidis* and *L. innocula*. Several active metabolites were identified, but some composition of this sample is not match with library. Unknown molecule should be analyzed by NMR spectra for 3d structure determination and identification.

Keywords*:* *Hericium coralloides*, mushroom, antimicrobial activity, bioactive composition, disk diffusion method, GC-MS

O-45

The effects of the pigments of *Sporobolomyces roseus* on biofilm structure

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Biofilms are complex structure of microbial communities that grow on different biotic and abiotic surfaces. These structures are quite hazardous in the medical and industrial fields such as cooling water, food processing, medical implants, oral healty, ship hulls, oil recovery and paper manufacturing. Recently, different anti-biofilm strategies have been used for controlling biofilm development mechanisms. However, the biofilm structure is very robust and resistant to antimicrobials. For that reason, biofilm inhibitors are needed to kill biofilm formation and degredation. The purpose of this study was to determine the effect of microbial color pigments on biofilm formation for the first time. We used *Sporobolomyces roseus* A2 isolate (KY705066), a unicellular basidiomycete red yeast, is grown on Potato Dextrose Agar (PDA). Petri dishes were incubated at 25±2 °C for 1 week. After incubation, this isolate was grown in pigment extraction medium (MYEB) for 3 days on rotary shaker at 30±2 °C. Pigments were extracted with dual asetone - petrolium ether as using organic solvent. Using *Pseudomonas aeroginosa, Staphylococcus aureus* and *Candida albicans* as a model for biofilm formation, antibiofilm activity of this pigment was determined with Crystal Violet (CV) Assay. In addition, biofilm degradation assay was conducted. Our results show that the pigments of the *Sporobolomyces roseus* A2 isolate can be used for the inhibition of biofilms of *P. aeroginosa,* and *C albicans*. Interestingly, it has activation effect for *S. aureus.*

Keywords: *Sporobolomyces roseus*, crystal violet assay, antibiofilm, pigment

O-46

Edible mushrooms of Yenice District (Karabük)

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Mankind is looking for ways to produce fast, practical, easy and continuous food with the developing technologies. For this reason, mushroom farming has been a good trade branch in recent years. However, in order to increase the financial gain in this area, it is necessary to determine the eaten macrofungi from nature and to investigate the culture conditions. Systematic and physiological studies on macrofungi will support the production of different macrofungi species.

Fungal samples were collected in Yenice district (Karabük) between 2012 and 2014. After identification process, samples are kept as fungarium materials.

As a result of the study, 52 edible mushroom species belonging to 25 families and 35 genus within the divisions *Ascomycota* and *Basidiomycota*, were identified. With this study, we aimed to identify the naturally grown mushrooms in Yenice District. The identified mushroom samples are kept in the Fungarium Laboratory of Selçuk University Directorate of Mushroom Application and Research Center.

Keywords: Systematic, Edible macrofungi, Yenice, Karabük, Turkey

O-47

Additions to the Turkish *Psathyrellaceae*

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The *Psathyrellaceae* is a family of small to medium sized, fragile, dark-spored agarics. Previously many of the species were classified in the family *Coprinaceae*, but recent DNA based phylogenetic research have shown *Coprinus* (the ink caps) to be polyphyletic and the genus has been split into 4 genera: *Coprinus* (which is now classified under *Agaricaceae*), *Coprinellus*, *Coprinopsis* and *Parasola*. Members of these genera (but not all) undergo partial to total auto-digestion, where the cap 'dissolves' and releases drops of black liquid (hence ink caps). The family includes *Psathyrella*, which is also considered to be polyphyletic (but no revision has been done yet) and *Lacrymaria*. Spores of *Psathyrellaceae* are generally black to very dark brown and rarely red. The colour is bleached by sulphuric acid and this is a diagnostic test to separate from *Panaeolus*. The spores normally have a germ pore. In *Psathyrella* the stipe is very fragile often breaking on handling. The cap is also very fragile, often fragmenting into several pieces. Members of *Coprinellus* and *Parasola* often have short lifetimes, usually a few hours. Identification of a *Psathyrellaceae* is often difficult and microscopic examination is required.

With this study, five *Psathyrellaceae* species (*Coprinopsis acuminata* (Romagn.) Redhead, Vilgalys & Moncalvo, *C. geesterani* (Uljé) Redhead, Vilgalys & Moncalvo, *Parasola lactea* (A.H. Sm.) Redhead, Vilgalys & Hopple, *Psathyrella dunarum* Kits van Wav., *P. hirta* Peck, *P. sublatispora* Örstadius, S.Å. Hanson & E. Larss.) are reported for the first time from Turkey.

Keywords: *Coprinopsis*, *Parasola, Psathyrella,* new records, Turkey.

O-48

Keratinophilic Fungi in Stratonikeia Archeological Warehouse and Determining Their Enzyme Production Potential

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Keratinophilic fungi having naturally a great role in the degradation of the keratin residues are ecologically significant. Therefore, the interest towards keratinophilic fungi increases day by day. In this study, isolation of the keratinophilic fungi was carried out in the excavation workshop of ancient city of Stratonikeia by its identification using phenotypic and genotypic methods. In addition, the production potentials of some enzymes playing a role in the pathogenesis of fungi identified were investigated in the present study.

With the approval granted by the excavation department, excavation samples were collected from 40 different location uncovered in the archeologic warehouse during the excavation periyod of 2015 in the ancient city of Stratonikeia. For isolation of the keratinophilic fungi, the well-known hair-baiting technique of vanbreuseghem was employed.

Molecular characterization of the isolates were based on the ITS1- 5.8-ITS2 (ITS) region. Based on the sequence data and cultural examinations, *Aspergillus fumigatus, Engyodontium album, Chrysosporium keratinophilum, Lecanicillium lecani, Purpureocillium lilacinum* species were determined. These species identified are non-dermatophyte species.

The 19 isolates identified were checked in terms of lipase, cellulase, cutinase keratinase and protease enzyme activities. While evaluating the lipase, cellulase, cutinase, keratinase and protease activities of the isolates, protease, keratinase, and cellulase were determined as moderate and high levels.

The present study formed a basis for the environmental keratinophilic flora studies of Turkey to be conducted in the future. Also, the enzymes investigated have numerous application fields in the industrial area. Non- dermatophyte strains having

high keratinase, cellulase and protease activity were obtained and thus the aim of the study was achieved. To conclude, the keratinophilic fungi are not only concerned about pathogenesis but also have a great ecological significance due to their roles in the degradation of keratin in nature.

Keywords: Keratinophilic, fungi, Stratonikeia, keratinase, cellulose, protease

Acknowledgment: The authors are thankful to Prof. Dr. Bilal SÖĞÜT, Department of Archeology, Faculty of Science and Arts, Pamukkale University, for providing necessary facilities.

O-49

New Genus Record for Turkey Mycobiota: *Sarcostroma insidens*

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To contribute to mycobiota of Turkey was aimed in this study. The microfungus sample was collected during periodic mycological excursion from the Kırşehir Province in May 2013. It was transferred to the laboratory and microscopic investigations were carried out. The collections were examined in distilled water and for microphotographs Olympus BX 53 with Olympus DP 22 digi–CAM (Japan) research microscope (Axio imager 2 equipped with Nomarski differential interference contrast optics) was used. The specimen was identified with the help of Nag Raj (1993). As a result: *Sarcostroma insidens* (Zabriskie) Nag Raj has been identified on dead branches of *Ulmus* sp. *Sarcostroma* has been recorded first time in genus level for Turkey mycobiota that rarely has been in the World. The sample is deposited at the Ahi Evran University, Arts and Sciences Faculty, Department of Biology, Mycology Laboratory.

Keywords: Biodiversity, New record, *Sarcostroma*, *Ulmus*

O-50

A new corticolous Myxomycetes record for the Myxobiota of Turkey

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The myxomycetes are eukaryotic microorganisms that occur wherever conditions on the earth's surface permit the growth of vegetation but are especially common in terrestrial forest areas. In this study fructifications of myxomycetes were grown with the moist chamber culture in laboratory. The collected substrates (decaying bark, wood, leaves, litters, debris materials) were moistened with distilled water for 24-48 hours. When developing myxomycetes were found, the myxomycetes were then dried for one week. Microscopic and macroscopic features of the sample were determined in the laboratory.

The family Liceaceae (order Liceales, Myxomycetes) has a single genus *Licea*. The genus *Licea* currently encompasses more than 72 species of worldwide distribution and in Turkey there are 21 species. *Licea* genera includes species with plasmodiocarpic to sporocarpic sessile or stipitate sporophores. Peridium membranous or coriaceous, consisting of one or two layers. Columella, capillitium and the pseudocapillitium are mostly absent. Spores are free, globose, often paler on one side, and smooth or minutely warted.

Shiny reddish brown to black sporangia of *Licea pescadorensis* is easily distinguished from other *Licea* species. Most of the mature sporangia are dark but rather inconspicuous. Some sporangia seem to be wrinkled and become angular or with a ridged peridium, others are not wrinkled and smooth in appearance.

Licea pescadorensis is characterized by fimicolous habitats but in our study we isolated from the bark of *Pinus brutia* Ten. Payas (Seashore)-Hatay. Most species of *Licea* were reported from fimicolous or corticolous habitats.

This species can be distinguishable from other *Licea* species by a densely gregarious sporangia, cartilaginous peridium and by smaller sized spores, mostly 7 – 8 µm diam. with evenly thickened walls.

Keywords: *Licea pescadorensis,* Myxomycetes, new record, Turkey

O-51

Antibacterial and anti-candidal activity of *Trcihaptum biforme*, *Inonotus hispidus*, *Fuscoporia torulosa* and *Trametes versicolor* against human pathogens

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Fungi samples were collected in the boundaries of Ankara province between 2010 and 2012. Necessary morphological and ecological characteristics of the samples were examined and microstructural data were obtained by light microscopy. Some reagents were used for microscopic investigations. Identification was performed according to literature. Methanol extracts obtained from *Trcihaptum biforme*, *Inonotus hispidus*, *Fuscoporia torulosa* and *Trametes versicolor* have been investigated for their antibacterial and anti-candidal activity against human pathogens. Each dry powdered samples (20 g) were extracted with 180 mL of 99% ethanol (Merck) for 12 h by using Soxhlet equipment. The extracts were filtered using Whatman filter no.1, and the filtrate solvent was evaporated under vacuum using a rotary evaporator at 55°C [yield: 10.6 % (*Trcihaptum biforme*), 11.3 % (*Inonotus hispidus*), 11.6% *Fuscoporia torulosa,* and 10.8 % (*Trametes versicolor*) for ethanol]. The resulting extract amounting to around 2 g was dissolved in 0.4 mL of DMSO before testing. Antimicrobial activity was determined with Gram positive bacteria (*Enterococcus faecalis*, *Staphylococcus epidermidis* and *Listeria monocytogenes*), Gram negative bacteria (*Citrobacter freundii*, *Stenotrophomonas maltophilia*, *Serratia marcescens* and *Salmonella typhimurium*) and *Candida* species (*Candida tropicalis*, *Candida guilliermondii*, *Candida albicans*, *Candida glabrata*) by the disc-diffusion method. According to our results; *Fuscoporia torulosa* extract had strong antibacterial (15-26 mm) and anti-Candidal activity (18-25 mm) compared to other fungal extracts against test microorganisms. We have determinated that fungus species revealed significant effect against Gram (+) and Gram (-) bacteria as compared to standart antibiotics, and fungus extracts and standart antifungal antibiotics were showed similarly effective on *Candida* species. As a result, *Trcihaptum biforme*, *Inonotus*

hispidus, *Fuscoporia torulosa* and *Trametes versicolor* may evaluate in advanced pharmacological studies.

Keywords: Antimicrobial activity, Anti-Candidal Activity, *Inonotus hispidus, Fuscoporia torulosa, Trcihaptum biforme* and *Trametes versicolor.*

O-52

An Ethnomycological Approach to the *Pleurotus eryngii* complex species from Bitlis: local names, cooking techniques, commercial value, ecology and vegetation periods

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In this study, it determined that the *P. eryngii* complex species grow naturally in the province of Bitlis (Merkez, Ahlat, Adilcevaz, Tatvan, Hizan, Mutki, Güroymak) that they have varying morphological structures and grow on different hosts, known as one species locally, known well by the rural villagers from the mountainous areas, has a high demand amongst the people of the cities and towns as a natural food source, becomes ripe in 10-15 days, only during a certain time period (April-June), its host plants include Apiaceae familya (*Ferula* sp., *Prangos* sp.) which are locally named as çakşır, heliz, jag ve kerkor, that they have various names in the region (göbelek, kerkor, kırkor and kiark), thay they are collected from the morning until sunset in mountainous areas, that they are rare than in the past, that they provide a daily income (25-30 TL), that they have a better taste and aroma than meat, that they have different cooking types (mostly grilling, frying with onions, cooking with other vegetables etc.), that they are consumed daily, that they are kept in the refrigerators for short-term and in freezers after being cookied for long-term use, that the gatherers see these as a commercial resource, or collect them as hobby, sports, or continuing the traditions, and see them as a natural commodity, that the information about these are transmitted traditionally from elders and no one is known to have been poisoned because of this mushroom. As a result, we believe that the environmental parameters and soil characteristics of the areas where the *P. eryngii* complex species grow naturally should be studied together with the characteristics of the host plants through detailed fieldwork in the province of Bitlis, the variations with different morphological features should be studied and determined, and these should be protected in order to conserve the genetic sources of the wild variations of the species.

Keywords: Bitlis, edible mushroom, ethnomycological aproach, *P. eryngii* complex species, natural food.

O-53

Determination of genotoxic-antigenotoxic effects of wild-grown *Ganoderma lucidum* (Reishi) from Turkey with the hen's egg test for analysis of micronucleus induction (HET–MN)

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Ganoderma lucidum (Curtis) P. Karst has been widely used by people in many countries such as China and Japan for many years. *G. lucidum* has been referred by names such as Reishi Mushroom and Mushroom of Immortality. It protects the skin from the sun's harmful rays. It strengthens the immune system and the muscular system. So it is used to reduce the side effects of chemotherapy and radiotherapy treatment. Hen's Egg Test for analysis of Micronucleus Induction (HET-MN) is a member of relatively new of micronucleus tests. HET-MN is an inexpensive, rapid, and extremely simple genotoxicity assay which is positioned between pure *in vivo* and *in vitro* analysis, strictly in line with animal protection regulations and ethical aspects. The aim of this study was to determine for the first time the possible genotoxic-antigenotoxic effects of the aqueous extract of wild-grown *G. lucidum* from Turkey in the HET-MN an alternative test method. *G. lucidum* aqueous extract at different doses (219 µg/egg, 875 µg/egg and 1750 µg/egg), vitamin C (50 µg/egg) as antigenotoxic compound, and cyclophosphamide (50 µg/egg) as genotoxic compound were injected separately and together into the fertilized chicken eggs at 8th day of incubation. Blood smears were prepared from peripheral blood samples of the embryos and stained with modified May Grünwald-Giemsa method, on the 11th day of incubation. In this smears, frequencies of micronucleus and nuclear abnormality in erythrocytes were determined under light microscope. Data were analyzed with statistical methods. While *G. lucidum* aqueous extract at the examined doses did not show genotoxic effect, it exhibited antigenotoxic effect. On the basis of the results obtained, *G. lucidum* extract should be regarded as a valuable source of natural antigenotoxic agent.

Keywords: Cyclophosphamide, hen's egg, micronucleus, Turkey, vitamin C, wild-grown *Ganoderma lucidum*.

O-54

The production, purification and characterization of β-glycosidase from *Trichoderma harzianum* NRRL 13019 by solid state fermentation and hydrophobic interaction chromatography

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Microorganisms are considered to be a source of enzymes because of their advantages such as their high catalytic activity, their availability in large amounts, their stability and cheapness and their inability to form unwanted by-products. In this study, the β-glycosidase enzyme was purified ammonium sulfate precipitation and sepharose-4B-L-tyrosine-1-napthylamine hydrophobic interaction chromatography from *Trichoderma harzianum* NRRL 13019.

β-glycosidases well-characterized and many of them used in biotechnological applications. It was obtained from the strain of *Trichoderma harzianum* NRRL 13019 by using moistening with NaH_2PO_4, pH 7.0 corn cob as a medium. For the production of the enzyme, conditions were determined 25°C and 7 days by solid state fermentation. The purification rate of our method was found 29.10 fold with a yield of 18.02%. The purified enzyme was migrated as a single band on SDS-PAGE. Optimum *β*-Glycosidase activity as a function of pH and temperature were determined 4.0 and 65°C using *p*-NPG (*p*-nitrophenyl-*β*-D-glucopyranoside) as substrate. The Km and Vmax values of the purified enzyme were determined 0.33 mM and 3333.33 EU, respectively. The enzyme was non competitively inhibited by D(+)Glucose against *p*-NPG as substrate. The IC50 and Ki values of D(+)Glucose was determined 4.95 mM and 0.0078±0.0061 respectively.

All of these data obtained as a result of our studies can lay the groundwork for the production of microbial enzymes. And because of their advantages in many fields, their use in a variety of industrial applications such as food, textiles, pulp and paper, detergent, biofuels, animal feed, pharmaceuticals and cosmetics, It is thought to contribute.

Keywords: *Trichoderma harzianum*, β-glukosidase, Solid Substrate Fermentation, Hydrophobic Interaction Chromatography, Production, Purification

O-55

Anti-respiratory syncytial virus (anti-RSV) activities of the macrofungi of *Fomes fomentarius* (L.) Fr. and *Morchella conica* (Pers.) Boudier

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Antiviral properties of methanol and aqueous extracts from *Morchella conica* and *Fomes fomentarius* were assessed by colorimetric XTT test against human respiratory syncytial virus (HRSV).

The crude methanol (ME) and aqueous extracts (AE) of *Morchella conica* and *Fomes fomentarius*, HEp-2 cell and ribavirin were used.

To assess the cytotoxic effects for *Morchella conica* and *Fomes fomentarius*, and ribavirin on uninfected HEp-2 cells, dilutions were used ranging from 50 - 0.10 mg/mL and 500 - 0.98 µg/mL, respectively. Maximum non-toxic concentrations (MNTCs) were determined for all extracts and ribavirin by comparing to the optical densities (ODs) of their cell controls. The concentration required for 50% protection against cytopathic effects caused by virus was defined as EC_{50}, the selectivity index (SI) was determined from the ratio of CC_{50} (concentration showing 50% cellular cytotoxicity) to EC_{50}.

The results of the study showed that aqueous extract of *Fomes fomentarius* had strong anti-HRSV activity (EC_{50} = 358.7 µg / ml, SI = 27.4) which could be compared with ribavirin (EC_{50} = 15.6 µg / ml, SI = 11.1) used as a positive control against HRSV. Other extracts were found to have weak antiviral activity.

As a result, we can say that aqueous extract of *Fomes fomentarius* is worthy of further study in order to develop RSV as an alternative to the drugs used clinically. This study is the first report on the anti-RSV activity of both fungal species.

Keywords: *Fomes fomentarius*, *Morchella conica*, methanolic and aqueous extracts, antiviral activity, respiratory syncytial virus.

O-56

Viruses of Fungi: Perspectives on Macrofungal Virology

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The term “Fungal virus” (or mycovirus) is used to refer to particular viruses that specifically infect fungi. Fungal viruses are found ubiquitously in wide range of fungal taxa. They are transmitted from one individual to another only in an intracellular fashion including vertical transmission mediated by sexual or asexual spores and horizontal transmission through cell-to-cell fusion (hyphal anastomosis). Although life cycles of fungal viruses do not involve any extracellular step and natural vectors, e.g., arthropods or annelids, they still have efficient transmission abilities. Due to the restrictive effects of vegetative compatibility on the reproduction of fungi, the natural host ranges of fungal viruses are limited to individuals found in the same or closely related vegetative compatibility groups. Most of the fungal viruses do not cause any symptom on their hosts.

With an estimation made based on the evaluation of fungal virus incidences, about 30% to 80% of phytopathogenic microfungal species are thought to be infected. On the other hand considering the approximate total number of macrofungal species which is the sum of 22000 or so known species and 31000 to 88000 unknown species, it is estimated that the number of undiscovered macrofungal viruses present in nature is even much greater. Most known fungal viruses have dsRNA genomes enclosed in a capsid with icosahedral symmetry, yet a growing number of positive-sense or negative-sense ssRNA and ssDNA viruses with fungal origin have also been discovered and characterized.

Since the first identification of viruses which give rise to Dieback (or La France) disease in infected cultivated mushroom *Agaricus bisporus*, our knowledge of fungal viruses has increased dramatically over the past 55 years. Yet, from the standpoint of macrofungi, a handful of viruses have hitherto been discovered. Examples of some of the macrofungi genera that viruses have been discovered are Pleurotus, *Boletus*, *Laccaria*, *Volvariella*, *Clitocybe* and *Tuber*.

In this presentation we would like to present the general biological properties of macrofungal viruses including their transmission, symptom expression, taxonomy, replication and gene expression strategies as well as their prospective studies, after giving some historical perspectives of this research area.

Keywords: Fungal virus, macrofungi, viral diversity, infection

O-57

Characterization of metalloprotease genes in anthropophilic *Trichophyton rubrum*

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Dermatophytes are considered as the most common cause of superficial fungal infections in both humans and animals. Several metalloproteases are described for dermatophytic fungi and exhibited keratinolytic, elastinolytic, and/or collagenolytic activities. We here investigated the isolated DNAs and the designed primers to amplify the metalloproteases genes (*MEP1-5*) of the anthropophilic *Trichophyton rubrum* using PCR. A total of 46 human isolates were included in the present study. Overall, *MEP*-1 gene was found to be positive in 33 (71.7%) isolates, *MEP*-2 gene in 34 (73.9%), *MEP*-3 gene in 29 (63%), *MEP*-4 gene in 28 (60.9%) and *MEP*-5 gene in 32 (69.6%) of the isolates. The results of this study demonstrated the presence of *MEP*1-5 genes in *T*. *rubrum* isolates from our region, hence we able to discuss the role of *MEP*1-5 on the pathogenetic mechanisms of dermatophytic fungi. We suggested that none of the screened genes is indispensable for the infection progress.

Keywords: Anthropophiles, metalloprotease, pathogenesis, *Trichophyton rubrum*

This study was supported by Academic Research Project Units of Mersin University (Project no: 2015-AP3-1230)

O-58

Genome Wide Analysis of Immunity against Fungal Pathogens in *Brassica napus*

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Brassicas are a major agricultural and horticultural crops grown throughout the world, and include a range of types such as oilseed rape (OSR) grown for edible and industrial oil as well as a great diversity of leaf and root vegetables. However, plant diseases cause significant losses to farmers, average of 26% of worldwide crop production and this amount of lose directly threatening our main life sources. More Durable and broad-spectrum disease resistant crop varieties are needed to ensure food security and stable production.

The first level of the plant immune response is PAMP-triggered immunity (PTI). PAMPs (Pathogen associated molecular pattern) are conserved molecules of fungal or bacterial pathogens that elicit host defence response. There is increasing evidence that PTI may contribute to durable disease resistance. This work is focussed on understanding the basis of QDR in Brassicas. I am studying PAMPs called NLPs (Necrosis & Ethylene-inducing peptide 1-like proteins) which were recently identified in Arabidopsis(Oome et al., 2014). NLPs are found in a wide range of phytopathogens, including major disease caused fungal species that infects Brassica species, so improved understanding of their recognition mechanisms could enable more fungal disease resistant crops to be developed. In order to identify genes controlling NLP response contributing to QDR, a panel of 192 diverse *B.napus* lines will be used. Genome Wide Association Studies (GWAS) and Associative Transcriptomics (AT) will be used to identify correlations with QDR for NLP response following an assay that measures the production of reactive oxygen species (ROS) in response to NLPs in this diversity set. Identified candidate genes will be functionally tested for NLP response and for bacterial and fungal disease resistance (*P.syringae* & *B.cinerea*) in Arabidopsis and Brassicas. Results will enable identification of gene markers that could be used to develop more durable disease resistance in agronomically important Brassicas.

Keywords: PAMP-Triggered Immunity, Quantitative Disease Resistance, Genome-Wide Association Study, Necrosis-inducing proteins, *Brassica napus*

O-59

Analysis of segregation and expression of transgenes in the progenies of *AFPCHI* transgenic melon plants

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Three transgenic melon lines (B4, D1 and M1) generated via *Agrobacterium* mediated transformation were used to analyze integration and expression of the progeny. Transgenic lines B4, D1 and M1, containing the selected marker (NPTII) and antifungal protein, chitinase (AFPCHI) under the control CaMV35S promoter. T1 generation was obtained by selfing of each T0 lines. T1 generation seeds obtained from the transgenic melon plants were tested after germination in the presence of kanamycin and segregation analysis was confirmed. PCR and Southern Blot Analysis confirmed that the transgenes were passed into the T1 progeny. RT-PCR and Western Blot Analysis confirmed expression in the T1 progeny. The qualitative and quantitative horticultural traits at flowering and ripe fruit stages of the transgenic lines were also evaluated. T1 transgenic plants were inoculated with *Rhizoctonia solani* in greenhouse. All tested the transgenic plants were able to inhibit *Rhizoctonia solani* growth and symptoms.

Keywords: Segregation, progeny, transgenic plant, *Rhizoctonia solani*

O-60

Production of Ochratoxin A (OTA) by *Aspergillus* section *Nigri* strains on various natural substrate based media

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This study aims the investigation of ochratoxin A (OTA) production on different substrates including rice, grape and raisin by different *Aspergillus* section *Nigri* strains. A total of 28 native strains isolated from vine yards belong to *Aspergillus* section *Nigri* (*A. Niger* (3), *A. awamori* (5) and *A. foetidus (20)* and *A. ochraceus* NRRL3174 as reference strain were used in the *in vitro* experiments. First, the screening of the OTA production abilities of strains were carried out on rice based medium then OTA analysis was carried out by HPLC. The highest levels of toxin was produced by the reference strain followed by *A. foetidus* K-730 strain as an amount of 2847 and 1083 ng/g OTA, respectively. Then, these two strains were selected for the further evaluation of the OTA production on grape based media (crushed and uncrushed berries) having different brix values and raisin based media (undiluted and diluted in 1:1 distilled water) having different water activity values. Highest levels of the OTA was observed on the 18th day by *A. ochraceus* NRRL3174 on the grape based media having 15.6 brix level with the amount of OTA 854 ng/g (on uncrushed berries) and 761.2 ng/g (on crushed berries). On the diluted raisin based media that have a 0.75 level of water activity the average amount of OTA was detected as 229.0 ng/g. By *A. foetidus* K-730 strain, the amounts of produced OTA were 80 ng/g on grape based media having 19 brix level on 8th day of incubation and 52.8 ng/g on the diluted raisin based media that had the level of water activity 0.76. In undiluted raisin based media neither mold growth nor toxin production was detected.

Keywords: *Aspergillus* Section *Nigri*, Ochratoxin A, natural substrate based media

O-61

Investigation of presence of endofungal bacteria in *Rhizopus* spp. isolated from the different sources on market

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Rhizopus species are opportunistic pathogens and cause infections which lead to deaths in individuals with a weakened immune system. When the infection occurs, *Rhizopus* species produce a variety of enzymes, proteins and by-products with pathogenic potential. Mycotoxins are secondary metabolites of molds that affect plant, animal and human health negatively through infections and food deterioration. In previous studies, it was known that mycotoxins were produced only by the fungi. However, in recent studies, it has been observed that mycotoxins are produced by endosymbiotic bacteria living in fungi.

Some strains of *R. microsporus*, a filamentous fungus belonging to Zygomycetes,have been detected to have symbiotic relationship with bacteria. These bacteria have been shown to be the members of the genus endosymbiont *Burkholderia* living in *Rhizopus* species. Members of the *Burkholderia* genus cause different infections. If bacterial endosymbionts are released from fungal mycelium, sepsis or more serious problems can occur. Therefore, in the present study,we aimed to investigate the presence of endofungal bacteria in *Rhizopus* species isolated from different food samples.

In the present study, different food products were obtained from different markets and used. For the isolation of *Rhizopus* from them, the dilution-based technique was used. After the incubation, the presence of endofungal bacteria in the isolated *Rhizopus* colonies was investigated. For this purpose, *Rhizopus* isolates were incubated in malt extract broth in a shaking incubator. Fungal pellets were exposed to mechanical fragmentation. Then, this suspension was inoculated into the antifungal-containing medium and incubated for 24-48 hours at 30ºC. Following the incubation, samples were taken from the petri dishes in which bacterial growth was observed. The samples then were subjected to gram staining and examined under a

microscope. *Rhizopus* strains containing the endofungal bacteria were identified through phenotypic and genotypic methods. They were also identified in endofungal bacteria genotypically isolated from fungal hyphae. In order to prove the presence of endosymbiont in fungal hyphae, live / dead staining was conducted.

In the present study, 51 *Rhizopus* isolates were isolated. Of them, 14 bacterial endosymbiont were isolated. According to the results, we found that *Serratia marcescens* was detected in fungal hyphae. *Serratia* species are important because they are opportunistic pathogenic, gram negative, aerobic bacteria and very dangerous for human health.

Keywords: Opportunistic pathogen, *Rhizopus* spp., endofungal bacteria, *Serratia marcescens*

O-62

Effects of light and temperature stress on polyketide gene expression levels of *Hypogymnia tubulosa* (Schaer.) Hav. Mycobiont

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Nowadays, drugs derived from natural products, instead of synthetic ones, are preferred in the treatment of several diseases. Lichens are used as folk medicine since ancient times. Since they are slow-growing organisms, it is very difficult to obtain their active substances in sufficient quantities to be used for pharmaceutical industry. For this purpose, we aimed to identify the polyketide synthase genes (PKS) which are effective in the propagation of lichen substances in laboratory conditions and in the synthesis of secondary metabolites in lichens, and also to determine the effect of expression levels of these genes under different light and temperature stress conditions.

Hypogymnia tubulosa mycobiont samples were collected and incubated for 15 and 30 days. Temperature (15 ^{0}C and 37 ^{0}C) and light stress (light and darkness conditions) were applied to the samples. The changes in the ratio of PKS gene expressions measured using qPCR method were examined with the primers designed for *H. tubulosa* in the stress-applied samples. We observed that the expression ratios of PKS genes in 15-days samples were lower than 30-days samples under stress conditions.

The temperature stress experiments showed that PKS gene expression levels were higher in the samples incubated at 15 ^{0}C when compared to the samples at 37 ^{0}C. In the samples exposed to light stress, increase in the expressions of PKS genes was observed. The expression of PKS genes increase under stress conditions and therefore might result in increased production of lichen substances. In conclusion, we applied temperature and light stress to the *H. tubulosa* samples and demonstrated that PKS gene expressions and accordingly lichen substances were increased under test conditions. The need to increase the synthesis and the quantity of secondary

metabolites of lichens for the pharmaceutical industry may be resolved by applying stress conditions.

Keywords: *Hypogymnia tubulosa* mycobiont, PKS gene expression, temperature stress, light stress

TÜBİTAK COST, 214S122 no'lu proje ile desteklenmiştir.

O-63

Galactomannan Antigen Test in Diagnosis of Invasive Fungal Infections In Neutropenic Patients

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Invasive fungal infections are known as a cause of morbidity and mortality in patients with allogeneic bone marrow transplantation. Especially in stem cell transplant recipients, moulds have emerged as a major cause of mortality and incidence of invasive aspergillosis has been shown to be increased. Rapid diagnostic procedures are needed in order to diagnose invasive fungal infections especially *Aspergillus* infections.

Aspergillus infections usually occur following inhalation of *Aspergillus* spores which are present in the environment. Invasive forms, which have been on the increase for the past 10 years, constitute the most serious infections. They mainly occur in neutropenic patients and in patients treated with immunosuppressants and corticosteroids.

Galactomannan test which, when used in conjunction with other diagnostic procedures such as microbiological culture, histological examination of biopsy samples and radiographic evidence can be used as an aid in the diagnosis of Invasive Aspergillosis. In our study was aimed determination of the oncology patients galactomannan levels. It was seen 6.3 % positive and 2.2 % borderline results of all. Positive results must be repeated.

Keywords: Galactomannan antigen, Netrupenic patients, Aspergillosis

POSTER

PRESENTATION

P-01

Proteolytic Activity of *Rhizopus oryzae* ATCC 963 Strain

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Proteases are extracellular enzymes that can be produced by both submerged fermentation and solid-state fermentation. They hydrolyse peptide bonds and release amino acids from protein molecules. Protease enzymes are used in food processing, detergents, dairy industry, textiles and leathermaking.

In this study Calcium Caseinate Agar and Skim Milk Agar were used as substrate for the detection of protease activity. The proteolytic activity was determined by both direct streaking on agar plates and well diffusion method by using crude enzyme which was obtained by fermentation.

Rhizopus oryzae ATCC 963 was streaked on Calcium Caseinate Agar having different pH values as 4.2, 5.0, 6.6, 7.3, 8.7 and on skim milk agar having pH 7. The plates were incubated at 30^{o}C for 48 hrs. To obtain crude enzyme 10 gr of whole wheat flour were added to 250 mL erlenmeyer flask and moistened with 15 ml of distilled water then inoculated by one ml of spore suspension (1x 10^{7} spor/ml) of *Rhizopus oryzae* ATCC 963 and incubated at 30^{o}C for 96 hrs. After incubation, 75ml of distilled water was added to the flasks and shaken on rotary shaker for one hour at 180 rpm. The contents of flasks were filtered and centrifuged at 9000 x g at 4 ^{o}C for 20 min and the supernatant was used as crude enzyme.

In direct streaking of *Rhizopus oryzae* ATCC 963 on Calcium Caseinate Agar at pH 8.7 the clearence zone of proteolytic activity was 36 mm and on skim milk agar at pH 7 was 31 mm. The clearence zone by using well diffusion method at pH 6 was 6-10 mm.

Keywords: *Rhizopus oryzae* ATCC 963, Calcium Caseinate Agar, Proteolysis

P-02

Two New Record Microfungi on *Juniperus excelsa* for Turkey

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Juniperus excelsa M.Bieb. (*Cupressaceae*) is one of the most important forest plants in Turkey. There are 7 species of *Diplodia* and 1 species of *Passalora* species known on this host plants.

Diplodia is commonbpathogens associated with various diseases on different woody plants around the world. Species of *Diplodia* have been found in association with different disease symptoms such as canker, gummosis, fruit rot, dieback and twig blight. They attack plants of all ages. This genus comprises 26 species. They are distinguished by pycnidia ellipsoid to ovoid, hyaline and aseptate or dark brown and septate conidia.

Passalora Fr. is a well-established anamorphic genus widely distributed throughout the world and many of which are described as plant pathogens which cause various leaf spots. Most species of Passalora are foliicolous in nature and distinguished by producing dematiaceous conidiophores and phragmosporous conidia with conspicuous conidial scars and conidial hila. Many species have been described in this genera.

In this study, *Diplodia juniperi* Westend. (*Botryosphaeriaceae*, Ascomycota) and *Passalora juniperina* (Georgescu & Badea) H. Solheim (*Mycosphaerellaceae*, Ascomycota) on *Juniperus excelsa* M.Bieb. (*Cupressaceae*) is reported for the first time from Niğde and Kayseri for Turkey. A short description, host, distribution and photographs related to macro and micromorphologies of the species are provided and discussed briefly.

Keywords: New record, Microfungi, Ascomycota, Turkey.

Acknowledgement: This study was supported by TUBİTAK (Project no: 113Z093).

P-03

Determination of Oxidant / Antioxidant Status and Element Contents of *Helvella leucomelaena*

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In addition to its nutritional values, many edible mushroom species have long been used for medical purposes in many countries of the world. In addition, many nonedible and toxic fungi species have been identified as having important medical properties. In this study, it was aimed to determine total antioxidant (TAS), total oxidant values (TOS), oxidative stress level (OSI) and heavy metal content (Fe, Cu, Zn, Pb and Ni) of *Helvella leucomelaena* (Pers.) Nannf. collected from Gaziantep province. The ethanol extract of the mushrooms was extracted in the soxhlet device. TAS and TOS values were determined using Rel Assay Diagnostics kits. OSI value was determined by TOS / TAS ratio. Heavy metal contents were determined using the atomic absorption spectrophotometer following the wet digestion process. As a result of the studies performed, TAS value was found to be 2.367 mmol/L, TOS value was 55.346 µmol/L and OSI value was 2.338. Fe, Zn, Cu, Pb, and Ni (mg/kg) contents were determined 60.02, 60.54, 15.45, 5.42 and 0.59 respectively. As a result, *H. leucomelaena* mushroom collected from Gaziantep province should not be over-consumed due to heavy metal levels and oxidant levels. On the other hand, it is considered that fungal samples collected from regions with low levels of heavy metal pollution and oxidative stress can be used as alternative antioxidant source.

Keywords: *Helvella leucomelaena*, Oxidant, Antioxidant, Heavy metal, Gaziantep.

P-04

Determination of Antioxidant and Oxidant Levels of *Sarcosphaera coronaria*

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In this study, it was aimed to determine total antioxidant (TAS), total oxidant values (TOS), oxidative stress level (OSI) and heavy metal content (Fe, Cu, Zn, Pb and Ni) of *Sarcosphaera coronaria* (Jacq.) J. Schröt. collected from Gaziantep province. The ethanol extract of the mushroom was extracted in the soxhlet device. TAS and TOS values were determined using Rel Assay Diagnostics kits. The OSI value is calculated using the TOS / TAS formula. Heavy metal contents were determined using an atomic absorption spectrophotometer (AAS). As a result of the studies performed, TAS value was found to be 1.066 mmol/L, TOS value was 41.672 µmol/L and OSI value was 3.909. Fe, Zn, Cu, Pb and Ni (mg/kg) contents were determined 54.86, 8.85, 2.69, 6.86 and 0.00 respectively. As a result, it is suggested that the consumption of *S. coronaria* collected from Gaziantep is limited due to the oxidative stress level. However, it is considered that fungal samples collected from regions with low levels of heavy metal pollution and oxidative stress can be used as alternative antioxidant source.

Keywords: *Sarcosphaera coronaria*, Oxidant, Antioxidant, Heavy metal, Gaziantep.

P-05

Çeşitli Mikrofungus Türlerinin Lipolitik Aktiviteleri Açısından Taranması

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Lipazlar gıda, deterjan ve ilaç sanayi başta olmak üzere bir çok sektörde yaygın olarak kullanılan enzimlerdir. Lipaz üretimi için yeni kaynaklar yaratılması önemli bir konudur. Özellikle mikrobiyal lipazlar, üretim kolaylığı nedeni ile değer kazanmaktadır. Bu çalışmada, Trakya Üniversitesi Arda Meslek Yüksekokulu mikroorganizma koleksiyonunda yer alan 85 adet mikrofungus suşu ekstraselüler lipaz üretme yetenekleri açısından taranmıştır. Çalışmada tüplerde hazırlanan Tributirin Agar besiyeri kullanılmış ve lipaz enzimine sahip küflerin besiyerinde oluşturduğu berraklık, lipaz pozitif (+) olarak değerlendirilmiştir. Taranan suşların besiyerlerine aktarılmasını takiben inkübasyon süresince tüplerde meydana gelen berraklık takip edilmiş ve yedinci gün ölçümleri esas alınmıştır. Değerlendirmeye alınan küflerin %85'i lipolitik aktivite göstermiştir. Ölçüm sonuçları değerlendirildiğinde *Aspergillus*, *Penicillium* ve *Rhizopus* cinsine ait türlerin yüksek lipolitik aktiviteye sahip oldukları belirlenmiştir.

Keywords: Mikrofungus, enzim, lipaz, lipolitik aktivite.

P-06

Çeşitli Mikrofungus Türlerinin Tarama Besiyerlerindeki Proteolitik Aktiviteleri

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Bitkisel ve hayvansal kaynaklı olarak üretilen proteaz enziminin kullanıldığı sektörlerde (deterjan, gıda, deri, ilaç vb.) ihtiyaç duyulan miktarları karşılamadaki yetersizliği, hızlı ve kolay üretilebilirliği nedenleri ile mikrobiyal proteaz üretimine olan ilgiyi arttırmıştır. Günümüzde birçok mikroorganizma, enzim üretim yetenekleri açısından araştırılmaktadır. Bu çalışmada da, Trakya Üniversitesi Arda Meslek Yüksekokulu mikroorganizma koleksiyonunda yer alan 81 adet mikrofungus suşunun, endüstriyel öneme sahip proteaz enzimi açısından taranması amaçlanmıştır. Çalışmada küflerin proteaz enzimi üretim yetenekleri, yağsız süt tozu içeren besiyerlerinde araştırılmıştır. Petri kaplarında üretilen mikrofungus kültürlerinden bu besiyerlerine ekim yapılmış ve 7 günlük inkübasyon sonunda süt kazeinini parçalayarak berraklık oluşturanlar proteolitik aktivite açısından pozitif (+) olarak değerlendirilmiştir. Değerlendirmeye alınan 17 cinse ait mikrofungus türlerinin % 74'ü proteolitik aktivite göstermiştir.

Anahtar Kelimeler: Mikrofungus, enzim, proteaz, proteolitik aktivite.

P-07

Determination of fungi from teas and herbal teas

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Tea is one of the most common drinks in the world. The product, which is obtained by fermentation of different types *of Camellia sinensis* (L) Kuntze, is defined as tea. Herbal teas are products that used various dried parts of the plants. Substances of tea and the high ambient tropical temperatures (where tea is grown) make tea a good medium for the growth of many saprophytic fungi. Worldwide very little information is available on the mycoflora of tea and herbal tea and also the associated quality problems. In this study, our aim was to determine the fungal contamination of tea and herbal teas**.**

Tea and herbal tea samples were purchased from local herbalists and markets in Eskisehir, Sakarya and Istanbul which were packaged and unpackaged products. We were carried the isolation of fungi from infusions and suspension of 40 different tea samples by using the pour plate method. To apply this method, Potato Dextrose Agar was used and incubated at 25 °C for 5–7 days. Isolated fungi were identified firstly to genus level according to the microscopic and colonial characteristics. For molecular characterization of fungi, isolates were grown on Malt Extract Agar prior to DNA extraction. DNAs were isolated by using Zymo Fungal DNA isolation kit and used for PCR amplification. Internal transcribed spacer (ITS) regions of the rDNA genes, part of the β-tubulin (*BenA*) and actin genes which were the standard gene regions for molecular identification were amplified. Than they were sequenced by CEQ 8000 Genetic Analysis System. Obtained sequences in this study were compared with those deposited in the National Center for Biotechnology Information (NCBI) Database by BLAST for identification. Aflatoxigenic molds were determined by AFPA medium.

As a result of this study, 30 fungi isolates were obtained. Seven different fungal genus were determined by using morphological characterization. Determined genuses were *Trichoderma, Penicillium*, *Aspergillus*, *Rhizopus, Fusarium, Alternaria, Pseudocercospora.* After using multi locus gene analyses, 12 different fungal species

were identified at the species level and *Aspergillus flavus* and *A. niger* appeared as the most abundant species in the study. It was determined that *Aspergillus flavus* species in the study were aflatoxigenic. The results showed that teas were contaminated by fungi such as *Aspergillus flavus.* The presence of toxigenic moulds represents a potential risk of mycotoxin contamination that might constitute health problems for humans. The post harvest contamination of tea could be eliminated or reduced if processing is conducted under more hygienic conditions.

Keywords: Tea, *Camellia sinensis,* fungal contamination, molecular characterization.

P-08

Screening of filamentous fungi from Salda Lake (Turkey) for antimicrobial silver nanoparticles synthesis

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Nanoparticles have many applications in different fields including medicine, food and agriculture. Synthesis and characterization of nanoparticles have therefore attracted interest of scientific community. Here we review green methods of synthesis of metal nanoparticles. The present work had the goal of screening 7 fungal strains, isolated from Salda Lake, Turkey, in order to identify those capable of biosynthesis of silver nanoparticles. Four strains were found to be capable of biosynthesis of silver nanoparticles. The biosynthesised nanoparticles were characterised by UV–vis spectroscopy, transmition electron microscopy. They were found to have an average size of 10–80 nm, different geometric shapes, and potential antimicrobial activity against Serratia marcescens, Staphylococcus aureus, S. aureus (V and M resistans), Bacillus cereus. Mycogenic synthesis of nanoparticles is a green biogenic process preferable to other alternatives. Because fungi are great producers of extracellular enzymes this process makes scaling-up an easier task with high importance for clinical microbiology on the fight against microbial resistance, as well as for other industrial applications.

Keywords: Silver nanoparticles, filamentous fungi, mycogenic synthesis, antimicrobial activity

P-09

Two New Records for Turkish Orbiliaceae

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The Orbiliaceae Nannf. is the only family of the order Orbiliales and the class Orbiliomycetes with 12 genera and 288 species. Though most members of Orbiliaceae are saprobes on rotten stumps and woods or herbaceous stems, some anamorphs are partly predacious on invertebrates. The family is well known one due to its many nematophagous species. According to the most recent classification of Ascomycota, the Orbiliaceae contain only two (teleomorph) genera, the *Hyalorbilia* Baral & G. Marson and the *Orbilia* Fr. They usually have small, brightly colored or translucent disc-shaped apothecia.

During routine field studies in Gaziantep province, two specimens of Orbiliaceae were collected. Before collection they were photographed in their natural habitats. Then the samples were carried to the fungarium and they were identified as *Hyalorbilia inflatula* (P. Karst.) Baral & G. Marson and *Orbilia aristata* (Velen.) Velen. Tracing the current literature it was found that three taxa belonging to the family Orbiliaceae (*Orbilia curvatispora* Boud., *Orbilia sarraziniana* Boud. and *Orbilia xanthostigma* (Fr.) Fr.) have so far been recorded from Turkey, and *Hyalorbilia inflatula* and *Orbilia aristata* have not been recorded before. *Hyalorbilia inflatula* is the first member of the genus *Hyalorbilia* in Turkey. The study aims to make a contribution to the mycobiota of Turkey by adding two new records.

Keywords: Orbilia, *Hyalorbilia,* New Records, Gaziantep, Turkey.

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P-10

Does different substrates affect antioxidant properties and antimicrobial activity of *Pleurotus ostreatus*?

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Antioxidant properties and antimicrobial activities of *Pleurotus ostreatus* grown on different tree sawdust including populus (PS), fagus (FS), quercus (QS), tilia (TS) and alnus (AS) alone and with 20% supplementation of tea waste (TW) and wheat bran (WB) and on logs of populus, fagus and alnus and also collected from nature were compared in the present study.

A total of 19 *P. ostreatus* samples were used to determine antioxidant properties and antimicrobial activities. Antimicrobial activities of methanolic extracts from *P. ostreatus* against to *Escherichia coli, Yersinia pseudotuberculosis, Pseudomonas aeruginosa, Enterococcus faecalis, Listeria monocytogenes, Staphylococcus aureus*, *Bacillus cereus*, *Mycobacterium smegmatis*, *Candida albicans* and *Saccharomyces cerevisiae* were tested by agar well methods. Ampicilline (10 µg) and fluconazole (5 µg) were used as the standard control agents for bacteria and yeasts, respectively. The total phenolic content was measured using the Folin-Ciocalteau procedure. The antioxidant capacity was determined using ferric reducing antioxidant power (FRAP) and free radical scavenging activity of DPPH.

It was determined that the extract of mushrooms obtained from the 80QS+20TW substrate was the most effective antimicrobial agent against to all of bacteria and yeasts investigated in the present study. Significant differences ($P<0.01$) were found among the antioxidant contents of the mushroom extracts obtained from different substrates. Total phenolic, ferric reducing antioxidant power (FRAP) and scavenging of free radical (DPPH) assay contents of methanolic extracts from *P. ostreatus* varied between 1.016 and 4.772 mg GAE/g, 2.245 and 8.902 µmol FeSO4.7H2O/g, 4.650 and 22.922 mg/mL, respectively.

According to the study results, extracts obtained from *P. ostreatus* which grown on different substrates had significant antioxidant activity.

Keywords: Mushroom, antimicrobil, antioxidant, phenolics

P-11

Saxicolous lichen biodiversity around Şeker Canyon (Karabük, Turkey)

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The lichens occupying rocks as their substrates generally known as saxicolous species. There is a direct relationship between lichen biodiversity and features of rocks. Different types of rocks such as sandstone, granitic, calcareous, siliceous are affected in quite different way the weathering process. In this study, 15 taxa were reported from 4 localities around the Şeker Canyon. These taxa were living on calcareous rock type. *Verrucaria* sp. Shrad. was the most distribution genus between 11 different genus in the area.

Keywords: Biodiversity, calcareous rock, saxicolous lichen, Şeker Canyon

P-12

Atmospheric fungus content of Yalova Province, Turkey, 2004-2005

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Fungi are the pathogens of crop plants and humans, the decomposers of the dead organic matter and the producers of the many important metabolites. Fungi originate from soil, plants and plants and animal remains. They reproduce with spores and disperse through air. Airborne concentrations of certain fungal spores have been linked with detrimental effects on human health. Identification of the fungal spores in the air is the first step to prevent the sensitive people from the diseases. The aim of this study was to determine fungal taxa and spore types, their counts and distributions in Yalova Province atmosphere.

Airborne fungal spores were recorded by use of a Hirst-type seven day volumetric spore trap, which situated on the roof of a building in Yalova between the years of 2004 and 2005. The fungal spores were counted and identified by light microscopy. Analyses were performed on the slides and the data were expressed as spore average daily concentrations per cubic meter of air.

Atmosphere of Yalova was studied with volumetric method and a total of 634.870 s were recorded during the study period. 49 fungal taxa were identified and *Aspergillus*/*Penicillium* spores type, Myxomycota, one-septate ascospores and hyphal fragments were recorded as groups.

This study revealed that a great variety of fungal spores constitute the airborne fungal spora of Yalova. By this study, the first aeromycological profile of Yalova has been given and new information on the field of aerobiology in Turkey has been provided. The presented data may also be useful for clinicians to make an exact diagnosis.

Keywords: Atmospheric fungi, volumetric method, aeromycological monitoring, Yalova

P-13

Tephrocybe atrata (Lyophyllaceae): A new record for the Turkish Mycota

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The aim of the present study is to contribute to Turkish Mycota with a new record. The genus *Tephrocybe* is represented by 58 species in the world and 3 species in Turkey. Fruiting bodies of this group are mycenoid, clitocyboid, collybioid or tricholomatoid. Pileus may be conical, bell-shaped, expanded or depressed; greyish, creamy or brownish. Lamellae are narrowly attached, free or slightly decurrent. Basidiospores are hyaline; globose, elliptic, subglobose, fusiform, rhomboid or tetrahedral; smooth or ornamented. Cheilocystidia are generally absent; most of them are saprotrophic on litter in forests.

The basidiomata for this study are collected in October 2016 in Trabzon, Maçka, Sevinç Neighbourhood. Colour slides were taken and materials were collected in the field. A piece of basidioma was squeezed with a forceps to obtain the basidiospores. Sections from the fruiting bodies were examined under light microscope to observe basidia, pileipellis and mycelium. Congo red, ammonia and pure water were used to prepare the materials for microscopy. Identification was made according to results of morphological and molecular studies. *Tephrocybe atrata* was determined as new record for the Turkish Mycota. The new record is a clitocyboid, convex to expanded, greyish to blackish brown species; generally grows at burnt places from spring to winter.

Keywords: *Tephrocybe atrata,* new record, Turkish Mycota

P-14

General characteristics of entomopathogenic fungi and their potential of insect pest control in agricultural areas

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There are many pests in agricultural areas all around Turkey and they have serious negative impact on quality and quantity of agricultural products. Due to the harmful effects of excessive use of wide-spectrum pesticides on human health and environment, alternative management methods are developed against agricultural pests. Among these alternative methods, biological control with microbial agents is becoming more common.

Entomopathogenic fungi can be grouped as specific obligate pathogens, general pathogens and facultative pathogens. Fungal epizootics (naturally occurring entomopathogens) can be common for some insect species, but they can be rare for some other insects. At least 700 entomopathogenic fungi species under 90 genus were identified and several species including *Beauveria bassiana*, *Metarhizium anisopliae*, *Isaria fumosorosea* (=*Paecilomyces fumosoroseus*) and *Verticillium lecanii* are being used commercial microbial agents against agricultural pests all over the World. Pathogens generally infected insects through cuticle and develop their mycelia inside the pest. After infectation of the host with full of mycelia, pathogens kill host with their toxins. Many studies have proven the effectivity of microbial agents on control of insects. In this review, information about general biology of the entomopathogenic fungi, control of insects with these fungi and potential of entomopathogenic fungi in biological control was given.

Keywords: Microbial control, entomopathogenic fungi, pests

P-15

A new *Agaricus* record for Turkish mycota

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Agaricus L.*,* is one of the classical taxa containing edible and poisonous species. The genus *Agaricus*, which is characterized by its fleshy structure, chocolate color sports print, ring structure and saprophytic nature, is very common worldwide and contains nearly 289 species. This genus, commonly referred to as "culture mushroom, meadow mushroom" in Turkey, is represented by 39 taxa.

In this study, *Agaricus* specimens were collected in 2016- 2017 years. In the field, the specimens were photographed and the diagnostic characters such as color, shape, taste, odor and habitat features were recorded. Besides of this, schaffer and KOH reactions were performed on the specimen and the results were recorded. The specimen was brought to Muğla Sıtkı Koçman University, Cryptogam Research Laboratory and stored in the same laboratory. Microscopic features of the specimen were analyzed and identified by examining of the current literature.

As a result of the field and laboratory studies, *Agaricus bohusii* Bon has been identified for the first time and reported as new records for Turkish mycota. Thus, with *Agaricus bohusii*, the number of *Agaricus* determined in our country was updated to 40 and contributed to mycota of Turkey.

Keywords: *Agaricus bohusii* Bon, macrofungi, Turkey, biodiversity

P-16

The evaluation of contribution of herbal products, curcumin, naringenin, ginger, and epigallotectin gallate, on the antifungal drug activity against clinical mold isolates

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The increase in antimicrobial resistance with the restricted number of commercially available antifungal drugs that have many side effects is the cause for this problem. These limitations emphasize the need to develop new and more effective antifungal agents. Natural products are attractive prototypes for this purpose due to their broad spectrum of biological activities.

In this study, the antifungal activities of curcumin, naringenin ginger, and epigallotectin gallate alone and in combination with caspofungin, voriconazole and amphotericin B were tested against clinical isolates of 4 *Aspergillus spp*, 2 *Fusarium oxysporum* and 2 *Rhizopus oryzae* strains in vitro. Antifungal susceptibilities were evaluated according to CLSI (Clinically and Laboratory Standards Institute) guidelines, checkerboard method was used for combination tests. The interactions were assessed by calculating the fractional inhibitory concentration index (FICI); <0.5 indicates synergism, 0.5 <FICI ≤4.0 indicates indifference, and >4.0 indicates antagonism.

Neither naringenin nor curcumin exhibited any antifungal activity alone (MIC>1600 µg/mL) and FICIs in their combination with antifungals were 0.75-2.5 (indifference interactions). Although epigallocatechin galleate didn't show any antifungal activity alone, it decreased the MIC values of voriconazole and caspofungin in combinations against some *Aspergillus* and *R.oryzae* isolates (FICI=0.252-2). The MIC values of ginger alone were 240->640 µg/mL, and ginger significantly reduced the MIC values of caspofungin and amphotericin B in combinations against some isolates (FICI=0.27-2).

In conclusion, although naringenin and curcumin didn't show positive activity alone or positive interaction with antifungals, epigallocatechin galleate and ginger exhibited

promising results for especially in combinations of ginger with caspofungin and amphotericin B, and in combination of epigallocatechin galleate with all three antifungals against *Fusarium* and *Rhizopus* isolates because of their antifungal resistances.

Keywords: Antifungal activity, mold isolates, natural compounds

P-17

In vitro activity of farnesol and carvacrol, alone and in combination with antifungals, against clinical mold isolates

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The incidence of fungal infections has dramatically increased in the last two decades. However, toxicity, resistance and low efficacy rates of antifungal agents have become an important problem in many invasive fungal infections. So that, the interest of studying the antimicrobial activity of plant extracts and essential oils has increased in recent years. The aim of the present study was to investigate the in vitro activity of two terpenic derivates, carvacrol and farnesol, alone and in combinations with caspofungin, voriconazole and amphotericin B against clinical isolates of 4 *Aspergillus* spp*,* 2 *Fusarium oxysporum* and 2 *Rhizopus oryzae.*

The antifungal susceptibilities of terpenes were determined by broth microdilution method according to document M38-A2 from the Clinical Laboratory Standards Institute (CLSI) for flamentous fungi. Checkerboard method was used for combination studies. Drug interactions were assessed by calculating the fractional inhibitory concentration index (FICI). The interactions were assessed by calculating the fractional inhibitory concentration index (FICI); <0.5 indicates synergism, 0.5 <FICI ≤4.0 indicates indifference, and >4.0 indicates antagonism.

Both carvacrol and farnesol exhibited apparent activity against molds in this study; MIC values were 80-160 µg/mL for carvacrol and 0.6-150 µg/mL for farnesol. Although the significant synergic interaction was not observed between carvacrol and antifungals, the MIC values of especially caspofungin and voriconazole decreased significantly in combinations (FICI=0.5-3). The combinations of farnesol with caspofungin and voriconazole were resulted significant sygnergic interactions against both *Rhizopus* and *Fusarium* isolates (FICI=0.0078-0.75). However, combination of farnesol with voriconazole caused antagonistic interaction against Asergilllus isolates (FICI=1.5-65).

Rhizopus species have limited antifungal treatment alternatives. The combination of carvacrol or farnesol with caspofungin or voriconazole may be an alternative in treatment of *Fusarium* and *Rhizopus* infections. However further studies are required to prove the contribution of these compound on the antifungal therapy.

Keywords: Antifungal activity, carvacrol, farnesol, mold isolates

P-18

Is it possible to use yeasts in productıon of hyaluronic acid?

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Hyaluronic acid (HA) is a polymer that is naturally produced in tissues; and has many properties. It is formed by repetition of D-glucuronic acid and N-acetylglucosamine disaccharide units linked by β-1,3 and β-1,4 glycoside linkages.

HA is a polymer, that has high economic value due to production of cosmetic products, the production of medicines for wound, tissue regeneration and treatment, delivery of drugs to target tissue, eye drops, prostheses, remodeling of skin tissue, treatment of soft tissues. In addition to all these, HA, which has vital activities in the body, is becoming more important day by day.

In this study, it was aimed to produce cheaper and more abundant HA with yeast isolates. Yeasts used in the study were obtained from Anadolu University Biology Department Microbiology laboratory.

The isolates used were screened by uronic acid carboxyl reaction method for the production of hyaluronic acid. The reaction of the resulting compound with carbazole was determined spectrophotometrically at 550 nm and compared with the prepared standard curve. Partial purification was carried out by production with the isolates determined to produce hyaluronic acid. Partial purification was done by production with isolates that were determined to produce hyalunoric acid. The isolates The partially purified hyaluronic acid was controlled by hyaluronidase enzyme and FTIR.

As a result, it has been observed that yeasts tested have produced hyaluronic acid at different ratios. It is thought that yeast and HA production can be done by developing this technique.

Keywords: Yeast, hyaluronic acid, carboxyl reaction

P-19

Investigation of antioxidant activity and detoxification properties of ethanolic extract from *Ramaria flava* mushroom

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Recently natural sources exploration for novel bioactive compounds have gain so much attentions where it has helped to provide therapeutic drugs and principal compounds. Mushrooms traditionally have been known as the valuable source of natural bioactive compounds and have been studied widely for their therapeutic capabilities. In this study, the ethanol extracts of *Ramaria flava* was studied for the polyphenolic contents using spectrophotometric method. The free radical scavenging activity of extract was evaluated by 2,2-Diphenyl-1-(2,4,6-trinitrophenyl) (DPPH) assay. Furthermore, the mushroom extract effect was examined on the glutathione peroxidase (GPx) and glutathione-S-transferase (GST) enzymes activities by kinetic assays. Total phenolic contents were determined by using the Folin-Ciocalteu's method. According to the method, the total phenolic contents of extracts were calculated using the equation obtained from the standard curve of gallic acid graphic. The amount of total phenolic compounds found in the ethanol extract of *R.flava* was 14.899±0.0031mg GAE/g dry sample. The total concentration of flavonoids in extracts were determined by employing the aluminium chloride colorimetric method. The total flavonoid contents of extracts were calculated using the equation got from the standard curve of quercetin graphic. Total amount of the flavonoid contents found in the ethanol extracts of *R. flava* was 0.180±0.0003mg QE/g dry sample. The scavenging effect of *R. flava* on DPPH radicals was measured as 60% at 10 mg/mL concentration. Also, ethanol extract of *R. flava* showed good GPx and GST enzymes activities at 2.5 and 10 mg/mL concentrations, respectivitily. Therefore, *R. flava* may be considered as a good source of food for the detoxification and antioxidant defense systems.

Keywords: *Ramaria flava*, antioxidant activity, detoxification properties

P-20

Investigation of Probiotic Properties Of Yeats Isolated From Kefir

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Kefir is a drink that is produced with fermentation of milk by lactic acid bacteria, yeasts and acetic acid bacteria. It contains all the nutrients in the milk. The effects of the microorganisms in the structure of the kefir granules increases the nutritive value and results with better absorption by the body. Rich in B1, B12, and K vitamins, the digestible protein contains various minerals and essential amino acids. Studies go on about the control and improvement of many diseases with kefir consumption. It has protective and therapeutic effects against diseases with stabilization of the stomach and intestinal flora by its antimicrobial and anticancercogenic effects.

In this study, our aim was to determine the probiotic properties of yeasts according to their physical and biochemical characteristics that isolated from the kefir.

Yeasts, which were isolated from kefir samples, firstly were purified in Malt Extract Agar and then they were identified by VITEK II. In order to determine initial pathogenic properties of isolates, the ability of phospholipase, esterase and hemolysisi in bloody agar was investigated. Antimicrobial and antifungal activities of isolates were determined by well and agar disc method. The ability of biofilm formation was determined by microtiter plate method. Beta galactosidase activity, resistance to antifungal agents, pH, bile salt, and gastrointestinal conditions, auto aggregation capacity, hydrophobicity, adhesion, temperature, bile salt hydrolase activity of the isolates were determined.

None of the isolates were found as pathogenic. It was noted that isolates had antimicrobial activity against oral and dermal pathogens; they were strong biofilm producers and had high beta-galactosidase activity, growth in low and high pH environments, developed at high and low temperatures, resistant to antifungal agents. It has been observed that the probiotic properties of isolates vary according to the strain.

Keywords: Yeast, probiotic, kefir

P-21

Antimicrobial activity screening of *Pseudevernia furfuracea*

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Lichens are symbiotic organisms between algae and fungi. Science ancient time, they have been utilized as folk medicine and they can be survive extreme conditions thanks to unique secondary metabolite. These biochemical are significant for antiviral, antibiotic, antimitotic, cytotoxic and anti-inflammatory effects. *Pseudevernia furfuracea* is lichen specie and it was collected from Yomra, Trabzon. In vitro performance of *P. furfuracea* ethanol extract was researched against 17 bacteria and 1 fungi by using disk diffusion method. 0.4, 0.8 and 2.0 mg samples were prepared in order to determining of broad range antimicrobial potential. These microbial species include Bacillus, Enterobacter, Enterococcus, Escherichia, Klebsiella, Listeria, Pseudomonas, Salmonella, Staphylococcus and Candida geniuses. The results were presented that *P. furfuracea* has antimicrobial activity against thirteen of the studied strains. Five of them have high susceptible (higher than 15 mm); five of them have moderate susceptible (14-10 mm) and three of them have low susceptible (9-7 mm).

Keywords: *Pseudevernia furfuracea*, lichen, antimicrobial activity, disk diffusion method, ethanol extract

P-23

Nutritional, antioxidant and antibacterial properties of *Terfezia claveryi*

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In this study; it was aimed to determined the nutritional contents, antioxidant and antimicrobial activities of *T.claveryi* naturally grown in the Baskil district of Elazığ province and its surroundings.

The dry matter (89.59 %), crude ash (0.04%), crude oil (0.03%), crude protein c (15.31%), organic matter (83.47%), energy (399.98 kcal) and moisture (10.40%) were determined in *Terfeza claveryi*, respectively.The amounts of macro and micro elements were measured as K 52.5 mg / kg, Na 560 mg / kg, Fe 2.76 mg / kg, Zn 0.37 mg / kg, Cu 0.08 mg / kg and Co 0.01 mg / kg.

Total antioxidant level of *Terfezia claveryi* was determined 1.18 µmol / l and total oxidant level was 3.45 µmol / l.

Extract of *Terfezia claveryi* inhibited the development of microorganisms used at different rates.

Keywords: *Terfezia claveryi,* nutrients, antioxidant, antimicrobial

P-24

In vitro antiviral activity of *Phellinus igniarius* (L.) Quél. Extracts

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Methanol and aqueous extracts of Phellinus igniarius naturally grown in Turkey were investigated as in vitro to reveal its antiviral activities against Human respiratory syncytial virus/ HEp2 cell system with a XTT-based colorimetric assay.

The crude methanol (ME) and aqueous extracts (AE) of P. igniarius, HEp-2 cell and ribavirin were used.

To assess the cytotoxic effects for P. igniarius and ribavirin on uninfected Hep-2 cells, dilutions were used ranging from 50 - 0.10 mg/mL and 500 - 0.98 µg/mL, respectively. Maximum non-toxic concentrations (MNTCs) were determined for all extracts and ribavirin by comparing to the optical densities (ODs) of their cell controls. The concentration of 50% protection against to the cytopathic effect caused by the virus, extracts and ribavirin (EC50) was calculated, and CC50 values and the selectivity index (SI) was determined as the ratio of CC50 to EC50.

Maximum nontoxic concentrations on HEp-2 cells were determined for aqueous and methanol extracts as 1000 µg/mL and 500 µg/mL, respectively. At the result, it was determined that EC50 value of aqueous extract was 486.40 µg/mL, and SI value was 11.98 while EC50 and SI values of methanol extract could not calculated due to it has no antiviral activity against Human respiratory syncytial virus.

As a result, we can say that aqueous extract of P. igniarius is worthy of further study in order to develop RSV as an alternative to the drugs used clinically. This study is the first report on the anti-RSV activity of P. igniarius.

Key words: Phellinus igniarius, extracts, anti-HRSV activity.

*This research is a part of Pınar Tuncer's Master Thesis.

P-25

Antioxidant potentials of some edible mushrooms of Antalya Province

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The use of mushrooms is ongoing since ancient times and it has increased the importance of fungi, both in terms of medical and nutritional aspects. The aim of this study was to determine and compare antioxidant potentials of the ethanol extracts of *Suillus bovinus* (Pers.) Roussel, *Suillus luteus* (L.) Roussel, *Auricularia auricula-judae* (Bull.) Quél., *Cantharellus cibarius* Fr., *Lactarius deliciosus* (L.) Grey and *Tricholoma terreum* (Schaeff.) P. Kumm. collected from Antalya Province. Mushroom samples were dried in the laboratory, after drying were pulverized by mechanical grinding. Then, it was weighed 30 gram of each mushrooms for the test and was extracted in a Soxhlet extractor at 75 ° C for approximately 6 hours with commercial ethanol. The antioxidant activity of mushroom extracts were analyzed using DPPH method. Ethanol extracts of mushroom samples were showed different antioxidant activity in different concentrations. The highest DPPH activities were found in *C. cibarius* and the lowest DPPH activities were found in *S. luteus* extract. As a result, it is thought that mushrooms can be used as alternatives of the other antioxidant resources.

Keywords: Antioxidant, edible mushrooms, Antalya

P-26

Alternative obtaining methods of Myxomycetes

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The myxomycetes are a group of fungus-like organisms. They occur on all types of terrestrial decaying plant mass, on decaying woody debris, the bark surface of living trees, forest floor litter, the dung of herbivorous animals, soil, and aerial litter. They feed on bacteria, protozoa, fungal spores and other decaying organic materials. Myxomycetes can be obtained in three ways;

Natural Collection: It is very difficult to detect, to see and to collect myxomycetes in natural environment. Sometimes it is impossible. Because the average height is 1 - 2 mm. In nature, slime molds typically live in cool, shady, moist places, such as on decaying logs, woods, barks and leaves. Occasionally, they appear on lawns just after a rainy period.

Moist Chamber Technique: The fructifications of myxomycetes are obtains from the moist chamber culture in the laboratory. For growing myxomycetes sporophores, spores or plasmodiums are collects from on bark, leaf, wood, branches, animal manure samples. Several layers of filter paper are spreaded in sterile petri dishes. The collected materials are placed, distilled water is added and waited at 24-48 hours at 21-26 °C. Plant material is swollen and spores germinates. When developing myxomycetes were found, the moist chamber was allowed to dry slowly and the myxomycetes were then dried and become suitable to make fungarium material.

Producing on Agar Medium: The fruiting bodies of the myxomycetes are apply on an agar with a suspension of *E. coli* or other microorganisms. After standard incubation at 25 °C in the dark for 4-5 days, myxamoebic plaques appear and the plaques are transfered several times to new agar plates containing the same media as above until plasmodial formation was observed. The plasmodia are then in mass culture in agar plates with oatmeal for 1-2 weeks at 25 °C in the dark. There are different media containing nutrient agar.

Keywords: Myxomycetes, obtaining methods

P-27

An investigation on biodiversity, seasonal distribution and the relationship of the substrate of myxomycetes in Belen - Hatay (Turkey)

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Myxomycetes; investigated in kingdom Protista Mycetozoa which are usually present and sometimes abundantly in terrestrial forest ecosystems. We collected the substrates at 10 different stations from the Belen between the years 2013-2014. Natural mature fructifications of Myxomycetes were gently collected from substrates. Bark, leaf, decayed and undecayed all kinds of plant materials, manure and animal remains samples are collected and applied the moist chamber culture in laboratory for growing to sporophore of Myxomycetes. As a result of field and laboratory studies 40 species (304 sample) belonging to 5 order, 9 families and 19 genera were identified. 43 samples collected natural environment, 261 samples obtained from moist chamber technique and 15 samples obtained from moist chamber technique and the natural environment. The most common four families which has the most species are Stemonitidiaceae (12), Physaraceae (8), Arcyriaceae (6) and Trichiaceae (3) are contain 29 species and this number is constitutes 72.5% of the total number. When analyzed according to the substrate, the majority of samples obtained from Pinus sp. and Quercus sp. Within obtained 304 sample lignicolous myxomycetes 82%, corticolous myxomycetes 17%, foliicolous myxomycetes 1%. When looking at the seasonal distribution 80 samples obtained fall (70 Moist chamber technique, 10 natural) 180 winter (158 Moist chamber technique, 22 natural), 32 spring (22 Moist chamber technique, 10 natural) and 12 were obtained in the summer (10 Moist chamber technique, 2 natural). In addition to these information Myxomycetes are known as bioindicator and in the research area Myxomycetes relationship with anthropogenic and pollution factors is discussed in detail. Also, considering the importance of species diversity of Myxomycetes in research area, highlighted the contribution of existing biodiversity.

Keywords: Myxomycetes, biodiversity, seasonal distribution, Belen- Hatay

P-28

RNA-seq analysis and characterization of polyketide synthases in mycobiont culture of *Usnea rubrotincta*

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Lichen substances have been used as medicines, dyes and perfumes since ancient times all over the world. However, it is difficult for stable mass production of useful lichen substances by mycobiont culture. To clarify the biosynthetic pathway and genes for heterologous production, we performed RNA sequencing (RNA-seq) analysis between non-producing mycobiont culture and a symbiotic state of co-culture with depsidones of *Usnea rubrotincta*. Among 110,225 contigs by a de novo assembly, 187 contigs for polyketide synthase (PKS) and 886 contigs for cytochrome P450 were annotated. Among 1,466 differentially expressed transcripts, two and eleven transcripts for PKS and P450 were found to be upregulated, respectively. By further expression analysis of these UrPKS genes using real-time RT-PCR, UrPKS5 transcript level was only found to increase markedly and reach a maximum level at 4 weeks. The expression pattern was similar to the production of depsidones. In addition to its expression similarity, protein domain architectures and phylogenetic relationship between UrPKSs suggested that UrPKS5 might play an important role in the biosynthesis of salazinic and norstictic acid in cultured mycobiont of *U. rubrotincta*.

Keywords: Lichen, *Usnea*, RNA-seq, polyketide, PKS

P-29

The biocontrol activity of *Trichoderma harzianum* ID11C against to biotic stress of *Rhizoctonia solani* B227 in bean development

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The aim of the study was to determine the efficacy of *Trichoderma harzianum* ID11C strain isolated from tea soil on germination of seeds (tomato, maize and bean) and to investigate the biocontrol efficacy against biotic stress of *Rhizoctonia solani* B227(AG4) in beans. The pathogenicity test against the bean development of the *Rhizoctonia solani* isolate and the efficiency of the *T. harzianum* strain to seed germination success were determined by the water agar method. In the presence of *T. harzianum* and *Rhizoctonia solani*, bean development parameters were investigated by pot experiment. Physiological parameters (root and stem length, number of hair root, leaf surface area and number, wet and dry weights, etc.) were measured and then statistical analyzes were performed.

It was determined that *T. harzianum* strain had no negative effect on the germination success of the seeds compared to the control. In the pot experiment, when the control group and *R. solani* groups were compared with each other, it was determined that there was a significant difference between the results of the statistical analysis performed with the stem and main root length, the number of lateral root and the root lesion scale (Tukey test, $p<0.05$). The effects of *R. solani* or *T. harzianum* on bean development were not as good as the control group. However, ID11C and B227+ID11C groups were found to reduce pathogenic activity when compared with group B227.

It was determined that *R. solani* caused pathogenesis in the bean (Zulbiye), whereas *T. harzianum* strain decreased pathogenicity in all parameters, although it is not statistically significant. It was concluded that *T. harzianum* ID11C strain could be used as biocontrol and plant supporting agent against *Rhizoctonia* solani in bean farming.

Keywords*:* *Trichoderma harzianum*, *Rhizoctonia solani*, Biocontrol, plant pathogen

P-30

The evaluation of contribution of herbal products, curcumin, naringenin, ginger, and epigallotectin gallate, on the antifungal drug activity against clinical *Candida* isolates

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Currently, there are limited numbers of antifungal drugs developed to use in the treatment of fungal infections. These are usually narrow-spectrum, costly and have significant toxic side effects. Due to the necessity of new alternatives for antifungal therapy, interest to plant-derived components with various biological activities has increased.

In this study, the antifungal activities of curcumin, naringenin, ginger and epigallotectin gallate alone and in combination with caspofungin, voriconazole and amphotericin B were tested against clinical isolates of three *Candida albicans*, three *C. parapsilosis* and two *C. glabrata* strains in vitro. Antifungal susceptibilities were evaluated according to CLSI (Clinically and Laboratory Standards Institute) guidelines and checkerboard method was used for combination tests. Drug interactions were assessed by calculating the fractional inhibitory concentration index (FICI); <0.5 indicates synergism, 0.5 <FICI ≤4.0 indicates indifference, and >4.0 indicates antagonism.

Neither naringenin nor curcumin exhibited any antifungal activity alone (MIC>1600 µg/mL for naringenin, MIC=800 µg/mL for curcumin) and FICIs in their combination with antifungals were 0.5-2.0 (indifference interactions). MIC values of epigallocatechin galleate alone were 16-64 µg/mL and epigallocatechin galleate decreased the MICs of voriconazol and amphotericin B in combination significantly (FICIs=0.375-2). The MIC values of ginger alone were 80-320 µg/mL, and combinations of ginger with all three antifungals were resulted a marked decrease in the MICs of these drugs against all of the *Candida* isolates (FICIs=0.375-2).

As a result, naringenin and curcumin did not cause a significant reduction in the MIC values of all three antifungals against *Candida* isolates. However epigallocatectin galleate and ginger reduced the MIC values of almost all three

antifungals and resulted synergic interactions for several combinations against *Candida* isolates. We think that the reductions in MIC values of caspofungin, voriconazole and amphotericin B will be important because of their toxic side effects.

Keywords: antifungal activity, herbal products, *Candida*

P-31

In vitro activity of farnesol and carvacrol, alone and in combination with antifungals, against clinical *Candida* isolates

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The incidence of fungal infections has dramatically increased in the last two decades. However, toxicity, resistance and low efficacy rates of antifungal agents have become an important problem in many invasive fungal infections. Therefore, the interest of studying the antimicrobial activity of plant extracts and essential oils has increased in recent years. The aim of the present study was to investigate the in vitro activity of two essential oils, carvacrol and farnesol, alone and in combinations with caspofungin, voriconazole and amphotericin B against clinical isolates of 3 *Candida albicans*, 3 *Candida parapsilosis* and 2 *Candida glabrata.*

The antifungal susceptibilities of essential oils were determined by broth microdilution method according to Clinical Laboratory Standards Institute guide (CLSI M27-A3) for yeasts. Checkerboard method was used for combination studies. Drug interactions were assessed by calculating the fractional inhibitory concentration index (FICI); <0.5 indicates synergism, 0.5 <FICI ≤4.0 indicates indifference, and >4.0 indicates antagonism.

Both carvacrol and farnesol exhibited apparent activity against yeasts in this study; MIC values were 60-160 µg/mL for carvacrol and 37.5-150 µg/mL for farnesol. Although the combination of carvacrol and voriconazole showed synergistic effects on only 1 *C. glabrata* isolate, carvacrol reduced the MIC values of caspofungin for 5 isolates, voriconazole for 7 isolates and amphotericin B for all isolates by at least 4 fold (FICIs=0.5-2). Farnesol caused the marked reductions in MIC values of antifungals and significant synergistic activities occurred in combination of farnesol with all three antifungals against almost all *Candida* isolates (FICIs=0.09-2).

In conclusion, carvacrol and farnesol provided the promising results in terms of the reduction of MIC values of antifungals. However further studies are required to prove the contribution of these compounds on the antifungal therapy.

Keywords: Antifungal activity, carvacrol, farnesol, yeast isolates

P-32

Three New *Entoloma* Records from Mount Ida (Kazdagi)

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Turkey has a high potential in macrofungal diversity partly due to its climatic conditions. It has been recorded that nearly 2400 macrofungi species exist in Turkey.

In the present study, fungal samples were collected from Mount Ida (Kazdagi) during routine field studies between 2014 and 2016. In the field, ecological and macroscopic features were recorded and photographed. After the field studies, specimens were brought to laboratory and identified morphologically using reference books. After the field and laboratory studies, *Entoloma anatinum* (Lasch) Donk, *Entoloma caeruleum* (P.D. Orton) Noordel., *Entoloma dichroum* (Pers.) P. Kumm. were identified.

Keywords: *Entoloma*, New records, Mount Ida, Kazdagi

P-33

Isolation and molecular identification of probiotic yeasts isolated from fermented foods

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Probiotics are known as non-pathogenic living microorganisms have a positive effect on the health and physiology of a person when taken in sufficient quantities. The mechanisms of action of probiotics can be stated in three ways: (i) reduction in the number of pathogenic and harmful bacteria, (ii) alteration in microbial metabolism (enzymatic activity), and (iii) improvement of the immune system. to gain acceptance as a probiotic a microorganism should have many characteristics such as ability to affect pathogenic bacteria without destroying normal microflora, be resistant to acid, pH and bile salts, adaptation to natural flora and prevention of antibiotic resistant microorganisms development. Most of the yeasts are approved as safe organisms. Yeasts are probiotically good candidates due to their ability to grow in environments with high salt or substrate concentration, additıonally they can also grow well in low humidity and low pH. Moreover, they are dont produce toxins therefore they considered safe in this aspect when compared to their bacterial counterparts. In this study, seventy-one yeast isolates were obtained from various fermented foods including wine, tarhana dough, boza, apple vinegar, pickled olives, etc. Antibiotic resistance towards five antibiotics (streptomycin, tetracycline, chloramphenicol, erythromycin, and gentamicin), bile resistance (0.5%, 0.6%, 1%,) and tolerance to low (2.5-4.0) and high pH (9.0-9.5) values were determined. Antagonistic activity against seven pathogenic microorganisms consisting of five bacteria (*Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli* O157:H7, *Listeria monocytogenes*, *Salmonella typhimurium*) and two yeast species (*Candida albicans*, *Candida tropicalis*) were also evaluated. Molecular chracterization of the yeast strains with probiotic potency was carried out based on sequence analysis of D1/D2 domain of 26S rDNA regions. *Candida glabrata, Wickerhamomyces anomalus, Debaryomyces hansenii* and *Yarrowia lipolytica* were among the identified species.

Keywords: Probiotic, yeasts, isolation, molecular identification, fermented foods

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P-34

Isolation, identification and biocontrol activity of *Trichoderma* species in a vegetable garden

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The aim of the study is to determine the identification and potential biocontrol properties of *Trichoderma* isolated from samples taken from diseased vegetable garden (tomato, pepper and eggplant).

In the study, a total of 16 specimens were taken according to microbiological criteria, from the diseased plants found in vegetable garden of about 100 m^2 and the soil of these plants. Dilution method was used in the analysis of soil samples. In the analysis of plant samples, surface sterilization was first applied, then homogenized and diluted. All samples were cultured on DRBC agar media and incubated at 26 ° C for 7-10 days. PDA was used for pure cultures. For isolation and identification of cultures, conventional (macroscopic and microscopic examination) and molecular methods (18S rRNA gene and *ITS* regions) were used. The antagonistic properties of 10 *Trichoderma* strains determined by their morphological characteristics were tested by dual culture method against to a group of pathogenic fungi (*Fusarium* sp., *Rhizoctonia solani* end *Sclerotinia sclerotiorum*).

A total of 22 *Trichoderma* spp were identified and species identification confirmed by molecular method. While *Trichoderma harzianum* and *T. hamatum* species are the most isolated species, the less isolated species is *Trichoderma aureoviride*. The presence of strong biocontrol properties of *Trichoderma* spp. YP1a, Yp4a and Yp24b isolates against to some plant pathogenic fungi was determined.

Trichoderma species are saprophytic soil fungi. *Trichoderma* are widely distributed all over the world and they occur in nearly all soils and other natural habitats, especially in those containing or consisting of organic matter. The some isolates (YP1a, Yp4a and Yp24b) have a wide spectrum of biological activity, other strains may control only specific pathogens, while still others may have little or no biocontrol efficacy.

Keywords: *Trichoderma*, Isolation, Molecular characterization, Dual culture

P-35

Assessment of some Macrofungi in Terms of Cytotoxic Effects

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Mushrooms are used as nutrients by many communities due to their taste and nutritional content. Because of their nutritional qualities and their medical potential, fungi are attractive natural ingredients. The aim of this study is to determine the cytotoxic effects of *Trametes gibbosa* (Pers.) Fr., *Fomes fomentarius* (L.) Fr., *Fuscoporia torulosa* (Pers.) T. Wagner & M. Fisch., *Daedalea quercina* (L.) Pers., *Inonotus hispidus* (Bull.) P. Karst. and *Trichaptum biforme* (Fr.) Ryvarden. Esktrakts from fungal species were prepared as standard solutions at 25, 50, 100 and 150 µg / ml concentrations and cell viability was tested with lung cancer cell line A549. When the findings are evaluated, it is observed that extracts of *F. fomentarius*, *D. quercina* and *T. biforme* reduce dose-dependently cell viability. As a result, macrofungus used in the study are thought to be able to be used as natural sources in medicine, pharmacology, food and perfumery due to their strong cytotoxic activities.

Keywords: Wood decaying, cytotoxic effects, natural resources

P-36

Determination of Antioxidant, Antimicrobial Activities and Oxidative stress index of *Tricholoma virgatum*

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Fungi are used today because of their medical properties as well as their use as food. In this context, the determination of the biological potential of fungi is very important in terms of the elucidation of the medical properties.

In this study, it was aimed to determine antioxidant, antimicrobial activities and oxidative stress conditions of *Tricholoma virgatum* (Fr.) P. Kumm. mushroom. Mushroom specimens were dried at 40 °C in an incubator. Dried mushroom samples were powdered with the aid of mechanical grinder. It was then extracted with ethanol at 50 ^{0} C. for 6 hours in the soxhlet extractor. Antimicrobial activity was tested against *Pseudomonas aeruginosa*, *Staphylococcus aureus, Enterococcus faecalis, Candida albicans, C. tropicalis* and *Escherichia coli* using agar dilution method recommended by Clinical and Laboratory Standards Institute (CLSI). Antioxidant activities were determined by the DPPH method. Total antioxidant (TAS) and total oxidant (TOS) levels and oxidative stress indices (OSI) were determined using Rel assay kits. As a result, it was determined that ethanol extracts of *T. virgatum* had antimicrobial effect at concentrations of 200-400 (µg / mL). In addition, antioxidant activity was found to be higher than rosmarinic and cafeic acid, which are lower than ascorbic acid. TAS value was 3.754 mmol/L, TOS value was 8.362 µmol/L and OSI value was 0.223. As a result, it is thought that *T. virgatum* can be used as a natural antioxidant, antimicrobial source.

Keywords: *Tricholoma virgatum*, Antimicrobial, Antioxidant, Oxidative stress, Gaziantep.

P-37

Case report of *Scedosporium apiospermium complex* fungemia

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Scedosporium apiospermium is a fungus that can be found in nature especially in soil. It has been indicated as opportunistic pathogen since 1990s and can cause extensive infections in immunosuppressed people and animals.

Eighty one-year-old male patient applied to Trakya University Hospital in December 2015. He suffers arms and legs weakness which remains for over one year. The patient was diagnosed polyneuropathy and Guillain Barre Syndrome and interned to neurology clinic. He was conscious but he couldn't speak and hear. He had atrophy in distal hand and proximal muscles. Body temperature, pulse, respiration of the patient, haemogram and biochemical value of his blood was normal. Intravenous immunoglobulin and pulse steroid cure was started. White blood cells, C-reactive protein, AST, ALT, urea and creatinine values of his blood increased but thrombocytes decreased in his haemogram in third day of steroid cure. Antibiotherapy was administered as ampicillin-sulbactam and piperacillin-tazobactam intravenously. Disseminated intravascular coagulation was progressed and steroid cure was stopped in tenth day and interned intensive care unit. Antibiotherapy was changed as colistin, linezolid and meropenem. The patient arrested was accepted as exitus on the third day of the intensive care unit.

When he was in intensive care unit, *Scedosporium apiospermium* complex was isolated in three bottles of blood cultures. Minimum inhibitory concentration values of the fungus were 8 µg/ml, 1 µg/ml, 4 µg/ml, 2 µg/ml and 1 µg/ml for amphotericin B, anidulafungin, itraconazole, posaconazole and voriconazole, respectively.

As a result, it should be kept in mind that *Scedosporium apiospermium* in the patients administered steroid cure.

Keywords: *Scedosporium apiospermium* complex, fungemia, *Pseudoallescheria boydii,* Turkey

P-38

The antimicrobial potentials of *Clitocybe nebularis, Suillus bovinus, Lepista nuda*

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Mushrooms, showing a broad distribution in nature, have been commonly used in various societies throughout history because of their nutrient and medical properties. The purpose of this study is to determine the antimicrobial potential of the ethanol extracts of mushrooms *Clitocybe nebularis* (Batsch) P. Kumm., *Suillus bovinus* (L.) Roussel. ve *Lepista nuda* (Bull.) Cooke collected in Belgrade Forest (Istanbul). The mushroom samples which were dried in laboratory conditions were pulverized with a mechanic grinder after the drying process. Later, *Soxhlet* extraction was performed using ethanol at 50°C for 6 hours. The antimicrobial activities of the mushroom samples were determined using modified agar dilution method. At the end of the study, antimicrobial activity at the concentration of 400-100 µg/ml was observed in the antimicrobial activity tests. It was discovered that, among the mushroom extracts, the mushroom *C. nebularis* was the most effective species against the strands that were used and that *L. nuda* and *S. bovinus* were effective at high concentrations. As a result, it is believed that these mushroom extracts can be natural antimicrobial sources.

Keywords: Antimicrobial activity, *Clitocybe nebularis*, *Lepista nuda*, *Suillus bovinus*

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Commercialized Wild Mushroom Species: A Case Study Balıkesir/Sındırgı, Turkey

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Wild edible mushrooms have played an important role in human nutrition and well-being from the ancient times. Turkey has a great potential in terms of wild mushroom species due to suitable ecological conditions. Approximately 2500 mushroom species are identified and 300 of them are considered as edible mushrooms in Turkey. 40 mushroom species are gathered from wild for consumption and approximately 25 of them are sold at local or foreign markets. Using data from a survey of vendors selling wild mushrooms in local markets in the Sındırgı district, Balıkesir Province of Turkey, this study examines the species of wild mushrooms sold in markets and the market demand and values of the wild mushrooms. The most common commercialized mushroom species in the area were determined as *Lactarius deliciosus*, *Russula delica*, *Ramaria* spp., *Macrolepiota procera*, *Pleurotus eryngii*, and *Morchella* spp.

Keywords: Wild edible mushrooms, local markets, demand, market value, Balıkesir

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Induction of *Lentinus brumalis* for Ligninolytic Enzyme Production

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In this study, screening of ligninolytic enzyme production of 13 macrofungus isolates and improving of the ligninolytic activity of the selected isolate by different agricultural wastes and/or commercial inductors were aimed.

Ligninolytic enzyme activity of 13 macrofungus isolates was screened by using of the media including of Poly R-478 as an indicator. Laccase and Mn-dependent peroxidase (MnP) activity of OBCC 09 isolate in presence of different agricultural wastes (kiwi fruit, orange peel, wheat bran, pine cone and banana peel) and commercial inductors (vanillin, veratryl alcohol and xylidine) were followed during 20 days of incubation period.

According to the obtained results, OBCC 09 was the best isolate for ligninolytic enzyme activity among the investigated macrofungus isolates. This isolate presented 11.84 - 436.67 and 37.44 - 950.83 U/L maximum laccase and Mn-dependent peroxidase activity depending on the agricultural wastes in the growth media, respectively. Among five examined agricultural wastes, orange peel has presented the highest laccase and MnP activities with a 25-fold increase when compared with glucose-based control medium for both enzymes. Induction of enzyme production by orange peels was also higher than all tested commercial inducers, namely vanillin, veratryl alcohol, and xylidine.

OBCC 09 isolate was identified according to its LR0R-LR7 primer sequence analysis as *Lentinus brumalis*.

Keywords: Agro-wastes, Inductors, Lignin modifying enzyme, *Lentinus brumalis*.

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Two new rare Physarum (Mycetozoa) records from Hatay Turkey

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Myxomycetes, also known as myxogastrids or plasmodial slime molds, encompass a monophyletic group of amoeboid protists, which are found in almost all terrestrial ecosystems. Plant materials such as woods, barks, leaves, debris collected and moistened with distilled water in petri dishes for Moist chambers techniques. The developed Myxomycetes were allowed to dry.

The genus *Physarum* is the largest genus in Physaraceae with more than 143 species. The fruiting bodies of all members in Physaraceae are often limy, their capillitia are typically composed of calcareous nodes connected by slender and hyaline threads (physaroid) and dark-colored spore mass.

Brown colour distinguishes *P. murinum* from *Physarum globuliferum* (Bull.) Pers. *P. murinum* could be distinguished from similar columellate species by its calcareous stipes with brown color, especially in capillitial lime nodes. *P. murinum* reported dead leaves and woods. Our collections occurred on *Pinus* sp. wood. This is always rare species, known only from Europe, North America and Costa Rica.

Physarum schroeteri has orange sporangium, often joined in pairs by the fusion of stipes, a plainly double peridium, a large columella and profusely developed capillitium with yellow, fusoid nodes and large, strongly spinulose, dark violaceous brown spores. The presence of crystalline lime and capillitium being intermediate between *Physarum* and *Diderma* support the notion that this very distinctive species belongs to a different genus. Habitat of this species includes; on conifer litter, on dead leaves, woods and twigs. In our study this species is reported on leaves of some *Pinus* sp. This is known a rare species especially in Europe, North America, Morocco, India and Pakistan.

Key words: Myxomycetes, *Physarum*, New records, Hatay, Turkey

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Medicinal Potential of *Morchella esculenta* (L.) Pers.

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In this study, it is aimed at antimicrobial potential of ethanol extracts of kind of mushrooms, total antioxidant (TAS), total oxidant (TOS), oxidative stress index (OSI), determination of element (Fe, Cu, Zn, Pb, Ni, Mn, Co, Cd, Cr) content. Samples of mushroom dried in the laboratory were pulverized after drying process by a mechanical grinder. Afterwords at 50^{o}C for 6 hours the extraction process was performed with ethanol in soxhlet device. Antimicrobial potential of mushroom sample was determined by using the modified agar dilution method against *Staphylococcus aureus*, *Enterococcus faecalis, Escherichia coli, Pseudomonas aeruginosa, Candida albicans* ve *Candida tropicalis* standard strains. TAS, TOS and OSI values was identified by using Rel Assay Diagnostic Kit. Element processing was found by using atomic absorption spectrophotometry subsequent to wet burning process. At the end of study, the antimicrobial potential test of the mushroom extract was found to be effective against microorganisms at a concentration of 200 µg/ml. It was also found that the extract was more effective on *C. albicans* and *C. tropicalis*. The determined values of TAS, TOS and OSI were measured as 4.580 mmol, 13.549 µmol, 0.296 respectively. The content of Fe, Cu, Zn, Pb, Ni, Mn, Co, Cd, Cr (mg/kg) was determined as 264.57, 14.77, 7.82, 12.59, 0.53, 19.45, 3.82, 2.45, 6.86 respectively. It is tought that mushroom can be used as a medical natural resource due to its high antioxidant and antimicrobial values.

Keywords: *Morchella esculenta*, Antimicrobial, TAS, TOS, OSI, Element content

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Determination of Biological Activity of *Leucoagaricus leucothites*

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Mushrooms that serve as a good source of food for human beings for centuries are now being used due to their medical properties as well as their nutritional properties. In this study, it was aimed to determine the biological potential of *Leucoagaricus leucothites* (Vittad.) Wasser. In this context, fungal samples were dried at 40 °C in an incubator. Dried mushroom samples were powdered with the aid of mechanical grinder. It was then extracted with ethanol at 50 ^{0}C. for 6 hours in the soxhlet extractor. Antimicrobial activity was tested against *Pseudomonas aeruginosa, Staphylococcus aureus, Enterococcus faecalis, Candida albicans, C. tropicalis* and *Escherichia coli* using agar dilution method recommended by Clinical and Laboratory Standards Institute (CLSI). Antioxidant activities were determined by the DPPH method. Total antioxidant (TAS) and total oxidant (TOS) levels and oxidative stress indices (OSI) were determined using Rel assay kits. The contents of Fe, Cu, Zn, Pb, Ni, Mn, Co, Cd and Cr were determined by atomic absorption spectrophotometry following wet aging. As a result, it was determined that ethanol extracts of *L. leucothites* were more effective against *C. albicans, C. tropicalis* and *E. coli.* In addition, antioxidant activity was found to be higher than rosmarinic and cafeic acid, lower than the ascorbic acid standards used. TAS value was 8.291 mmol / L, TOS value was 10.797 µmol / L and OSI value was 0.130. It has been determined that the heavy metal levels are generally in the literature range. As a result, high biological activity of *L. leucothites* is thought to be used as a natural antioxidant, antimicrobial source.

Keywords: *Leucoagaricus leucothites*, Antimicrobial, Antioxidant, Oxidative stress, Heavy metal.

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Identification and pathogenic characterization of *Fusarium* species isolated from root rot of tomatoes in Rize

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In this study, it was aimed to isolate and identify the microfungi that causing the plant disease from tomato (root, stem and fruit) and soil samples. All *Fusarium* strains collected during this study were used to detect their pathogenicity against germination of tomato seeds. According to the soil samples dilution method, plant samples were homogenized after surface sterilization and planted on DRBC medium. All the isolates were grown on PDA at room temperature (26 ± 2°C). Species were differentiated according to the morphology of the macroconidia, microconidia and their arrangement in chains or false heads, the type of conidiophore, and the presence or absence of chlamydospores. Using ITS region sequencing, all collected fungi were identified at the species level. All *Fusarium* strains collected during this study were used to detect their pathogenicity and the vigor index against to germination of tomato seeds.

A total of 25 specimens were collected from soil and tomatos (root, stem and fruit) from which root rot disease was observed. A total of 14 *Fusarium* spp. were detected from PDA agar media in according to the morphological characteristics. The species were identified as *F. oxysporum*, *F. solani*, *F. sambucinum* and *Fusarium* spp. among the species, *F. sambucinum* was the most frequently detected. In the seed assay, germination success was determined to decrease in the seeds infected with *Fusarium* spp. according to the control groups. There was statistically significant difference between control and *Fusarium* spp. Yp4c, Yp13b and Yp18b strains compared to Vigor index ($p < 0,05$).

Fusarium spp Yp4c, Yp13b and Yp18b strains were identified as the most pathogenic strains from tomato germination. This is the first report on the identification of major pathogenic fungi isolated from tomato root rot disease in Rize.

Keywords: *Fusarium oxysporum*, tomato, soil, Rize

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The biocontrol activity of *Trichoderma harzianum* ID11D against to biotic stress of *Rhizoctonia solani* B227 in bean development

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The aim of the study was to determine the efficacy of *Trichoderma harzianum* ID11D strain isolated from tea soil on germination of bean seed and to investigate the biocontrol efficacy against biotic stress of *Rhizoctonia solani* B227(AG-4) in beans.

The pathogenicity test against the bean development of the *R. solani* B227 isolate and the efficiency of the *T. harzianum* ID11D strain to seed germination success were determined by the water agar method. In the presence of *T. harzianum* ID11D and *R. solani* B227, bean development parameters were investigated by pot experiment. Physiological parameters (root and stem length, number of hair root, leaf surface area and number, etc.) were measured and then statistical analyzes were performed.

It was determined that *T. harzianum* ID11D strain had no negative effect on the germination success of the seeds compared to the control. In the pot experiment, when the control group and *R. solani* groups were compared with each other, it was determined that there was a significant difference between the results of the statistical analysis performed with the stem length, the number of lateral root and the root lesion scale (Tukey test, $p<0.05$). The *T. harzianum* ID11D group was observed to be better in most of the tested parameters than the other groups.

It was determined that *R. solani* caused pathogenesis in the bean (Zulbiye). It was observed that *T. harzianum* ID11D decreased statistically significant pathogenic effects caused by *R. solani* B227 in some parameters. In some of the parameters, it was determined that the pathogenic activity was reduced although there was no statistically significant difference. It was concluded that *T. harzianum* ID11D strain can be used as a biocontrol and plant promoter against the pathogenic effect of *R. solani*.

Keywords*: T. harzianum* ID11D, *Rhizoctonia solani*, biocontrol, plant pathogen

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The biocontrol activity of *Trichoderma atroviride* ID20G against to biotic stress of *Rhizoctonia solani* B227 in bean development

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The aim of the study was to determine the efficacy of *Trichoderma atroviride* ID20G strain isolated from tea soil on germination of seeds (tomato, maize and bean) and to investigate the biocontrol efficacy against biotic stress of *Rhizoctonia solani* B227(AG4) isolate in beans.

The pathogenicity test against the bean development of the *R. solani* B227 and the efficiency of the *T. atroviride* ID20G strains for seed germination success were determined by the water agar method. In the presence of *T. atroviride* ID20G and *R. solani* B227, bean development parameters were investigated by pot experiment. Physiological parameters (root and shoot length, number of hair root, fresh and dry weights, etc.) were measured and then statistical analyzes were performed.

It was determined that *T. atroviride* ID20G strain had no negative effect on the germination success of the seeds compared to the control. In the pot experiment, when the control and *R. solani* groups were compared with each other, it was determined that there was a significant difference between the results of the statistical analysis performed with the shoot and main root length, leaf count, the number of lateral root, fresh and dry shoot weight and root weight (Tukey test, $p<0.05$). *T. atroviride* ID20G was found to increase the length of the shoot and the number of lateral root and leaf, fresh and dry shoot weight and root weight more than the control.

In the presence of biotic stress, the administration of *T. atroviride* ID20G negatively affected the development of bean, whereas it was positively affected in the absence of biotic stress. It was concluded that *T. atroviride* ID20G strain could not be used as a biocontrol agent against *R. solani* pathogen but could be a plant growth promoting agent under healthy conditions.

Keywords*: T. atroviride* ID20G, *Rhizoctonia solani*, biocontrol, plant pathogen

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Determination of some Macrofungi in Terms of Chemical Compounds

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Living organisms which are cosmopolitan fungus has been used for centuries for food and medicine. Fungus are contains several secondary metabolites, including phenolic compounds, polyketides, terpenes and steroids in their structures. The purpose of this study is to determine the chemical content of *Trametes gibbosa* (Pers.) Fr., *Fomes fomentarius* (L.) Fr., *Fuscoporia torulosa* (Pers.) T. Wagner & M. Fisch., *Daedalea quercina* (L.) Pers., *Inonotus hispidus* (Bull.) P. Karst. and *Trichaptum biforme* (Fr.) Ryvarden. Chemical contents were scanned with GcMs device. As a result of the investigations, 70 different chemical compounds were identified in different amounts in about 6 mushroom species. As a result, it is thought that macrofungus are rich in chemical compounds and can be used as natural sources in the field of food and perfumery.

Keywords: Chemical compounds, Macrofungi, Biological activity, Natural resource.

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Antibiofilm activities of *Sarcosphaera crassa* against five opportunistic pathogens

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Mushrooms are used as food sources with a rich content that is consumed lovingly by people. In addition to consuming fungi as nutrients, it is also very important from a medical point of view. The use of natural products has been extremely successful in the discovery of new medicine, and mushrooms could be a source of natural antimicrobials. *Sarcosphaera crassa* (Santi) Pouzar, although it is poisonous, has been consumed especially in our country and in different parts of the world for many years. The aim of this study was to perform the biofilm inhibitory effect and devastating efficacy of *S.crassa* extract. The microdilution method was used to evaluate the minimum inhibitory concentration (MIC) of this extract on total five opportunistic pathogens, including *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Bacillus cereus, Candida albicans*, and biofilm inhibition was assayed. Minimum inhibitory concentrations (MIC), minimum bactericidal concentration (MBC) were determined on planktonic microbial cells and crystal violet methods carried out to detect the biofilm inhibition and amount of destruction.

The present results showed that *S.crassa* exhibited antibiyofilm properties to all the bacteria and yeast tested. *S.crassa* extract is an effective antimicrobial and antibiofilm agent on important opportunistic pathogens and has a possible therapeutic potential as an clinical antibiofilm agent.

Keywords: Antibiofilm activity, Mushroom, Opportunistic pathogens, *Sarcosphaera crassa*

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Determination of Antifungal Activities of Some Plant Species

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People have been trying to find remedy diseases for centuries with the plants and the methods of treating with plants have been very successful. It has been understood that natural medicines, some of which are coincidental, some of which have been influenced by curiosity, have spread among people and have been curative for diseases. Therefore, the use of plants in the treatment continued until today. The aim of this study was to screen antifungal activities of *Lamium amplexicaule* L., *Mentha pulegium* L., *Salvia syriaca* L., *Capsella bursa-pastoris* (L.) Medik., *Hypericum spectabile* Jaub & Spach, *Convolvulus arvensis* L. and *Mentha longifolia* (L.) Huds. collected from Gaziantep Province. Plant materials were dried in the laboratory, after drying were pulverized by mechanical grinding. Then, it was weighed 30 gram of plant materials for the test and was extracted in a Soxhlet extractor at 50 ° C for approximately 6 hours with commercial ethanol. The antifungal activity of plant extracts were determined for *Candida albicans* and *C. tropicalis* by using agar dilution method approved by the Clinical and Laboratory Standards Institute (CLSI). In this study, the highest antifungal activity was found in *H. spectabile* extracts. *L. amplexicaule*, *M. pulegium*, *M. longifolia*, *S. syriaca*, *C.bursa-pastoris* and *C. arvensis* were found to be effective, respectively. *C. arvensis* and *C. bursa-pastoris* extracts were determined with low antifungal activity. It is thought that the plants used in the study may be the natural antifungal source.

Keywords: Medicinal plant, *Candida albicans*, *Candida tropicalis*, Gaziantep

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Analysis of antifungal susceptibilities and identification of *Candida* ısolated from blood cultures

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Candida spp. are isolated as the second most influential cause of Hospital-acquired bloodstream infection. The presence of *Candida* spp. in one or more than one blood culture is defined as candidemi. In this study, we determined the status of antifungal susceptibility underlying conditions and determination of *Candida isolates* which antifungal drug could be better research at a public hospital in Denizli and identifying *Candida* types defined as the cause of candidemi.

Identification and antifungal susceptibilities of isolates produced in blood culture of 30 different patients were determined using Vitek 2 (bioMerieux, France) system. Conventional methods were also used in the diagnosis of *Candida* spp. Susceptibilities of isolates to amphotericin B, caspofungin, flucytosine, fluconazole, voriconazole and micafungine were determined.

Out of 30 isolates, 15 of them were defined as *Candida albicans* (50%), 5 of them as *Candida parapsilosis* (17%), 5 of them as *Candida tropicalis* (17%), 3 of them as *Candida glabrata* (10%), 1 of them as *Candida krusei* (3%) and 1 one of them as *Candida kefyr* (3%). All of the isolates (100%) were found to be susceptible to amphotericin B and voriconazole. Flucytosine resistance was observed only in isolates typed as *C. crusei*. An intermediate resistance to Fluconazole was detected in one of the five isolates as identified of *C. tropicalis* Resistance was observed in one of the *C.albicans* isolates for caspofungin and the same strain was found to be intermediate resistant to micafungin.

As a result of the study, resistance was detected in all tested antifungals except amphotericin B and voriconazole. In similar prospective studies, diagnosis of the Candida at the type level and the reporting of antifungal susceptibility cases will guide the clinician in planning the treatment, especially in critically ill patients.

Keywords: *Candida,* antifungal, resistance, candidemi

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Anti-bacterial activity of extracts from cultured lichen mycobionts and analysis of active compounds by HPLC-PDA and LC-MS/MS

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Elucidation of new anti-bacterial compounds is greatly important because of antibiotics resistant of bacteria. Staphylococci aureus, S. epidermidis, Streptococcus puogenes and Propionibacterium acne cause generally serious infectious diseases. Lichens, symbiotic organisms of mycobionts and photobionts, produce numerous useful compounds (lichen substances) such as anti-bacterial activity. However, there are a few active compounds isolated from cultured lichen mycobionts. Therefore, we report the screening test on the extracts of cultured lichens inhibited to growth of above 4 bacteria and indicate putative structure of active compounds.

Screenings of anti-bacterial activity for 4 bacteria were performed by MIC (Minimum Inhibitory Concentration) method. The acetone extracts of 39 cultured lichen mycobionts were prepared to half dilution series from 250 μg/ml by antibiotic-free broth containing each bacterium in 96 wells plates, which were incubated in 37 oC during 20 hours. It's observed the MIC endpoint as the lowest concentration of extracts at which there is no visible growth. After preparative thin-layer chromatography, fractions were analyzed by HPLC-PDA and LC-MS/MS.

The extracts obtained from cultured Cladonia boryi and C. cristatella strongly inhibited the growth of 4 bacteria. Five fractions separated from an extract of cultured C. boryi were tested, and then Fr.3 and 5 showed an activity. UV spectra of major compound (Comp. 1) of these fractions were similar to pulvinic acid derivatives. Moreover, mass spectrum of Comp. 1 corresponding to product ions with desorption of carboxylic acid from precursor ion was detected. These results suggested that pulvinic acid deriveatives having carboxylic acids as the partial structure in C. boryi mycobiont have anti-bacterial activity.

Keywords: Anti-bacterial activity, lichen mycobionts, lichen substances

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Evaluation of the risk factors, clinical presentation and prognosis in mixed candidaemia episodes

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Candidaemia is the fourth most common cause of nosocomial bloodstream infections and invasive candidiasis has a significant impact on patient outcomes. The reported low incidence of mixed candidaemia (MC) may have prevented to realize of its clinical presentation. The aim of this study was to analyse risk factors, clinical presentation, prognosis, blood cell and inflammatory parameters in MC episodes.

Mixed candidaemia episode was defined when the presence of two different *Candida* species isolated from a single blood culture of a patient. A total of 17 patients with MC episodes were identified between January 2003 and January 2017. As a control group, 48 patients with monomicrobial candidaemia were included in this study. Underlying diseases, antifungal and antibacterial treatments, usages of steroid and chemotherapy, blood cells (platelet, erytrocyte and neutrophile) accounts were registered for all patients. In addition, several risk factors for developement candidaemia such as central venous catheter, total parenteral nutrition, immunosuppressive therapy and prior abdominal surgery were evaluated.

The *Candida* species isolated from MC were as follows; *C. albicans* and *C. parapsilosis* in 5 patients (29.4%), *C. glabrata* and *C. parapsilosis* in 4 patients (23.5%), *C. albicans* and *C. glabrata* in 3 patients (17.6%), *C. glabrata* and *C. tropicalis* 2 patients (11.7%), *C.krusei* and *C. albicans/C.lusitaniae* 2 patients (11.7%), *C.tropicalis* and *C. parapsilosis* 1 patient (5.8%). The isolation frequency of *C. glabrata* and *C. parapsilosis* was higher in MC than monomicrobial episodes (*p=0.003* and *0.007*). Also intensive care unit hospitalitazion and prior abdominal surgery were slightly more common in cases with MC than monomicrobial episodes.

Mortality rates, median length of hospitalization and the other parameters did not show statistically difference.

In conclusion, epidemiology, clinical features and risk factors associated with the development of MC episodes are not well determined. Further larger studies required in future.

Keywords: candidaemia, prognosis, risk factors

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Five new microfungi records from Central Anatolia Region

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Present microfungi have been recorded on *Juglans regia* L. that grown on middle Kızılırmak river basin from Central Anatolia region. Materials were collected on Walnut trees infected by microfungi from different natural and cultivated ecosystems in area between 2012 – 2013 years. Thereafter, the specimens were taken to the laboratory and examined morphologically using an Olympus SZX 16 – (Japan) a compound binocular stereomicroscope. The collections were examined in distilled water and for microphotographs and investigations Leica DM 3000 research microscope was used. For the identification of fungi species numerous literature sources were employed (Bensch et al. 2012; Ellis & Ellis 1998; Saccardo 1884, 1906). At the result of investigation that identified species *Cladosporium fasciculatum* Corda, *Cladosporium stromatum* Preuss, *Coniothyrium episphaerium* Höhn., *Coniothyrium parasitans* (Berk. & Ravenel) Tassi, and *Dendrophoma juglandina* Schulzer & Sacc. have been determined as new records for Turkey mycobiota. Samples heve been deposited as fungarium material in the Mycology Laboratory of Ahi Evran University, Arts and Sciences Faculty, Department of Biology. The Authors wish to express their thanks for the financial support to Ahi Evran University Scientific Project Fund (Project no: PYO-FEN.4003.12.008).

Keywords: Biodiversity, *Juglans regia*, mycobiota, new record, species

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Wild Edible Mushrooms of Edremit

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Turkey has a large wild edible mushrooms potential because it possesses favorable environmental conditions for the growth of mushrooms. Specimens of wild edible macrofungi were collected from Edremit during routine field studies between 2014 and 2016. In the field, ecological and macroscopic features were recorded and photographed. After the field studies, specimens were brought to laboratory and identified morphologically using reference books. After the field and laboratory studies, fifty-seven wild edible species were identified.

Keywords: Edible Mushrooms, Edremit, Turkey

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Technological properties of the yeasts with probiotic potential

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Yeasts are microorganisms of great economic interest due to their numerous applications in traditional and modern biotechnology. They demonstrate the most important criteria in the selection of probiotics which include their ability to resist pathogens, grow in extreme pH and bile salts concentrations. Probiotics are live microorganisms that confer a beneficial effect on the host when administered in proper amount. It is well known that yeasts also play an important role in some fermented products. Lactic acid is known for its ability to metabolize and reduce the acidity and facilitate the growth of acid sensitive bacteria. The ability of some yeasts to produce killer toxins exerts an antagonist effect during their interaction with other species and provides protection against unwanted microorganisms. Such finding adds to their value as biocontrol agents and results in designing new products inclusing probiotics. For this reason, the technologic properties of yeasts with potential probiotic is evaluated. In this study, one hundred and forty yeasts were isolated from thirty six different samples obtained from breast milk, baby stool, chickpea bread dough, lemon juice, kefir and koumiss. The yeasts with probiotic potential were investigated for their technological traits such as their ability to produce killer toxin, enzymatic activities (amylase, lipase, protease, catalase, β-glycosidase), acetic acid (0.15%-0.30%) and lactic acid (0.6%-1.2%) resistance. Molecular identification of the relevant yeast strains was performed based on sequence analysis of the D1 / D2 domain of 26S rDNA regions. *Candida zeylanoides, Candida tropicalis, Wickerhamomyces anomalus, Wickerhamomyces sp., Kluyveromyces marxianus, Kluyveromyces lactis* and *Clavispora lusitaniae* were among the identified species.

Keywords: Probiotic yeasts, identification, technological properties, killer toxin, extracellular enzymes

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Microfungi Associated with *Fagus orientalis* in Istranca Mountain

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Beech (*Fagus orientalis* Lipsky) has got the most important among tree species which form forests in the area. It shows wide spread constituting mixed and pure communities in the Black Sea and Marmara coast regions of Turkey. It goes up from sea level to 2000 m and forms forests in region with *Picea orientalis* (L.) Link, *Carpinus betulus* L., *Pinus sylvestris* L. *Acer platanoides* L. and others. At the result of mycological researches seventeen micromycetes species have been found on Beech trees of natural forest ecosystems in Istranca mountain that are: *Amphisphaeria umbrina* (Fr.) De Not., *Annulohypoxylon cohaerens* (Pers.) Y.M. Ju, J.D. Rogers & H.M. Hsieh, *A. multiforme* (Fr.) Y.M. Ju, J.D. Rogers & H.M. Hsieh, *Anthostoma decipiens* (DC.) Nitschke, *Apiognomonia errabunda* (Roberge ex Desm.) Höhn., *Asterosporium asterospermum* (Pers.) S. Hughes, *Brunnipila clandestina* (Bull.) Baral, *Cleistophoma dryina* (Berk. & M.A. Curtis) Petr. & Syd., *Cryptocoryneum condensatum* (Wallr.) E.W. Mason & S. Hughes, *Diaporthe macrostoma* Nitschke, *Diatrype disciformis* (Hoffm.) Fr., *Diatrypella decorata* Nitschke, *Eutypella grandis* (Nitschke) Sacc., *E. ventricosa* (Fuckel) Sacc., *Hypoxylon subterraneum* Fuckel, *Melanconium ramulorum* (Corda) Sacc., and *Phoma desolationis* Speg. The most of them are Teleomorphic fungi (55%) and others are Anamorphic fungi (35%). Their taxonomies, descriptions, morphological characters, trophic structures, relationships with hosts and some photos have been presented in the text.

Keywords: Biodiversity, *Fagus orientalis*, Forest ecosystem, Microfungi

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Microfungi Associated with *Carpinus betulus* in Istranca Mountain

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Materials collected on *Carpinus betulus* L. trees from different localities of Istranca Mountains in Thrace region. *C. betulus* shows wide spread in Beech forests with *Quercus petraea* (Matt.) Liebl., *Alnus glutinosa* (L.) Gaertner subsp. *glutinosa*, *Populus tremula* L., etc. in region. At the result of mycological investigations fourteen micromycetes species have been found on Beech trees of natural forest ecosystems in Istranca mountain that are: *Amphisphaeria betulae* (Niessl) Schrantz, *A. magnusii* E. Bommer & M. Rousseau, *Annulohypoxylon cohaerens* (Pers.) Y.M. Ju, J.D. Rogers & H.M. Hsieh, *Anthostoma decipiens* (DC.) Nitschke, *Bertia moriformis* (Tode) De Not., *Diatrype disciformis* (Hoffm.) Fr., *Dothiorella dryophila* Sacc., *Eutypella quaternata* (Pers.) Rappaz, *Fusicoccum betulae* Cooke, *Massaria subpustulosa* (G.H. Otth) Jacz., *Melanconium apiocarpum* Link, *Pseudomassaria sepincoliformis* (De Not.) Arx, *Septonema strictum* Corda, and *Taeniolella alta* (Ehrenb.) S. Hughes. The most of them are Teleomorphic fungi (64%) and others are Anamorphic fungi (36%). Their taxonomies, descriptions, morphological characters, trophic structures, relationships with hosts and some photos have been presented in the text.

Keywords: Biodiversity, *Carpinus betulus*, Forest ecosystem, Microfungi

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Microfungi Associated with *Cornus mas* in Istranca Mountain

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Cornus mas L. is one of the important members that productive forests in Thrace region. The microfungi samples have been collected during periodic mycological excursion from different localities of region. The samples transferred to the laboratory and microscopic investigations carried out. As a result of mycological researches twenty-two micromycetes species have been found on *C. mas* trees of natural and cultivated forest ecosystems in Istranca mountain. These are: *Amphisphaeria millepunctata* (Fuckel) Petr., *Aposphaeria collabens* (Berk. & M.A. Curtis) Sacc., *Bactrospora corticola* (Fr.) Almq., *Coniothyrium olivaceum* Bonord., *Cordana crassa* Tóth, *Cryptocoryneum condensatum* (Wallr.) E.W. Mason & S. Hughes, *Cucurbitaria rabenhorstii* Auersw., *Cytospora chloroglaea* Berk. & M.A. Curtis, *Didymosphaeria oblitescens* (Berk. & Broome) Fuckel, *Diplodia amphisphaerioides* Pass., *D. mamillana* Fr., *Diplodina corni* Cooke, *Hendersonia fiedleri* Westend., *Hysterobrevium mori* (Schwein.) E. Boehm & C.L. Schoch, *Macrophoma paniculata* (Ellis & Dearn.) Sacc. & P. Syd., *Metasphaeria cerlettii* (Speg.) Sacc., *Paraconiothyrium fuckelii* (Sacc.) Verkley & Gruyter, *Phoma cornicola* D. Sacc., *Pseudovalsa titan* (Berk. & Ravenel) Sacc., *Saccothecium sepincola* (Fr.) Fr., *Sphaeropsis atra* (Preuss) Sacc., and *Zignoëlla fallaciosa* Rehm. The most of them are Anamorphic fungi (59%) and others are Teleomorphic fungi (41%). Their taxonomies, descriptions, morphological characters, trophic structures, relationships with hosts and some photos have been presented in the text.

Keywords: Biodiversity, *Cornus mas*, Forest ecosystem, Microfungi

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New Species Record for Turkey Mycobiota: *Macrophoma strobi*

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To contribute to mycobiota of Turkey was aimed in this study. The microfungus sample was collected during periodic mycological excursion from the Kırşehir Province in May 2013. It was transferred to the laboratory and microscopic investigations were carried out. The collections were examined in distilled water and for microphotographs Olympus BX 53 with Olympus DP 22 digi–CAM (Japan) research microscope (Axio imager 2 equipped with Nomarski differential interference contrast optics) was used. The specimen was identified with the help of Grove (1935). As a result: *Macrophoma strobi* (Berk. & Broome) Berl. & Voglino has been identified on fallen cones of *Pinus sylvestris*. *Macrophoma strobi* has been recorded first time for Turkey mycobiota. The sample is deposited at the Ahi Evran University, Arts and Sciences Faculty, Department of Biology, Mycology Laboratory.

Keywords: Biodiversity, Microfungi, New record, *Pinus sylvestris*

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Biomonitoring Air Quality İn The European Side Of Istanbul City By Lichens

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In this study, epiphytic lichens with biomonitor characteristics have been collected from 20 trees in 12 predetermined stations in the European Side of Istanbul. As pollution factors, ten elements (Al, As, Cd, Cr, Fe, Ni, Mn, Pb, V and Zn) have been specified and analyzed in ICP-MS. From the collected lichen species, *Physcia adscendens* has been preferred because it has been found in all of the stations (the collecting sites); and *Xanthoria parietina* has been chosen since it has been present in many stations. Unlike the other studies; lichen samples have been analyzed separately by grouping the thalli (foliose) as large in diameter (old) and narrow in diameter (young). The aim is to have an idea about the air quality of the study region in the past and at present. Thus, the result of the environmental health measures which were taken in the past can be evaluated. As the result of analyses in the study, the most polluted station is Şişli Armenian Catholic Cemetery and the most unpolluted one is Florya Atatürk Forest. When the old and the young lichen specimens are compared, the old lichens which have been collected from the 1, 2, 9, 10 and 11th stations have been measured to have accumulated more elements than the young lichens. At the other stations, a significant difference has not been observed. As a result of the correlation between the old and the young lichens; a strong relationship has been observed in terms of Al, Fe, Cr and V elements.

Keywords: Biomonitoring, heavy metal, air pollution, lichen, age, Istanbul

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Lichen Mycota of Gölcük Nature Park (Isparta)

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Studies on "Lichen Biodiversity of Turkey" have more importance and value than in past since the country has a great degree of lichen biodiversity which must be protected as well as the plant biodiversity.

In this study, lichen specimens were collected from twenty-four localities of Gölcük Nature Park in Isparta between the dates April 11, 2009 and July 22, 2010, in order to determine lichen mycota of the nature park and the city. Isparta is a province located in the north-western part of Mediterranean Region of Turkey. Although there have been some studies on lichens from Isparta province before, none of them have a systematic approach of a long-term study. As a result, 190 species and 3 varieties (193 taxa) belonging to 74 genera, representing the lichen mycota of Gölcük Nature Park and its surroundings, were identified. Distribution of the taxa in the research area has been recorded as well as information on the substrate and diversity. 67 species were firstly recorded for the research area and Isparta, together with 6 new records for Turkish Lichen Mycota.

Notwithstanding that there is not a collection of "Lichen Mycota of Turkey", there have been an increase in the number of mycotic studies on lichens in Turkey. This study aims to make a contribution to taxonomic and mycotic studies on lichens in Turkey and provide a basis for further ecological, chemical such studies of lichenology that can be done in the region in the following years.

Keywords: lichenized fungi, gölcük nature park, Isparta, mycota

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Different Ecological Groups and Distribution of Myxomycetes

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Myxomycetes or plasmodial slime moulds are phagotrophic eukaryotes and commonly in association with decaying logs and litter in terrestrial ecosystems. Most of the species are cosmopolitan in distribution. They are especially known terrestrial organisms but some species have been reported from aquatic habitats like *Didymium difforme, Diderma effusum, Physarum album* and *Fuligo cinerea.* Some ecological parameters like temperature, moisture, pH, light and the availability of decomposing plant material seem to represent the principal factors of the occurence of myxomycetes in a region. The studies on the factors determining the distribution of the myxomycetes are more prevalent in the temperate and tropical regions.

According to subtrate type they are examined generally in four major ecological groups. These groups are the; (a) lignicolous (inhabit dead and decaying wood, most abundant and widespread group (b) corticolous (associated with the bark surface of living trees) (c) litter-inhabiting (associated with the complex mixture of plant parts that have fallen to the ground like dead leaves, pieces of barks, small twigs, fruits, and flower parts) and (d) coprophilous (occur on the dung of herbivores). In addition to the four major ecological groups, there are several other relatively various minor groups of myxomycetes. These include the soil-inhabiting, aerial litter-habiting, twig-inhabiting, bryophilous, and nivicolous (snowbank) myxomycetes.

In summary, it can be said that from studies carried out in various localities throughout the World, there are differences in both distribution and abundance of myxomycetes and these differences can be related to different types of vegetation that exist from one region to another.

Key words: myxomycetes, distribution, habitat, ecology

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Antifungal Activity of Bee-Collected Pollen Grains Against *Candida albicans*

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Bee-pollen is a fine, powder-like material that produced by flowering plants and gathered by bees. Flower pollens, contain carbohydrates, amino acids, proteins, lipids, vitamins, minerals, phenolic compounds, flavonoids, concentrations of phytosterols and are also rich in phytochemicals. Because of having several phytochemicals such as carotenoids, steroids, terpenoids and flavonoids, they are known as folk medicine.

In recent years many researchers have been investigated antimicrobial and phenolic contents of bee pollens due to the importance.of biological effects like antioxidant activity, antiviral, anti-inflammatory and antiallergic. In this research, antifungal activity of five bee-pollens belonging to *Cistus* sp. and *Trifolium* sp were tested against the yeast *C. albicans.* These pollen loads were provided by the bee-keepers from Çanakkale province (Gökçeada, Lapseki,Biga) on April-May 2016. Disc diffusion method was used for screening antifungal effect of bee-pollens. Mueller Hinton Agar (Merck) was preferred as a medium and ketoconazole (50 µg) was used as a reference antifungal disk for control. The study was carried out in duplicate.

As a result, when the inhibition zone diameters from disk diffusion method were evaluated, it was determined that bee-pollens didn't have any antifungal activity against *C. albicans.* It is thought that this situation might be related to the drying of pollen loads, the low level of effective substances in their composition or it has been over a period of one year.since bee-pollens were collected. This research can be developed by using different kinds of Candida and yeast species.

Keywords: antifungal activity, bee-pollen grains, *C. albicans, Çanakkale*

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Evaluation of Antibiofilm Activities of Nicotine

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Nicotine is a nitrogen containing chemical including a pyridine and a pyrrolidine ring. It is found in many types of plants such as tobacco, red peppers, eggplant, tomatoes and potatoes. Nicotine, which has different effects on humans, especially increases heart rate. On the other hand, biofilm is a microbial community that is very dangerous for medical and industrial fields. Recently, it is one of the most popular research subjects to produce new compounds with low side effects that can be used in the treatment of bacterial infection. Furthermore, nicotine can be used as candidate drug for biofilm formation with its antimicrobial feature. In literature, there is no information about antibiofilm activity of nicotine. For that reason, we investigated the effect of nicotine with different concentration on biofilm formation. In this study, we used *Pseudomonas aeruginosa* (ATCC 27853), *Staphylococcus aureus* (ATCC 25922) and *Candida albicans* to detect biofilm formation. Pure nicotine solution (100 µg/ml - 4 mg/ml concentration) was prepared in steril saline. Antibiofilm activity was determined with Crystal Violet (CV) assay. Bacterial and yeast culture was grown in Mueller Hiltone broth (MHA) and Potato Dextrose broth (PDB), respectively. The amount of cells equal to 0,5 McFarland and different concentration of nicotine incubated at 37˚C for 48 hours. After incubation, suspension cell was removed and biomass was detected with CV. In the light of the findings, nicotine has antibiofilm effect with increasing concentration.

Keywords: Biofilm, Nicotine, Crystal Violet Assay

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Antifungal Effect of Propolis Encapsulated Chitosan Microparticles Against *Penicillium, Aspergillus* and *Cladosporium* Isolated from Buildings

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Molds are ubiquitous, and mold spores are a common component of household and workplace dust. They may cause hazardous effects on human health including allergic reactions and respiratory problems. There is a growing need to utilize novel materials that have antifungal effect to prevent health problems by inhibiting mold formation on buildings.

Propolis is a natural material produced by bees to protect beehive from external effects. Antifungal activity of propolis is reported in various studies. However, because of its characteristic smell and color, it is not suitable to use commercially. In this study, it's aimed to prevent smell and color of propolis by performing encapsulation with chitosan and investigate its antifungal activity against certain molds.

Swap samples were taken from from various walls to perform objective study. Microfungus from wall samples were identified microscopically. Microdilution method was used to investigate antifungal activity of propolis and propolis loaded chitosan microparticles.

According to the results, propolis and propolis loaded chitosan microparticles have antifungal activity against certain mold species breeding indoor conditions. It's foreseen that propolis may be used as antifungal agent in building materials such as paint and cement.

Keywords: Chitosan, microencapsulation, antifungal, building molds

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Determination of the Inhibitory Effect of Phytochemical Loaded Microcapsules on Phytopatogenic Fungus *Botrytis cinerea*

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Grape, having a wide range of products, is an economically valuable agricultural product for Turkey and Aegean Region both. 520 thousand hectares of the field are cultivated in Turkey and 3.5 million tons of products are obtained. However, there are some significant problems in grape breeding and this effects grape's economic value.

One of the most important of these problems is fungal diseases. It is known that increasing the use of chemicals to prevent products from fungal diseases in agricultural fields reduces the quality of the products. Natural molecules are used to struggle with fungal diseases without reducing the quality of the product and avoiding harming human health recently. Phytochemicals have been an important source for this way. However, their high sensitivity to environmental factors prevents long-term use. Microencapsulation is a technology used to increase the sensitivity of phytochemicals to environmental factors.

In this study, the inhibitory effect of thymoquinone, carvacrol, thymol and allicin loaded chitosan microcapsules on *Botrytis cinerea* isolated from grape was investigated.

The Checkerboard method was used to investigate the synergistic effects of thymoquinone, carvacrol, thymol and allicin, and the effective combination was encapsulated with chitosan. The encapsulated combination was applied to grape specimens that *B. cinerea* was inoculated into and the changes were observed for a month.

In the light of the results, it's determined that the combination of chitosan-encapsulated phytochemicals showed an inhibition effect on *B. cinerea* at 2000 ppm.

It is foreseen that the combination may be used to increase the shelf life of the grape after the toxicity tests are completed.

Keywords: Chitosan, microencapsulation, antifungal, building molds

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Investigation of Availability of Phytochemicals Loaded Microparticles Against Post-Harvest Cherry Molds

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All over the world, approximately 2 million tons of cherries are produced. Turkey ranks first among the countries producing cherries in the world. 398 thousand tonnes (19.9%) of cherry production is performed in Turkey. However, because of the low quality of the products and low-shelf life, the selling price of cherries is rather low. By supporting domestic production, it is needed that natural preservatives that can increase the resistance of products to microorganisms and environmental conditions may increase the value of cherries with high export potential.

In agricultural products in the world, molds after harvest lead to both consumer health and economic loss. Since methods are non-effective for protecting products from molds and materials are harmful to human health, novel techniques are needed to prevents products from molds.

Phytochemicals have been used to struggle with microorganisms for years. However, their use is limited since they are sensitive to environmental conditions and have low stability. Microencapsulation is an innonative technology that prevents phytochemicals from environmental conditions. In this study, it's aimed to investigate effects of carvacrol, thymol, propolis and alicin loaded microparticles against *Rhizopus sp.* that causes molding in cherries.

Rhizopus sp. which is used as a target microorganism was isolated from cherry samples. Checkerboard method was used to investigate synergistic effect of carvacrol, thymol, propolis and allicin. Effective combination was determined and microencapsulation was performed with chitosan. The encapsulated combination was applied to cherry samples that *Rhizopus sp*. inoculated into and changes were observed for 1 month.

In the light of the results, it has been observed that the combination of chitosan-encapsulated phytochemicals inhibited cherry molding when applied at a dose of 2000 ppm. It is foreseen that the combination has a potential for using to increase the shelf life of the cherries after the toxicity tests are completed.

Keywords: cherry, mold, chitosan, synergetic effect, microencapsulation

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Investigation Anticandidal Activity of Propolis In Various Solvents Against *Candida* Species

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Candida species cause various infections including nosocomial infections on human. Especially in immunocompromised patients, *Candida* species causes serious infections and in some cases, drugs can't be effective and correspondingly, rates of reinfections caused by *Candida* spp. increases day by day. Therefore, novel molecules are needed to struggle with *Candida* infections.

The molecules in the nature have been used to struggle with microorganisms for years. In nature, there are various materials that have antimicrobial activities. Propolis is one of these natural materials that is a resinous substance and produced by bees. Antimicrobial properties of propolis have been shown in various studies. In this study, it's aimed to investigate anticandidal activity of propolis in various solvents on *Candida albicans, C. glabrata* and *C. krusei.*

Anticandidal activity of olive oil, ethyl alcohol and propylene glycol extracts of propolis were investigated. Anticandidal tests were performed by serial microdilution method with 96-well microplates. The effective extract of propolis and MIC values were determined.

According to results, anticandidal activity of propolis differs depending on the solvent. This effective and non-toxic concentrations may be used directly on medical applications, devices and biomaterials against *Candida* species.

Keywords: Propolis, Candida albicans, C. glabrata, C. krusei, anticandidal

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Investigation of Inhibition Effect Of Phytochemical Loaded Microcapsules on *Aspergillus spp.*, *Alternaria ssp.*, *Penicillium spp.* and *Rhizopus spp.* Isolated from Bread

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Nutrition is one of the most important vital activities for living creatures to survive. Especially in Turkey, one of the most important foods in our daily diet is bread. Every year 1.79 billion pieces of bread are wasted since the most of the preservaties are insufficient to protect bread from environmental conditions and microorganisms. For this reason, novel natural, effective and harmful preservatives are needed to increase shelf life.

Phytochemicals are natural resources used in different fields for years. However, their use commercially are limited since they are sensitive to environmental conditions. Microencapsulation is an innovative technology used to increase the sensivity of phytochemicals to environmental factors and ensure their long-term use.

In this study, it was aimed to investigate the inhibitory effect of carnation oil, cinnamon oil, borage oil and allisin loaded chitosan microcapsules on *Aspergillus spp., Alternaria spp*., *Penicillium spp*., and *Rhizopus spp* isolated from bread samples.

The Checkerboard method was used to investigate the synergistic effects of carnation oil, cinnamon oil, borage oil and allisin microencapsulation of effective combination was performed with chitosan. Encapsulated combination was applied to bread samples that *Aspergillus spp., Alternaria ssp., Penicillium spp.* ve *Rhizopus spp.* were inoculated into. The changes were observed for a month.

When the results are evaluated, it is observed that microencapsulated combination showed an inhibitory effects on *Aspergillus spp., Alternaria ssp., Penicillium spp.* and *Rhizopus spp.* at 2000 ppm. It's considered that phytochemical loaded microcapsules may be used as antifungal agents for protecting bread and increasing its shelf life after toxicity testes are completed.

Keywords: Chitosan, microencapsulation, antifungal, bread

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Investigation of the Availability of Phytochemically Loaded Microcapsules to Prevent Tomato Molding

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Turkey is ranked 5th in the world in tomato production. Thousands of tons of tomatoes can be exported each year, but Turkey has the lowest selling price because of its low shelf life and quality. By supporting domestic production, it is needed that natural preservatives that can increase the resistance of products to microorganisms may increase the value of tomatoes with high export potential.

Phytochemicals have been natural sources for many years to struggle with microorganisms. However, they are sensitive to environmental conditions and have low stability, which prevents their long-term use. Microencapsulation is an innovative technology used to increase the stability of phytochemicals and protect them against environmental conditions. In this study, it was aimed to investigate the inhibitory properties of carvacrol, thymol, propolis and allicin-loaded chitosan microcapsules against tomato molds.

Rhizopus sp. isolated from tomato samples was used as the target microorganism in the study. In order to investigate the synergistic effect of carvacrol, thymol, propolis and allicin, Checkerboard method was used and the effective combination was encapsulated with chitosan. The encapsulated combination was applied to tomato samples that *Rhizopus sp*. inoculated into and changes were observed for 1 month.

According to the results, it has been observed that the combination of chitosan-encapsulated phytochemicals inhibited tomato molding when applied at a dose of 2000 ppm. It is envisaged that the combination can be used to increase the shelf life of the tomato after the toxicity tests are completed.

Keywords: Chitosan, microencapsulation, tomato, synergetic effect

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Obtaining Chitosan From Microfungus And Investigating Its Antifungal Activity

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Today, the recycling of environmental waste is becoming more important issue. Chitin comes first among these products and chitosan is the most widely used form of it. Chitosan has some superior properties such as biocompability, antimicrobial activity, positive-charged, biodegradability. Due to these properties of chitosan, it is widely used in various areas such as cosmetic, microbiology, food and biotechnology industries. Chitosan is generally obtained from shrimps, but obtaining chitosan with this way is commercially expensive for use. In this study, it's aimed that obtaining chitosan from microfungus which are waste, determining its characterization and investigating its antimicrobial activity.

Rhizomucor miehei was used for obtaining chitosan with chemical methods. Chitosan was isolated from *R. miehei* by demineralization, deacetilation using acetic acid and sodium hidroxide solutions. Characterization of chitosan was determined by NMR and FTIR. Its antifungal activity was tested against *Aspergillus spp.* and *Penicillium spp* that are isolated from foods by using standart microdilution method. Various concentrations of chitosan was tested against microorganisms in microplates and MIC values were determined.

Our study has shown that microfungal chitosan has antifungal activity against *Aspergillus spp.* and *Penicillium spp.* The data obtained present that microfungal chitosan may be used in food products, after further *in vitro* and *in vivo* tests.

Keywords: Chitosan, Rhizomucor miehei, antifungal

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Antimicrobial activity screening of *Usnea barbata*

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The novel antimicrobial and aseptic agent should be improved because of antibiotic resistance of several bacteria. Lichen species can be used as traditional healer at many developing countries due to the lack of pharmaceutical drug. Research on lichens and lichen extracts is becoming popular because of their specific biochemical composition. *Usnea barbata* is belonging to Usneaceae family and it is an epiphytic lichen species which grows on branches and trunks of trees. Ethanol extract of this lichen was determined for antimicrobial activity against 17 bacteria and 1 fungi. Twelve of these microorganisms are standard species and they are important for exact determination of human infection disease. These microbial strains include *Bacillus, Enterobacter, Enterococcus, Escherichia, Klebsiella, Listeria, Pseudomonas, Salmonella, Staphylococcus* and *Candida* geniuses. Samples with amounts of 0.22, 0.44 and 1.1 mg were analyzed by using disk diffusion method. It was concluded that *U. barbata* has antibacterial potential against fourteen of the tested strains. Two of them showed high sensitivity (higher than 15 mm); six of them were moderately sensitive (14-10 mm) and six of them were low sensitive (9-7 mm).

Keywords: *Usnea barbata*, lichen, antimicrobial activity, disk diffusion method, ethanol extract

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Isolation of *Beauveria bassiana* Secondary Metabolites and Evaluation of Their Antibacterial and Antibiofilm Activities

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Beauveria bassiana is one of the entomopathogenic fungi which is pathogen of insect species. *B. bassiana* produces a number of biologically active extracellular metabolites including polyketides, nonribosomally synthesized peptides, pigments and virulence factors. These metabolites have potential importance for biotechnology. Within this scope, it is important to know the antimicrobial activity of the *B. bassiana* metabolites. In this study, antibacterial activities of *B. bassiana* extracellular metabolites were evaluated. As a part of this study we also examined antibiofilm activity of these metabolites. *B. bassiana* isolate PaF04 (Accesion Number: KT962854) and PaF09 (Accession Number: KT962855) were used and these isolates were grown in 250 ml Erlenmayer conical flask containing 100 ml Saboraud Dextrose broth for two weeks on rotary shaker at 25±2 °C. At the end of the incubation period, the fermentation broth of the *B. bassiana* was extracted with equal volume of adding Ethyl acetate for 30 minutes. The organic phase of mixture containing the extracted compounds was separated using separating funnel. Secondary metabolite compound was dried in rotary evaporator to yield the crude metabolite. *Escherichia coli* (ATCC 25920), *Pseudomonas aeruginosa* (ATCC 27853), *Enterococcus faecalis* (ATCC 29212) and *Staphylococcus aureus* (ATCC 25922) were used as a test organism for determination of antibacterial activity. Agar disk diffusion assay results show that secondary metabolites of *B. bassiana* has a potential inhibitory effect on gram positive bacteria. Antibiofilm activity is also determined with crystal violet assay. Our results show that *B. bassiana* metabolites inhibit biofilm formation at increasing concentrations. This study was supported by the Erzurum Technical University scientific research project.

Keywords: *Beauveria bassiana,* antibacterial, antibiofilm

This work was supported by the Erzurum Technical University Research Foundation (ETU-BAP: 2015.021).

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Determination of Aflatoxin M1 on Follow-on Milk by ELISA Method

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Milk, which is an important source of nutrition is used for infant feeding and consumed widely all over the world. Mycotoxins are one of the chemical contaminants that are known to pass through milk. They are produced by molds and pass through milk, and may cause health problems in infants. Determination of AFM_1 levels in follow-on milks which is one of the most important nutrients for healthy grown babies is important in prevention of toxic effects of mycotoxins. Promoting social protection studies concerning aflatoxins as milk contaminants and raising awareness on follow-on milks is important in protection of public health. In our study, investigation of Aflatoxin M1 in follow-on milks; a product that newborns take in their diet, and to evaluate the results in terms of public health. For this purpose, 60 follow-on milk samples with different serial numbers were collected from 7 companies. AFM1 concentrations were determined by Enzyme-Linked Immunosorbent Assay (ELISA). Our results showed that 37 samples contained AFM1 with <0.05 ppb concentrations, while 23 samples contained AFM1 with >0.05 ppb concentrations. In conclusion, the latter 23 samples including AFM1 values above Turkish Food Codex limits are important in terms of public health.

Key words: Follow-on milk, Aflatoxin M1, Elisa method.

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Investigation of The Dermatophyte Agents İsolated from Clinical Samples at A University Hospital in The Last Four Years (2012-2016)

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In this study it was aimed to detect distribution of dermatophyte species isolated from the clinical samples of patients with dermatophytosis.

A total of 232 skin, nail and scalp/hair specimens obtained from 227 patients (130 were male and 97 were female) who applied to different outpatients of ANS Research and Practice Hospital ,Afyon Kocatepe University and pediatrics diseases outpatients of Evliya Çelebi Research and Practice Hospital were included to the study between January 2012 and Decemder 2015.

All the samples have been evaluated by direct microscopic examination with KOH and by culture Sabouraud Dextrose Agar (SDA). Samples were examined by light microscobe under 40x10 enlargement.

A total of 86 (37.8 %) samples were determined as positive for dermatophytes. Forty six samples were positive by the both microscopy examination and culture methods, eight samples were found to be positive only with culture , and thirty seven samples were positive only with microscopy .Five (9.8 %) of 60 culture positive samples were found as negative by microscopy, while 40 (47 %) of 85 microscopy positive samples were found as negative with culture. The most prominent species isolated from the cultures were *Trichophyton spp*. with a rate of 90% (78/86), followed by *Epidermophyton spp*. (5.8 %) and , *Microsporum spp.* (4.2%). About 37 % of the samples obtained from the patients who applied to the hospital between December and February. The presence of fungal infection in the family, male gender, usage of immunsuppresive drugs were found as risk factors of increasement of the risk of

dermatophytosis. Increases in the rate of dermatophyte infections starts from the age of 25 and peaked in the ages between 50-60 years old.

As a result Trichophyton spp. was determined as the most frequent dermatophyte agent and tinea pedis was the most frequent clinical form in our study.

Keywords: Trichophyton spp., dermatophyte, direct microscopy

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Morphological and Molecular Evaluation of *Tricholoma Terreum* Complex in Turkey

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Tricholoma terreum complex are one of the most controversial groups. The taxa, belonging this complex (*T. terreum, T. bonii* and *T. triste*), have similar morphological characters so they can be misidentified. Also, *T. terreum* has variable morphological characters and many authors consider is as *T. gausapatum, T. leucoterreum, T. myomyces* and *T. terreum*. For this reason, we aimed to discuss this controversial group by evaluating morphological differences and ITS gene sequences.

The analyzed specimens were collected different parts of Aegean Region of Turkey between 2013 and 2015 years. The specimens were brought the laboratory in Muğla Sıtkı Koçman University and identified morphologically. ITS gene sequences were amplified by PCR using ITS1F and ITS4 primers. The ITS gene sequences were analyzed using MEGA 6 and neighbor-joining trees were constructed by 10000 replicates for estimating bootstrap values.

According to morphological and molecular results, the *T. terreum* complex were clearly distinguished three distinct species; *T. terreum*, *T. bonii* and *T. triste*. Although these species have similar morphological characters, they have clearly branched in the phylogenetic tree. Besides of this, *T. terreum* has rather morphological differences. ITS gene sequences of the specimens identified as *T. gausapatum*, *T. myomyces* and *T. terreum* are showed % 100 similarity. Also, ITS gene sequence of *Tricholoma leucoterreum*, thoroughly white specimens, matched *T. terreum* with %100 percent. According to this, *Tricholoma terreum* can produce albino basidiocarp.

Keywords: *Tricholoma terreum*, *Tricholoma bonii*, *Tricholoma triste*, taxonomy, ITS

Acknowledgements: We would like to thank TUBITAK (The Scientific and Technical Research Council of Turkey) for supporting this project (TBAG-114Z721) financially.

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Determination of Mycelial Growth Rates of *Amanita Muscaria* on Different Carbon Sources

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In this study, growth rate of mycelium of *Amanita muscaria* (L.) Lam., obtained from Turkey was investigated on different carbon sources. Arabinose, fructose, galactose, glucose, lactose, maltose, sucrose and xylose were used as carbon sources. Mycelium from stock cultures was inoculated on culture medium (minimal agar with different carbon sources mentioned above) in Petri dishes. Mycelial growth rates were measured in daily periods. As a result, fructose and galactose have been identified that the best carbon sources for mycelial growth of *A. muscaria*.

Keywords: *Amanita muscaria*, macrofungi, mycelial growth, Turkey

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Amylase Activities of Some Wild and Commercial Macrofungi

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It is aimed to study, the enzymatic activity potential of mycelia obtained from some wild and commercial macrofungus species. For this purpose, mycelial cultures of 5 macrofungus [*Armillaria mellea* (Vahl) P. Kumm., *Lentinula edodes* (Berk.) Pegler, *Lentinus sajor-caju* (Fr.) Fr., *Postia stiptica* (Pers.) Jülich, and *Russula fellea* (Fr.) Fr.] taken from a mycelium collection will be screened for production of amylase. As a result of screening tests for amylase production in solid starch medium, *L. edodes* and *L. sajor-caju* showed 36 and 26 mm clear zones, respectively. Therefore, enzyme analysis carried out in liquid media, 22,50 U/ml amylase activity detected by mycelium of *Lentinula edodes*

Keywords: Amylase, macrofungus, mycelia, Turkey

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Importance of the Glycosylation in Fungal Infections

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Glycosylation plays critical roles in the infections. The cell wall is the first site of interaction between most fungal pathogens and host cells. The major components of fungal cell walls are polysaccharides (α- and β-glucans, chitin, and glycoproteins) widely modified with both *N*- and *O*-linked carbohydrates. Their structures vary among filamentous fungi and yeast and also among fungal species. Some of these molecules can be useful in the diagnosis of fungal infections. Inflammatory responses and activation of microbicidal mechanisms by leukocytes are triggered by recognition of these carbohydrate-containing molecules by the innate immune system. It is important to understand these interactions because microbial resistance to antibiotics has increased and their efficacy has decreased recently. In this review, it is aimed to point out the importance of the glycosylation patterns of fungal cell wall components in the infection development. Understanding of glycosylation of fungal cell wall components may provide new opportunities for the development of new classes of antigens, adjuvants, and immunomodulators.

Keywords: glycosylation, fungus, cell wall, infection

P-84

Determination of Possible Mycotoxigenic *Aspergillus* spp Using Coconut Cream Agar

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Aspergillus species are widely found in food and agricultural products. Some of them causes disease agricultural products and some species produce mycotoxins such as aflatoxin and ochratoxin which are very important for food and agricultural products.. Bozcaada which is a province of Çanakkale is located between 39^0 48' northern parallel and 26^0 02' eastern meridians. It is located in the north-east of the Aegean Sea. Vineyards compose a large part of vegetation in Bozcaada different grape varieties are growing in Bozcaada but Karalahna and Çavuş grape varieties are unique to the island. Since Bozcaada is located at the exit of the Çanakkale Bosphorus, the northern winds are dominant in the island. Due to these winds, microflora of the island is changing continually. In this study, grape samples were collected from 2 Karalahna vineyards and 4 Çavuş vineyards in two different location of the island. A total of 11 samplings were done during two years period (2015-2016) *Aspergillus* isolates were obtained from DRBC and DG18 media. A total of 298 *Aspergillus* isolates were plated on Coconut Cream Agar for determination of mycotoxigenic species according to Dyer and McCammon's method. Plates were incubated at 30°C for 7 days in the dark. After incubation, isolates were evaluated for colony colour, colony diameter and radiation emission at 366 nm UV wavelength. As a result, 68.9% and 60.5% of *Aspergillus* isolates were determined as probable mycotoxigenic species in 2015 and 2016 respectively.

Keywords: Grape, *Aspergillus*, Mycotoxins.

P-85

Morphologıcal and Molecular Characterizatıon of Three *Melanoleuca* Specıes in Hakkari Province, Turkey

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Melanoleuca is a character poor genus because lots of species are morphologically very similar. The main objective of our study was to determine the taxonomic position of newly reported three *Melanoleuca s*pecies, *M. dryophila, M.heterocystidiosa* and *M. communis* by using both morphological and molecular methods. Molecular data is needed to figure out the taxonomic positions of the species due to morphological similarities.The specimens were collected from Hakkâri province of Turkey and identified by using the structures of pileus, lamellae, stipe, spores, basidia and cystidia. For molecular studies, genomic DNA was isolated from dried specimen and LSU nrDNA region was analyzed via bio informatic programs.

According to morphologic and molecular data, three new records of *Melanoleuca* species were described as *M. dryophila, M. heterocystidiosa* and *M. communis*. Taxonomic position of *M.dryophila* was uncertain since morphological features were not enough to describe its position within the genus. We need more characters to differentiate *M.dryophila* correctly. As a result, the unknown taxonomic position of *M. dryophila* was decided to put in subgenus *Urticocystis.*

Keywords: LSU,*Melanoleuca,* new records

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Effect of Hypogymnia tubulosa Acetone Extract on *Pseudomonas aeruginosa* Quorum Sensing Systems and Biofilm Formation

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Pseudomonas aeruginosa is an opportunistic human pathogen that causes various infections. The cell-to-cell communication system through chemical signalling molecules known as Quorum Sensing (QS) plays an important role in the infections, antibiotic resistance and biofilm formation of *P. aeruginosa*. For this reason, there is a growing need to utilize novel biological materials that will inhibit the QS mechanism. Lichens are one of the natural resources that have strong antimicrobial activities. In this study, it is aimed to investigate QS Inhibitory (QSI) potential of Hypogymnia tubulosa lichen.

The acetone extract of H. tubulosa collected from Bolu-Aladağlar was obtained. For anti-QS, antibiofilm and swarming-motility tests, *P. aeruginosa* rhlA-gfp and lasB-gfp monitor strains and PAO1 strain were used, respectively. Anti-QS and anti-biofilm tests were performed by serial microdilution method using 96-well microplates. Concentrations of the extract ranging from 1,562 µg/ml to 25 µg/ml were tested to determine effects on bacterial growth and fluorescence. Results were measured using multimode microplate reader (Cytation 3-BioTek) for 16 hours. Antibiofilm tests were performed by crystal violet staining methods at the same concentrations applied in anti-QS tests. For swarming-motility tests, soft agar treated with acetone extracts at different concentrations was poured into petri dishes and 0.5 McFarland P. aeruginosa was inoculated. After 16 hour incubation, swarming of the bacteria was photographed.

H. tubulosa acetone extract showed approximately 50% QS inhibition at 25 µg/ml on monitor strains. It also inhibited biofilm formation of *P. aeruginosa* 55% at 12.5 µg/ml and swarming-motility approximately 90%.

Therefore, QSI potential of H. tubulosa extract was demonstrated and preliminary information on the use of extracts from lichens for antibiotic-assisted drug development has been obtained.

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Keywords: lichens, Pseudomonas aeruginosa, Quorum Sensing, biofilm, swarming-motility,

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Comparative evaluation of performances of three different chromogenic media with conventional methods and automated identification system (VITEK® 2) used for typification of Candida strains

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In this study, it was aimed to compare diagnostic performances of three different chromogenic agars with conventional methods and VITEK 2 for typification of Candida strains.

Clinical samples obtained from patients diagnosed with systemic candidiasis, were included in the study.

Identification results of Candida colonies,by the both conventional method and VITEK2, were compared with three different the chromogenic media (ChromID Candida Smart Agar, CHROMagar Candida, BBL CHROMagar Candida Medium). While conventional methods are accepted as the gold standard for identification of *C. albicans*, automated yeast identification method are accepted as the reference method for other Candida subspecies.

A total number of 201 Candida isolates were identified as 106 *C. albicans*, 48 *C. parapsilosis*, 22 *C. tropicalis*, 15 *C. glabrata*, 6 *C. lusitaniae*, 4 *C. kefyr*, 1 *C. krusei*, 1 *C. famata*. While 199 of the 201 Candida strains were typified as concordant with conventional methods and VITEK 2, only two *C. albicans* were identified as *C. tropicalis* with VITEK 2. Specificity, sensitivity rates of the chromogenic agars were found as: 95%, 80 % for ChromID Candida Smart Agar, 92.5 %, 87 % for BBL CHROMagar Candida Medium, and 86 %, 89.2 % for CHROMagar Candida, respectively.

It was determined that; using chromogenic agars are easy to use, cost-effective, rapid and reliable diagnostic method for typification of *Candida albicans.* Therefore, chromogenic agars may also be used additionally with conventional methods and/or VITEK 2 for typification of Candida strains in the routine diagnostic procedures of medical mycology and microbiology laboratories.

Keywords: *Candida albicans*, chromogenic medium, typification, VITEK 2.

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Screening of Fungi As Producers of β-Glucosidase (BGL) and Their Glucose Tolerance

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In the present study a total of 73 fungal cultures which of 39 belong to *Trichoderma* and 34 black *Aspergillus* genera isolated from soil were screened for β-glucosidase (BGL) activity. For primary screening, strains that grown on PDA were inoculated on BGL screening agar and the plates were incubated. Then the plates were observed under UV light. Colonies which showed fluorescence were sorted out. Of the 12 strains showed the remarkable fluorescence.

For secondary screening, Mandel and Weber medium with 0.1% cellulose as carbon source was used for the experiment for BGL production The pH of the media was adjusted with 1N HCl. The flasks were incubated at 30 °C on an incubated shaker at 150 rpm agitation to the desired incubation period. The samples were taken out every 2days to determine the activity of BGL and pH. At the end of fermentation, biomass was separated by centrifugation at 10000 rpm for 10 min at 4 °C and the supernatant was used as the crude enzyme preparation. Enzyme assays were conducted to determine the activity and glucose tolerance. BGL activity was assayed using p-nitrophenyl- β-D glucopyranoside (pNPG) as substrate The absorbance of p-nitrophenol released was measured at 410 nm. For estimating glucose tolerance, instead of citrate buffer, citrate buffer containing 1.0 M or 2.0 M glucose was used. One unit enzyme activity was defined as the amount of enzyme required to release 1 µM of p-nitrophenol per minute and was expressed as U/ml.

Keywords: β-glucosidase (BGL) activity, glucose tolerance

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Teratogenic and embryotoxic effects of the aqueous extract of wild-grown *Ganoderma lucidum* (Reishi) from Turkey given in ovo on the chick embryos

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Ganoderma lucidum (Curtis) P. Karst, known as Reishi Mushroom and Mushroom of Immortality, has been widely used by people in many countries such as China and Japan for many years. It protects the skin from the sun's harmful rays. It strengthens the immune system and the muscular system. Moreover, *G. lucidum* has been used in the treatment of disorders such as fungal infections, influenza, common cold, hepatitis, diabetes, high cholesterol and cancer. So it is used to reduce the side effects of chemotherapy and radiotherapy treatment. The aim of this study was to determine the some effects of the aqueous extract of wild-grown *G. lucidum* from Turkey on the development of chicken embryos an alternative experiment animal for the first time. *G. lucidum* aqueous extract at different doses (219 µg/egg, 875 µg/egg and 1750 µg/egg) and distilled water as control group were injected into the fertilized chicken eggs at 8th day of incubation. Following parameters of each group were examined on 11th day of the incubation: rates of dead and abnormal embryo, malformation types, live embryo weights. In addition, some of the embryos were totally stained with Alizarin Red-S method for bone development. Data were analyzed with statistical methods. *G. lucidum* extract at doses tested did not present embryotoxic and teratogenic effects on chick embryos. It also did not affect the bone development of chicken embryos at the macroscopic level. Based on the results, it was concluded that metabolized *G. lucidum* extract have no negative effects on chicken embryos, related to the functional maturation of chick liver and a wide range of metabolic activities occurring in these days of incubation.

Keywords: Chick embryo, embryotoxicity, teratogenicity, Turkey, wild-grown *Ganoderma lucidum*.

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Colony Morphology of Semi-Synthetic Modified Media of Some Isolates of *Aspergillus*

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In this research it is intended to investigate the effect of the usage of medium and their modified conditions, that have been used on mold culturation and identification, on colonial morpohology. It is also intended to find the culturation yields in accordance to the used izolators.

2 microfungus strains have been used, which are as follows: *Aspergillus fumigatus* and *Aspergillus nomius*). These strains, Blakeslee's Malt extract Agar (BL), Czapek Yeast Agar (CZYA), Glucose Pepton Yeast Extract Agar (GPYA), Glucose Yeast Pepton Agar (GYPA), Malt extract %2 (ME%2), Malt extract %5 (ME%5), Malt Extract Agar (Samson, MR) ve Patato Dextrose Agar (PDA) are the standard used 8 medium.

The selected media are modified and 24 differeny broths are produced, for which we have made point planting in a form of 1 drop, and are investigated under macroscopic examination for changes in morphological colonies. They are left for incubation for 7 days in 25°C. And each one has been photographed, have been measured for their colonial diameter, and are left for a 7 day incubation in 25°C and photographed.

As a result, in all of the media, except *A. fumigatus* PDA, growth has been shown, especially ME%5 and CZYA are compatible for sporulation. *A. nomius* has shown growth in every medium, and especially has shown a more dense sporulation in 1-BL, 3BL, 1-CZYA and ME%2 broths, and sclerotia has been seen in media of 2-BL, 4-BL, 3-MR ve 1-GPYA.

Keywords: Fungal media, Fungal sporulation, Microfungi, Modified media, *Aspergillus*.

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Investigation of Antimicrobial Activity of Some Mushroom Extracts Growing In The Region of Tokat

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Mushrooms is a good diet food because it has high fibre content and low fat content. Also, fungi are medically important because of the antimicrobial substances they contain. Our aim in this study, antibacterial and antifungal activity of some mushroom species that is eaten by human as a food are determined.

The mushroom samples were collected in Tokat province. Three solvents were used for chemical extraction ethanol, ethyl acetate and acetone. All the test microorganisms *Proteus vulgaris*, *Escherichia coli*, *Bacillus cereus*, *Pseudomonas aeroginosa*, *Bacillus subtilis*, *Staphylococcus aureus*, *Salmonella enteritidis*, *Staphylococcus pyogenez*, *Candida albicans*, *Candida utilis* were obtained from the culture collection of Department of Biology, Natural and Applied Sciences of Gaziosmanpaşa University. Antimicrobial activities of the extracts of mushrooms were determined by the disc diffusion method.

As a result of study, it was seen that all extracts presented significant activity against one or more of the target microorganisms. The extracts of A*garicus campestris* inhibited the growth of *P. vulgaris, S. enteritidis, S. pyogenez, C. albicans and C. utilis. Morchella conica* extract effected the growth of all tested microorganism in different degrees. Solvent extracts of *Pleurotus ostreatus* effected against seven pathogens i.e. *P. vulgaris*, *S. enteritidis*, *S. pyogenez, E. coli, P. aeroginosa, C. albicans* and *C. utilis.* All the extracts of *Tricholoma terreum* showed different degree of antimicrobial and antifungal activity on *B. cereus, S. enteritidis, E. coli, P. aeroginosa, B. subtilis, S. pyogenez, C. albicans, C. utilis.*

Key Words: Macrofungi, antimicrobial activity, disc diffusion

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Levels of Trace Elements in Some Edible Mushrooms

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Turkey has a large edible mushroom potential and is becoming an important exporter of wild mushrooms. In the Tokat region the climate is mild and rainy. The climate, especially in spring and autumn, is ideal for fungal growth. In recent years, there have been studies many of heavy metals in cultivated and uncultivated mushrooms of Turkish origin. The purpose of this study are trace elements (Fe, Cu, Cd, Zn, Mn, Cr, Ni, and Co) in mushroom species from Tokat, Turkey.

Trace metal levels in four different mushroom species, *Coprinopsis atramentarius* (Bull.) Redhead, Vilgalys & Moncalvo*, Coprinus comatus* (O.F.Müll.) Pers, *Ganoderma lucidium* (Curtis) P. Karst and *Leatiphorus sulphureus* (Bull.) Murrill obtained from Tokat-Turkey were determined by flame and graphite furnace atomic absorption spectrometry after microwave digestion. Minimum and maximum values of iron were 223.16 and 1183.6 mg/g. The highest and lowest levels of iron were found in *Coprinopsis atramentarius*. The highest content of manganese was 64.2 mg/g in *Coprinopsis atramentarius*, whereas the lowest manganese content was 12.9 mg/g in *Leatiphorus sulphureus*. Zinc levels were determined to be 28.3 mg/g in *Leatiphorus sulphureus* and 288.40 mg/g in *Coprinopsis atramentarius*. In this study, the lowest copper content was 5.2 mg/g in *Leatiphorus sulphureus*; the highest lowest was 57.1 mg/g in *Coprinopsis atramentarius*. Cadmium contents were between 1.32 and 2.56mg/g in the samples. The average cobalt concentration was 1.60–4.50 mg/g. Maximum nickel level was 17.4 mg/g in *Coprinopsis atramentarius* and minimum nickel level was 8.2 mg/g in *Ganoderma lucidium*. The range of chromium concentrations was 6.2–23.1 mg/g in *Ganoderma lucidium* and *Coprinopsis atramentarius.*

The contents of trace metals in the mushroom samples were found in the ranges 223.16–1183.60, 5.20–57.12, 1.32–2.56, 28.36–288.40, 19.36–64.20, 6.24–

23.16, 7.16–17.40 and 1.60–4.50 µg/g for Fe, Cu, Cd, Zn, Mn, Cr, Ni, and Co, respectively.

Keywords: Atomic absorption spectrometry, mushrooms, Tokat, trace metals

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Bursa – Alaçam Bölgesinden toplanan *Cladonia rangiformis* Liken Türünün *Propionibacterium acnes* Biyofilm Formu Üzerindeki Etkisi

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Akne, çoğunluğu 12-24 yaş arası olan, Dünya'da her yıl yaklaşık 45 milyon bireyi etkileyen bir cilt hastalığıdır. Son yıllarda hastalığın tedavi sonucu ortadan kaldırılamamasında, bakterilerin antibiyotiğe dirençli biyofilm formuna dönüşmesi sebep olarak gösterilmektedir. *Propionibacterium acnes*'in oluşturduğu biyofilmler, yaygın olarak kullanılan anti-akne ajanlarına karşı direnç artışı sergilemektedir. Bakterilerin oluşturdukları biyofilm formu, çevre koşullarına ve antibiyotiklere oldukça dayanıklı olmalarını sağlamaktadır. Biyofilm formu oluşturan bakterilere karşı verilen mücadelede antibiyotiklerin yetersiz kaldığı durumlar ortaya çıkmakta, bunun bir sonucu olarak da kronik enfeksiyonların meydana gelme sıklığı arttığı belirtilmektedir. Bu sebeple, biyofilm oluşumunun inhibe edilerek azaltılması veya tamamen engellenmesi oldukça önem kazanmıştır. Son yıllarda, bakteriyel biyofilmin engellenmesinde çeşitli fitokimyasallar ile çalışmalar öne çıkmaktadır. Bu çalışmada *Cladonia rangiformis* liken türüne ait aseton özütün *P. acnes* biyofilm formu üzerinde etkinliklerinin belirlenmesi amaçlanmıştır.

Bolu-Mudurnu bölgesinden toplanan ve teşhisi yapılan *C. rangiformis* liken tallusları toz haline getirildikten sonra üzerlerine aseton çözücüsü eklenmiş ve aseton uçurulduktan sonra elde edilen kuru liken aseton özütleri %100'lük DMSO'da çözülmüştür. Özüt, biyofilm testlerinde kullanılmak üzere fizyolojik tuzlu su ile %4'lük konsantrasyona seyreltilmiştir. Biyofilm testleri 96 kuyucuklu plakalar kullanılarak seri dilüsyon yöntemi ile gerçekleştirilmiştir. Mikroplaka kuyucuklarına LB broth ile 1:100 oranında seyreltilmiş bir gecelik bakteri kültürü ve seyrelen dozlarda liken aseton özütleri eklenmiştir. Mikroplakaların 24 saat boyunca 37°C'de inkübasyona bırakılmasının ardından biyofilm formu %0,1'lik kristal viyole ile boyanmıştır. Boyanan biyofilm formu etanol ile çözülmüş ve multimod mikroplaka okuyucuda (Cytation 3 – BioTek) OD:590 nm'de ölçümler gerçekleştirilmiştir.

Ölçümler sonucunda, uygulanan *C. rangiformis* aseton özütünün 40 µg/ml dozunda %27, 80 µg/ml dozunda %45 ve 160 µg/ml dozunda %57 oranlarında, *P. acnes* biyofilm oluşumunu inhibe ettiği gözlenmiştir.

Sonuç olarak acne vulgaris hastalığının etmenlerinden olan *P. acnes* bakterisinin biyofilm formunun engellenmesinde, *C. rangiformis* likeninde bulunan metabolitlerin etkili olabileceği tespit edilmiştir.

Anahtar kelimeler: *Propionibacterium acnes, Cladonia rangiformis*, sekonder metabolit, acne vulgaris.

Bu çalışma, TÜBİTAK COST, 214S122 no'lu proje ile desteklenmiştir.

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Usnea florida Liken Türünün *Propionibacterium acnes* Biyofilm Formu Üzerindeki Etkisi

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Bakterilerin oluşturdukları biyofilm formu, çevre koşullarına ve antibiyotiklere oldukça dayanıklı olmalarını sağlamaktadır. Bakterilerin biyofilm formlarına karşı verilen mücadelede antibiyotiklerin yetersiz kaldığı durumlar ortaya çıkmakta, bunun bir sonucu olarak da kronik enfeksiyonların meydana gelme sıklığı arttığı belirtilmektedir. Bu nedenle, biyofilm oluşumunun inhibe edilerek azaltılması veya tamamen engellenmesi oldukça önem kazanmıştır.

Akne, Dünya'da her yıl yaklaşık 45 milyon bireyi etkileyen bir cilt hastalığıdır. Son yıllarda hastalığın tedavi sonucu ortadan kaldırılamamasında, bakterilerin antibiyotiğe dirençli biyofilm formuna dönüşmesi sebep olarak gösterilmektedir. *Propionibacterium acnes*'in oluşturduğu biyofilmler, yaygın olarak kullanılan anti-akne ajanlarına karşı direnç sergilemektedir. Bakteriyel biyofilmin engellenmesinde son yıllarda çeşitli fitokimyasallar ile yapılan çalışmalar dikkat çekmektedir. Çalışmamızda *Usnea florida* liken türüne ait aseton özütün *P. acnes* biyofilm formu üzerinde etkinliklerinin belirlenmesi amaçlanmıştır.

Teşhisi yapılan *U. florida* liken tallusları Bolu-Mudurnu bölgesinden toplanmış ve toz haline getirildikten sonra üzerlerine aseton çözücüsü eklenmiştir. Aseton uçurulduktan sonra elde edilen kuru liken özütleri %100'lük DMSO'da çözülmüştür. Özüt, biyofilm testlerinde kullanılmak üzere fizyolojik tuzlu su ile %4'lük konsantrasyona seyreltilmiştir. Biyofilm testleri 96 kuyucuklu plakalar kullanılarak seri dilüsyon yöntemi ile gerçekleştirilmiştir. Mikroplaka kuyucuklarına LB broth ile 1:100 oranında seyreltilmiş bir gecelik bakteri kültürü ve seyrelen dozlarda liken aseton özütleri eklenmiştir. Mikroplakaların 24 saat boyunca 37°C'de inkübasyona bırakılmasının ardından biyofilm formu %0,1'lik kristal viyole ile boyanmıştır. Boyanan biyofilm formu etanol ile çözülmüş ve multimod mikroplaka okuyucuda (Cytation 3 – BioTek) OD:590 nm'de ölçümler gerçekleştirilmiştir.

Uygumalar sonucunda, *U. florida* aseton özütünün 40 µg/ml dozunda %28, 80 µg/ml dozunda %55 ve 160 µg/ml dozunda %54 oranlarında, *P. acnes* biyofilm oluşumunu inhibe ettiği gözlenmiştir. Sonuç olarak acne vulgaris hastalığının etmenlerinden olan *P. acnes* bakterisinin biyofilm formunun engellenmesinde, *U. florida* likeninde bulunan metabolitlerin etkili olabileceği düşünülmektedir.

Anahtar kelimeler: *Propionibacterium acnes, Usnea florida*, sekonder metabolit, acne vulgaris.

Bu çalışma, TÜBİTAK COST, 214S122 no'lu proje ile desteklenmiştir.

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