

CONGRESS BOOK



SELJUK SUMMIT

5th INTERNATIONAL APPLIED SCIENCES CONGRESS

Issued: 20.12. 2021

ISBN : 978-625-7341-79-0





SELJUK SUMMIT
5th INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11 - 12, 2021
KONYA

Edited By

DR. GÜLTEKİN GÜRÇAY
KHORRAM MANAFIDİZAJI

All rights of this book belong to UBAK Publishing house.

Without permission can't be duplicate or copied.

Authors of chapters are responsible both ethically and juridically.

UBAK Publications – 2021 ©

Issued: 20.12.2021

ISBN: 978-625-7341-79-0

CONGRESS ID

**SELJUK SUMMIT
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS**

DATE – PLACE

DECEMBER 11- 12, 2021
KONYA

ORGANIZATION

UBAK International Sciences Academy

CONGRESS ORGANIZING BOARD

Head of Organizing Board: Dr Gültekin Gürçay
Organizing Committee Member: Dr. Nadire Kantarcıoğlu
Organizing Committee Member: Dr. Leman Kuzu
Organizing Committee Member: Editor of the USE Journal
Organizing Committee Member: Editor of the EuroAsia Journal
Organizing Committee Member: Editor of UBAK Publishing house.
General Coordinator: Amaneh Manafidizaji

EVALUATION PROCESS

All applications have undergone a double-blind peer review process.

PARTICIPATING COUNTRIES

Turkey –India- Azerbaijan- Pakistan – South Africa, Egypt- china- Kazakhstan-
France – Indonesia- Korea

PRESENTATION

Oral presentation

LANGUAGES

Turkish, English, Russian, Persian, Arabic

Scientific & Review Committee

Dr. Gulmira ABDİRASULOVA
Kazak Devlet Kızlar Pedagoji Üniversitesi

Prof. Dr. Yunir ABDRAHIMOV
Ufa State Petroleum Technological University

Dr. Maha Hamdan ALANAZİ
Riyad Kral Abdülaziz Teknoloji Enstitüsü

Dr. Dzhakipbek Altaevich ALTAYEV
Al – Farabi Kazak Milli Üniversitesi

Doç. Dr. Hülya BALKAYA
Atatürk Üniversitesi

Doç. Dr. Mehmet Fırat BARAN
Mardin Artuklu Üniversitesi

Dr. Amina Salihi BAYERO
Yusuf Maitama Sule Üniversitesi

Dr. Karligash BAYTANASOVA
Al – Farabi Kazak Milli Üniversitesi

Dr. Baurcan BOTAKARAEV
Hoca Ahmet Yesevi Üniversitesi

Dr. Ahmad Sharif FAKHEER
Ürdün Devlet Üniversitesi

Dr. Zehra FIRAT

Doç. Dr. Abbas GHAFARI
Tebriz Üniversitesi

Prof.Dr. Ariz Avaz GOZALOV
Moskova Devlet Üniversitesi

Prof. Dr. Gulzar İBRAGİMOVA
Bakü Avrasya Üniversitesi

Dr. Gültekin GÜRÇAY

Doç. Dr. Dilorom HAMROEVA
Özbekistan Bilimler Akademisi

Dr. Bazarhan İMANGALİYEVA
K.Zhubanov Aktobe Devlet Bölge Üniversitesi

Dr. Keles Nurmaşulı JAYLIBAY
Kazak Devlet Kızlar Pedagoji Üniversitesi

Dr. Mamatkuli Jurayev
Özbekistan Bilim Akademisi

Dr. Kalemkas KALIBAEVA
Kazak Devlet Kızlar Pedagoji Üniversitesi

Dr. Bouaraour Kamel
Ghardaia Üniversitesi

Dr. Nadire KANTARCIOĞLU

Prof. Dr. Ergün KOCA
Girne Amerikan Üniversitesi

Prof Dr. Bülent KURTIŞOĞLU
Ardahan Üniversitesi

Dr. Leman KUZU
İstanbul Kültür Üniversitesi

Sonali MALHOTRA
Delhi Balbahtri Academy

Dr. Alia R. MASALİMOVA
Al – Farabi Kazak Milli Üniversitesi

Prof. Muntazir MEHDI
Pakistan Language Academy

Dr. Amanbay MOLDİBAEV
Taraz Devlet Pedagoji Üniversitesi

Doç. Dr. Yeliz ÇAKIR SAHİLLİ
Munzur Üniversitesi

Dr. Aysulu B. SARSEKENOVA
Orleu Milli Kalkınma Enstitüsü

Dr. Gulşat ŞUGAYEVA
Dosmukhamedov Atyrau Devlet Üniversitesi

Doç. Dr. Yeliz KINDAP TEPE
Cumhuriyet Üniversitesi

Doç. Dr. Mehmet Özkan TİMURKAN
Atatürk Üniversitesi

Dr. K.A. TLEUBERGENOVA
Kazak Devlet Kızlar Pedagoji Üniversitesi

Dr. Cholpon TOKTOSUNOVA
Rasulbekov Kırgız Ekonomi Üniversitesi

Doç. Dr. Yıldırım İsmail TOSUN
Şırnak Üniversitesi

Dr. Botagul TURGUNBAEVA
Kazak Devlet Kızlar Pedagoji Üniversitesi

Dr. Dinarakhan TURSUNALIEVA
Rasulbekov Kırgız Ekonomi Üniversitesi

Doç. Dr. Ali Korkut ULUDAĞ
Atatürk Üniversitesi

Prof. Dr. Akbar VALADBİGİ
Urumiye Üniversitesi

Doç. Dr. C. VIJAI
St.Peter's Institute

Dr. Yang ZITONG
Wuhan Üniversitesi



SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA

Meeting ID: 867 0329 1286
Passcode: 121221



SELJUK SUMMIT
5th INTERNATIONAL SOCIAL SCIENCES CONGRESS
5th INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021
KONYA

CONGRESS PROGRAM
Online and Face to Face Presentation

Meeting ID: 867 0329 1286
Passcode: 121221



SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA



Meeting ID: 867 0329 1286
Passcode: 121221

IMPORTANT, PLEASE READ CAREFULLY

- To be able to make a meeting online, login via <https://zoom.us/join> site, enter ID instead of “Meeting ID
- or Personal Link Name” and solidify the session.
- The Zoom application is free and no need to create an account.
- The Zoom application can be used without registration.
- The application works on tablets, phones and PCs.
- Speakers must be connected to the session **10 minutes before** the presentation time.
- All congress participants can connect live and listen to all sessions.
- During the session, your camera should be turned on **at least %70** of session period
- Moderator is responsible for the presentation and scientific discussion (question-answer) section of the session.

TECHNICAL INFORMATION

- Make sure your computer has a microphone and is working.
- You should be able to use screen sharing feature in Zoom.
- Attendance certificates will be sent to you as pdf at the end of the congress.
- Moderator is responsible for the presentation and scientific discussion (question-answer) section of the session.
- Before you login to Zoom please indicate your name surname and hall number,

exp. H-..., S- ... NAME SURNAME

SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA



Meeting ID: 867 0329 1286
Passcode: 121221

12. 12. 2021	10: 00 – 12: 00
Meeting ID: 867 0329 1286	Passcode: 121221
HALL: 1 SESSION: 1	MODERATOR: DR. HAYAL ÖZÇİM
DUYGU BAYSAL KURT ŞADUMAN YILDIZ	Cari İşlemler Dengesi, Reel Efektif Döviz Kuru Ve Turizm Gelirleri Arasındaki Nedensellik İlişkisinin Türkiye İçin Analizi
ASLAN BUZLUK	Tarımsal Destekleme Politikaları: Türkiye Örneği
ELİFE ZEHRA YILDIRIM	21. Yy'da Türkiye'nin Orta Asya Politikası
DR. HAYAL ÖZÇİM	Katılım Bankalarının Ve Mevduat Bankalarının Karşılaştığı Finansal Riskler
DR. HAYAL ÖZÇİM	Katılım Bankaları Ve Asimetrik Bilgi İlişkisi
İBRAHİM KAHRAMAN ENGİN ÇAKIR	Sosyal Medya Fenomenlerinin Satın Alma Niyetine Etkisi; Bir Uygulama Örneği
ABDULKADİR KOCA DOÇ. DR. TUBA DERYA BASKAN	İşletmeler İçin Vergi Planlamasının Avantajlarının Örnek Uygulamalarla İrdelenmesi
TURGUT SAĞLAM	Türkiye'nin Askerî İnsansız Hava Araçlarının Çatışma Bölgelerinde Kullanımı : Suriye Ve Libya Örneği
MAMADOU OURY DIALLO	Kamusal Alan Ve Gine'deki Kamu Pratiğinin Yeniden Yapılandırılması
ERKAN UZUN	Lojistik İşletme Maliyetleri Ve Maliyetleri Azaltma Yolları
ERKAN UZUN	Lojistik İşletmelerde Faaliyetler Ve Bu Faaliyetlere İlişkin Maliyetlerin Analizi: Şırnak İli Örneği

SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA



Meeting ID: 867 0329 1286

Passcode: 121221

12. 12. 2021	10: 00 – 12: 00
Meeting ID: 867 0329 1286	Passcode: 121221
HALL: 2 SESSION: 1	MODERATOR: DOÇ. DR. SERPİL DURĞUN
DR. ÖĞR. ÜYESİ EMİNE KEF	Cam Tabutlar: İlham Etmekten İfşa Etmeye Müzelerin Düşüşü
DR. ÖĞR. ÜYESİ KUBİLAY ÇELİK	Yapay Zekâ Gazetecilerin Medyaya Katkıları, Oluşan Sorunlar Ve Çözümleri!
HASAN YAZICI	Kadın Ve Giyim
DR. GÜLSÜN EBİRİ	Artuklu Dönemi Mardin Türbelerindeki Kitabeler
DR. GÜLSÜN EBİRİ	Anadolu Selçuklu Sultan Türbelerindeki Farsça Şiirler Ve Beyitlerden Oluşan Kitabeler
DOÇ. DR. SERPİL DURĞUN	Aristoteles'in Ruh Teorisinin Feminist Cephedeki Tezahürü
DOÇ. DR. SERPİL DURĞUN	Marx'ın Ve Foucault'nun Düşünceleri Üzerinden Emek Kavramına Dair Bir İrdeleme
NURİYE HANDE KUTBAY H. GÜÇLÜ YAVUZCAN SİNAN AKTAŞ	Sürdürülebilirlik Terimlerinin Sınıflandırılması Ve Tanımlanması
NURİYE HANDE KUTBAY H. GÜÇLÜ YAVUZCAN SİNAN AKTAŞ	Examination Of Current Practices Of Mycelium Based Materials In Design And Architecture

SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA



Meeting ID: 867 0329 1286

Passcode: 121221

12. 12. 2021

10: 00 – 12: 00

Meeting ID: 867 0329 1286

Passcode: 121221

HALL: 3 SESSION: 1

MODERATOR: PROF. HACER HUSEYNOVA

ARŞ. GÖR. DR. YUSUF ÖZCAN
DR. ÖĞR. ÜYESİ ERTUĞRUL
DÖNER

Türkçe Sözcükleri Açısından Yemen-Osmanlı Münasebetleri

F.Ü.F.D YEGANƏ QÜRBƏT
QIZI QƏHRƏMANOVA

“Qorqud” Adının Etimoloji İzahı

ARŞ. GÖR. DR. YUSUF ÖZCAN
ARŞ. GÖR. DR. AHMET RIFAT
GEÇİOĞLU

Öğrenci Profili Ve Yabancı Dil Öğrenme Çabası İlişkisi (Ç.Ü. İlahiyat
Fakültesi Örneği)

PROF. HACER HUSEYNOVA

Monoloq Və Dialoqların Üslubi Xüsusiyyətləri

DR. ÖĞR. ÜYESİ RAMAZAN
SÖNMEZ

خير الدين شمسى باشا وكتابه معجم الأمثال العربية

GÖKÇE ULUS

“Şair Evlenmesi”nden Önceki İlk Türkçe Oyunlar” Ve Bu Oyunların
Ortak Özellikleri

NURAY GÜNEŞ

Osmanlı’da Farsça Beyitlerle Hıfzısıhha Tavsiyeleri

F.Ü.F.D. DOSENT RƏHİLƏ
HÜMMƏTOVA

Müasir Ədəbi Dil Səviyyəsində Arxaikləşmiş Bəzi Leksik
Vahidlərin Tarixi-Linqvistik Təhlili

DOSENT, DOKTOR
ALLAHVERDİ HACIYEV

Türkiyə Türkçəsi ilə Azərbaycan Türkçəsi Arasında Fərqli Fonetik
Xüsusiyyətlər.

SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA



Meeting ID: 867 0329 1286
 Passcode: 121221

12. 12. 2021		10: 00 – 12: 00	
Meeting ID: 867 0329 1286		Passcode: 121221	
HALL: 4 SESSION: 1		MODERATOR: HEMANT KUMAR	
BHIM KUMAR DAHAL	Methodology: A Review in Modelling and Predictability of Embankment in Soft Ground		
HEMANT KUMAR	Spatial Variability of Brahmaputra River Flow Characteristics		
ZENAB NASEEM SADIA IMRAN	Assessing the Viability of Solar Water Pumps Economically, Socially and Environmentally in Soan Valley, Punjab		
U. KAIROV T. KARPENYUK, E. RAMANCULOV A. ZINOVYEV	Categorization and Estimation of Relative Connectivity of Genes from Meta-OFTEN Network		
NOVI KHILA FIRANI ELISA NESDYANINGTYAS	The Lymphocytes Number in the Blood of Kwashiorkor Rat Model Induced by Oral Immunization with 38-kDa Mycobacterium tuberculosis Protein		
SEUNG PIL PACK	Analysis of DNA-Recognizing Enzyme Interaction using Deaminated Lesions		

SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA



Meeting ID: 867 0329 1286
Passcode: 121221

12. 12. 2021

14: 00 – 16: 00

Meeting ID: 867 0329 1286

Passcode: 121221

HALL: 1 SESSION: 2

MODERATOR: DOSENT TAMAM MEHRABOVA

DOÇ. DR. BAHADIR
GÜLBAHAR
ÖĞR. ÜYESİ GÖZDE SEZEN
GÜLTEKİN
DOÇ. DR. MESUT GÜN

Öğretmenlerin İşe Bağlılıkları, Takım Çalışması Tutumları Ve Sınıftaki Farklılıklar Yeterlilikleri Arasındaki İlişkinin İncelenmesi: Yapısal Bir Eşitlik Modellemesi

DOSENT TAMAM
MEHRABOVA

Azərbaycan Türkcəsi ilə Türkiyə Türkcəsi Arasında Fərqli Morfoloji Xüsusiyyətlər(Əsas Nitq Hissələri Əsasında)

KAAN TUNCA

Sören Kierkegaard Ve Arthur Schopenhauer'a Göre İnsanlar Neden Evlenir?

P. Ü.F. D. DOSENT
SƏFƏRƏLİYEVƏ FƏRİDƏ AKİF
QIZI

Mətnlər Üzrə İş Zamanı Leksikologiya ilə Bağlı Məsələlərin Tədrisi.

ÖĞR. GÖR. VEYSAL BATTAL
ÖĞR. GÖR. ERGİN SARI

Eğitim Öğretimde Ders Materyali Olarak Belgesel Sinema

ÖĞR. GÖR. VEYSAL BATTAL
ÖĞR. GÖR. ERGİN SARI

Sinema Ve Televizyonda Teknolojik Gelişimin Sonucu Olarak Yöndeşme Kavramı

MUHAMMET AYDIN

İslam Siyaset Düşüncesi (Kişiler-Metinler I) İbnü'l-Mukaffa` Örneği

MUHAMMET AYDIN

İslam Siyaset Düşüncesi (Kişiler-Metinler II) Necmeddin Et-Tarsûsî Örneği

SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA



Meeting ID: 867 0329 1286
Passcode: 121221

12. 12. 2021

14: 00 – 16: 00

Meeting ID: 867 0329 1286

Passcode: 121221

HALL: 2 SESSION: 2

MODERATOR: BAŞ MÜƏLLİM KÖNÜL MƏMMƏDOVA

YL. ÖĞRENCİSİ REMZİYE AVCI

Kırsal Alanda Yaşayan Kadınların Toplumsal Cinsiyet Algısının
Sosyolojik Olarak İncelenmesi *Adana İli Örneklemi

BAŞ MÜƏLLİM KÖNÜL
MƏMMƏDOVA

Psixi İnkişafın Biogenetik Və Sosiogenetik Amilləri

MELİS ERDENER

Amartya Sen'in Yapabilirlik Yaklaşımı Perspektifinden Yaşlı
Yoksulluğu

MELİS ERDENER

Kronik Hastalıklarda Varoluşçu Psikoloji Ve Psikoterapi

MÜZEYYEN ÇATKAFA

Cinsiyet Ayrımcılığının Temeline İnmek: Ebeveynlerin Cinsiyet
Algısı Ve Yaptığı Ayrımcılıklar Üzerine Bir İnceleme

NİSHA HARRY

Personal Factors and Career Adaptability in a Call Centre Work
Environment: The Mediating Effects of Professional Efficacy

SEVDE YILMAZ
MUSTAFA PAMUK

Ergen Ebeveyn Çatışmasında Sosyal Medya Ve Oyun
Bağımlılıklarının Rollerinin İncelenmesi

SELJUK SUMMIT
5TH INTERNATIONAL SOCIAL SCIENCES CONGRESS
5TH INTERNATIONAL APPLIED SCIENCES CONGRESS
DECEMBER 11-12, 2021 - KONYA

Meeting ID: 867 0329 1286
Passcode: 121221



12. 12. 2021

14: 00 – 16: 00

Meeting ID: 867 0329 1286

Passcode: 121221

HALL: 3 SESSION: 2

MODERATOR: DR. LEMAN KUZU

HAVVA AHSEN ŞİMŞEK

İskeletlerin Kimliklendirilmesinde Osteopatolojilerin Rolü

MÜJGAN ELİF KAPLAN

Yabancı Hakem Kararlarının Tanınması Ve Tenfizi

MÜJGAN ELİF KAPLAN

Üçüncü Kişi Yararına Sözleşmelerin Hukuki Niteliği Ve Benzer Sözleşmelerden Farkı

SENA VİDİNLİOĞLU

Muris Muvazaasına Dayalı Tapu İptal Ve Tescil Davalarında İspat

KÜBRA ÖZTEKİN

Tüzel Kişilerin Şahsa Sıkı Sıkıya Bağlı Hakları Kullanma Ehliyetleri

FEYZANUR SOYLU

İsimsiz Sözleşmelerin Sınıflandırılması

RANIA RUSHDY MOUSSA

A Sustainable Design that Enhance the Quality of Life and Human Behavior's

HASAN FEHMİ DEMİRCİ

Mobil Sağlık Uygulamalarının Toplum Tarafından Kullanımı

ODAY ALKAHLOUT
PROF. DR. ŞUAYYİP ÇALIŞ

Dijital Dönüşüm Ve İşletmelerin Dijital İky Uygulamalarının Araştırılması

CONTENT

CONGRESS ID	
SCIENTIFIC & REVIEW COMMITTEE	
PROGRAM	
CONTENT	
ORAL PRESENTED PAPERS IN THE CONGRESS	
Nuriye Hande KUTBAY& H. Güçlü YAVUZCAN& Sinan AKTAS	1
EXAMINATION OF CURRENT PRACTICES OF MYCELIUM BASED MATERIALS IN DESIGN AND ARCHITECTURE	
	13
METHODOLOGY: A REVIEW IN MODELLING AND PREDICTABILITY OF EMBANKMENT IN SOFT GROUND	
Hemant Kumar	14
SPATIAL VARIABILITY OF BRAHMAPUTRA RIVER FLOW CHARACTERISTICS	
Zenab Naseem & Sadia Imran	15
ASSESSING THE VIABILITY OF SOLAR WATER PUMPS ECONOMICALLY, SOCIALLY AND ENVIRONMENTALLY IN SOAN VALLEY, PUNJAB	
U. Kairov & T. Karpenyuk & E. Ramanculov, & A. Zinovyev	16
CATEGORIZATION AND ESTIMATION OF RELATIVE CONNECTIVITY OF GENES FROM META-OFTEN NETWORK	
Novi Khila Firani & Elisa Nesdyaningtyas	17
THE LYMPHOCYTES NUMBER IN THE BLOOD OF KWASHIORKOR RAT MODEL INDUCED BY ORAL IMMUNIZATION WITH 38-KDA MYCOBACTERIUM TUBERCULOSIS PROTEIN	
Seung Pil Pack	18
ANALYSIS OF DNA-RECOGNIZING ENZYME INTERACTION USING DEAMINATED LESIONS	

11 - 12 ARALIK 2021

EXAMINATION OF CURRENT PRACTICES OF MYCELIUM BASED MATERIALS IN DESIGN AND ARCHITECTURE

Nuriye Hande KUTBAY¹, H. Güçlü YAVUZCAN², Sinan AKTAŞ³

¹ Gazi University, Faculty of Architecture, 0000-0003-1458-7984

² Gazi University, Faculty of Architecture, 0000-0001-8560-7845

³ Selçuk University, Faculty of Science, 0000-0003-1657-5901

ABSTRACT

Developing technologies and increasing opportunities lead to an intense increase in production and consumption. Despite the economic benefits of this situation, the negative effects it creates in terms of environment are increasing and moving towards a point that is difficult to compensate. Especially since the twentieth century, these activities have had strong effects on the ecosystem on a global scale. With greater awareness of the magnitude of the damage done to the environment, interest in more environmentally friendly materials, products and processes has increased. At the same time, due to the risk of depletion of fossil-based resources, renewable resource usage and researches have gained importance. Along the studies on re-involving wastes back into production, researches for utilization of natural fibers in material production within the context of renewable resource creation studies have also gained importance in recent years. Compared to fossil-based resources, natural fibers are rapidly and easily accessible, renewable, more cost-efficient and more environmentally friendly alternatives. Comprehensive researches are carried out especially on the inclusion of agricultural wastes and by-products as natural fibers into production while some of these researches are material development studies that using fungal mycelium as a matrix (bonder). Being added on to raw materials such as agricultural waste under suitable growing conditions, the mycelium grows by feeding on natural fibers with the enzymes it secretes, while also bonding these fibers together. Studies are carried out on product development and creating structural elements in architecture with mycelium-based materials, the production method of which is an organic growth process. Although most of the implementations are still at the experimental stage, there are also commercialized examples that can be mass-produced. Within this study, the current product design and architecture practices of mycelium based materials are classified and examined.

Keywords: Mycelium based materials, agricultural waste, product design, architecture

1. USING FUNGI FOR MANUFACTURING BIOMATERIALS

While fungal cells form hyphae in the form of a filamentous structure by coming one after the other, the structure formed by intertwined hyphae is called mycelium [1,2].



Figure 1. *Pleurotus ostreatus* mycelium on coffee ground [3]

When environmental conditions in terms of humidity, light, pH value and temperature are appropriate, mycelium can grow on many organic materials, especially on wastes or by-products from forestry and agriculture [4]. Mycelium grows by feeding from the organic materials in the environment through the extracellular digestion with the powerful enzymes it secretes. During this feeding and growth, the mycelium also acts as a natural glue between the nutrients it digests thanks to its enzymes and bonds them to each other. Based on this feature, fungi have been included in the scope of researches with increasing interest in biomaterial production studies in the last few years. Intensive studies are carried out especially on the development of mycelium-based materials on natural fibers, agricultural wastes and by-products.

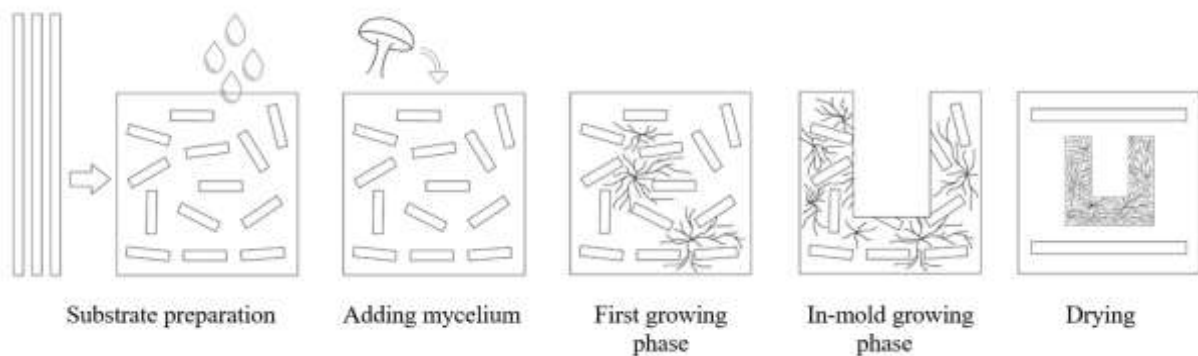


Figure 2. Mycelium based material production steps [5]

Mycelium-based materials and their properties can vary greatly in line with many variables such as which mushroom species is used in production, on which raw material the mushroom is grown, growth conditions, composition of raw materials and particle sizes [6]. On the other hand, the most important common features of mycelium materials are being low cost, being rapidly renewable, being produced in any form, not being petroleum-based, being fire resistant, being VOC free, buoyant [1], being composed of completely natural components and being biodegradable very quickly in nature.



Figure 3. Section of a mycelium sheet [7]

2. CURRENT PRACTICES OF MYCELIUM BASED MATERIALS IN DESIGN AND ARCHITECTURE

In this section, examples produced for both experimental and commercial purposes, in which mycelium materials are used, are examined. Current applications using mycelium-based materials are examined by categorizing under three groups: products (pendant lamps, table lamps, coffee tables, sitting units, flower pots, beverage coolers), packaging products (protective packaging products specially produced for certain products and for general use) and their use in buildings (architectural applications and acoustic panels). The products discussed here are products that are completely or partially made of mycelium-based materials and experiments with artistic purposes in which the mycelium is just grown on an existing structure or product are not included.

2.1. Using Mycelium Based Materials for Structures



Figure 4. Architectural Approaches

The “Growing Pavilion” shown at “a” in Figure 4 is a temporary event space designed by Pascal Leboucq for the 2019 Dutch Design Week. For its construction, plants, wood and wooden products, agricultural wastes, etc. are used and it is desired to give the pavilion an aesthetically natural appearance and texture by preserving the original appearance of those raw materials [8,9]. The panels between the load-bearing wooden structures are prepared with mycelium-based materials.

The work named as Mycotecture which is created by Philip Ross is shown at “b” in Figure 4. Ross, who is interested in the use of mycelium as a tool for art rather than its use as a building material, first created units in the form of bricks by using reishi mushroom in this work, and then brought them together to form an arch [10,11]. In the image on the far right, there is the work called Hy-Fi Tower, which was exhibited as a temporary structure in the MoMA PS1 area

in 2014. It was designed by architect David Benjamin and produced in collaboration with Ecovative firm. After the structure was modelled on a computer program, molds were produced specifically for the mycelium bricks that will form the structure. Corn stalks and hemp were used as the raw materials of the environment on which the mycelium will grow during the production of bricks [12,13].

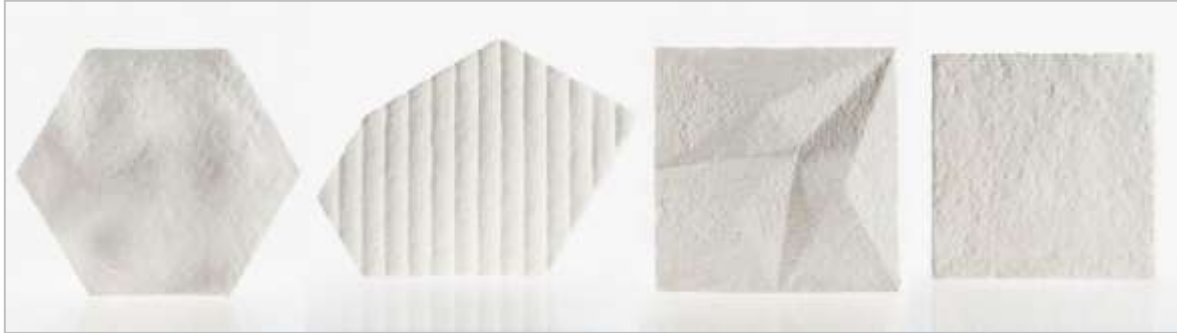


Figure 5. Acoustic Panels

Acoustic panels shown in Figure 5 are produced by Mogu company. In this product group, where they offer different size and pattern alternatives, recycled textile residues are used as the raw material of mycelium-based material [14].

2.2. Products Made of Mycelium Based Materials



Figure 6. Pendant Lights

Mycelium materials were used in the production of the lampshades of the pendant lights given in Figure 6. Products named as “MushLume Cup Light Pendant” (a) and “MushLume Hemi Pendant” (b) which are designed by Danielle Troffe are made-to-order products [15,16]. The products named “MushLume Cascade Trio” (c) and “MushLume Trumpet Pendant” (d) which are also created by the same designer and the lighting products (e) designed by Sebastian Cox and Ninela Ivanova are non-commercial examples that are produced just for experimentation [17,18].



Figure 7. Table Lamps

The “Grow Table Lamp” given on Figure 7.a is a commercialized table lamp designed by Dainelle Trofe [19]. His another design “MushLume Table Lamp” (c) [18] which is produced for experience has a mushroom analogy in terms of form. The name MushLume, given to the lighting series by the designer, refers to the combination of mushroom and lumen, lumination. Nir Meiri, designer of the lamps given on “b”, tries different materials in the lighting product designs and prefers to preserve the natural structure of organic material. Those lamps of Meiri were produced for experimental purposes and used paper waste is used as the raw material for mycelium [20].



Figure 8. Coffee Tables

The first two (a and b) products in Figure 8 are the coffee tables produced and traded by the biotechnology company Grown.bio [21,22]. The body parts of these products, which are produced with mycelium-based material, are produced as solid blocks. Although the final growth phase of this material is usually carried out in a mold to make the product get its final shape while using mycelium based materials, a different method has been tried by Tom Sippel.

In creating the shape of the coffee table body in Figure 8 c, Sippel first cultivated the material as a block for a few days, then carved the block into shape at different time intervals while the material was still moist and growing [23].



Figure 9. Seating Units

The stools shown on the left in Figure 9 were produced by four architecture students at Harvard University Graduate School of Design as part of the materials course. On the inside of the seating surface, which is formed by the mycelium material developed on corn and hemp by-products, there is a wooden board placed there during the growth phase and the wooden legs are attached to it [24]. The seating units named CR Bench shown on the right were produced by the architects of Carlo Ratti to be exhibited within the scope of Milan Design Week 2019 and were commercialized by Grown.bio [25].



Figure 10. Planters

The products and similar ones in Figure 10 are produced by several companies and can be used as a planter either indoors or outdoors [26–28]. Considering that it will biodegrade in a very short time when mixed with the soil and also act as a fertilizer support, it makes sense to use mycelium-based materials as planting containers. However, when it comes to keeping the plants in these containers for a long time or using them as pots instead of planting pots until they are taken into the soil environment, and considering the need for watering of the plants, it is thought that these products alone will not be sufficient. Different studies on the water absorption

properties of mycelium-based materials [5,29,30] show that when there is a direct contact with water, these materials tend to absorb water rapidly and intensively in a short period of time.



Figure 11. Coolers

The purpose of the products given in Figure 11 is to keep the drinks put in it cold, and the product on the left [31] continues to be produced and sold, while the product on the right [32] is no longer produced.

2.3. Packaging Products Made of Mycelium Based Materials



Figure 12. Packages Produced for Certain Products

The products in Figure 12 are packaging products specially produced for certain companies' certain products [33–38]. When they used these packaging products produced with mycelium-based packages in their products, most of the companies stated they preferred these since they are more environmentally friendly and sustainable alternatives instead of plastic packaging. Considering that most of them use these products for a short time, it is possible to say that the purpose of using these products by companies is to create a perception among consumers that the company prefers environmentally friendly approaches. Beverage producer Seedlip, with the product image in Figure 12.i, still use mycelium-based packaging products, and instead of creating a periodic perception, it prefers to proceed with nature-friendly approaches throughout the brand in terms of its own product contents, transportation of products, packaging of its products [39].

These product-specific packaging products are mostly produced by Mushroom Packaging, Paradise Packaging and Magical Mushroom companies. In the production of these materials, Magical Mushroom company uses hem, sawdust and cork [40]. Mushroom Packaging company and its production and distribution partner Paradise Packaging company generally use hemp hurds. Figure 13 shows the production process of a mycelium-based packaging product for a particular product. The preparation of the mold are shown in the first four stages, the growing of the material are in the next four stages, and the drying of the product is in the final stage.

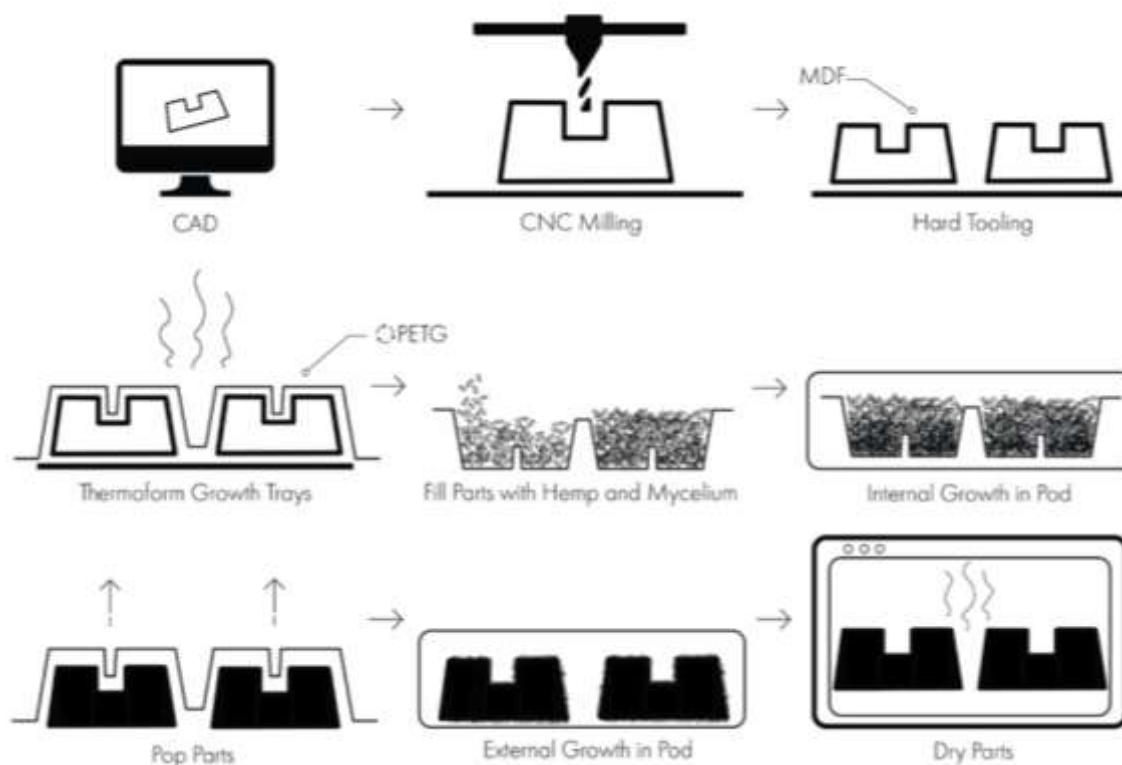


Figure 13. Production Process of Mycelium Based Packages [41]



Figure 14. Packages Produced for General Use

In Figure 14, there are packaging products that are not specific to a particular product, but produced for general use. These products are mostly produced by Ecovative, the company which have done the first studies on mycelium materials, and its licensed business partners (Grown.bio, Mushroom Packaging, Magical Mushroom, Paradise Packaging, Bio Fab) in different regions mycelium materials, and are also produced by some independent companies such as BIOfábrica [42] in Ecuador.

The product shown in Figure 14.a [31] is produced in order to keep the coldness of products that can be affected by temperature changes and it is advised to use it with the addition of a cooling material such as dry ice, cooling gel, etc.. The product in the second image [43] is a protective material and used by being placed inside the box at the top and bottom of the jar in order to prevent the glass jars from being damaged during transportation. They are produced in different sizes for use with different products. The product in the third image [44] is also for providing protection to the product inside of it (wine bottle or glass bottles of close size) during transportation, and unlike the previous one, it does not need an outer box for its use. In the fourth image mycelium-based packaging filler material [45] is shown and it can be used to fill the gaps in the package of any product that should not be damaged during transportation. The edge and corner protectors given in the last two images [46,47] are also used to provide protection during transportation.

3. RESULTS AND DISCUSSION

In most of the products described in “2.2. Products Made of Mycelium Based Materials” part of this study, manufacturers or designers of these products emphasize the benefits of mycelium material like being important in terms of sustainability, its lightness, being low cost, and being obtained from organic materials through a natural production process. They also give particular emphasis of its being a fully biodegradable material (and therefore biodegradable product). However, apart from coolers and planters, the products included here are products that normally not having short lifetime and they can be used for a very long time as long as there is no irreparable deterioration or breakage. On the other hand, mycelium-based materials are easily

damaged due to their structure, and their direct use in these products also shortens the life span of these products. Although it is possible and easy to replace the damaged part with a new one, it is thought that studies should be carried out to improve the material properties of mycelium-based materials for use in durable consumer goods. Considering their current properties, packaging products with a short period of use constitute the most suitable area of use for mycelium-based materials.

All packaging products given here at part “2.3. Packaging Products Made of Mycelium Based Materials” are at a level that they can compete with the available packing products made of plastic, foam rubber, foam, etc. to perform the same function., Regardless of the material they are produced of, considering that all these packing products are used only once and after they turn into waste; it is obvious that using mycelium based products, which are completely natural in structure, require less energy and low cost in production, become a part of nature in a very short time instead of harming nature after its useful life, will have great benefits in terms of economy and environment. However, because of some reasons like this material is still not known enough, the production method is not widely known, the number of manufacturers is very low, and the existing manufacturers usually demand high prices, its use is not widespread enough yet.

ACKNOWLEDGEMENT

This paper is a part of PhD thesis currently undertaking at Gazi University Graduate School of Natural and Applied Sciences Department of Industrial Design

REFERENCES

- [1] <https://www.ecovatedesign.com/how-it-works> (accessed November 15, 2017).
- [2] <http://www.biyodoc.com/010/hif-ve-miselyum-nedir-arasindaki-farklar.html> (accessed May 22, 2021).
- [3] <https://www.tipacilar.com/miselyum/>.
- [4] P. Stamets, *Mycelium running: How mushrooms can help save the world*, Ten Speed Press, New York, 2005.
- [5] N.H. Kutbay, H.G. Yavuzcan, S. Aktaş, *Mantarın Bağlayıcı Olarak Kullanıldığı Bir Kompozit Malzemenin Üretilmesi ve Tutuşma Süresi ile Su Alma Özelliklerinin Tespiti*, J. Polytech. Advance online publication, 2021.
<https://doi.org/10.2339/POLITEKNIK.943738>.
- [6] C. Girometta, A.M. Picco, R.M. Baiguera, D. Dondi, S. Babbini, M. Cartabia, M. Pellegrini, E. Savino, C. Girometta, A.M. Picco, R.M. Baiguera, D. Dondi, S. Babbini, M. Cartabia, M. Pellegrini, E. Savino, *Physico-Mechanical and Thermodynamic Properties of Mycelium-Based Biocomposites: A Review*, Sustainability. 11 (2019) 281. <https://doi.org/10.3390/su11010281>.
- [7] T. Vallas, L. Courard, *Using nature in architecture: Building a living house with mycelium and trees*, Front. Archit. Res. 6 (2017) 318–328.
<https://doi.org/10.1016/j.foar.2017.05.003>.

- [8] <https://thegrowingpavilion.com/about/> (accessed December 11, 2021).
- [9] <https://www.dezeen.com/2019/10/29/growing-pavilion-mycelium-dutch-design-week/> (accessed December 10, 2021).
- [10] <https://inhabitat.com/phillip-ross-molds-fast-growing-fungi-into-mushroom-building-bricks-that-are-stronger-than-concrete/> (accessed December 10, 2021).
- [11] <https://www.treehugger.com/mycotecture-mushroom-bricks-philip-ross-4857225> (accessed December 11, 2021).
- [12] <https://inhabitat.com/interview-architect-david-benjamin-on-building-the-worlds-first-mushroom-tower-at-ps1/> (accessed December 10, 2021).
- [13] <https://www.dezeen.com/2014/07/01/tower-of-grown-bio-bricks-by-the-living-opens-at-moma-ps1-gallery/> (accessed December 11, 2021).
- [14] <https://mogu.bio/acoustic/> (accessed December 10, 2021).
- [15] <https://www.grown.bio/product/pendant-lamp/> (accessed December 10, 2021).
- [16] <https://www.grown.bio/product/mush-lume-hemi-pendant-lamp/> (accessed December 10, 2021).
- [17] <https://inhabitat.com/14-spectacular-lamps-unveiled-at-the-london-design-festival/mushroom-mycelium-lamps-by-sebastian-cox-and-ninela-ivanova/> (accessed December 10, 2021).
- [18] <https://designawards.core77.com/Furniture-Lighting/30307/Mush-Lume-Lighting-Collection> (accessed December 10, 2021).
- [19] <https://www.grown.bio/product/grow-table-lamp/> (accessed December 10, 2021).
- [20] <https://www.icmimarlikdergisi.com/2019/01/14/mantar-miselyumundan-tasarlanan-surdurulebilir-aydinlatmalar/> (accessed December 10, 2021).
- [21] <https://www.grown.bio/product/table/> (accessed June 12, 2021).
- [22] <https://www.grown.bio/product/stack-table/> (accessed December 10, 2021).
- [23] <https://grow.bio/blogs/learn/can-i-carve-the-mycelium-material-into-a-shape> (accessed December 10, 2021).
- [24] <https://www.gsd.harvard.edu/project/mycelium-stool/> (accessed December 10, 2021).
- [25] <https://www.grown.bio/product/cr-bench/> (accessed December 10, 2021).
- [26] <https://www.paradisepackaging.co/store/p/round-planter> (accessed December 10, 2021).
- [27] <https://www.grown.bio/product/square-planter/> (accessed December 10, 2021).
- [28] <https://www.paradisepackaging.co/store/p/square-planter-w26jn> (accessed December 10, 2021).
- [29] F.V.W. Appels, S. Camere, M. Montalti, E. Karana, K.M.B. Jansen, J. Dijksterhuis, P. Krijgsheld, H.A.B. Wösten, Fabrication factors influencing mechanical, moisture- and

- water-related properties of mycelium-based composites, *Mater. Des.* 161 (2019) 64–71. <https://doi.org/10.1016/J.MATDES.2018.11.027>.
- [30] M. Jones, A. Mautner, S. Luenco, A. Bismarck, S. John, Engineered mycelium composite construction materials from fungal biorefineries: A critical review, *Mater. Des.* 187 (2020) 108397. <https://doi.org/10.1016/j.matdes.2019.108397>.
- [31] <https://www.paradisepackaging.co/store/p/cooler-69gxw> (accessed December 10, 2021).
- [32] <https://www.grown.bio/product/wine-cooler/>.
- [33] <https://au.lush.com/products/mycelium-hemp-box>.
- [34] <https://www.paradisepackaging.co/> (accessed December 10, 2021).
- [35] <https://www.trendhunter.com/trends/compostable-box> (accessed December 10, 2021).
- [36] <https://www.paradisepackaging.co/inquiry-quote> (accessed December 10, 2021).
- [37] <https://www.vogue.co.uk/beauty/gallery/directors-cut-4-march-2020?image=5e5fc5d48cbeaa0008b024c8>.
- [38] <https://www.seedlipdrinks.com/en-gb/journal/mycelium-technology/> (accessed December 10, 2021).
- [39] <https://www.seedlipdrinks.com/en-gb/our-story/>.
- [40] <https://www.magicalmushroom.com/> (accessed December 11, 2021).
- [41] Mushroom Packaging, Material Specifications, (2021). <https://static1.squarespace.com/static/5c33b1a3c3c16a25b5b770db/t/6197ece6025cfd1cb039fe91/1637346534872/MP-SpecSheet-2021-web.pdf> (accessed December 11, 2021).
- [42] <https://mushroomsfabrik.com/biomateriales-biofabrik/>.
- [43] <https://www.paradisepackaging.co/store/p/mason-jar-end-caps> (accessed December 10, 2021).
- [44] <https://www.paradisepackaging.co/store/p/single-bottle-wine-shipper> (accessed December 10, 2021).
- [45] <https://www.instagram.com/p/CM-0fV-HJtE/>.
- [46] <https://www.grown.bio/product/break-away-corner/> (accessed December 10, 2021).
- [47] <https://www.paradisepackaging.co/store/p/breakaway-corners-nark2> (accessed December 10, 2021).

METHODOLOGY: A REVIEW IN MODELLING AND PREDICTABILITY OF EMBANKMENT IN SOFT GROUND

Bhim Kumar Dahal

HUAZHONG University

Wuhan china

Abstract:

Transportation network development in the developing country is in rapid pace. The majority of the network belongs to railway and expressway which passes through diverse topography, landform and geological conditions despite the avoidance principle during route selection. Construction of such networks demand many low to high embankment which required improvement in the foundation soil. This paper is mainly focused on the various advanced ground improvement techniques used to improve the soft soil, modelling approach and its predictability for embankments construction. The ground improvement techniques can be broadly classified in to three groups i.e. densification group, drainage and consolidation group and reinforcement group which are discussed with some case studies. Various methods were used in modelling of the embankments from simple 1-dimensional to complex 3-dimensional model using variety of constitutive models. However, the reliability of the predictions is not found systematically improved with the level of sophistication. And sometimes the predictions are deviated more than 60% to the monitored value besides using same level of erudition. This deviation is found mainly due to the selection of constitutive model, assumptions made during different stages, deviation in the selection of model parameters and simplification during physical modelling of the ground condition. This deviation can be reduced by using optimization process, optimization tools and sensitivity analysis of the model parameters which will guide to select the appropriate model parameters.

Keywords: Embankment, ground improvement, modelling, model prediction.

KONYA

11 - 12 ARALIK 2021

SPATIAL VARIABILITY OF BRAHMAPUTRA RIVER FLOW CHARACTERISTICS

Hemant Kumar

Hemant Kumar is with the BIT Mesra, India

Abstract:

Brahmaputra River is known according to the Hindu mythology the son of the Lord Brahma. According to this name, the river Brahmaputra creates mass destruction during the monsoon season in Assam, India. It is a state situated in North-East part of India. This is one of the essential states out of the seven countries of eastern India, where almost all entire Brahmaputra flow carried out. The other states carry their tributaries. In the present case study, the spatial analysis performed in this specific case the number of MODIS data are acquired. In the method of detecting the change, the spray content was found during heavy rainfall and in the flooded monsoon season. By this method, particularly the analysis over the Brahmaputra outflow determines the flooded season. The charged particle-associated in aerosol content genuinely verifies the heavy water content below the ground surface, which is validated by trend analysis through rainfall spectrum data. This is confirmed by in-situ sampled view data from a different position of Brahmaputra River. Further, a Hyperion Hyperspectral 30 m resolution data were used to scan the sediment deposits, which is also confirmed by in-situ sampled view data from a different position.

Keywords: Spatial analysis, change detection, aerosol, trend analysis.



KONYA
11 - 12 ARALIK 2021

ASSESSING THE VIABILITY OF SOLAR WATER PUMPS ECONOMICALLY, SOCIALLY AND ENVIRONMENTALLY IN SOAN VALLEY, PUNJAB

Zenab Naseem

Sadia Imran

Lahour school of Economics Pakistan

Abstract:

One of the key solutions to the climate change crisis is to develop renewable energy resources, such as solar and wind power and biogas. This paper explores the socioeconomic and environmental viability of solar energy, based on a case study of the Soan Valley Development Program. Under this project, local farmers were provided solar water pumps at subsidized rates. These have been functional for the last seven years and have gained popularity among the local communities. The study measures the economic viability of using solar energy in agriculture, based on data from 36 households, of which 12 households each use diesel, electric and solar water pumps. Our findings are based on the net present value of each technology type. We also carry out a qualitative assessment of the social impact of solar water pumps relative to diesel and electric pumps. Finally, we conduct an environmental impact assessment, using the lifecycle assessment approach. All three analyses indicate that solar energy is a viable alternative to diesel and electricity.

Keywords: Alternative energy sources, pollution control adoption and costs, solar energy pumps, sustainable development.



KONYA

11 - 12 ARALIK 2021

CATEGORIZATION AND ESTIMATION OF RELATIVE CONNECTIVITY OF GENES FROM META-OFTEN NETWORK

U. Kairov

Kazakh National University

T. Karpenyuk

Kazakh National University

E. Ramanculov,

National Center for Biotechnology, Astana, Kazakhstan

A. Zinovyev

Institute Curie, Paris, France

Abstract:

The most common result of analysis of highthroughput data in molecular biology represents a global list of genes, ranked accordingly to a certain score. The score can be a measure of differential expression. Recent work proposed a new method for selecting a number of genes in a ranked gene list from microarray gene expression data such that this set forms the Optimally Functionally Enriched Network (OFTEN), formed by known physical interactions between genes or their products. Here we present calculation results of relative connectivity of genes from META-OFTEN network and tentative biological interpretation of the most reproducible signal. The relative connectivity and inbetweenness values of genes from META-OFTEN network were estimated.

Keywords: Microarray, META-OFTEN, gene network.

KONYA

11 - 12 ARALIK 2021

**THE LYMPHOCYTES NUMBER IN THE BLOOD OF KWASHIORKOR RAT
MODEL INDUCED BY ORAL IMMUNIZATION WITH 38-KDA
MYCOBACTERIUM TUBERCULOSIS PROTEIN**

Novi Khila Firani,

University of Brawijaya, Indonesia.

Elisa Nesdyaningtyas

University of Brawijaya, Indonesia

Abstract:

Kwashiorkor is one of nutritional problem in Indonesia, which lead to decrease immune system. This condition causes susceptibility to infectious disease, especially tuberculosis. Development of new tuberculosis vaccine will be an important strategy to eliminate tuberculosis in kwashiorkor. Previous research showed that 38-kDa Mycobacterium tuberculosis protein is one of the potent immunogen. However, the role of oral immunization with 38- kDa Mycobacterium tuberculosis protein to the number of lymphocytes in the rat model of kwashiorkor is still unknown. We used kwashiorkor rat model groups with 4% and 2% low protein diet. Oral immunization with 38-kDa Mycobacterium tuberculosis protein given with 2 booster every week. The lymphocytes number were measured by flowcytometry. There was no significant difference between the number of lymphocytes in the normal rat group and the kwashiorkor rat groups. It may reveal the role of 38-kDa Mycobacterium tuberculosis protein as a potent immunogen that can increase the lymphocytes number from kwashiorkor rat model same as normal rat.

Keywords: kwashiorkor rat, lymphocytes, 38-kDa Mycobacterium tuberculosis protein

KONYA

11 - 12 ARALIK 2021

ANALYSIS OF DNA-RECOGNIZING ENZYME INTERACTION USING DEAMINATED LESIONS

Seung Pil Pack

Department of Biotechnology and Bioinformatics, Korea University

Abstract:

Deaminated lesions were produced via nitrosative oxidation of natural nucleobases; uracil (Ura, U) from cytosine (Cyt, C), hypoxanthine (Hyp, H) from adenine (Ade, A), and xanthine (Xan, X) and oxanine (Oxa, O) from guanine (Gua, G). Such damaged nucleobases may induce mutagenic problems, so that much attentions and efforts have been poured on the revealing of their mechanisms in vivo or in vitro. In this study, we employed these deaminated lesions as useful probes for analysis of DNA-binding/recognizing proteins or enzymes. Since the pyrimidine lesions such as Hyp, Oxa and Xan are employed as analogues of guanine, their comparative uses are informative for analyzing the role of Gua in DNA sequence in DNA-protein interaction. Several DNA oligomers containing such Hyp, Oxa or Xan substituted for Gua were designed to reveal the molecular interaction between DNA and protein. From this approach, we have got useful information to understand the molecular mechanisms of the DNA-recognizing enzymes, which have not ever been observed using conventional DNA oligomer composed of just natural nucleobases.

Keywords: Deaminated lesion, DNA-protein interaction, DNA-recognizing enzymes



KONYA

11 - 12 ARALIK 2021