

**2nd International Sino-Egyptian Congress on Agriculture,
Veterinary Sciences and Engineering
(2nd ISEC-AVE) 7-10th October 2017, Benha, Egypt**



**المؤتمر المصري الصيني الدولي الثاني بجامعة بنها
Second International Sino-Egyptian Congress On
Agriculture ,Veterinary Sciences & Engineering**

MESSAGE OF BENHA UNIVERSITY PRESIDENT

We are delighted to welcome you in Egypt in Benha University, 7-10 October 2017, the single event assembling brainstorming among Academics experts and industry, with a very open and active discussion time. This would be animated by a mix of Egyptian University members with academics and industry and governmental background in China.

We hope you will enjoy and benefit from this unique event

El-Sayed Youssef El-Kady
President of Benha University

**“2nd International Sino-Egyptian Congress on
Agriculture, Veterinary Sciences and Engineering”
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GENERAL INFORMATION

Congress Venue:

The congress ceremony as well as the scientific sessions will be held in Benha University – Benha city, 40 km north of Cairo.



Accommodation for Chinese Participants

Ramses Hilton Hotel, Cairo, Egypt
1115 Nile Corniche, Sharkas, Cairo, Cairo Governorate 12344

All rooms are on bed & breakfast basis

Check in Time 2:00 p.m 7th of October

Check out Time 12:00 p.m. 10th of October.



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Website of Sino-Egyptian Congress:



<http://isecae.bu.edu.eg>

<http://isec.bu.edu.eg>

Electricity:



The electricity supply in Egypt is 220 Volts, 50 Hz.
Most hotels also provide 110 Volts outlets for shavers

Currency Banking:

(Rates are subjects to market fluctuations)



Egyptian Pound (EGP) is the official currency in Egypt. Foreign currency exchange is available in most of the hotels, banks and currency exchange offices. ATM machines are available all through the city, at the convention center and at the vicinity of all hotels.



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Language:

The official language is English. All lectures and presentations will be held in the English language only. There will be no translation available.

Meal Timing:

Saturday 7th of October 2017, Welcome ceremony & Dinner (VIP & Foreigners), Nile cruise 18:00-19:00.

Sunday, 8th of October 2017, Coffee Break 10:30-11:00 (AM), Lunch break 14:00-15:00 (PM), Dinner for Chinese participants 20:00-21:00 (PM).

Monday, 9th of October 2017, Coffee Break 10:30-11:00 (AM), Lunch break 14:00-15:00 (PM), Dinner for Chinese participants 20:00-21:00 (PM).

Tuesday, 10th of October 2017, Tour in Cairo for Chinese participants

Registration Hours:

Saturday 7th of October 2017, from 18:00 to 19:00, Ramses Hilton Hotel for Chinese participants.

Sunday, 8th of October 2017, from 08:00 till 16:00, Big Hall, Benha University.

Monday, 9th of October 2017, from 08:00 till 16:00, Big Hall, Benha University.

Badge:

All registrants must wear their name badge to have access to forum sessions. All access to Halls of the Meeting will be with the badge.

Certification

Attendance of all program sessions is mandatory to be legible to receive your certificate. Please make sure that you scanned your badge before every session, as this is the only way to assure your attendance and taking your certificate. Attendance Certificate will be delivered to all delegates on Monday, 9th of October 2017, from Registration Desk



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Scientific Partners:



**Wuhan
University**



**Beijing Forestry
University**



**Benha
University**



**Huazhong
Agricultural
University**

Accompanying Exhibition

Benha University Exhibition for Faculties of Agriculture, Veterinary Medicine, Engineering and Science from 9:00 AM of 8th of October to 17:00 PM of 9th of October.



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1. Keynote Speakers



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Understanding the molecular base of different citrus color

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Abstract

The flesh and peel color are important agronomic traits for citrus fruit quality. Understanding the molecular bases for the color formation has a great impact on citrus cultivar improvement. During the past 15 years, mutants with changed color of sweet orange and pummelo were exploited and used for the color research. Results showed that there exist two alleles of *PSY1* in citrus, i.e. *CsPSY1a* and *CsPSY1b*. The former is more efficient to convert geranylgeranyl diphosphate to phytoene, as leads to the difference in the carotenoid content among citrus varieties. Meanwhile, different chromoplast-specific *CsLCYB2* alleles are proved to determine the color of flesh in sweet oranges. Allele a has higher efficiency to cyclize lycopene to β -carotene, i.e. from pink to orange color. In the pink flesh mutant, allele b is dominantly expressed instead of a in the chromoplast, as will lead to the accumulation of lycopene. Another typical and identical color of citrus is of the crimson. Study showed the crimson-peel varieties of citrus, including red tangerine, and ‘Newhall’ navel orange, have high expression of *CsCCD4b*, a gene coding for enzymes cleaving the 40-carbon carotenoid into 30-C apo-carotenoid. In the crimson-peel citrus varieties, citraurin, an apo-carotenoid showing the crimson color, are detected. Further analysis verified that the crimson-peel varieties have a MITE insertion at the upstream of *CsCCD4b* promoter.

Keywords: Citrus fruit quality, Molecular bases, Citrus color.



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Genomics aids in deciphering cotton fiber development

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Abstract

To understand the process of fiber development in cotton, analyses of transcriptomes, functional genomics and population genomics were performed. Gene expression shows obviously different patterns during the four distinguished development stages. microRNAs were proved to be involved in fiber development, histochemical analyses detected the biological activity of miRNA156/157 in ovule and fiber development. Suppressing expression of miRNA156/157 resulted in the reduction of mature fiber length, illustrating that miRNA156/157 plays an essential role in fiber elongation. In addition to miRNAs, long noncoding RNAs were found to function in regulating fiber development. We identified several functional lncRNA candidates involved in cotton fiber initiation and elongation. The lncRNAs generating miR397 and its targets showed pivotal functions in regulating lignin metabolism in domesticated tetraploid cotton fiber during genome polyploidization. To evolutionarily understand the effects of human selection on fiber parameters, we constructed a variation map based on 352 wild and domesticated cotton accessions, and scanned 93 domestication sweeps and identified 19 candidate loci for fiber-quality-related traits through a genome-wide association study. Our results show that asymmetric subgenome domestication was coupled with directional selection of long fibers. The effects of domestication on *cis*-regulatory divergence were also described. Our study provides new insights into the evolution of gene organization, regulation and adaptation in cotton, and should serve as a rich resource for genome-based cotton improvement. To use the genes in fiber improvement, the proposed pivotal genes were functionally analysed by genetic transformation. Some genes were proved useful for developing elite fiber germplasm. Genes and gene interactions were investigated during fiber development, indicating that a complicated network controls fiber quality formation. The whole understanding of fiber development would be useful in guiding cotton fiber improvement.

Keywords: cotton fiber, genetic transformation, fiber development, transcriptomes, functional genomics



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The Energy System of Egypt, Where to?

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Abstract

Energy is a fundamental pillar of economic and social development. Egypt depends on the achievement of economic and technological development on several available primary sources of energy, which are petroleum, natural gas, hydro and renewable energy. The Egyptian reserves of fossil energy sources (oil, natural gas) are not in a position either to meet the needs of sustainable development or draw ambitious plans for sustainable development. Egypt has already developed most of its hydropower resources, converting those sources into electrical power. Egypt has some proven sources of renewable energies, whether wind or solar energy. As the investment cost of solar power plants in the last decades was currently very high in comparison with oil and gas fired power plants and it is envisaged that Egypt's strategy for developing its renewable energy capacity was directed to the wind sector. The information to be presented covers the assured reserves of crude oil and natural gas, the production-consumption rates as well as the exports-imports, if any. New natural gas discoveries, and their proposed development dates, have been also accounted for. The presentation also refers to the oil refineries capacities (installed and operational), as well as the refined oil products and their distribution among the different sectors. Renewable forms of energy sources are also addressed herein including the hydro, wind and solar energy. Until now Egypt does not have a commercial nuclear power plant. The country operates two small research reactors,. Egypt has proposed plans in the past to build a nuclear power plant at El Dabaa on the Mediterranean Coast, about 100 miles west of Alexandria, but the project has been repeatedly delayed. In early 2015, Russia and Egypt signed a preliminary deal to work together to build the plant at El Dabaa with four reactors producing 1,200 MW each. Energy Demand forecasting is also discussed.

Keyword: Egypt, Energy, crude oil, oil refineries capacities, refined oil products, natural gas, renewable energy, nuclear power.



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**Impacts of land degradation and desert land reclamation on Agriculture
Developments in Egypt**

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Abstract

Egypt has a total area of about one million Km² under arid to hyper arid climatic conditions. It is a densely populated country with more than 90 million inhabitants, mainly concentrated on a small territory (about 5%) around the Nile Valley and Delta with regions. This situation will lead to many environmental problems including deterioration of soil and water qualities. Land reclamation and sustainable agriculture developments were considered one of the solutions for alleviating these problems. The study included monitoring of land use changes in agriculture areas in the last 35 years using different data sources including satellite data. It indicated that more than 3 million Feddans were reclaimed and developed from desert areas in the last 30 years. Results indicated that total agriculture areas increased while informal urbanization dominated the patterns of urbanization encroachment. It shows that urbanization denatures the unique alluvium soils and the annual agriculture land use loss was 31.0 thousand Feddan/ year in the period 1985-2007. The annual loss in the period from 2007-2010 was about 41.0 thousands feddan/year. If this urbanization rate act ahead and ceaselessly continues, the integrated loss of the remaining cultivated soil will result a catastrophic loss of the Nile alluvium soils. The study reflected also that careful new land expansion and development in the desert can be a solution for many of the serious environmental problems facing the country of Egypt.

Keywords: Land reclamation, Urbanization, Land Use, Nile Valley and Delta.



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Veterinary Profession from the Economic Point of View

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Abstract

Veterinary medicine plays a central role in Egypt's national and economic status as well as in the protection of the public health. Its network of 17 veterinary faculties is larger than any other country in the Arab world and Middle East as well as Africa. Egypt has made important advancements in veterinary medical educations to meet social needs. Within the global economic problem approach that affecting the country, Egyptian government impels different programs and strategies to improve, restore and maintain food- and economic security. Veterinary medicine improvement programs are multifaced, bear different modes of intervention and aim at assisting the Egyptian national economy in a timely and flexible ways concerning and responsible for animal diseases, health and welfare as well as economic reality in regard to the total national economic conditions.

Keywords: Veterinary medicine, national economic, health, welfare.



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Current status of China's aquaculture and development in future

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Abstract

Increasing the population and the ongoing worldwide food crisis, the demand for cheap, high yield, and quality proteins has increased. Fishery and aquaculture play an important role in global alimentation. Over the past decades food fish supply has been increasing with an annual rate of 3.6 percent, about 2 times faster than the human population. This growth of fish production is meanwhile solely accomplished by an extension of aquaculture, as over the past thirty years the total mass of captured fish has remained almost constant. Aquaculture in China developed rapidly in the past few decades. China has dominated global aquaculture production for more than two decades. Aquaculture production in China increased from 24.6 million metric tons (mmt) in 2000 to 47.5 mmt in 2014, an increment of 93.1%, accounting for more than 60% of the world's production. Freshwater aquaculture production accounts for 90.8% of total Chinese aquaculture production, except those of molluscs and algae. The leading five provinces in freshwater aquaculture production are Hubei, Guangdong, Jiangsu, Hunan and Jiangxi. Freshwater fish fauna in China is comprised of 1323 species. The majority of species belong to Cypriniformes and Cyprinidae. In 2014, China produced >90% of the world's carp, 50% of global penaeid shrimp, and 40% of global tilapia.

Keywords: Aquaculture, China, Fish production.



2. Biotechnology and Molecular Genetics



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Keynote Paper

Molecular cytogenetic analysis for some Egyptian varieties of tetraploid and hexaploid wheat and their utilization in genetic improvement

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Abstract

The main aim of wheat breeding is to increase the quantity and security of wheat yield. The wheat yield could be improved by cultivars which are tolerant to biotic and abiotic stresses. Useful genes responsible for the wheat biotic and abiotic stress tolerance could be derived from wheat related species. Species having homologous genomes with hexaploid wheat (*Triticum aestivum* L., $2n=6x=42$, AABBDD), belongs to the primary gene pool of wheat. Gene transfer from these species can be achieved by direct hybridization, homologous recombination, backcrossing, and selection. Tetraploid wheat (*T. dicoccum* L., $2n=4x=28$,) belongs to this group. Its genome shows close homology with the A genome of hexaploid wheat. Tetraploid wheat is one of the most popular cultivated crops in Upper Egypt. The transfer of agronomical useful traits from alien species into the wheat could be achieved by means of interspecific crosses. The chromosome-mediated gene transfer via interspecific hybrids is the only allowed method by law in Egypt nowadays. The aim of our research is the efficient use of *T. dicoccum* chromatin in wheat breeding programmes. This aim will be implemented by the following tasks: In the course of alien gene transfer it is need to follow the alien chromosomes and chromosome segments. C-banding technique is one of the most powerful techniques for detection and identification of the introgressed chromosome segments in the wheat background. C-banding technique making this technique an excellent tool for the karyotypic analysis of interspecific hybrids and their progenies. The other task is to find the factors and mechanisms responsible for grain hardness/softness by investigation of the starch-lipid-friabilin-matrix protein complex.

Keywords: Wheat, Genetic Improvement, Biotic and Abiotic stress, Tetraploids and Hexaploids.



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**Quantitative Trait Loci associated with egg traits in F₂ intercross between
Golden Montazah and White Leghorn chickens**

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Abstract

Quantitative trait loci (QTL) affecting age at first egg (AFE), weight at first egg (WFE), 120-days of egg number (EN), egg weight (EW), Hugh unit (HU) and egg shell strength (ESS) were identified in F₂ intercross population produced by crossing males of Golden Montazah (M) with females of White Leghorn (L). QTL analysis, 1011 hens of F₂ were genotyped using 45 genetic markers in nine autosomal linkage groups and Z chromosome and the mixed model including the fixed effects of hatch along with the additive and dominance effects of QTL as random effects was used. The total map length was 1949 cM and a total of 15 significant QTL were detected for egg traits and these QTL were distributed over four distinct regions on five chromosomes (2, 3, 4, 8 and Z). The additive effects attributable to QTL explaining 5.4 to 53.0 % for WFE, 1.6 % for AFE, 4.4 to 8.2 % for EN, 3.0 to 6.5 % for EW, -0.6 and -6.2 % for Hu and -55.6 % for ESS of the total phenotypic variance of the F₂ population.

Keywords: Chickens, QTL, microsatellite markers, egg traits, additive effects, dominance effects.



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**Effect of genetic variations in BMP 4 gene (exon 2 plus part of intron 2) on
infertility in Egyptian Buffaloes**

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Abstract

Bone morphogenetic proteins (BMPs) are growth factors belonging to the transforming growth factor beta (TGF- β) superfamily. BMPs are intra ovarian factors expressed in mammalian ovaries by oocytes, granulosa and theca cells. The present study was designed to isolate and detect polymorphism in BMP4 (exon 2 plus part of intron 2) gene associated with infertility in Egyptian buffalo cows using PCR-RFLP and nucleotide sequencing techniques. PCR amplification of DNA from 35 Egyptian water buffalo (5 normal fertile, 14 anestrus and 16 repeat breeders) with 482 bp expected size was purified and sequenced. There was no variation in the sequence of amplified region between fertile and infertile group. PCR product was digested using TaqI and HinfI give one type of the restriction banding pattern with no polymorphism. Concluded that bmp4 is highly evolutionarily conserved.

Keywords: Egyptian buffalo, infertility, BMP4 gene, sequence PCR-RFLP.



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Polymorphisms of the Bovine Bone Morphogenetic Protein 7 Gene (BMP7) and its association with infertility in Egyptian Water Buffaloes

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Abstract

BMP7 is a member of transforming growth factor- β (TGF- β) superfamily which plays an important role in the growth and follicular development in mammalian ovary. The present study was designed to amplify and detect polymorphism in BMP7 (exon 6) and BMP 7 (Part of intron 6 plus part of exon7) genes associated with infertility in Egyptian buffalo cows. PCR amplification of DNA isolated from blood of 35 Egyptian water buffalo cows (5 normal fertile, 16 repeat breeders and 14 anestrus) reveals the expected size (259 bp) for exon 6 and (360 bp) for (Part of intron 6 plus part of exon7). Polymorphisms in these two loci were studied by using direct sequencing and RFLP technique. No SNP was detected in exon 6, a monomorphic restriction banding pattern observed in normal cyclic and infertile animals. Non-synonymous SNP (G/A) at base 82 from the start of exon 7 was discovered in BMP7 gene. G to A transition revealed two genotypes GG and GA in the investigated Egyptian water buffaloes. The GG genotype was predominant with a genotype frequency of 0.94. GA genotype was found in some infertile animal with frequency of 0.06. Thus, BMP7 gene (exon 7) polymorphism can select efficiently in marker-assisted selection in breeding programs for the Egyptian water buffalo.

Keywords: Egyptian buffalo, infertility, BMP7 gene, sequence, PCR-RFLP.



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Genetic diversity in some introduced cassava genotypes via Simple Sequence Repeat markers (SSR)

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Abstract

The objective of this study was to characterize morphologically and molecularly genetic diversity of three important cassava genotypes (*ManihotesculentaCrantz*). Three Introduced cassava genotypes were utilized as a part of the present study. These genotypes named American, Brazilian, and Indonesian. These plants procured name as per its unique area. Morphological appraisal showed a few contrasts between the three genotypes. Plant leaf hues demonstrated clear differences depending on genotype for instance leaves of Indonesian genotype was green, including leaf neck, then again leaves of the American genotype was green shaded with green-red neck while the leaves of the Brazilian genotype was green with some reasonable red spots. The three genotypes likewise differentiated in branching capacity as the American genotype frame three branches while Indonesian and Brazilian genotypes have no branching capacity. The outer shade of the American tubers was light brown; then again outside tuber shade of Indonesian and Brazilian genotypes was dark brown. Concerning the interior shade of Brazilian genotype, tubers were pink, while the Indonesian tubers were light pink, yet American genotype was white. Tuber lengths likewise measured, and the American tubers were the tallest, then Brazilian tubers were taller than Indonesian which considered the briefest. Concerning tuber distance across, Brazilian tuber width gave the most elevated qualities, trailed by the American, while the Indonesian gave least values. American tubers weight was the biggest, followed by Brazilian, and Indonesian tubers weight was the least one. Ten SSR primers successfully generated reproducible and reliable amplicons for the three imported cassava genotypes. Population structure was analysed by means of genetic distances and probabilistic models; allelic frequencies were used in order to assess the genetic diversity indexes (Ht, Ho, PIC, % polymorphism and a number of alleles) for each studied locus. Some microsatellite loci typed were polymorphic. The average number of alleles per locus was 2.700 ranging from 1 in SSRY38 and SSRY103 to 4 in SSRY108 and SSRY4. Mean observed heterozygosity was 0.02 ranging from 0.000 in SSRY106, SSRY38, SSRY103, SSRY177, GA-136 and GA-134 to 0.667 in SSRY108 and SSRY4 while the mean expected heterozygosity was 0.600 ranging from 0.000 in ssry38 and ssry103 to 0.800 in SSRY108, SSRY177, SSRY4, GA-136 and GA-134. The average PIC was 0.443 ranging from 0.000 at locus SSRY38 and SSRY103 to 0.620 at locus SSRY108 and SSRY4. Outcomes demonstrated that genetic similarity between the three cassava genotypes was running from 25% to 41.7%, highest percentage



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41.7 was between American and Brazilian genotypes. The lowest percentage of 25% was between American and Indonesian genotypes. Dendrogram exhibited a strong association between the American and Brazilian, on the other hand, this association was lower between the American and the Indonesian relationship, and these are because of the root of species sources.

Keywords: Cassava, (*Manihot esculenta Crantz*), Simple sequence repeat (SSR) marker, Cluster analysis, Genetic diversity



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**Knocking down of Cathepsin L- like cysteine protease-induces internal egg hatching
in *Caenorhabditis elegans* during embryogenesis**

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Abstract

Cathepsin-like cysteine proteases are one of four major classes of enzymes; play critical biological roles in both intracellular and extracellular processes such as animal development as well as these enzymes act in the lysosome. In this study, *Caenorhabditis elegans* was used as the most fruitful experimental animal model. It has been reported that *C. elegans* embryogenesis is a powerful in vivo model to study gene function because of its germline is highly sensitive to RNA interference (RNAi) as a reverse genetic technique, facilitating the detection of genes with essential functions in the embryo. Our findings found that the knocking down of *cpl-1* activity leads to internal egg hatching (worm bag- WB) for L1 larvae indicating that *cpl-1* may have multi-biological functions during *C. elegans* embryogenesis. Therefore, our study offers novel evidence of the roles of *cpl-1* gene in early embryogenesis and normal growth in *Caenorhabditis elegans*.

Keywords: Cpl-1, embryogenesis, RNAi, worm bag, *C. elegans*.



**Using Bulked Segregant Analysis (BSA) for determining *Orobanche Crenata*
resistance in Faba Bean (*Vicia Faba* L.)**

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Abstract

The present study aimed to discovery the molecular markers for *Orobanche* tolerant and susceptible in faba bean by using Bulked Segregant Analysis (BSA) using RAPD and ISSR techniques. A cross between x-1722 (tolerant) and Giza-40 (susceptible) was chosen for molecular analysis. DNA isolated from the two parents; F1 and the two extreme groups of F2 plants using bulked Segregant analysis (BSA) technique. Six RAPD primers (A09, B05, B11, B17, B18 and B20) and four ISSR primers (HB11, HB12, HB13 and 17899B) were used in this study. The results showed that, Primer B20 released four positive molecular markers with molecular size of 766, 557,419 and 281 bp), these four positive and three negative RAPD markers could be considered as a reliable markers for *Orobanche* tolerance in faba bean. While there were three negative molecular with molecular sizes 949, 355 bp for primer A09 and 441bp for primer B18. On the other hand, Primer B05 exhibited unique band for tolerant parent (x-1722) with molecular size 400 bp, as well as primer B11 showed three unique bands with molecular size 1278, 773 and 437 bp. While primer B17 exhibited unique band for sensitive parent (Giza 40) with molecular size 421bp. For ISSR primers, Primer HB12 showed one negative molecular marker which was found only in the sensitive parent (Giza 40), F1 and the sensitive F2 bulk with molecular size of 880bp. Only one unique band for sensitive parent (Giza 40) released in primer HB12 with molecular size 106.

Keywords: Molecular Markers - *Orobanche Crenata* - Faba Bean - Bulked Segregant Analysis – RAPD – ISSR.

3. Biochemistry



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The biochemical effect of silymarin treatment on blood and tissue parameters in experimental nonalcoholic steatohepatitis in rats

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Abstract

Non alcoholic steatohepatitis (NASH) is a pathological condition characterized by accumulation of lipids in the liver of non alcoholic individuals and consequent oxidative stress leading to cirrhosis of liver in the long run. Silymarin is a unique flavonoid complex extract isolated from seeds of the milk thistle plant (*Silybum marianum*) and has strong antioxidant and radical scavenging properties. The present research aimed to evaluate the therapeutic effects of silymarin (Slym) as natural antioxidant and anti-inflammatory on liver tissue of male rats exposed to experimental model of non alcoholic steatohepatitis (NASH) induced by supplementation of high fat diet (HFD) for 3 months. Through evaluation of serum Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Alkaline Phosphatase (ALP) and Gamma Glutamyl-Transferase (γ -GT) activities and Albumin, Total Protein, Total Bilirubin, Total Cholesterol and triglycerides concentrations. Levels of reduced glutathione (GSH) and activities of Superoxide Dismutase (SOD) and Catalase (CAT), were determined in liver tissues. Extent of oxidative stress was also assessed by hepatic lipid peroxides (MDA). HFD supplementation induced a significant increase in 1) serum ALT, AST, ALP and γ -GT activities, in addition to Total Bilirubin, Total Cholesterol and triglycerides concentrations. 2) Liver MDA concentration. On contrast, it exhibited a significant decrease in serum Albumin and Total Protein, also marked depletion in liver GSH, CAT and SOD, were observed after HFD supplementation. Silymarin treatment was able to mitigate and ameliorate hepatic NASH induced by HFD and showed pronounced curative effect against lipid peroxidation and deviated serum enzymatic variables as well as maintained glutathione status and antioxidant enzymes toward control levels. Silymarin treatment was highly effective against HFD induced NASH. The results of the present study suggest that silymarin has the potential to exert curative effects against liver NASH.

Keywords: non alcoholic steatohepatitis, silymarin, liver functions, antioxidants, lipid profile



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The ameliorative antioxidant role of Quercetin in experimental model of non alcoholic Steatohepatitis in male rats

Hussein, S.A., Elsenosy, Y.A., Mahfouz, M.K., Afaf, D.A., and Marzouk, M.A.A.
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Abstract

Quercetin (QRST) is a polyphenolic phytochemical flavonoid, it is a strong reactive oxygen species (ROS) scavenger and good metal chelator, rich in phenolic hydroxyl groups that have strong antioxidant activity. For the present study, the strong antioxidant activity of QRST on several biochemical parameters in blood and liver of male rats exposed to high fat diet (HFD) induced non alcoholic steatohepatitis (NASH), were investigated. Sixty white male albino rats weighting 150 - 200 gm were used in this study. The rats were divided into four equal groups. 1) Normal group: received no drugs. 2) NASH group: received HFD daily for 12 weeks. 3) NASH + Quercetin group: received HFD daily for 3 months then QRST treatment (50 mg/kg body weight) through intraperitoneal route (i.p) daily for 10 weeks after induction of NASH. Blood and liver samples were collected from all animal groups two times, after the 6th and 10th week of treatment period. Serum was separated for determination of serum Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Alkaline Phosphatase (ALP) and Gamma Glutamyl-Transferase (γ -GT) activities and Albumin, Total Protein, Total Bilirubin, Total Cholesterol and triglycerides concentrations. Levels of reduced glutathione (GSH) and activities of Superoxide Dismutase (SOD) and Catalase (CAT), were determined in liver tissues. Extent of oxidative stress was also assessed by hepatic lipid peroxides (MDA). The obtained results revealed that, HFD supplementation exhibited a significant increase in: 1) serum ALT, AST, ALP and γ -GT activities, in addition to Total Bilirubin, Total Cholesterol and triglycerides concentrations. 2) Liver MDA concentration. QRST administration in NASH rats exhibited a significant increase in all mentioned parameters. On contrast, HFD supplementation exhibited a significant decrease in serum Albumin and Total Protein, also marked depletion in liver GSH, CAT and SOD, were observed. QRST administration in NASH rats exhibited significant increase in all mentioned parameters. From the obtained results, it could be concluded that, the potential of QRST as natural antioxidant act as a powerful agent against the harmful effects of NASH

Keywords: Quercetin, non alcoholic steatohepatitis, liver functions, antioxidants.



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Biochemical effect of domperidone on cardiac functions after induction of peptic ulcer on albino rats

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Abstract

The objective of the present study was to evaluate the biochemical effect of domperidone on the cardiac functions after induction of peptic ulcer on albino rats. Sixty white male albino rats, average body weight 200-250 gm and 12-16 weeks old were used in the experimental investigation of the study. Rats were randomly divided in to two large groups Group A consist of thirty rats divided in to three subgroups (subgroup G1, G2, G3), and this group is completely healthy without ulcer induction receiving domperidone three times per day half an hour before male each sub group receives a different dose using subgroup G1 as control. Group B consist of thirty rats undergo stomach ulcer induction and it is divided in to three subgroups (subgroup G4, G5, G6) received domperidone three times per day half an hour before male with different doses according to the subgroup. Blood samples were collected for biochemical examination three times during the study after one week, two weeks and four weeks. We found elevated levels of Troponin, CK-MB, LDH, ALT, AST, Cholesterol, Triglycerides, HDL and LDL in groups treated with high doses of domperidone and results was time dependent.

Keywords: Domperidone, CK-mb, Troponin, stomach ulcer.



**Chemopreventive effect of silymarin in N-nitrosodiethylamine induced
hepatocellular carcinoma in rats via modulation of inflammatory mediators,
Caspase-3, oxidative damage and antioxidant status in liver tissues**

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Abstract

Liver cancer, predominantly hepatocellular carcinoma (HCC), represents a complex and fatal malignancy driven primarily by oxidative stress and inflammation. The chemopreventive effect of silymarin on inflammatory markers and oxidative damage, caspase-3 and antioxidant status as well as the histopathological alterations in hepatic tissue in N-nitrosodiethylamine (DEN)-induced hepatic carcinogenesis in male albino rats was investigated. To induce hepato cellular carcinoma, rats were given DEN injections (i.p, 200 mg/kg b.wt.) three times at a 15 days interval. Seventy-five rats divided into five equal groups. Group I: (Control group): received no drugs. Group II: (DEN group). Group III: (DEN+silymarin protected group): orally received silymarin (37.8mg/kg b. wt/day) one week before DEN injection and continued to be 13 weeks. Group IV: (DEN+silymarin treated group): Injected with DEN then orally treated with silymarin from the 8th week till the end of the experiment (13th week). Group V: (normal–silymarin group): received silymarin. Blood samples and liver tissues were collected from all experimental groups at the end of experiment on 13th week. The obtained results showed that, DEN-induced hepatic carcinogenesis significantly decreased super oxide dismutase (SOD) and Catalase (CAT) activities in liver tissue. On the other hand, a marked increase in liver tissue L-Malondialdehyde (L-MDA), DNA fragmentation percent, caspase-3 and nuclear factor -kappa beta (NF-κB) and in serum AFP, IL-6 and TNF-α levels were observed in DEN injected rats. silymarin was able to mitigate liver tissue damage induced by DEN through increasing of SOD and CAT activities in addition to decreasing DNA fragmentation percent, L-MDA, caspase-3 and NF-κB and nuclear factor kappa B P65. These data suggest that silymarin exhibited significant protection against DEN-induced hepatocarcinogenesis, which might be related with the enhancement of the antioxidant activity and the induction of apoptosis.

Keywords: Hepatocarcinogenesis, silymarin, inflammatory mediators, oxidative damage, Histopathology.

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Urinary Exosomal AQP1 and ALIX proteomes: A promising sensitive and noninvasive biomarkers for early diagnosis of Gentamicin-Induced Nephrotoxicity

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Abstract

Urinary exosomes are tiny (50-100 nm) membrane-bound vesicles secreted into urinary space from all nephron segments, reflecting the cell-type of origin. Therefore, urinary exosomes could be a promising source for the discovery of biomarkers for early diagnosis of nephrotoxicity. Gentamicin is commonly used as a nephrotoxic model. In the current study, we examined whether urinary exosomal aquaporin1 (AQP1) and apoptosis linked gene interacting protein X (ALIX) could serve as a potential biomarker for gentamicin-induced nephrotoxicity. Rats were received gentamicin intraperitoneally for consecutive 7 days. Urine was collected on the day 2, 4, and 7 for isolation of exosomes and immunoblotting. Kidney samples were collected on the day 2, 4, and 8 for mRNA extraction, immunoblotting, histopathology, and immunohistochemistry. Gentamicin increased the urinary excretion of exosomal AQP1 and ALIX on the day 2. However, our group has reported that gentamicin increased the plasma creatinine level only after 5 days treatment in rats. Moreover, the histopathology and immunohistochemistry data indicated that gentamicin induced injury in the kidneys of the treated animal especially in the cortical region. Gentamicin enhanced urinary excretion of exosomal AQP1 and ALIX protein earlier than plasma creatinine, suggesting they could be potential biomarkers for early diagnosis of gentamicin-induced nephrotoxicity.

Keywords: Urinary exosomes, Gentamicin, AQP1 proteomes, ALIX proteomes.



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The physiological effects of royal jelly administration on hypercholesterolemic male albino rats

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Abstract

Hypercholesterolaemia is a disorder characterized by very high levels of cholesterol in the blood which is a risk factor of cardiovascular health. Medicines which formed from chemical compounds cause serious side effects that cause an imbalance in the body's functions. Therefore utilization of natural compounds could be an alternative concept in the treatment of diseases, as they have no side effects on human health. The present work aimed to evaluate the physiological effects of royal jelly (RJ) on the hypercholesterolaemic male albino rats. Forty two male albino rats were used in current study, rats were divided into six groups as follow, control group, coconut oil treated group, cholesterol treated group (450 mg/kg b.w of cholesterol dissolved in 0.5 ml coconut oil) for four weeks, royal jelly treated group (300 mg/kg b.wt) for two weeks, RJ then cholesterol and RJ after cholesterol treated groups. At end of the experimental period rats were fasted overnight and seven animals of each group were weighted then anaesthetized by ether inhalation and blood samples were collected from dorsal aorta in dry centrifuge tubes and centrifuged at 3000 rpm for 15 minutes. The sera were separated and stored at -20 °C until biochemical analysis. Cholesterol administration caused significant increases in serum levels of triglyceride (TG), total cholesterol (TC), low density lipoprotein cholesterol (LDL-C) and very low-density lipoprotein cholesterol (VLDL-C), and significant decreases in high density lipoprotein cholesterol (HDL-C) level, serum antioxidant enzymes, nitric oxide (NO) and vascular endothelium growth factor (VEGF) compared with those of control and other treated groups. Royal jelly administration caused significant reductions in serum levels of LDL-C, VLDL-C, TG and TC and induced significant elevations in HDL-C level, serum antioxidant enzymes, NO and VEGF compared with those of control and other treated groups. Treatments with royal jelly before and after cholesterol help to return serum NO, VEGF levels toward control values and cause significant decrease in LDL-C level and significant increase in HDL-C level compared to control group. In conclusion, RJ ameliorates the harmful effects of cholesterol administration on male albino rats and plays an important role in cardiovascular health protection.

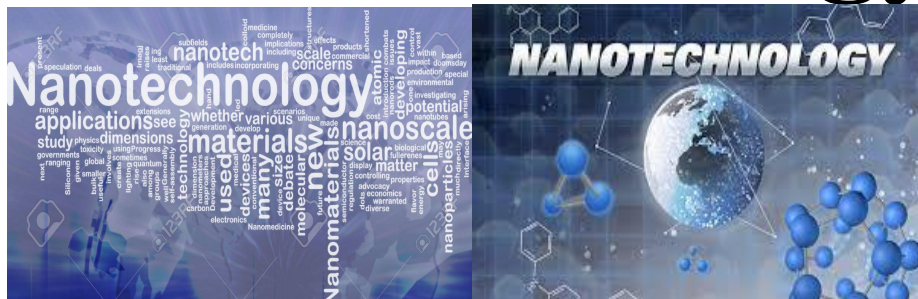
Keywords: Hypercholesterolaemia, cholesterol administration, royal jelly, albino rats.



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4. Nanotechnology



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Perspectives of Nanotechnology in Future Agriculture

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Abstract

Nanotechnology is an interdisciplinary research arena. Currently, great efforts have been made to enhance agricultural yield through comprehensive investigation by using nanomaterials. However, the over usage of chemical fertilizers and multiple pesticides have caused a tremendous loss in soil bio-structure and developed resistance against bacterial & fungal pathogens as well. To further understand the interface mechanism between nanomaterials for instance Graphene Oxide (GO) and representative phytopathogens, a specific investigation was carried out to test the antimicrobial activity of GO nanomaterial against four pathogens, two bacterial and two fungal, *P.syringae* and *X. campestris* pv. *Undulosa*; *F. graminearum* and *F. oxysporum*, respectively. An interesting result showed that GO had a powerful effect on the reproduction of all four pathogens. It is likely that GO nanomaterials interacts with different pathogens by mechanically encapsulating, locally detrimental the cell membrane and causing finally cell lysis, which may be one of the foremost toxicity actions of GO against phytopathogens. The antibacterial activity anticipated in this research suggests that the GO nanomaterials may possess antibacterial activity against more multi-resistant bacterial and fungal phytopathogens, and provides helpful evidence about the application of GO nanomaterials in resisting crop diseases in the future.

Keywords: Nanotechnology, Graphene Oxide (GO), Phytopathogens, Antibacterial activity.



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Nano-encapsulation of food bio-active ingredients

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Abstract

Nano-science is gaining a great attention in food research. An application of Nano science in food science is the encapsulation of bioactive compounds at the Nano scale for incorporation in food products. Encapsulation is known to enhance the water solubility of bioactive compounds. Nano-encapsulation enhances solubility, bioavailability and health beneficial activities. This effect is due to the Nano size that increases surface area, in turn, activity. After consumption of the food the bio-actives For example, (vitamins and antioxidants) are released at the targeted organ of the body and utilized for its nutritional property. The evergreen olive tree (*Olea europaea* L.) is becoming a source of natural antioxidants because of its phenolic contents in fruits , oil and leaves. Among different parts of olive tree, the leaves are one of the richest sources of phenolic compounds. Several reports have demonstrated that olive leaf extract has the capacity to lower blood pressure in animals and increase blood flow in the coronary arteries, to relieve arrhythmia and prevent intestinal muscle spasms.

Keywords: Nan particles, Bio active compounds, Phenolic compounds.



Protective effects of (Garlic and zinc oxide (ZnO) coated by cetyl trimethyl ammonium bromide) nanoparticles on hepatocarcinoma-induced by N-Nitrosodiethylamine in rats

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Abstract

To investigate the protective effects and the possible mechanisms of (Garlic and zinc oxide (ZnO) coated by cetyl trimethyl ammonium bromide) nanoparticles against N-nitrosodiethylamine (DEN) induced hepatocarcinoma in rats. Wistar rats were orally administered Garlic nanoparticles 30 mg/kg b.wt, one time per day for 4 weeks and subsequently rats were orally administered DEN with a dose of 20 mg/kg b.wt., five times a week for 6 weeks. The changes of histology, the biochemical indices of serum, and the levels of Caspase 3 and DNA fragmentation percent of liver were examined to assess the protective effects. At the end of the study (10 weeks), DEN induced elevation of the serum biochemical indices alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), gammaglutamyl transferase (GGT), Alpha feto-protein (AFP) and total bilirubin, and decrease total protein, albumin and A/G ratio. Garlic nanoparticles administration significantly inhibited the increase of the ALT, AST, ALP, GGT, AFP and total bilirubin and increase total protein, albumin and A/G ratio, improved hepatocellular architecture and dramatically inhibited. The mechanistic studies demonstrated that Garlic nanoparticles counteracted DEN induced protein levels of Caspase 3 and DNA fragmentation percent were significantly increased. These data suggest that Garlic nanoparticles exhibited significant protection against DEN induced hepatocarcinogenesis, which might be related with the induction of apoptosis.

Keywords: Garlic, Zinc oxide (ZnO), Nitrosodiethylamine, Hepatocarcinoma, Apoptosis.

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Effect of Garlic, Zinc oxide and CTAB nanocomposite against hepatocellular carcinoma in vitro and rats on cell cycle, caspase 3 and DNA fragmentation percent

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Abstract

Nanoparticles plans to overcome the problems related to human diseases at the nanoscale level and making significant contributions to the improvement of new approaches of drug delivery in cancer and can provide a stage for combined therapeutics with subsequent monitoring of response. (Garlic and zinc oxide (ZnO) coated by cetyl trimethyl ammonium bromide) nanoparticles have been applying treatment action against hepatocellular carcinoma in vitro and in vivo which was done on 60 rats and was divided into four groups, each group has (15 rats), (Group 1) NTBR (Negative control) group; (Group 2) (TBR) HCC [N-nitrosodiethylamine (DEN)] group (Group 3) (TBRT) (garlic / Zinc oxide / CTAB) nanoparticles; (Group 4) (TBRT Doxorubicin) .The changes of the biochemical indices of serum, and the levels of the Cell cycle, Caspase 3 and DNA fragmentation percent of liver were analyzed to evaluate the treatment activity. At the end of the study (10 weeks), DEN induced elevation of the serum biochemical indices alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), gammaglutamyl transferase (GGT) and Alpha feto-protein (AFP). (garlic/Zinc oxide/CTAB) nanoparticles administration significantly inhibited the increase of the ALT, AST, ALP, GGT and AFP. The mechanistic studies demonstrated that (garlic/Zinc oxide/CTAB) nanoparticles counteracted DEN induced protein levels of Caspase 3 and DNA fragmentation percent were significantly increased. We observed that nanocompsite has different effects on liver cell viability *via* killing cancer cells, while posing no effect on normal cells of the liver. The marked difference in cytotoxicity between cancer cells and normal cells suggests an exciting potential for nanocompsite as novel alternatives to hepatocellular carcinoma therapy.

Keywords: Garlic, Zinc oxide, CTAB, Nanoparticles, Cell cycle, Caspase 3and DNA fragmentation percent.



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Study of Anti-Lock brake system and Anti-Roll Bar for passenger cars

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Abstract

Nowadays the Anti-lock Brake System (ABS) is a standard safety feature in modern vehicles. Therefore, this study is focused on investigate the vehicle performance during different braking manoeuvres using the ABS. Furthermore, the influence of the proper selection of anti-roll bar (ARB) to improve the vehicle roll and lateral dynamics during braking is investigated. A one axle 6-DoF Vertical-Longitudinal vehicle mathematical model considering the roll motion of the vehicle body and the rotational motion of the wheels is developed. The suspension system is modelled as independent suspension with Anti-roll bar. The tire-road interface is modelled using Magic formula together with a signal point of contact road excitation considering the road roughness. The ABS control algorithm is developed based on the PID control theory employing wheel slip control strategy. The results showed that, using the ABS improved the braking performance in terms of the stopping distance and time in comparison with the conventional brake system for all the investigated braking manoeuvres. Furthermore, the vehicle roll and lateral dynamics in the split μ braking manoeuvre is improved by the proper selection of the Anti-roll bar.

Keywords: ABS, Anti-roll bar, stopping distance, roll dynamics.



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**Effect of tool rotational speed, pin profile and post weld heat treatment on
microstructure and hardness of aa7020-o aluminum plates joined using friction stir
welding**

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Abstract

In the current study, plates from AA7020-O rolled plates were joined using friction stir welding (FSW). The effect FSW tool rotational speed, tool pin profile and postweld heat treatment (PWHT) on the microstructure and hardness of AA7020-O Al plates were investigated. FSW was conducted using two tools having different pin profiles; typically, tapered cylindrical pin (TCP) and two flat sides cylindrical pin (TFSCP).

Keywords: Friction stir welding, aluminum alloys, post-weld heat treatment, microstructure.



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Study of sustainability of a paper recycling supply chain based on profit optimization

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Abstract

In the last few decades, recycling and closed loop supply chain became very important research topics due to their economic and environmental impacts. Paper recycling is one of the most important industries as it saves natural resources as trees , saves production energy and landfill space. A multi echelon, multi-product, single facility capacitated closed loop supply chain model is proposed in this paper. A linear programming model is presented to optimize profit in a capacitated paper manufacturing supply chain producing different paper grades. Further, in this paper the environmental and social impacts are studied based on profit optimization at different production capacities and different waste costs.

Keywords: Optimization, green supply chain, closed loop supply chain.



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Numerical investigation of heat transfer and fluid flow of a heat exchanger tube fitted with twisted tape

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Abstract

The present paper, numerically investigated the effect of the twisted tape with different twisted ratios on the heat transfer rate, friction factor and thermal performance factor for Reynolds number ranging from 4900 to 21,000 to determine the optimum twisted ratio that give the highest heat transfer rate and the best thermal performance factor. ANSYS Fluent16.0 [1] is the computational fluid dynamic (CFD) software used in this paper. The Nusselt number and friction factor increase as the twisted tape ratio decrease. The twisted tape with twisted ratio $y/w=1.75$ give the highest heat transfer rate reach to 1.78 times that of the plain tube at Reynolds number 4900.

Keywords: Numerical simulation, Heat transfer augmentation, Performance evaluation criteria, Twisted tape, Twisted tape with rod.



Spark ignition engine performance at different spark timing

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Abstract

In the following experimental investigation on a single-cylinder four-stroke spark ignition engine operating with gasoline was performed to study the effect of spark timing on its performance when it is fueled with hydrogen-gasoline blends. The hydrogen is inducted in the air inlet manifold with volume ratios of 24%, 28%, 29%, 31%, 49% of total intake volume. The combustion analysis is carried out for change spark timing. The results show that due to the rapid rate of burning of gasoline-air mixture with the addition of hydrogen leading to increase in cylinder pressure. Fuel consumption is decreased by increasing the flow rate of hydrogen for all loads until reaching a percentage 31% then increase. Both HC and CO is decreased by increasing hydrogen flow rate till its percentage reaches 28% after which they remain almost constant an increasing the hydrogen flow rate till reaching a percentage of 31% after which decrease. Efficiency increases by increasing the flow rate of hydrogen for all loads until reaching to percentage 31% then it decreases with increasing hydrogen flow rate. Fuel consumption becomes lower when retarding the spark time. Adding hydrogen at percentage of 31%, and having retarded spark time at 30 BTDC, the gasoline consumption decreases to 13% at 1.822 kW load and to 5% at no load. Adding hydrogen at percentage of 31%, and having retarded spark time at 30 BTDC, the thermal efficiency increases to 12% at a load of 1.822 kW, and 6% at 0.659 kW. CO% becomes greater when retarded spark time. On supplying hydrogen at percentage of 31%, and having retarded spark time at 30 BTDC, the percentage of CO increases to 21% at 1.822 2 KW, and 50% at no load. Also, it is noted that HC% increases when retarded spark time at low load then decreases at high loads.

Keywords: Hydrogen, Dual Fuel Engine, Spark Ignition Engine, emission, thermal efficiency.

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Experimental investigation for horizontal wind turbine of direct-drive

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Abstract

Wind turbines work by converting the kinetic energy in the wind first into rotational kinetic energy in the turbine and then electrical energy that can be supplied. The objectives of this paper are to design a small wind turbine that is optimized for the constraints that come with residential use of a 0.75 kW generator for a direct-drive wind turbine and to compare the generator systems for pitch control and for active speed stall control. A 250 W at average 4 m/s, 4-meter diameter wind turbine designed at a TSR of 4.7. The design and implementation process includes the selection of the wind turbine type and the determination of the blade airfoil, pitch angle distribution along the radius, and chord length distribution along the radius. The pitch angle and chord length distributions are optimized based on conservation of angular momentum and theory of aerodynamic forces on an airfoil.

Keywords: Wind energy, small wind turbine, pitch control.



6. Material and Industrial Engineering



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**Tribological characteristics of EPOXY/MWCNTS and EPOXY/AL2O3
Nanocomposites under dry sliding conditions**

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Abstract

In the present investigation, the tribological performance of epoxy-based nanocomposites filled with multi-wall carbon nano-tubes (MWCNTs) and aluminum oxide (Al₂O₃) nanoparticles in different weight percentages was investigated. The coefficient of friction (COF) and wear rate of the Epoxy/MWCNTs and Epoxy/Al₂O₃ nanocomposites were evaluated using a pin-on-ring apparatus in a dry sliding conditions under different contact pressures and sliding speeds. The results demonstrated that the hardness, COF and wear rate were significantly improved by the dispersion of MWCNTs and Al₂O₃ nanoparticles into the epoxy resin. Increasing the MWCNTs and Al₂O₃ nanoparticles weight percent increases the hardness and reduces the COF and wear rate of the nanocomposites. The epoxy/MWCNTs nanocomposites showed lower COF, but higher wear rate when compared with epoxy/Al₂O₃ nanocomposites.

Keywords: Nanocomposites, Tribological behavior, Epoxy, MWCNTs, Aluminum Oxide.



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**Effect of friction stir processing on the mechanical and dynamic behavior of
aluminum alloys AA6061**

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Abstract

This work aims to study the effect of the friction stir processing (FSP) on the mechanical and dynamic properties for aluminum alloys. There are several parameters were used such as the rotational speeds and the traverse speeds. Several tests were evaluated to compare the mechanical and dynamic properties for the base AA6061 aluminum alloy with the other nine FSPed. Such micro hardness, tensile, impact and vibration test for AA6061 aluminum FSP. The grain refinement were improved after FSP [3,4]. By increasing the rotational speed, the grain size of the base alloy increased. The average grain size of the material was in the range of 19.4–36.04 μm and the micro-hardness of them was 116–193 Hv. The σ_y and σ_t is decreased by increasing the rotational and traverse speeds. The impact force increasing with increasing in traverse speeds. And increase also with the increase in rotational speeds. In the vibration test we find that the natural frequency was decreased by increasing in the rotational and traverse speeds.

Keywords: Friction Stir, AA6061 aluminum alloy, FSP.



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Direct and Indirect Evaporative Cooling for Closed Greenhouse

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Abstract

Energy saving in greenhouses is a key objective in the world, especially in the summer. So it is necessary to design cooling systems that saving energy and reach temperatures below 30 °C inside the greenhouse and maintaining it almost consistently to sustain the operation of the greenhouse. The objective of this study is to make a direct evaporative system (Fan –Pads) in case A and adding indirect evaporative system (cooling tower) plus fan-pads system in case Band made a comparison between them, also study the effect of each of them with respect to the outside temperature. The experiments conducted in October 6 University, 6 October city, Giza, Egypt at summer rush hours. The results were maintained the temperature variation under 30 °C during the day rush hours, especially in the area designated for the growth of plants inside the greenhouse.

Keywords: Greenhouse; direct evaporative cooling; indirect evaporative cooling.



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Optimization of friction stir spot welding process parameters using Taguchi's approach

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Abstract

In the present investigation, friction stir spot welding (FSSW) on AA2024-T6 aluminum alloy plates was performed. The influences of the tool rotational speed, dwell time, plunge depth and plunge rate on tensile-shear load of welds were evaluated. The process parameters were optimized by Taguchi technique based on Taguchi's L₉ orthogonal array. The optimum FSSW process parameters were predicted and their percentage of contribution was estimated by applying the signal-to-noise ratio and analysis of variance. The experimental results showed that the optimal levels of the rotational speed, plunge depth, plunge rate and dwell time were found to be 2500 rpm, 1.5 mm, 10 mm/min and 10 seconds, respectively. The analysis of variance (ANOVA) results showed that the rotational speed is the most influential FSSW process parameter on the tensile-shear load with a percentage of contribution of 66.69 % of the overall response. The plunge depth, plunge rate and dwell time FSSW process parameters showed percentage of contribution of 27%, 4% and 3%, respectively, of the overall response.

Keywords: Taguchi's approach, Optimization, friction stir spot welding.



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**A prediction tool for the appointment of the true lifespan of lubrication oil in
gasoline engines under specific working conditions**

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Arab academy for science technology and maritime transport, Egypt.

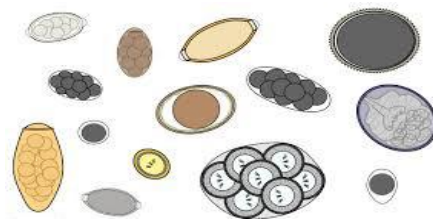
Abstract

This paper describes an approach for the determination of the optimum life span of gasoline engines' lubrication oils under specific working conditions. The approach is piloted in Egypt where the running conditions are characterized by being harsh. The problem lays in the big waste of money and resources on lubrication oils according to changing them at fixed or pre-defined intervals without considering their actual state. In this paper, the most relevant lubrication oils' characteristics namely: PH, cleanliness code, viscosity at 40°C and at 100°C; are measured in specific ranges of operations relating to the oldness of engines and the oldness of their lubrication oils. This relationship is programed in a predictive tool which predicts the optimum oil change interval for each set of conditions of engines running.

Keywords: Oil Degradation, Oil Life Span optimization, Gasoline Engines, Harsh Operation conditions.



7. Pest Control and Parasitology



**“2nd International Sino-Egyptian Congress on
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Keynote Paper

For fun and benefit, we should be ahead of them: natural insect control strategies

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Abstract

Arthropods not only transmit diseases to humans and animals but also damage agricultural crops and consume and/or damage harvested food. Applying botanical insecticides dates back at least two millennia in ancient Egypt, China, Greece, and India, but discoveries of synthetic chemical insecticides in the mid-1930s to 1950s was the major weapon against insect control till the appearance of pest resistance. Furthermore, synthetic pesticides induce environmental contamination, toxicity to non-target organisms, and negative effects on animal and human health. A dramatic re-emergence of epidemic vector-borne diseases have been reported in the past 30 years throughout much of the world. Nowadays, farmers and growers are under huge pressure to reduce the reliance on chemical parasiticide without forfeiting yields or crop quality. *Biorational* pesticides have limited or no adverse effects on the environment, non- target organisms including humans. They, optimistically, are gaining popularity in the current climate of environmental awareness as well as public concern. Biorationals include biochemicals as botanicals, pheromones, photo insecticides, fatty acids, inorganics, and insect growth regulators; biologicals, using competitors and natural enemies such as parasitoids, predators, nematodes, and pathogens; and transgenic pesticides. Besides having medical, veterinary, and economic importance, controlling pests naturally and safely is enthralling (fun), which could yield products (profit). We should be ahead of pests and try to win the never-ending battle of resistance via searching for safe and complex alternatives that they can't defeat.

Keywords: Pesticides, Biochemical, Botanical, Biological, Repellent, Fumigant, Insect growth regulators, Photosensitizers, Nanopesticides.



**“2nd International Sino-Egyptian Congress on
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Survey of the scale insects and Mealybugs species and their associated natural enemies on mango trees in different governorates in Egypt.

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Abstract

Studies on survey of scale insects and mealybugs infested mango trees and its associated parasitoids and predators were carried out at many governorates in Egypt during two successive years (2013- 2014 and 2014- 2015). The obtained results provided the occurrence of ten scale insects and mealybugs species found on mango trees. These species were *Kilifiaacuminata* (Signoret), *Ceroplastesfloridensis* Comstock, *Aulacaspistubercularis*Newstead, *Pulvinariapsidii* (Maskell), *Aonidiellaaurantii* (Maskell), *Lepidosaphes pallidula* (Maskell), *Planococcus citri*Risso, *Iceryaseychellarum* (Westwood), *Maconellicoccus hirsutus* (Green) and *Hemiberlesia lataniae* (Signoret). Also, We recorded many species of parasitoids were associated with scale insects and mealybugs during two years of study. The parasitoids species were *metaphycus flavus* (Haward), *Habrolepis aspidioti*(Compere & Annecke), *Encarsia citrine* Craw, *Aphytis chrysomphali*Mercet and *Aphytis lepidosaphes* Compere and we recorded several of predators were associated with scale insects and mealybugs, *Rodalia cardinalis* (Mulsant), *Scymnus syriacus* (Marseul), *Exochomus flavipes* (Thunberg) and *Hemisarcoptes coccophagus* (Meyer).

Keywords: Survey, Scale insects and mealybugs, parasitoids and predators, Mango trees, Egypt.



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Integrated management of tomato sclerotinia rot disease by using the combined treatments between compost, bioagents and some commercial biocides

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Abstract

Efficacy of compost, bioagents and some commercial biocides individually or in combination for managing tomato sclerotinia rot caused by *Sclerotinia sclerotiorum* (Lib.) de Bary under greenhouse and field conditions was studied. Results indicated that *Trichoderma album* and *Bacillus subtilis* were the best bioagents in inhibiting the mycelial growth of *S. sclerotiorum* *in vitro*. All treatments significantly reduced disease incidence and severity of tomato white rot disease compared with untreated control. However, *Trichoderma album* and *Pseudomonas fluorescens* integrated with compost reduced disease incidence and disease severity from 100 and 77.40 in control to 11.1 & 1.5% and 11.1 & 2.5% respectively under greenhouse conditions. The integrated *Trichoderma album*, *Pseudomonas fluorescens* and Bio-Zeid with compost recorded the highest increase of fresh weight and dry weight of shoots and roots compared with the individual treatments and control. Under field conditions, adding compost to the soil pre-transplanting decreased the percentage of infection and increased yield of tomato plants compared with un-amended treatments with compost. In this respect, the integration between *T. album* + *B. subtilis* + *Ps. fluorescens* and compost was the most effective treatment where it reduced effectively the disease incidence and disease severity to be 4.16 & 2.3 % respectively. As well as, it increased fruit weight per plant from 2.1kg in control to be 3.85 kg. All treatments increased phenols and flavonoids content in treated tomato plants. The highest increase in the total phenols and flavonoids contents were recorded with *Trichoderma album*, *Pseudomonas fluorescens* and Bio-Zeid integrated with compost. Also, all treatments increased peroxidase (PO), polyphenoloxidase (PPO), chitinase and β -1, 3- glucanase activities in treated tomato plants. It could be concluded from the obtained results that the combination between compost, bioagents and some commercial biocides might be useful as a good tool for controlling tomato sclerotinia disease caused by *Sclerotinia sclerotiorum* under greenhouses and field conditions.

Keywords: Tomato, Sclerotinia rot, Bioagents, Commercial biocides, Compost, Enzymes.



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Epidemiology of *Rhinoestrus* spp. Larvae Infesting Donkeys in Egypt

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Abstract

The aim of this study was updating the information about the prevalence of infestation with *Rhinoestrus* spp. larvae in Egypt and as a result determining the correct time for chemotherapy. 303 Egyptian donkeys (*Equus asinus*) of different ages and sex slaughtered at Giza Zoo slaughter house from June 2014 to May 2015 were examined for the presence of *Rhinoestrus* spp. larvae. A total of 8388 *Rhinoestrus* spp. larvae [7221 L1 (86.08%), 545 L2 (6.49%), 622 L3 (7.41%)] were recovered from 74.91% of donkeys with an overall mean of 27.68 ± 2.43 larvae per head. Heavier infestations were recorded in winter and summer. There were more than two generations of *Rhinoestrus* spp. occurred in the year. Two yearly treatments during June and November are recommended for eradication of such infestation from donkeys.

Keywords: *Rhinoestrus* spp., Prevalence, Donkeys, Egypt.



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Skin hypersensitivity test against nasal bots infestations in Donkeys and Camels

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Abstract

The objective of this study was assessing the Intradermal test (IDT) in the diagnosis of both rhinoestrosis and cephalopinosis. 12 female Egyptian donkeys (*Equus asinus*) admitted to Giza zoo abattoir from Bani-suef, beside, 6 males one-humped dromedary camels (*Camelus dromedarius*) admitted to camel hosting house of El-Basateen slaughter house were subjected to an intradermal injection of 0.5 ml of PBS PH (7.2) at one side of the neck and this served as negative control; on the other side of the neck each animal received 3 intradermal injections of 3 different protein concentrations (0.5mg/ml, 1mg/ml and 1.5 mg/ml) for each antigen (Excretory secretory product (ESP), Salivary gland extract, Mid-gut extract and Mixed crude extract of *Rhinoestrus* spp. larvae, and, 1st larval instars crude extract and salivary gland extract of *Cephalopina titillator* larvae). The results of the IDT were determined through measuring the diameter of the resulting wheals using a scale bar and by detection of presence or absence of skin reactions. The swelling size in the skin was increased with increasing the concentration of the injected antigen. Most animals showed skin reactions after 30 min. The results signified the critical role of IDT in early diagnosis of rhinoestrosis and cephalopinosis.

Keywords: Rhinoestrosis, Cephalopinosis, IDT, Diagnosis.



8. Livestock Production and Reproduction



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Keynote Paper

Reproduction of Egyptian Buffaloes (from Ancient to Modern Technology)

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Abstract

In Egypt buffaloes (*Bubalus bubalis*) are a traditional farm animal, which used as the main source of red meat (66% of the total national production of milk and 45% of the meat). Under good management, milk production ranges between 1000 and 3000 kg per lactation, two to three times higher than that of native cows. The prenatal and postnatal morphological and histological changes in the buffalo ovaries may help to give an idea about the postnatal reproductive life. Early estimation of amniotic fluid testosterone and estrone sulphate levels and chromosomal analysis would facilitate an early identification of the gender of buffalo embryos. Concerning Artificial Insemination (A.I) technique, the use of milk extender for freezing buffalo semen packaged in mini straws is an efficient method for obtaining good quality semen and high fertility rate. Regarding the in vitro fertilization and embryo production in buffaloes, better recovery, maturation, fertilization rates and embryo production were achieved when ovaries stored not more than 4 hours post-slaughter in warm sterile saline and the medium sized follicles (2-8 mm) should be selected by aspiration technique, buffalo oocytes should be incubated for 22 - 24 hours in TCM-199 provided with either FCS or EBS, in vitro matured oocytes should be inseminated with fresh semen that has been capacitated by heparin and/or caffeine at a concentration of $2-3 \times 10^6$ sperms/ml and Vitriification is a successful method for cryopreservation of matured buffalo oocytes but still has adverse effects on the viability and percentage of oocytes reached Metaphase II. Clinco-therapeutic strategies for improving reproduction revealed that Injection of β blockers (Carazolol) at the time of calving together with the addition of L-Tyrosine in ration at 21 days postpartum resulting in the shortening in the time needed complete uterine involution, first postpartum observed heat and conception. New Strategy of reproductive management for estrus synchronization revealed that, The estrous response is more evident on using the Heatsynch, than Ovsynch in buffalo heifers, The long heat duration for buffalo heifers under the effect of estradiol (32 – 34 hr) might be beneficial in allowing more time for the estrous detection and optimizing the proper time of insemination, Estradiol esters (EB and ECP) could be used as part of timed insemination program in buffalo heifers to replace the second GnRH injection of an Ovsynch program. Our duties must be focused more attention toward the modern biotechnology and genetic mapping techniques.

Keywords: *Bubalus bubalis*, Egypt buffaloes, Artificial Insemination, estrus synchronization.



Effect of herbal plants “ *Thymus vulgaris* and *Rosmarinus officinale*” on growth performance and protection of *Oreochromis niloticus* against *Aeromonas hydrophila* infection

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Abstract

The present study was carried out to investigate the effects of thyme and rosemary as feed additives on growth performance, cellular immunity, and protection of *Oreochromis niloticus* against *Aeromonas hydrophila*. Fish were divided into 3 groups and fed on three experimental diets (basal diet 0%, 1% thyme, and 1% rosemary). Fish received thyme and rosemary treated diets showed a significant increase ($P<0.05$) in weight gain rate, specific growth rate, and average body weight at 2nd and 4th weeks. Feed conversion ratio revealed significant increase at 4th weeks for thyme treated group compared to the control. Intestino-somatic index was significantly increased ($P<0.05$) in thyme fed group at 6th weeks while hepato-somatic index exhibited significant increase ($P<0.05$) at 2nd weeks post feeding for rosemary treated fish. Blood parameters showed that total erythrocytes, packed cell volume, hemoglobin concentration, total leucocytes and differential leukocytic count were significantly increased in thyme-treated group at 6th weeks. Fish fed on rosemary-supplemented diet revealed significant increase in total leukocytic counts at 4th and 6th weeks, while differential leukocytic count had significant increase along the experimental period. Serum lysozyme activity was significantly increased in thyme fed group along the whole period and in rosemary treated group at 2nd and 4th weeks in relation with control. Nitric oxide was significantly lower in thyme fed group than the control group. Antioxidant enzymes Superoxide Dismutase, Catalase and Glutathione Reductase revealed significant increase ($P<0.05$) with significant decrease of malondialdehyde in thyme treated group in relation with control. Challenge infection by *A. hydrophila* showed highly significance protection with survivable rate of 90 % in groups fed with rosemary and thyme for 6 weeks. The results suggested that thyme and rosemary can be recommended as a supplementary for *O. niloticus* increasing the protection against *A. hydrophila*.

Keywords: herbal plants, *Thymus vulgaris*, *Rosmarinus officinale*, *Oreochromis niloticus*, *Aeromonas hydrophila*.

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**Use of glycerolized Bovine pericardium versus polypropylene mesh for hernioplasty
in domestic animals**

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Abstract

Eighty animals (21 cow calves, 17 buffalo calves, 19 sheep, 6 goats, 5 bulls, 6 horses, 5 donkeys, and one mule) with umbilical, abdominal, inguinal or scrotal hernias were included in this study. These animals were randomly assigned to one of two groups. In the first group, the hernial defects were repaired by using Glycerolized Bovine Pericardium (GBP, n=35 cases), while the defects in the second group were repaired by using Polypropylene mesh (PPM, n=45 cases). The clinical symptoms as well as the ultrasonographic images of these cases were described and illustrated. Follow up of the clinical cases was carried out for two months. Comparison between the two groups was outlined. All cases treated using GBP showed successful healing without major complications. On the other hand, cases treated using PPM showed delayed healing (7 cases, 15.56%) and recurrence (4 cases, 8.88%). The results of this study demonstrated that Glycerolized Bovine Pericardium could be used for hernioplasty in domestic animals. It is less expensive and has less postoperative complications than Polypropylene mesh.

Keywords: Glycerolized Bovine Pericardium, Hernioplasty, Hernia, Polypropylene mesh.



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Effect of *in ovo* somatostatin injection on some immunophysiological parameters in Japanese Quail

Rasha, E. Azab^{1,*}, Fattahallah, M. M.¹, Azab, M. E.¹, Randa, S. Ismail¹ and Abeer, A. Nafeaa¹

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Abstract

This study was carried out to investigate the effect of *in ovo* somatostatin injection on some physiological and immunological parameters. A total number of 600 Japanese quail eggs were incubated at 37.5°C and 50-60% relative humidity, with automatic turning every two hours till the 15th day of incubation. On the 5th day of incubation (day of injection), the eggs were randomly divided into three equal groups, and the solutions were injected into the yolk sac through the narrow end. After hatching, hatchability percentages and hatching weights were recorded. Twenty birds (ten males and ten females) from each group were identified and weighed weekly for successive 8 weeks to evaluate the live body weights. The amount of utilized food and body weight gain were recorded to calculate both feed intake and feed conversion rate. For 4-time periods (1st, 4th, 6th and 8th weeks of age), three birds from each group were slaughtered then muscle (chest) and spleen samples were collected for molecular investigation of insulin like growth factor(IGF)-1, interleukin(IL)-1 β and IL-2. The results of this study concluded that somatostatin significantly decreased hatchability, hatching weights and live body weights of male and female Japanese quails but it resulted in significant increases in the daily feed intake and feed conversion rate. The relative expressions IGF-1, IL-1 β and IL-2 genes were significantly downregulated after somatostatin injection.

Keywords: *In ovo* injection, Somatostatin, Body weight, feed intake, IGF-1, Interleukins.



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Effect of *in ovo* Melatonin Injection on Some Immunophysiological Parameters in Japanese Quail

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Abstract

This study was carried out to investigate the effect of *in ovo* melatonin injection on some physiological and immunological parameters. A total number of 600 Japanese quail eggs were incubated at 37.5°C and 50-60% relative humidity, with automatic turning every two hours till the 15th day of incubation. On the 5th day of incubation (day of injection), the eggs were divided into three equal groups and the solutions were injected into the yolk sac through the narrow end. After hatching, hatchability percentages and hatching weights were recorded. Twenty birds (ten males and ten females) from each group were identified and weighed weekly for successive 8 weeks to evaluate the live body weights. The amount of utilized food and body weight gain were recorded to calculate both feed intake and feed conversion rate. For 4-time periods (1st, 4th, 6th and 8th weeks of age), three birds from each group were slaughtered then chest muscle and spleen samples were collected for molecular investigation of insulin like growth factor(IGF)-1, interleukin(IL)-1 β and IL-2. The obtained results concluded that melatonin significantly increased hatchability, hatching weights and live body weights of male and female Japanese quails but it significantly decreased the feed intake and feed conversion rate. The relative expressions of IGF-1, IL-1 β and IL-2 genes were significantly upregulated after melatonin injection. Melatonin can be used commercially to improve quail productivity.

Keywords: *In ovo* injection, Melatonin, Growth, Immunity, IGF-1, Interleukins



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Keynote Paper

**Synthesizing new rabbit line to be diffused for the small breeders in Egypt:
Emphasis of results and prospects of developmental project in Qalyoubia
governorate**

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Abstract

This review article is dealing with the foundation process of new synthetic rabbit line named Moshtohor, characterization of the line, genetic diversity and polymorphism in progesterone receptor gene, and intensification and diffusion of such synthesized rabbits. This line was created using a crossbreeding program between Sinai Gabali and Spanish V-line rabbits followed by several generations of selection and *interse* mating. Also, this line was selected to increase litter weight at weaning and individual weight at 56 d using the BLUP method under a repeatability animal model. Global assessment and characterization of the line were commented in terms of reproductive efficiency, lactational and maternal abilities, growth rate, carcass traits and semen quality. Recently, molecular analyses searching for some genes associated with certain productive and reproductive traits in this synthesized rabbits were performed. To illustrate the role of the Faculty of Agriculture, Benha University in serving the surrounding community, a developmental project granted from Banque Misr since 2013 and titled "Intensification of breeding and production of genetically improved Moshtohor rabbits" was applied. The Main objectives of this project were: 1) to diffuse Moshtohor line rabbits to the small breeders in Egypt and Qalyoubia governorate in particular, 2) to spread the culture of rabbit breeding in the Egyptian villages, and 3) to evaluate the current situation and prospectives of the project. During the execution of this project, a total of 5024 rabbits, 1406 bucks and 3618 does were distributed to 876 small breeders in 11 villages; 9 of them located in Qalyoubia governorate in Nile Delta and the other two located in Upper Egypt. Means of litter traits in Moshtohor rabbits were 3252±43 g, 6.94±0.24 kit, 5.77±0.27 kit and 3415±130 g for doe weight at kindling, litter size at birth, litter size at weaning and total milk yield during 4 weeks of lactation, respectively, while the means for body weight at 4, 8 and 12 weeks of age, daily weight gain from 4 to 8 and from 8 to 12 weeks of age were 589±7 g, 1193±14 g, 1676±18 g, 21.2±0.4 g and 17.5±0.6 g, respectively. Moshtohor rabbits showed good carcass traits where the means for fasting weight, hot carcass weight, dressing percentage and commercial carcass weight were 1775.5 g, 1048 g, 59 % and 1020.3 g, respectively. Regarding semen quality traits, Moshtohor bucks had superior values and recorded 0.72±0.01 ml, 7.75±0.03,



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456.11×10⁶±4.2, 2.41±0.04, 54.82±0.7 %, 81.99±0.25 % and 12.09±0.14 % for ejaculate volume, semen pH, sperm concentration, mass motility, individual sperm motility, live sperm per ejaculate and sperm abnormalities, respectively. Diffusion of the synthesized Moshtohor rabbits could offer another source of meat for the small breeders in Qalyoubia villages, in addition to create some job opportunities. Genetic diversity and phylogenetic relationship between Moshtohor rabbits as a synthetic line and their parental rabbits of Spanish V-line and Sinai Gabali were assessed using microsatellite techniques. The polymorphism of the SNP (G/A₂₄₆₄) in progesterone receptor gene (*PGR*) based on PCR-RFLP were detected. A close relationship between Moshtohor and V-line (0.18) was supported by clustering analysis and the population structure appeared as one admixed mosaic cluster. The highest effective number of alleles for SNP of *PGR* gene was recorded for Moshtohor line (1.987). The means of observed and expected heterozygosity and the polymorphic information content were 0.840, 0.497 and 0.373, respectively.

Keywords: Moshtohor rabbits, line synthesizing, BLUP evaluation, genetic diversity, SNP analysis, developmental project, rabbits diffusion.



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**Application of Bio-floating Bed on Intensive Pond Culture: An Approach for
Cleaning Water and Improving Fish Muscle Quality**

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Abstract

A planted bio-floating bed equipped in the intensive pond can be used to clean water through absorbing exceeded nutrients in culture pond water by plants and biodegradation by microbiota colonized in the bed matrix. Fish production and flesh quality are significantly related to aquaculture environment. In order to study the growth and flesh quality of fish cultured in the ponds with bio-floating bed, we chose grass carp (*Ctenopharyngodon idellus*) culture ponds as experimental ponds and designed two groups to evaluate the effect of bio-floating bed. One was the treatment equipped with bio-floating bed planted with water spinach (*Ipomoea aquatica*). The other was the control without treatment. The results showed that the usage of bio-bloating bed significantly reduced the concentrations of nitrite and ammonia in pond water as well as increased water transparency. Compared to the control, occurrence of fish disease declined in the treatment group. Grass carp in the treatment ponds grew faster than that in the control. Flesh weight gain was significantly greater than that of the control ponds. Fish in the treatment ponds exhibited significant higher flesh content and lower visceral mass ratio. A significant higher content of crude protein and a lower content of fat were observed in muscle of fish in the treatment ponds. Flesh water holding capacity was higher in the treatment than those in the control. The values of hardness, springiness, gumminess, and chewiness were higher in the treatment ponds, whereas cohesiveness and resilience was higher in the control ponds. The significant differences were found in springiness, overall acceptability, aroma, and palatability in sensory evaluation of the fillets of grass carps between the treatment and control groups. In conclusion, planted bio-floating bed could not only restore pond environment but also improve cultured fish flesh quality.

Keywords: Bio-floating, Fish Muscle Quality, *Ipomoea aquatic*.



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Estimation of genetic and phenotypic parameters for some productive and reproductive traits in Egyptian Buffaloes

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Abstract

The present study aimed to display effects of age at first services, age at first calving (AFC), calving interval, days open, number of services per conception, days dry, season of calving on total milk yield (TMY) and 305 milk yield (305MY). Also, to estimate effect of season and parity on calving interval (CI) and days open and then the effect of level of production on service per conception, age at first service, age at first calving, calving interval and days open. Heritability estimates for 305-day milk yield (0.18), days open (0.18), dry period (DP) (0.12), TMY (0.17) and CI (0.19). High heritability estimates were obtained for AFC (0.68) and lactation length (LL) (0.78). There were high positive genetic and phenotypic correlations between total milk yield and 305-day milk yield and low genetic and phenotypic correlations between most studied traits. Average EBV for AFS, AFC and 305MY were higher in cow than sire and dam. Also, average EBV for LL and DO were higher in sire than in cow and dam and average EBV for CI and DP were higher in dam than in cow and sire. But TMY was equal in sire and dam and higher than cow.

Keywords: Dairy buffalo, productive and reproductive traits, heritability, genetic and phenotypic correlation, breeding values.



**Comparative study on the effect of organic acids, prebiotics and enzymes
supplementation on broiler chicks' economic and productive efficiency**

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Sayed Abo-Salem² and Sanad Talaat Atallah³**

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Abstract

This study was conducted to evaluate the effects of different feed additives (Organic acids, Prebiotics and Enzymes) on economic and productive efficiency for two different broiler breeds. A total of 264 healthy unsexed one-day-old broiler chicks (Cobb and Indian River (IR) breeds) were allocated randomly in to eight groups (33 chicks/each group). Each group consists of three replicates (11 chicks/each replicate). Our results clarified that the value of final body weight of Cobb breed was the highest for organic acid (OA) treated group (2176.5187 gm) and the lowest value was for prebiotics treated group (1985.14 gm), while control group of (IR) breed showed the highest body weight (2238.87 gm) and the lowest value was for prebiotics treated group (2086.27gm). Cobb group treated with organic acid showed higher body weight than IR group treated with organic acid. Concerning net profit value, it was higher for control group of (IR) breed than the control group of Cobb breed (L.E 17.71 and 15.47 respectively), and the lowest net profit value was for prebiotics treated group for both Cobb and (IR) breed respectively (L.E 13.50 and 15.28). From our results, it would be concluded that organic acid was better than other used feed additives, and they had an important role in improving economic and productive efficiency of Cobb broiler Chicks'.

Keywords: Organic acids, Prebiotics, Enzymes, Body weight, IR, Cobb, Net profit.

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The effect of adding probiotic (Baymix®) and oregano essential oil (*Origanum majorana*) to diets on productive and economical performance of broiler chicks

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Abstract

The present study was aimed to investigate the potential effect of dietary supplementation of probiotic (Baymix®) and oregano essential oil (*Origanum majorana*) on productive performance of Hubbard broiler chickens. A total number of 420 unsexed broiler chicks one day-old were used in this study, chicks were randomly divided into seven experimental groups each of 60 birds in 3 replicates per group (20 chicks each). Chicks of the 1st group fed starter and grower basal diet (considered as control). Chicks of the 2nd, 3rd and 4th groups were fed on basal diet supplemented with Baymix® (PB) with levels of 0.5, 1.0 and 1.5 g/kg diet, respectively. While, chicks of the 5th, 6th and 7th groups fed basal diet supplemented with oregano essential oil (OEO) at a levels of 0.5, 1.0 and 1.5 g/kg diet, respectively. The obtained results showed high significant variations ($P<0.05$) were found in live body weight (LBW), body weight gain (BWG), growth rate (GR), feed conversion (FC), Mortality rate (MR), performance index (PI) and economical efficiency (EE) during all periods of estimation due to treatments applied. Chicks fed diet supplemented with OEO at a level of 1.5 g/kg diet significantly improved in growth traits (LBW, BWG, GR), FC, PI and decreased MR followed by those fed diet supplemented with OEO at a level of 1.0 g/kg diet, then by those fed diet supplemented PB at a level of 1.0 g/kg diet compared to the other treatments applied and control group. From the economic point of view, it could be recommended to use PB and OEO at a level of 1.0 g/kg diet as growth promoter to increase the productive performance of Hubbard broiler chicks.

Keywords: Broiler chicks, Probiotic, oregano essential oil, growth performance, economic efficiency.



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Effect of adding antibiotic, oregano essential oil and garlic powder levels on carcass meat yield, chemical composition, meat quality and microbial count of quails

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Abstract

This study was carried out to evaluate the effects of dietary supplementation of antibiotic, oregano essential oil and garlic powder as feed additives in quail diets on carcass meat yield, meat chemical composition and quality and meat microbial count of quail birds. A total number of 540 unsexed one week old Japanese chicks were randomly distributed into nine experimental treatments, each of 60 birds (3 replicates of 20 birds each). Chicks of the 1st experimental group were fed on basal diet without additives and considered as a control group. Chicks of the 2nd and 3rd experimental groups were fed on basal diets supplemented with oxytetracycline at levels of 0.5 and 1.0 g/kg diet, respectively. Chicks of the 4th, 5th and 6th groups were fed on basal diets supplemented with oregano essential oil (OEO) at levels of 0.5, 1.0 and 1.5 g/kg diet, respectively while, chicks of the 7th, 8th and 9th groups were fed basal diets supplemented with garlic powder (GP) at levels of 0.1, 0.2 and 0.3 g/kg diet, respectively. The obtained results revealed that high significant variations ($p \leq 0.001$) were found in absolute and relative carcass weights, chemical composition, detected antibiotic residues, sensory evaluation and microbial population count of quail meat. Chicks fed on diet supplemented with OEO at levels of 1.5 and 1.0 g/kg diet, respectively showed the highest significant improvement in carcass meat yield and quality and recorded the lower microbial population content in resulted meat compared with the other experimental groups and control group, followed by those fed on diet supplemented with 0.2 g/kg GP that showed slightly improve in the same traits. Thus, it could be recommended to use OEO at levels of 1.5 and 1.0 g/kg diet and GP at levels 0.2 g/kg diet in quail diets as growth promoters instead of antibiotics to improve carcass meat yield and quality of quails.

Keywords: Quail, Oregano essential oil, Garlic, Blood Parameters, Meat quality.



9. Horticultural Sciences



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**Identification of a negative MYB regulator of anthocyanin biosynthesis in peach
fruit**

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Abstract

Anthocyanin accumulation in fruit is beneficial for human health due to the anti-oxidation activity. Here, we report the feedback regulation mechanism underlying anthocyanin accumulation in peach mesocarp. In blood-flesh peach cultivar ‘Dahongpao’, the expression level of the positive regulator *PpMYB10.1* increased during fruit developmental stages, and reached a peak at the ripening stage, which accorded with the content change of anthocyanins. Interestingly, one MYB gene, designated *PpMYB6*, also showed high expression level at ripening stages. Functional analysis showed that *PpMYB6* could negatively regulate two anthocyanin structural genes *PpDFR* and *PpUFGT* in dual luciferase assay and inhibited anthocyanin coloration when it was co-infiltrated *PpMYB10.1* in transient color assay. These results suggest that anthocyanin accumulation in blood-peach fruit may be regulated by a feedback loop comprising *PpMYB10.1*, *PpMYB6* and anthocyanin structural genes.

Keywords: *Prunus persica*, anthocyanin, repressor.



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Response of strawberry plants to bio fertilization with methylotrophic bacteria and spray with methanol

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Abstract

Two field experiments were carried out during the two successive seasons of 2014/2015 and 2015/2016 in private sector farm at El-Dair village, Kalubia governorate in sandy soil to investigate the response of two strawberry cultivars namely Fortuna and Sweet Charlie to bio fertilization and spray with methylotrophic bacteria (10 cm³/l) on vegetative growth, chemical composition and productivity of used Strawberry cultivars. Obtained results show that there were significant differences among the studied strawberry cultivars in all measured vegetative growth traits, fruit yield and its components as well as fruit quality. In this respect, cv. Fortuna reflected the highest values of vegetative growth, chemical composition of plant foliage, fruit yield and its components as well as physical and chemical fruit quality. Also foliar spraying plants six times with methylotrophic bacteria at 10 cm³/l starting 20 days from transplanting and every 15 days by intervals during the growth season was superior in total fruit yield and marketable yield. Different tested bio-fertilization (methylotrophic bacteria and methanol) enhanced the vegetative growth, chemical constituents of plant foliage, total produced fruit yield and its components as well as fruit quality. In addition, using methylotrophic bacteria at 10 cm³/l reflected the highest values in all studied growth and yield traits of tested cultivars.

Keywords: Strawberry, cultivars, Fortuna, Sweet Charlie, Methanol, Vegetative growth, yield and quality, Methylotrophic bacteria.



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Utilization of grafting technique for sustaining cantaloupe productivity and quality under low quantity of irrigation water. I. Vegetative growth and chemical composition

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Abstract

Shortage water is the biggest challenge facing horizontal expansion of vegetable cultivation especially in the new reclaimed soil. So that, this experiment was carried out to investigate the possibility of utilizing grafting technique for ameliorating the negative effects of deficit irrigation water on vegetative growth and chemical composition of foliage which will be positively return on the cantaloupe yield as well as water use efficiency (WUE). This investigation was carried out under greenhouse conditions during 2015 and 2016 autumn seasons in a private farm, Kalyobiya Governorate, Egypt. In this experiment, two commercial cultivars "*Ideal* and *Veleta*" were used on its own roots or grafted on two rootstocks (*Cobalt* and *Strong-Tosa*). A modified tongue approach grafting method was used, then seedlings were cultivated under three irrigation levels [100 %, 75% and 50% of Class A pan evapo-transpiration] compared to non-grafted plants. The results showed that moderate level (75% ETC) of deficit irrigation water showed higher significant positive effects on some measured vegetative growth parameters i.e. stem length, branches number, and dry weight while increasing deficit levels up to 50 % ETC reduced all vegetative growth parameters such as stem length, branches number, total leaves area, fresh and dry weight as well as nutrient status i.e N, P and K. Meanwhile grafting treatments reversed these results as they increased values of all recorded items over non-grafted plants under all irrigation levels. Finally, the combination of *Ideal/Strong-Tosa* as well as combination of *Veleta/ Cobalt* resulted in best results of vegetative growth and nutrient status. Where, *Ideal/Strong-Tosa* combination increased vegetative fresh weight by 48.1 and 35.7 % when irrigated by levels 100, and 75 % ETC, respectively compared to non-grafted plants (control treatment) under the same irrigation level but this increase was 52.4 and 34.7 % with regard to *Veleta/ Cobalt* combination. Moreover, these combinations (*Ideal/Strong-Tosa* and *Veleta/ Cobalt*) recorded the lower reduction (28.8 and 17.5 %, respectively) at 50 % ETC as compared with non-grafted plants of either *Ideal* or *Veleta* cv. which recorded the higher reduction (43.2 and 47.7 %, respectively).

Keywords: *Cucumismelo*, Cantaloupe; Grafting; Rootstock-scion; Deficit irrigation water; Water use efficiency.



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**Studies on the physical and chemical changes associated with development of
broccoli curds to determine the maturity stage and the suitable harvesting age**

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Abstract

Two experiments were carried out on broccoli cultivar "Marathon" in the winter seasons of 2013-2014 and 2014-2015 at the farm of the Faculty of Agriculture, AL-Azhar University, Nasr City, Cairo. Curds of 5, 10, 15, 20, 25 and 30 days from the start of bud formation were used to study the changes occurred in the physical and chemical characteristics during developmental stages which stored under cold storage (8°C and 60-65% RH) to determine the maturity stage and the most suitable age for harvesting. The obtained results showed that there was a slow increase in the initial periods in the curd fresh weight and size until the age of 20 days which was followed by a sharp increase up to the age of 30 days exhibiting statistically a curvilinear shape. Meanwhile, the curd diameter increased from the start of curd formation up to the last examining age establishing a linear shape. Moreover, rapid accumulation in the contents of total chlorophyll, total carotene, titratable acidity, ascorbic acid and total sugars were detected up to the age of 25 days then followed by a decline up to the last age showing statistically a curvilinear shape. In addition, a linear curve with T.S.S. and dry weight which increased steadily with the progress of age from the start of curd formation up to the last examined age of 30 days. Furthermore, storing the curd developmental stages at 8°C and 60-65% RH exhibited that the age of 25 days reflected the minimum loss in weight, unmarketable percentage, lower degradation in colour during storage and contained the highest contents of total chlorophyll, T.S.S, ascorbic acid and total sugars. So, the curd maturity stage was determined at the age of 25 days from bud formation which consider fortunately the most suitable age for harvesting.

Key words: Broccoli, curds, maturity, harvesting.



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Evaluation of some female Jojoba shrubs under sandy land conditions

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Abstract

This investigation was carried out on female Jojoba (*Simmondsia Chinensis*, (Link) Scneider) shrubs in a private orchard at El-Haik-Step-Cairo Governorate to evaluate 15 female shrubs were about 8 years old during two successive seasons of 2014 and 2015. The shrubs growing in sandy soil in 4 lines at distance 3 × 3 meter part and irrigated with drip irrigation system. Through the rigorous assessment of female selected jojoba trees through the measurements of vegetative growth, floral measurements, productivity and the percentage of oil. The study recommends the following: Firstly: the strongest shrubs No. (1, 2, 5, 9, 10, 12) and (15). Second: The shrub number No (4) was the earliest one in the flowering date in the first and second seasons. Third: the highest yield recorded for female shrubs No. (5, 10, 12) and (15) in the first season while, in the second one were No. (9) and (12) on the branch. Fourthly: the female shrubs No. (13,2,5) and (7) gave the highest oil content in the first season, While in the second season, the female shrub No. (11) was the best Fifthly : genetic fingerprint of different species was made using 15 primer and it resulted in 5 positive primer and unaffected 10 then, when using ISSR marker the results showed that there are differences between breeds. It is clear from the foregoing that the shrubs No. 5,4,12, and 11 were the best in the strength of growth, early harvest, production and oil content percentage, and can be more vegetative and cultivated. As for a high value of genetic similarity was No. 8 and 6 and also, the highest similarity value (0.875) was found between the strains (T8 and T6) followed by 0.792 between (T5 & T15, T8 & T13 and T11 & T14), respectively. Generally, genetic similarity value was low among the investigated strains.

Keywords: Female Jojoba, Jojoba oil content, genetic fingerprint, primer.



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Keynote Paper

Challenges of incorporating the Science-Based Food Risk Assessment Technique in the Official Food Control Systems in Developing Countries

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Abstract

A considerable progress to strengthen food safety systems has been achieved in many developing countries, often with the support of the WHO and/or FAO food safety/security programs applied in many Regions. One of the most important challenges faced and still facing food control authorities and other regulators interested in food safety and consumer protection in developing countries has been addressed in incorporating Risk Analysis process, including risk assessment, in the official food control systems, in that it will need that the governmental food control shall cover the whole food chain, in full, depending on the type of food and type of hazard and its origin along with the whole food chain (local, imported and exported food). The most importantly, is the success in choosing the appropriate and effective measures and actions that can control, protect or even moderate risk, to maintain an acceptable level of safety and protection of consumer health, etc. Moreover, Lack of the effective coordination between competent authorities of food control in a country has been counted as an important challenge, as well. The present discussion paper is meant to explain in brief the basics of the Risk Analysis including the role of risk assessment in food safety as well as emphasizing the imperative presence of an ambitious national strategy and plan of action to start the incorporation of the risk analysis concept in the governmental food control system for local, imported and exported food, as one of the modern techniques which rely on the scientific basis for overall managing of risks arising from food. This strategy must take into consideration all the potential sources of pollution and contamination might be met with along with the food chain, including all kinds of foods with hazards and their origins. Important was also to mention the main components of the official food control system in the country, such as, and not exclusive to: food legislation, food administration and human resources, food inspection, food analysis and accreditation of laboratories, epidemiology and investigation of food-borne diseases, information systems, training and health education, etc. The strategy of incorporating the concept of risk analysis with its 3 components, risk assessment, risk management and risk communication, in the official food control must define and describe the current situation of the food control system



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applied in the country and perform a SWOT analysis of strengths and weaknesses, threats and opportunities for the internal and external environments of the system, as well as a study of gap analysis between current and desired situation after the introduction of the of risk analysis concept in food control system in accordance with international concepts in this regard. The strategic objectives and activities to achieve this goal should be planned. The action plan for the implementation of the strategy should include objectives, activities, mechanisms, responsibilities, time frames and success indicators for implementation after the end of the specified periods to realize the outcomes according to targets and policies. This conference is a good opportunity to open mutual extensive discussions about good use or taking advantage of using Risk Analysis Techniques in Developing Countries, particularly for launching Strategies for performing Risk Assessment studies for traditional foods and their specific hazards, if present, in every Developing country.

Keywords: Risk Analysis technique, risk assessment, risk management, risk communication, risk analysis strategy, food chain, food safety hazards, food control systems.



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Application of emerging technology for controlling and improving of food safety

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Abstract

Nanotechnology has emerged as one of the most innovative technologies, with the potential to improve food safety. This study will be aimed to develop the biosensor as a rapid technique for detecting the microbial and chemical contamination in food. The biosensors combine a biological recognition element (enzyme, antibody, receptor) with a transducer to produce a measurable signal proportional to the extent of interaction between the recognition element and analyst will be designed and tested. Three foodborne pathogens; Escherichia coli O157:H7; Staphylococcus aureus and Salmonella Typhimurium shall be inoculated at different dosages in deli meat. Additionally, two chemical contaminants such as aflatoxins B1 and B2 will be inoculated at different concentrations in peanut. Both contaminants would be detected using conventional methods and biosensor. The results will analyze statically, and determine the biosensor method efficiency.

Keywords: Nanotechnology, biosensor, foodborne pathogens, aflatoxins, microbial Contamination.



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Utilization of Sprulina Algae to improve the nutritional value of kiwifruits and cantaloupe nectar blends

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Abstract

In this study use the spirulina which is one of the blue-green algae rich in protein 61.57% and contains a high proportion of essential amino acids (38.81% of the protein) and a source of naturally rich in vitamins especially vitamin B complex such as vitamin B12 (193 µg / 100 g) and folic acid (9.66 mg / 100 g), which helps the growth and nutrition of the child brain, also rich in calcium and iron it containing (1043.625 and 338.765 mg / 100 g, respectively) to protect against osteoporosis and blood diseases as well as a high percentage of natural fibers. So, the spirulina is useful and necessary for the growth of infants and very suitable for children, especially in the growth phase, the elderly and the visually appetite. It also, helps a lot in cases of general weakness, anemia and chronic constipation. Spirulina contain a selenium element (0.0488mg/100 g) and many of the phytopigments such as chlorophyll and phycocyanin (1.472% and 14.18%), and those seen as a powerful antioxidant. Finally, spirulina called the ideal food for mankind and the World Health Organization considered its "super food" and the best food for the future because of its nutritional value is very high. In this study, products supported with spirulina, kiwifruits and cantaloupe were manufactured. Two types of vegetable and fruit juices, green and were used frequently in commercial manufacturing (cantaloupe - kiwi). Spirulina was added to them at different rates (zero control samples, 2.5, 5, 7.5, 10, 12.5 and 15% spirulina) The nectar blends were well studied to determine the best percentage of addition and then the analysis were done for the chemical, natural and microbiologically properties of nectar blends supported by spirulina. The rheological tests were performed by measuring the viscosity of the processed nectar blends. The all nectar blends prepared and supported by spirulina were highly accepted. Therefore, it is recommended to use spirulina in the field of strengthening juices, especially the rich types of chlorophyll, anti-oxidant and beneficial to public health such as kiwifruits and cantaloupe.

Keywords: Spirulina - Kiwi Nectar - Cantaloupe Nectar - Chemical composition - Nutritional value- sensory evaluation - physiochemical characteristics - microbiologically examination - rheological characteristics.



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The impact of conditions and methods of extraction on the proportion of some plant pigments in the alfalfa plant and the pumpkin fruits

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Abstract

Natural colorants are generally regarded as Safe (GRAS) substances. Therefore, they are more desirable than the synthetic ones for industrial or commercial applications as food additives. However, they are more expensive to obtain and usually they have lower stability, restricting sometimes their practical use as colorants. There for this study was done for obtaining plant pigments with important characteristics in food processing (antiseptics, antimicrobials and enhancers for sensory properties) of waste or some non-traditional sources such as clover and pumpkin. The objectives of this study was to extraction natural pigments from plants and examine the effects of temperatures and pH values on the pigment stability from alfalfa and pumpkin under various temperatures and pH conditions. The study will help improve extraction of pigments from alfalfa and pumpkin and promote better utilization of the extracted chlorophyll and carotenoids as food processing. The samples were obtained in fresh form, cleaned, washed and dried in the laboratory. The effect of solvents and the identification of the best solvents in extraction were studied. The carotenoids were estimated using HPLC in both the peel and pulp pumpkin. The results obtained were 9.874, 4.747 mg/100 g respectively, and the proportion of carotenoids in the pumpkin peel was higher than the pulp. More solvent in the extraction of carotenoids such as petroleum ether, ethanol and Hexane the best solvent in the extract was the petroleum ether. The concentration of the extracted carotenoids was 28.68 µg/g. The highest percentage of carotenoids in the seed residue was followed by the pulp and then the peel 29.76, 27.878, 23.286 µg / g respectively. to extract chlorophyll from the leaves and stem of alfalfa solvents were also used methanol, ethanol 77%, ethanol, acetone, hexane and toluene were the best solvents methanol followed by ethanol 77%. The concentration of pigment in leaf and stem was 62.302, 23.744 mg/L 60.063, 13.011 mg/L respectively.

Keywords: Pumpkin, Alfalfa, Carotenoids, Chlorophyll, Chemical composition, Solvent, Color stability, Effect pH and Temperature.

Chemical composition, sensory and rheological properties of some red pepper and tomato sauce blends



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Abstract

In this study, due to the nutritional and nutritional value of red pepper and tomatoes and the spread of their use locally and internationally, this study was use of red pepper as raw material for the production of red pepper sauce because of its health and medical benefits. Fresh red peppers and tomatoes were used in the preparation of puree and each were used in the production of red pepper sauce blends of red pepper and tomatoes as follows, (100% tomatoes, 90% tomatoes + 10% red peppers, 80% tomatoes + 20% red peppers, 70% tomatoes + 30% red peppers, 60% tomatoes + 40% red peppers, 50% tomatoes + 50% red peppers, 40% tomatoes + 60% red pepper, 30% tomatoes + 70% red pepper, 20% tomatoes + 80% red peppers, 10% tomatoes + 90% red pepper and 100% red pepper). The results showed that all the samples that were made in the mix obtained high scores in the sensory evaluation in color, taste, odor, texture and general accessibility. The results obtained showed that the pepper sauce manufactured from (50% tomatoes + 50% red pepper) have the best results (highest scores) in sensory evaluation. Moreover, stored at room temperature for 9 months. The blends were chemically analyzed every three months during storage. Microbiological quality was also tested and evaluated. The results showed that total soluble solids were slightly reduced during storage. As for the pH and total sugars, they also decreased with storage. Chemical analysis showed increased beta-carotene, lycopene and ascorbic acid, with the addition of red pepper in the sauce composition, and the microbial content of all samples was constant for six months. However, the increase was still below the allowable level of dietary laws. Since the first quality factor to determine the acceptability of the sauce products is the strength. The rheological properties of all the manufactured blends were estimated. The viscosity was measured by the Brookfield apparatus, The results obtained by using some of the mathematical equations used to describe the rational behavior, namely the equations of the Power law, Herschel-Bulkley and Bingham rheological models, and all the samples behaved the non-Newtonian (pseudoplastic) behavior, behave as a pseudoplastic fluid. In addition, the Arrhenius model gave a satisfactory description of the temperature dependence of apparent viscosity. The activation energy for apparent viscosity of all formulas was estimated. Finally, the study recommends the manufacture of these products trade and the speed of issuing the standard specifications of red pepper and tomato sauce.

Keywords: Tomato sauce, Red pepper sauce, Quality, Rheological characteristics.

Thermophilic Bacilli in commercially heat-treated milks



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Abstract

Thermophilic bacilli are an important group of contaminants in the dairy industry, as their presence in dairy products is an indicator of poor hygiene and high numbers are unacceptable to customers. A total of Fifty samples of pasteurized milk and UHT milk (25 of each) representing different brands available on the market were randomly collected in their retail containers from groceries, dairy shops and supermarkets in different localities at Menoufia governorate. These samples were examined bacteriologically for the presence of thermophilic aerobic spore forming bacilli. The highest incidence of thermophilic aerobic spore formers was in pasteurized milk followed by UHT milk with an incidence of 44% and 40% and with mean value of $1.3 \times 10^4 \pm 8.6 \times 10^3$ and $9.4 \times 10^2 \pm 3.9 \times 10^2$ C.F.U/ml, respectively. The most frequently isolated thermophilic (55°C) strains in examined samples were *Bacillus licheniformis* followed by *Bacillus stearothermophilus*.

Keywords: pasteurized milk, UHT milk, Thermophilic bacilli, aerobic spore formers.



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Induction of endoglucanase and hemicellulase enzymes from *Bacillus* sp. and *Pseudomonas* sp. for the saccharification of some lignocellulosic materials

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Abstract

Endoglucanase and hemicellulase are industrially important enzymes obtained from various microorganisms. From several investigated bacteria, two bacterial isolates showed high cellulolytic and xylanolytic activities and were biochemically and genetically (based on 16S rDNA sequencing) identified as *Bacillus* sp. and *Pseudomonas* sp. Saccharification of several lignocellulosic materials such as rice straw, wheat straw, bagas, saw dust and corn stalks were examined. Some environmental and nutritional factors were investigated for the maximal saccharification and secretion of endoglucanase and hemicellulase enzymes.

Keywords: Endoglucanase, hemicellulase, lignocellulose and saccharification.



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Assessment of biogenic amines in some fishes at Kalyobia Governorate

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Abstract

A grand total of 90 random samples of fresh fish samples represented by Nile fish (*Oreochromis niloticus*, *Clarias lazera* & *Bagrus bayad*) (15 of each) and marine fish (*Sardine*, *Saurus*, *Pagrus*) (15 of each) were collected randomly from different fish markets in Benha, Kalyobia governorate for determination of histamine and putrescine using High Performance Liquid Chromatography (HPLC). The results showed that 80%, 86.67% and 100% of Nile fish samples were positive for the presence of histamine residues for *Bagrus bayad*, *Tilapia niloticus* and *Clarias lazera*, respectively. Concerning to marine fish, the positive samples for histamine in samples from *Pagrus*, *Saurus* and *Sardine* were 93.33%, 100% and 100%, respectively. While, concerning to putrescine residues in Nile fish, the positive samples were 53.33%, 60% and 80% in *Bagrus bayad*, *Tilapia niloticus* and *Clarias lazera*, respectively; and in marine fish 66.67%, 80% and 86.67%.in *Pagrus*, *Saurus* and *Sardine*, respectively. The public health significance of histamine and putrescine residues in fish and some recommendations to control their presence were discussed.

Keywords: Fish meat, Fresh fish, Histamine, Putrescine, HPLC.



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Effect of some essential oils on biogenic amines in fishes at Kalyobia Governorate

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Abstract

A grand total of 21 samples of fresh fish fillets (*Oreochromis niloticus*) were collected randomly from different fish markets in Benha, Kalyobia governorate to determine the effect of some essential oils "clove oil (1%), thyme oil (1%) and lemon oil (1%) at 4°C for 2 and 4 days on their contents of various biogenic amines "histamine, putrescine, cadaverine and tyramine". The results indicated that histamine levels in the examined fish fillets were reduced by 5.5% - 14.75% by addition of clove oil (1%), 7.25 - 20.0% by addition of thyme oil (1%) and 15.8% - 29.3% by addition of lemon oil (1%) after 2 and 4 days, respectively. While, addition of clove oil (1%), thyme oil (1%) and lemon oil (1%) cause reduction to putrescine by 9.6 - 11.9%, 12.5 - 16.4% and 19.35% - 34.1% after 2 and 4 days, respectively. Concerning to cadaverine levels, the reduction occurred by 7.7 - 9.3%, 10.4 - 22.9% and 15.8% - 29.8% after 2 and 4 days, respectively. Finally, addition of clove oil (1%), thyme oil (1%) and lemon oil (1%) cause reduction to tyramine by 5.2 - 10.6%, 16.5 - 16.3% and 22.4% - 25.1% after 2 and 4 days, respectively. The obtained results it allows concluding that the addition of essential oils lead to reduction of biogenic amines in fish fillets eliminating the hazard effect of biogenic amines on human.

Keywords: Fish fillet, biogenic amines, clove oil, thyme oil, lemon oil.



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Studies on Tuberculosis in slaughtered animals at Menufia Governorate.

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Abstract

Bovine tuberculosis is highly infectious zoonotic disease of economic and public health importance. This study aimed to detection the prevalence of bovine tuberculosis by bacteriological examination and Real-time PCR. A total of 75 animals (61 cattle and 14 buffaloes) were routinely examined in the slaughterhouses of Menufia governorate, Egypt during the period of 2015 and 2016 for detection of tuberculosis. The suspected tuberculous lesions collected from cattle were from respiratory, digestive, head, mixed lesions and generalized lesions. While in buffaloes, the tuberculous lesions were from respiratory, digestive, mixed lesions and from head lesions. The bacteriological examination revealed that the isolation rate of *Mycobacterium bovis* (*M. bovis*) was 86.9% and 57.1% in cattle and buffaloes, respectively. The real-time PCR technique was applied to confirm the results of bacteriological examination and revealed that 90.2% and 85.7% *M. bovis* isolates in cattle and buffaloes respectively were positive with high sensitivity and specificity more than culture.

Keywords: Bovine tuberculosis, *Mycobacterium bovis*, Menufia, PCR.



11. Civil and Architecture Engineering



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Managing scope creep in construction projects in Egypt

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Abstract

Construction Projects widely experience the “Scope Creep” phenomena, which consumes both resources and contingencies allocated for those projects. Creep is always an unknown project risk and managing scope creep is a very complicated task. So, preventing the causes leading to scope creep seems an efficient strategy. To succeed in preventing scope creep in construction projects an understanding for conditions that lead to the creep is required, and an ability to choose the suitable action when the creep arises is needed. Hence, this research sought to identify, evaluate and rank the most important and frequent factors responsible for scope creep in construction projects. It considered the perspective of the owners, consultants and contractors in Egypt. Moreover, it aimed to identify and develop appropriate strategies for scope creep prevention. The study concluded that problems such as scope creep will arise in construction projects and should be taken into consideration in every project. The obtained information provides guidance for strategies to be developed to provide project leaders and other stakeholders with a practical professional approach for construction scope creep prevention.

Keywords: Project scope creep; prevention; phenomena; Egypt.



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Dog parks: the wasted new urban common in Rehab City, Egypt

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Abstract

Dog parks have been a growing phenomenon in Egypt for the past 4 years. Although it is increasing in numbers and size yet unofficially recognized and unmanaged by any institution and/or agency whether public or private as a common public resource (CPR). This has led to vivid ongoing conflicts between local communities surrounding the park and dogs owners' community. For dog parks to achieve effective and prosperous community relations, it has to be planned and designed on specific standards and regulations derived through the involvement of all concerned communities - not only dogs owners - and managing institutions. This paper aims to document, explore and analyze the standards upon which dog parks shall be designed and managed. It also sheds light on the reasons behind the failure and/or success of dog parks in achieving effective and close community relations as a CPR. Finally, it explores, analyses and documents the community conflicts in the case of GUC Dog Park in Rehab City, new Cairo, Egypt from establishment till closure.

Keywords: Dog Parks, Community Relations, Common Pool Resources, New Commons



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Heliopolis Horse Racing: The Unspoken Reality

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Abstract

Equestrian activities have been one of the main land use activities in East Cairo, Egypt since the construction of Heliopolis (i.e. The City of the Sun) in 1905. It went through various transformation and relocation with specific reference to the ongoing political economy shift since the 1952 Revolution. Like any other land use activities, equestrian activities have its own planning principles that guarantee its boom and success in achieving its goals. Such principles could be represented in three main interlocking domains that are the physical settings, the natural environment and the horsemanship community. Nevertheless, the current location, physical and community settings indicate some serious defects and negative impacts that affect the equestrian activities itself as well as the surrounding community. This paper aims to explore, analyze and document the history and development of equestrian activities in Heliopolis area. It also sheds the light on the vivid gap between theory and practice in relation to the urban planning and community relations. Finally, it alerts decision makers on the current situation of equestrian activities in Heliopolis area and its impact on surrounding communities.

Keywords: Horse Industry, Horse Racing, Heliopolis, urban transformation, community relations.



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Study of structural behavior of RC beams strengthened with FRP in fire conditions

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Abstract

Recently, fiber reinforced polymers (FRP) have been widely used in repairing and strengthening of reinforced concrete (RC) structures. In order to increase the acceptance and application of FRP for strengthening requirements, their performance of in case of fire needs more investigation research works. Experimental investigations are required to be carried out for such elements to predict the fire behavior of such insulated FRP-strengthened members and their efficiency under realistic fire loads, however these experimental studies require time and cost. The present paper gives numerical nonlinear finite element modeling of RC beams strengthened with FRP and insulated by a thermal resisting coating under elevated temperature specified by standard fire tests. The model takes into consideration the variation in thermal and mechanical parameters of the concrete, steel rebar, FRP and insulation material. The nonlinear finite element analysis is performed using ANSYS 12.1. Finite element modeling of insulated RC T-beam strengthened with FRP which has been experimentally tested in the published literature is presented herein. The obtained analytical results are in good agreement with the experimental ones regarding the temperature distribution and mid-span deflection. The presented modeling gives an economical and efficient tool to investigate the performance of fire insulation layers under high temperatures. The model can be used to design thermal protection layers for FRP strengthening systems that satisfy fire resistance requirements specified in building codes and standards.

Keywords: Nonlinear finite element, flexural strengthening, fiber reinforced polymers, fire, thermal insulation.



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**Development of a New Model for improving construction staff productivity using
artificial Neural Network in Egypt**

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Abstract

Productivity of construction staff represents a significant concern in all construction organizations. The optimization of the production of the total organization can be achieved through the coordinated improvement of the productivity of the staff, as the most valuable asset of any organization is a workforce which is productive. Nevertheless, just a few organizations consider the human capital as being their main asset, capable of leading them to success. So, it is necessary to exert efforts toward improving productivity by heads of organizations in recent times. As Egypt is seeking to promote a leading role in the international community and to overcome most of the problems affecting its development, construction productivity is of high concern. Construction staff productivity is affected by many factors, therefore the first objective of this study focused on identifying the most significant factors affecting productivity in Egypt through a questionnaire survey among construction experts in the Egyptian market. The second objective was the development of an Artificial Neural Network model that can assist any construction organization's decision makers to achieve a more reliable assessment for the expected percentage of improving construction staff productivity, MATLAB Neural Network (Matlab 2014b) software was used to develop the model. The phases of the model development will be presented.

Keywords: Artificial Neural Network, Staff Productivity, optimization.



12. Microbiology



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Keynote Paper

**Advances in Diagnosis Fish Diseases
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Abstract

Aquaculture production will need to double by 2030 to meet the global demand for fish. Diseases are recognized as one of the most limiting factors for fish production. Proper diagnosis helps to select accurate therapy, avoid indiscriminate use of therapeutics and to eliminate creation of antibiotic resistant pathogens. In the past decade, there have been significant advances in the tools and techniques available for identification and characterisation of fish pathogens. Molecular assays (PCR, Gene sequencing, RT-PCR, RFLP, DNA microarray) and immunodiagnostic (FAT, IFAT, ELISA) techniques are potentially accurate and more sensitive for diagnosis of disease outbreaks and detection of pathogens from a symptomatic fish. As a result, disease outbreak could be prevented and losses can be reduced. In conclusion, technologic advances are benefit in developing new research tools and improved speed and accuracy of diagnosis of fish disease.

Keywords: Aquaculture, Molecular assays immunodiagnostic.



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**Recent isolation and identification of Sheeppox Virus from Menofeia Province,
Egypt**

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Abstract

Sheeppox (SP) is a serious skin disease of sheep. Accurate and rapid diagnosis of SP is very important to control the rapid spread of disease in Egypt. In this study, seven skin scabs from infected sheep at different localities in Menofeia province, Egypt were used for isolation and identification of SP virus. A total of 200 serum samples were collected from non-vaccinated and vaccinated sheep to detect the neutralizing antibodies for SP virus by serum neutralization test (SNT). Isolation of SP virus was done by inoculation on chorioallantoic membrane (CAM) of specific pathogen free embryonated chicken eggs (SPF-ECEs). Identification of SP virus isolate was confirmed by immunofluorescence (IF) and polymerase chain reaction (PCR) targeting SP virus PRO30 gene. In conclusion, SP virus is still circulated in Egypt and a test for differentiation between infected and vaccinated sheep with SP virus is required.

Keywords: SP virus, sheep, CAM, IF, PCR, Egypt.



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**Efficacy of an inactivated trivalent FMD Vaccine adjuvant with montanide ISA 201
applied for Sheep**

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Abstract

Foot and mouth disease (FMD) is a contagious disease of cloven-hoofed animals including cattle, buffalo, sheep, goats and pigs with economic impact due to losses of production, reduced milk yield and abortion. Control of FMD depends widely on vaccination. This work aimed to evaluate an inactivated trivalent FMD vaccine prepared using Montanide ISA 201 adjuvant applied in sheep. The prepared vaccine was sterile, safe and induced protective neutralizing serum antibody titer from the second week post vaccination (WPV), reached the highest level at 12 WPV for FMDV serotypes O, A and SAT2. Serum neutralizing antibody titer persisted in protective level until 36 WPV for FMDV serotypes O and A, but for 40 WPV for FMDV serotype SAT2. These results were confirmed using ELISA. Evaluation of FMD virus-specific cell-mediated immunity in sheep vaccinated using XTT assay showed significant lymphocyte proliferation expressed by optical density in vaccinated sheep group from the 3rd day post vaccination (DPV), increased to reach a maximum value 2nd WPV and persisted in a high level till 9th WPV for FMDV types O, A and SAT2 inducers. It was concluded that the prepared inactivated trivalent FMD vaccine with ISA-201 adjuvant induced good humoral and cellular immune responses in sheep lasted for 36 WPV.

Keywords: FMD Vaccine, ISA 201, sheep, SNT, ELISA, XTT assay.



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Evaluation of the humoral and cell mediated immune response of Sheep vaccinated with an inactivated trivalent FMD Virus Vaccine adjuvant on montanide ISA 206

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Abstract

Foot and mouth disease (FMD) is a contagious disease of cattle, buffalo, sheep, goats, pigs, and wild cloven-hoofed animals with economic impact due to its ability to cause losses of production, reduced milk yield, abortion, and prenatal mortalities. Vaccination is widely used to control FMD. This study aimed to prepare and evaluate an inactivated trivalent FMD vaccine using Montanide ISA 206 (water-in-oil-in-water) adjuvant that was applied in sheep. The prepared vaccine was sterile and safe. It was found that the prepared vaccine induced protective neutralizing serum antibody titer from the third week post vaccination (WPV), reached the highest level at 10 WPV for FMDV serotypes O and SAT2 but at 12 WPV for FMDV serotype A. Serum neutralizing antibody titer persisted in protective level until 32 WPV for FMDV serotypes O and SAT2 but for 28 WPV for FMDV serotype A. These results were confirmed using ELISA. Evaluation of FMD virus-specific cell-mediated immunity in sheep vaccinated using XTT assay showed significant lymphocyte proliferation expressed by optical density in vaccinated sheep group from the 3rd day post vaccination (DPV), increased to reach a maximum value 2nd WPV and persisted in a high level till 9th WPV for FMDV types O, A and SAT2 inducers. It was concluded that the prepared inactivated trivalent FMD vaccine with ISA-206 adjuvant induced good humoral and cellular immune responses in sheep started from the third WPV and lasted for 32 WPV.

Keywords: FMD Vaccine, ISA 206, sheep, SNT, ELISA, XTT assay.



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Molecular characterization of recent isolates of befv virus in Egypt

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Abstract

The present work was conducted to identify and characterize recent isolate of bovine ephemeral fever virus (BEFV) in Egypt. 103 serum samples were obtained from 1600 vaccinated animals in El-Salhia dairy farm during the period of July to August 2015. The 103 animals were found to have non-protective low titers of BEF antibodies ($\leq 2-8$) as tested by serum neutralization test (SNT), showing BEF signs (fever; hurried respiration; lameness and recumbency). Three buffy coat and five blood plasma samples from the 103 suspected infected dairy cattle were collected. Trials of virus isolation in baby mice brain and BHK21 cell culture revealed that three samples of buffy coat and five blood plasma samples were suspected to contain BEFV. Virus identification using virus neutralization tests (VNT) and direct fluorescent antibody technique (FAT) confirmed the presence of BEFV. In addition, PCR, sequencing analysis and phylogenetic tree showed that the obtained isolate is closely related to Egypt-2005 strain. These findings indicated that the locally produced vaccine is highly immunogenic inducing a protection rate of 93.6%. Appearance of disease signs in cattle with low immune levels could be due to parturition and high lactation stress factors in addition to suspected other infection leading to poor immune response (immune suppression) to the vaccine.

Keywords: bovine ephemeral fever (BEF) isolation, identification, PCR – FAT.



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Improvement of inactivated rabies vaccine using montanide pet Gel-A

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Abstract

The present work was designed to investigate the ability to use montanide pet gel-A (polymeric adjuvant manufactured under Good Manufacturing Practice, GMP rules) in the production of inactivated cell culture rabies vaccine for pet animals. The test of the National Institute of Health (NIH) indicated that antigenic values were 2.5, 2.0 and 3.0 for the reference, aluminum hydroxide gel and montainde pet gel-A vaccines respectively. The prepared montainde pet gel-A vaccine was found to be safe and immunogenic for experimental cats and dogs. Smaller dose of the prepared vaccine (1ml/cat or dog) was found to be immunogenic for such animals instead of a dose of 2ml of the aluminum based vaccine. Serum Neutralization Test (SNT) and antigen specific Enzyme Linked Immunosorbent Assay (ELISA) used to assess the immune response induced in vaccinated cats and dogs showing titers of 64, 64 and 128 by SNT and 5, 5 and 6 log₂ by ELISA in dogs and 64, 64 and 128 by SNT and 5, 5 and 5.5 log₂ by ELISA in cats vaccinated with the reference, aluminum hydroxide gel vaccine and pet gel A vaccine respectively. This study could recommend that montanide pet gel-A be used as an adjuvant to rabies vaccine for pet animals using smaller dose and inducing higher antibody levels. With smaller doses high production rate could be suggested.

Keywords: Rabies vaccines, Pet gel-A, Aluminum hydroxide gel, Serum neutralization test, Enzyme linked immunosorbent assay.



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Studies on different recent techniques for diagnosis of *Campylobacter* in rabbit

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Abstract

Rabbits can breed for the production of meat and fur. Their meat is considered as a source of human campylobacteriosis; caused by *Campylobacter* organism has been recognized as the main etiological agent of human bacterial gastrointestinal disease. Two hundred and thirty rabbit samples were collected including cloacal swabs from (130), liver (40), intestinal samples (40), water (10) and ration (10) from apparently healthy and diseased rabbits suffering from diarrhea in different farms. All rabbit samples were processed for isolation of *Campylobacters*. Each sample was homogenized in sterile Thioglycolate broth, incubated at 42°C for 48 hrs under microaerophilic condition. All The isolates were subjected biochemical tests, such as catalase, oxidase, hippurate hydrolysis test, glycine, sodium chloride (NaCl) 3.5% tolerance test and susceptibility to cephalothin and nalidixic acid. Identified colonies were stored at -70 C in nutrient broths with 15% glycerol until subjected to molecular identification. The results of this study showed that overall *Campylobacter* isolates was 58 (25.22%) from the different sources sampled. The prevalence of *C. jejuni* was the most prevalent species 26 (11.30%) in samples taken from rabbits followed by *C. coli* was 15 (6.52%) then *C. lari* was 12 (5.22%) and *C. hyointestinalis* was 5 (2.17%). The overall prevalence of *C. jejuni* and *C. coli* (74.3%) (25.70%); the difference was notably due to a positive hippurate test result for isolates identified as *C. jejuni* due to the absence of hippurate hydrolysis for *C. coli*. Multiplex PCR methods the genus specific (*16S rRNA*) revealed that 51 (22.17%) *Campylobacter* species isolates; 27 (52.94%) as *C. jejuni* specific at 323 bp while, 17 (33.33%) produced the *C. coli* specific at 126 bp and 7 (13.73%) other *Campylobacter* species. We concluded that *C. jejuni* and *C. coli* are highly prevalent in rabbit farms in Egypt. Control measures for contamination of the rabbit supply should be identified to protect human exposure to *Campylobacter* spp. Further analysis of rabbit samples by using PCR assay are needed to evaluate the applicability of the method for detection of *Campylobacter* organisms exposed to an environment.

Keywords: *Campylobacter*, Multiplex PCR, Rabbits, Diagnosis.



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Studies on virulence genes of *Staphylococcus aureus* isolated from mastitic cows

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Abstract

Staphylococcus aureus is the most frequently bacterial pathogen causing clinical and subclinical mastitis in cattle. In this research, the mastitic cases (103) were classified into clinical and subclinical cases. (47,56) respectively. All milk samples collected from infected cows were subjected to bacteriological examination and molecular characterization of some *Staphylococcus aureus* isolates. *Staphylococcus aureus* was isolated from clinical and subclinical mastitic cows in an incidence of (50% and 17%), respectively. The application of multiplex PCR on some *Staph.aureus* isolates (8) was effectively in detection of *Coa*, *SpA*, *TST*, *Hlg*, *CLF*, *nuc* genes by amplification at a single amplicon at (630bp, 226 bp, 326bp, 937bp, 638bp, 395 bp respectively.)

Keywords: *S. aureus*, cows, mastitis, PCR, virulence genes.



**Incidence and phenotypic characterization of *Staphylococcus aureus* isolated
from mastitic cows**

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Abstract

A total of 412 milk samples were collected from clinically and subclinical mastitic cows (188, 224) respectively and examined bacteriologically for *Staphylococcus aureus* for the isolation rate and studying of the phenotypic characterization of the isolates. The results revealed that *S. aureus* was isolated in an incidence of 50% and 17.5% from clinically mastitic and sub clinically mastitic cows respectively. All Staphylococcus isolates showed symmetrically in their phenotypic characterization including cultural characters on different media. Vitek2 system succeeded in providing definitive identification results for gram positive bacteria by identification card (GP) were used for rapid and easy identification of Staphylococcus spp .

Keywords: *S. aureus*, clinical-subclinical-mastitis-Vitek2.

Studies on ruminant brucellosis in El Salam canal area, Egypt

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Abstract

The current study is aimed to provide some epidemiological data about brucellosis and its impact among ruminants in the area around El-Salam canal, North Sinai. In addition to determination of the sensitivity, specificity; positive & negative predictive values and diagnostic efficacy of Brucella Antibody Test Kits as a rapid field assay for the diagnosis of brucellosis. Our results revealed that, the overall prevalence rate of brucellosis was 7.1% (12/168) and 10.1% (17/168) using ELISA and Brucella Antibody Test Kits respectively. Out of 168 serum samples; 9 were seropositive and 148 were seronegative for brucellosis by both ELISA and Brucella antibody test kits. Another 3 and 8 serum samples were only positive with ELISA and Brucella Antibody Test Kits respectively, revealing 75% sensitivity, 94.8% specificity, 47% positive predictive value, 53.5% negative predictive value and 93.4% diagnostic efficacy for this test. Brucellosis was found to be one of the causes of abortion in the study area as 61.9% (13/21) of aborted animals were seropositive for brucellosis. While to a little extent, it can be considered one of infertility causes as 4.7% (7/147) of infertile animals were seropositive for brucellosis. On the other hand, there were 38% (8/21) and 95.2% (140/147) of aborted and infertile animals respectively were sero-negative for brucellosis revealing that, there was another case of abortion and infertility in the area of study rather than brucellosis and there was a necessity for their further investigations in order to improve the fertility and productivity of the animals in this targeted area.

Keywords: brucellosis, ruminants, diagnosis, infertility.

13. Soil and Agricultural Engineering



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Technology and equipment for Rice production mechanization

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Abstract

According to the combination of agricultural machinery and agronomy, the presentation has an overall introduce on techniques and equipment research of rice production which include plowing, flat, seeding, planting, field management, and harvesting.

Keywords: Rice production, Field management, Harvesting, Technology.



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**Adsorption of cobalt (II) ions onto irradiated leucaena residue non-chared and
chared, from industrial wastewater**

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Abstract

A laboratory experiment was carried out in the laboratory of Soil and Water Research Department, Nuclear Research Centre, Atomic Energy Authority, Egypt, to study the effect of leucaena residue powdered or chared on on removal of Co (II) from industrial waste water contaminated with cobalt, Under condition of gamma ray irradiation and the contact time. The wastewater was obtained from Abu-Zaabal industrial area, Qalyubia Governorate, Egypt. doses of irradiation doses were 0, 5, 10 or 20 kGy .Scanning Electron Microscope (SEM) of the Leucaena powder had high and full cavities on its external surface , the time of contact was 1,3,6 and 24 h, Co increased with contact time . Irradiation resulted in adecrease in adsorption. The biochar resulted in the highest sorption values.

Keywords: Sorption, Leucaena residue, Cobalt, industrial wastewater.



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Basil drying performance and quality under different dehydration systems

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Abstract

The main aim of this study is to investigate the possibility of drying the basil plants under different conditions. The obtained results indicated that the accumulated weight loss of basil plants increased from 35.52 to 77.43, 35.06 to 74.00, 32.32 to 70.48, 17.82 to 74.92 and 29.85 to 77.99 %, for sun-drying system, shadow-drying system, room-drying system, solar-drying system and oven-drying system, respectively. The moisture content of basil plants decreased from 505.09 to 11.92, 503.99 to 13.43, 474.74 to 13.43, 534.69 to 11.84 and 442.55 to 4.97 % d.b. for sun-drying system, shadow-drying system, room-drying system, solar-drying system and oven-drying system, respectively. The highest value of equilibrium moisture contents were 13.94 and 37.01 % at 10 and 90 % equilibrium relative humidity was found from Modified Chung-Pfost equation under room system. The lowest value of equilibrium moisture contents were 0.83 and 15.07 % at 10 and 90 % equilibrium relative humidity was found for modified Oswin equation for oven system. The basil oil content values were 5.918, 7.911, 8.472, 6.547 and 5.230 % for the sun-drying, shadow-drying, room-drying, solar-drying and oven-drying, respectively.

Keywords: Basil, Sun-drying, Solar-drying, Oven-drying, Equilibrium Moisture Content, Oil content.



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A Comparative study between the effects of gated pipes and traditional irrigation systems on the main properties of soil, drainage water and water use efficiency under wheat and maize crops

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Abstract

This study was carried out in Sahl El-Tena (North West of Sinai Peninsula, Egypt; Latitude 30° 59 \ 7 \ and longitude 32° 26 \ 55 \) during the irrigation seasons of 2012, 2013 and 2014. The experimental area is 6.3 hectares. The area under experiment is characterized by a Mediterranean arid climate, with a mean annual rainfall of 33.3 mm and a mean daily temperature of 21.8°C. The main source of irrigation water is El-Slam Channel where water is a mixture of waste water and Nile fresh water at a ratio of 1:1. Two crops: maize (*Zea mays* L.) and wheat (*Triticumaestivum* L.) were grown on the investigated soils because of their high economic and strategic values. Crop yield, water use efficiency and soil properties were studied under two types of surface irrigation system i.e. traditional and gated pipes. The design of the experiment was a Randomize Complete Block Design (RCBD) with three replicates. Statistical analysis was carried out by the SPSS program to show the significant variance between means. The results of this study revealed that, values of yield and WUE with gated pipes were higher than the corresponding ones under the traditional system for the two crops under study. Also, using gated pipes reduced both soil EC and pH. Moreover, the quantity of drainage water under traditional system was higher than under the gated pipe system, therefore, the EC of drainage water under gated pipes system was higher than the corresponding one under the traditional method.

Keywords: Water use efficiency, gated pipes, surface irrigation system, drainage water.



14. Electrical Engineering and Energy



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Electron gun optimization for irradiation applications

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Abstract

Electron gun optimization for irradiation applications reports the results of different parameters and conditions on the electron gun system with a software SIMON 3D. As an application of this designed electron gun, irradiations of PET polymer samples have been studied. Operating characteristics of the electron gun have been optimized with the help of SIMION calculations and then experimentally verified. The current study focuses on the electron beam waist and the position of a Pierce-type electron gun and the effect on PET polymer samples by the electron irradiation. Beam optics extracted from a Pierce-type electron gun (Energy 75 keV, pulsating current 250 mA, $f=500/\text{sec}$) with spherical anode shows self-beam focusing and the ability to determine appropriate position of specimen irradiation by the electron beam. Theoretical, experimental and beam simulation by SIMION program has been carried out with an approximate agreement between them. A useful application of electron beam with poly(ethylene terephthalate)(PET) reveals an increase of thermal behavior and crystallization upon heating. Glass transition temperature of PET at different electron beam fluence was investigated and studied, where, the glass transition T_g decreases from 75 to 58 °C with an increase of the radiation fluence.

Keywords: Beam optics, SIMION simulation program, PET polymer.



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Performance analysis of applying load balancing strategies on different SDN environments

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Abstract:

Software Defined-Network (SDN) is considered a breakthrough in the global network. It plays an important role in performance improvement and network optimization. SDN is a new mechanism for managing and designing networks rather than the current traditional network system which does not afford more services and higher data rates; therefore, we analyze the effect of applying load balancing techniques and its importance in different SDN environments. In this paper, we propose a dynamic server load balancing technique in SDN architecture. Hence, we implement a server Connection-based load balancing technique and evaluate its performance with a static Round-robin and Random-based in both mininet emulation environment and Raspberry Pi Open Flow-enabled switch using Ryu Open Flow controller. The performance of the proposed algorithm is compared with Round-robin and random distribution of clients' requests. The results show that the proposed technique achieves more reliability and higher resource utilization than the Round-robin and Random-based load balancing strategies. In addition, the proposed scheme exhibits more scalability and low-cost characteristics.

Keywords: Software defined-network, Ryu controller, Load balancing, Open Flow, Raspberry Pi.



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A proposed MPPT strategy for distributed DFIG using fuzzy logic controller

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Abstract

This paper presents control of Wind Energy Conversion Systems (WECS) based on Doubly Fed Induction Generator (DFIG). A new maximum power point tracking (MPPT) strategy based on the fuzzy logic control was developed. At given wind velocity, the pitch compensation (pitch controller) is controlled to get the maximum power that can be extracted from the turbine. The proposed control strategy that achieved via a fuzzy controller is properly tuned using genetic algorithms (GA). The effectiveness of the proposed control strategies is validated by theoretical analysis and simulation carried out using MATLAB/Simulink environment.

Keywords: DFIG, pitch control, fuzzy logic, GA technique, Objective function, PI controller.



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Wind Energy DC residential local branch system applying MPPT in standalone and DC grid modes of operation

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Abstract

Wind Energy distributed generation via residential branches connected to DC Buses are increasing as an open energy source. Recently, small variable speed wind turbine (VSWT) directly coupled with permanent magnet synchronous generator (PMSG) are receiving much attention due to its good efficiency and higher torque to size ratio. To extract maximum power in small scale, it is recommended to use a simple, fast and low-cost controller. In this regard, this paper proposes a simple control strategy for operation at the maximum power point tracking (MPPT) on the generation side applied on switch mode rectifier via controlling only one switch of the buck converter. The control strategy is based on operation on optimum power curve till obtaining the optimum values of operation. The proposed controller is applied on small scale power for residential branch applications. This is often referred to a wind energy residential local branch system (WER-LBS), where the wind generation part is coupled to DC bus through switch mode rectifier (SMR) in a complete modeling using Matlab/Simulink package. Moreover, this proposed controller is tested under two modes of operation; standalone mode and DC grid connection mode. The behavior of the proposed WER-LBS modeling and optimum power tracking is shown under wind fluctuating and different loads at several modes of operation.

Keywords: Wind Energy Residential Local Branch System WER-LBS, Variable Speed Wind Turbine VSWT, Permanent Magnet Synchronous Generator PMSG, Switch Mode Rectifier SMR, Maximum Power Point Tracking MPPT, Single Terminal DC Bus STDC bus.



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Paralyzed patients' abilities improvement through Brain-Computer interface systems

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Abstract

Nowadays, there are millions of paralyzed patients in the world suffer from difficulty in speaking, writing and communication with their families. Therefore, brain computer interface (BCI) systems have been evolved to improve the cognitive abilities and motor skills of those patients. This paper presents a GUI application based on an offline BCI system to help the paralyzed patients to express their needs. The efficiency of this system depends on the selection of the processing methods. Therefore, Principal Components Analysis (PCA) was used to extract a group of statistical features from the recorded EEG signals. These features were classified into four classes are head movement to the up, down, right or left using three classification techniques are Artificial Neural Network (ANN), Support Vector Machine (SVM) and Linear Discriminant Analysis (LDA). The classifiers' performance was measured using three statistical parameters are the classification accuracy, sensitivity and specificity. It was concluded that ANN achieved the highest classification accuracy with a value of 93%. On the other hand, the classification accuracy of SVM and LDA was 81% and 67% respectively.

Keywords: Artificial Neural Network (ANN), Brain Computer Interface (BCI), Paralysis, Principal Components Analysis (PCA) and Support Vector Machine (SVM).



15. Communication and Computer Engineering



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A New approach for building secure electronic medical record for Egypt

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Abstract

The World Health Organization defines e-Health as the cost-effective and secure use of information and communication technologies for health and health-related fields. Many developing countries including Egypt faces many challenges in pursuing Electronic Medical Records systems implementation in terms of design, adoption, personnel, maintenance, and the lack of information and bureaucracy. Investigations and surveys about the current health systems adopted by public health care organizations in Egypt were carried out to research the current electronic medical record current situation in Egypt. The proposed new approach of development is people-centric and data-driven technology solutions are aimed to connect and deliver better public health services. Security issues are also addressed by ensuring patients' data privacy through a set of security aspects. Our mission is to promote collaborative healthcare delivery by creating platforms where healthcare practitioners, ancillary providers, medical facilities and patients can freely share information both safely and securely.

Keywords: secure use of information, data-driven technology.



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A hierarchical task allocation model in cloud computing environment using Multi-objective particle swarm optimization

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Abstract

Many cloud services are running on top of geographically distributed data centers in the service provider. For better reliability and performance, the optimum data center with the best suitable virtual machine must be selected by the service provider to handle the customer request. In this proposed work, A multi-objective particle swarm algorithm (MOPSO) is applied to select the optimum data center and virtual machine in the Cloud environment. The multi-objective particle swarm algorithm is an optimization algorithm inspired by social behavior of swarms' behavior. It is characterized by the relatively small number of parameters that need to be evaluated during the iterations. Thus, its convergence speed is much better than other swarm techniques like Ant Colony and Bee optimizations. The novelty of the algorithm that it considers many constraints such as data centers capacities, makespan using standard deviation, income for service provider and the customer requirements. The performance of the algorithm was evaluated against Round Robin and Benchmark algorithms. Simulation results show that the proposed algorithm reduced the makespan profoundly regardless of the number of requests reaching 14% of Round Robin, increased the service provider income by four times and attained a customer satisfaction of 97%.

Keywords: Service provider, virtual machine, load balance, standard deviation, MOPSO.



Enhanced FFR Scenario for Pilot Contamination Mitigation in 5G Systems with Massive MIMO

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Abstract

Massive multiple-input multiple-output (MIMO) is the technology of the future, because it has the capability to increase a wireless system capacity without costing the system to purchase an additional bandwidth. It also has the capability to decrease the energy consumption of the system. All these capabilities have promoted the massive MIMO to be a promising technology for the fifth generation (5G) wireless communication systems. However, it has an important issue that limits the benefits which can be acquired by deploying it in 5G. This issue is the pilot contamination, which means the interference between pilot sequences. This occurs when the same pilot sequence is used by more than one terminal in the channel estimation phase at the same time and this causes interference between data symbols later. In this paper, we propose an enhanced fractional frequency reuse (FFR) scenario to mitigate the effects of pilot contamination by following an algorithm in assigning the pilot sequences to the system terminals instead of the random assignment. Simulation results show that our proposed scenario outperforms the traditional FFR in terms of signal to interference and noise ratio (SINR) and capacity.

Keywords: 5G, Massive MIMO, Pilot Contamination, Inter Cell Interference.

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BER reduction using convolution product code technique in LTE system

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Abstract

The 3rd GPP Long Term Evolution (LTE) technology exhibits a major advance in wireless communication networks to meet increasing demands for high quality multimedia services. Turbo codes are used to play a major role in channel error correction. In this paper, Convolution Product Code (CPC) is going to be implemented in LTE system. A comparison study between turbo code and (CPC) for LTE system over an Additive White Gaussian Noise (AWGN) channel is presented. The results show that (CPC) gives good results in term of Bit Error Rate (BER) at different Signal to Noise Ratio (SNR) compared with turbo system; several results are obtained at different (IFFT) sizes and different modulating types.

Keywords: Long Term Evolution (LTE), Turbo code (TC), Convolution Product Code (CPC).



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New technique for coding in LTE system using random matrices

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Abstract

Long Term Evolution (LTE) is the latest technology for mobile communication. It provides high data rates, scalable bandwidth and offers legacy modes to support devices that operate using older technologies such as GPRS systems. The standard of LTE mentions that the mandatory coding technique is turbo code.

However this paper tends to use a new technique depends on the usage of a random matrix for both coding and decoding processes. The desired code rate in the proposed technique equals to the ratio between the columns and rows of the used matrix. The simulated results show that the proposal has better performance than that of the turbo code at low signal to noise ratios.

Keywords: Long Term Evolution, random matrices, GPRS.



16. Agro-ecology



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Analysing structural diversity in two temperate forests in North Eastern China

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Abstract

This contribution presents an analysis of the structural diversity in two temperate forest ecosystems in North-Eastern China, based on two large contiguous observational studies covering an area of 5.2ha (260×200 m²) each. The total number of living trees in the conifer and broad-leaved forest(CBF) study area is 2 927 per ha, comprising 37 species and 21 genera. The old growth forest(OGF) study area has 2 276 trees per ha, including 22 species and 13 genera. Tree species are classified according to their community status as mature and immature canopy, subcanopy and shrub. A clustering process based on two distinct communities of the bivariate dbh/height distributions is used to differentiate between mature and immature canopy species. Numerical analysis is based on these four distinct cohorts. Despite advances in remote sensing, mapped tree data in large observation windows are very rare. Thus, we are able to use methods for analysing forest structure which are suitable for both, unmapped and mapped data. The two data sets are unique in that all (approximately) 27 000 tree heights are available. Accordingly, it was possible to fit bimodal height distributions and bivariate mixed dbh/height distributions to almost all individual species that were represented by sufficiently large numbers. Methods of second order statistics (SOC), including marked point statistics as well as nearest neighbor statistics (NNS) based on nearest neighbourhood structure units are also presented, including bivariate mixtures of the NNS attributes "mingling" and "dominance". Mark Correlations were investigated for several marks, including diameters, heights and nearest neighbor statistics. Finally, we discuss the most important results and motivate the need for detailed assessments in large contiguous field plots. The literature on spatial statistics is often rather technical, and there is relatively little exchange between mathematicians developing the theory and ecologists who have interesting data from observational studies, such as presented in this contribution.

Keywords: spatial structure; second order statistics; nearest neighbour statistics; bivariate mixtures.



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Ternary agriculture in Botswana, its theoretical and policy implications

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Abstract

This paper identifies the ternary agriculture in Botswana, i.e. western style farming, Chinese farming and subsistence farming, and then further generalizes the ternary phenomena in the world. Then it tries to give an explanation from history and culture. Three types of culture, i.e., western trade based, East Asian intensive agriculture based and nomadic economy based cultures, are identified, of which, knowledge form (logic based or experience based) and competition pressure are two key dimensions for economic success. In the same vein, these three cultural modes may help to understand the current ternary phenomena in economic development in the world, and give some predictions for future trends of the ternary phenomena. In the end, the paper provides some policy implications based on the case study of Botswana. This research doesn't imply the superiority of any culture since all cultures just happened to adapt to the specific environment, and also doesn't imply that the economic development is preferable in any sense. However for any country that is pursuing economic development, fair market environment and local entrepreneurs are critical.

Keywords: Ternary Agriculture, style farming, fair market environment.



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Improving Wheat productivity under stress (Low inputs)

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Abstract

A vast area of Egypt is non-arable desert, except for some areas being newly reclaimed for arable use. Meanwhile, considerable population increase in Egypt entailed parallel rise in the "food gap" in Egypt. This gap could be narrowed through innovative efforts to increase local production of wheat. Nitrogen deficiencies or inadequate water supply, are the major factors which ultimately cause yield losses. Unfortunately, varieties that are best suited to stress conditions are limited, inaccessible, or costly. Due to the nature of breeding varieties for modern agriculture, conducted largely under optimal high-yielding conditions, varieties that possess genetic traits advantageous in low-input systems are often overlooked. To find ways of improving yield and quality of wheat this project pursued an ecological approach by studying potential interactions among appropriate varieties and various farm management practices (fertilizers and waters). To Evaluate of new bread wheat (i.e. varieties and elite introduced lines from CIMMYT) and characterized by their high yielding ability under low levels of N fertilization, used Nano nitrogen supply and irrigation to indicate the best one of them and the optimum irrigation amount as well as the optimum N - level . Elicitation of new drought tolerant lines to save the irrigation water and to reduce the mineral fertilizers amounts.

Keywords: Wheat, Low input, Nano nitrogen, Genotype-environmental interaction.



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Physiological studies on tolerance of different genotypes of fababean plant to NaCl stress.

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Abstract

Salinity stress is one of the major abiotic stresses that are a threat to crop production worldwide. Therefore, the aim of the present experiment was to select the tolerant genotype/s based on morphological, physiological and biochemical characteristics of five *Vicia faba* genotypes (Giza 716 "Egypt", Gza "Yemen", ALB "Algeria", Triple white TW "Sudan" and NA112 "Bakestane") under salt stress. We studied the effect of different levels of NaCl stress (0-100 mM-150 mM and 200 mM) on growth parameters (length, fresh weight and dry weight) of shoot and root, also some physiological and biochemical traits such as membrane stability index (MSI), leaf relative water content (RWC), chlorophyll (a, b and carotenoids) content, proline biomarker and activities of catalase (CAT, EC 1.11.1.6), peroxidase (POD; EC 1.11.1.7) polyphenol oxidase (PPO) enzymes in the five faba bean genotypes. The results indicated that, salt stress reduced all growth parameters, MSI, RWC and photosynthetic pigments content with all genotypes. However, the deteriorating effect of salt stress on the growth performance of genotype ALB were relatively low due to its better RWC, higher membrane stability, more stable for photosynthetic pigments, relatively high accumulation of proline and the high expression of some antioxidant enzymes inside plant cells. In the present study, genotype ALB and GZA were found to be relatively tolerant to salt stress while TW and NA112 genotypes were sensitive to salt stress.

Keywords: *Vicia faba*, salinity stress, growth parameters, proline, antioxidant enzymes, nutrient accumulation.



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Cadmium uptake by some *Chenopodium* spp. as model of phytoremediation technology

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Abstract

Cadmium (Cd) is extremely toxic heavy metal which adversely affects the growth of plants. Phytoextraction one from among of phytoremediation technology methods has proven to remediate media contaminated with heavy metals. The objective of this research is find out whether *Chenopodium* species (*Ch. ambrosoidae*, *Ch. album* and *Ch. quinoa*) can be used as a Cd hyperaccumulator from through study effects of Cd on growth of species seedlings. Therefore, three Cd concentrations (10, 20 and 30 ppm) with addition to control have conducted to archive aim of study. Different parameters have tested in present study include growth, physiological and biochemical parameters of growth seedlings stage. Results indicate that the inhibitory effect has observed on all growth, physiological and biochemical traits of early growth seedlings stage. *Chenopodium* species have many tolerance mechanisms against Cd stress such as membrane stability, stability pigments and activity of antioxidant enzymes under Cd treatments. Data indicated that *Ch. quinoa* get the better of another two species in Cd uptake and total tolerance index of Cd, so, we demonstrated that *Ch. quinoa* suitable for phytoextraction.

Keywords: Cadmium, *Chenopodium* spp., phytoremediation, antioxidants enzyme and chlorophyll content.



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**Investigation the allelopathic stress of *Alhagi maurorum* on growth and
physiological parameter of *Pisum sativum***

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Abstract

The present work was conducted to evaluate the effect of aqueous extract from shoot of *Alhagi maurorum* at different rates (0.01, 0.05, 0.10, 0.15 %, w/v) on some Physiological parameters of pea (*Pisum sativum*). The pot experiment revealed that *Alhagi maurorum* aqueous extract reduced all growth parameters of pea plant. Also, photosynthesis pigments, insoluble sugars, total carbohydrate, total protein and total phenolics were markedly reduced in response to treatment with aqueous *Alhagi* extract. On other hand, soluble sugars, soluble protein, proline and flavonoids increased upon treatment with *Alhagi maurorum* extract.

Keywords: Antioxidant enzymes, Flavonoid, Phenolic, Photosynthetic pigments, *Pisum sativum*, Proline.

