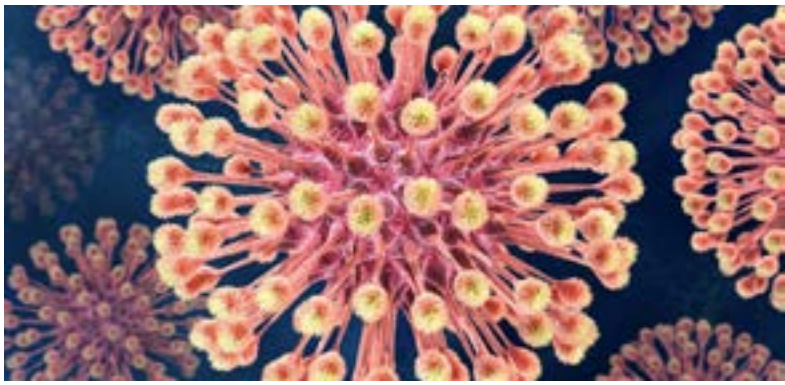
Microbial Ecology 2018



International Pre Conference Workshop on

Microbial Ecology & Eco Systems

June 28-29, 2018 | Alexandria, Egypt

SESSION-IV

Poster Presentations

Day 1

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Introduction of tryptophan residues towards the cytoplasmic end of the *Trepanosoma brucei* Aquaporin

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African Trepanosoma brucei cause sleeping sickness in humans, a disease that is typically fatal without chemotherapy. Unfortunately, drug resistance is common and our understanding of the underlying mechanisms remains incomplete. In Trypanosoma, three aquaporins genes, AQP1-3, have been identified. Recent studies have shown that loss of AQP2, a channel with an unusual selectivity filter, is specifically responsible for MPXR, leading to the hypothesis that some of the clinical trypanocides, specifically pentamidine and the melaminophenyl arsenicals enter through these aquaporins. In T. brucei, the TbAQP2 protein was found to be a highly efficient transporter for pentamidine and melarsoprol and introduction of the corresponding gene into Leishmania mexicana made these parasites more than 1000-fold more sensitive to melarsoprol, and 40-fold more sensitive to pentamidine. Therefore, an understanding of the mechanisms of AQP2-mediated drug uptake in African trypanosomes will facilitate the advancement of diagnostic tools and perhaps at the same time the improvement of enhanced treatments. We report here the construction of several genetic mutations (single amino acid substitutions) in AQP2 to investigate their effects on the ability of the gene for drug sensitivity and drug transport. As part of this strategy, leucine residues were replaced by tryptophan in three suggested sites in the Tb AQP2 gene. The results of introducing tryptophan residues in L84 and L118 in the TbAQP2 showed some loss of pentamidine susceptibility compared to the wild-type cells, whereas L218 showed equal sensitivity to pentamidine compared to the wild-type cells.

Keywords: African *trypanosomiasis*, drug resistance, *Leishmania spp*, *Trepanosoma brucei*

Biography

Ali Efan Alghamdi is currently a PhD student of the Genetics of Leishmania at the Institute of Infection, Immunity and Inflammation College of Medical, Veterinary and Life Sciences, University of Glasgow. He studied his Master degree in Biotechnology from Macquarie University, School of Science in Australia, and his B.Sc. in the Department of Biology, Albaha University, Albaha, Saudi Arabia.

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Monitoring of some physico-chemical properties and bacteriological pollutions in surface water of Nile river (Rosetta Branch) in Egypt.

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The experiment was conducted at Nile River (Rosetta branch) in Edfina, Beheira Governorate during three months (December 2016, January and Febrauary 2017). The physical parameters such as (Temperature (T), pH, Electrical Conductivity (EC) and total dissolve solid (TDS)) were measured in surface water. The results showed that temperature and TDS were low significant within the permissible limits, but the pH was high significant (8.83) in February 2017. Also, chemical parameters were evaluated and the Dissolved Oxygen (DO) was high significant in January 2017, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) in December 2016. The concentration of ammonia ion (NH_3-N), nitrite (NO_2-N) and nitrate (NO_3-N) were fluctuation during the period of study. Some heavy metals were estimated in this study; cadmium, iron, cooper, lead, manganese and zinc were less significant than the permissible limits. The results indicated that were within the allowable limits according to Egyptian law number 48 of 1982. Microbiological tests were also carried out in the present study measuring total coliform, total fecal coliform and number of algae, the results showed that the highly significant values of the bacteriological counts such as total coliforms (130001.33 MPN/100ml), faecal coliforms (17002.33 MPN/100ml) in February 2017, but the low significant values in the counts of total and fecal coliform and recoded 35003.33 in December 2016 and 1401.33 in January 2017, respectively. Also, the results obtained the algae were high significant (1621.33 N/ml) in January 2017 and low significant (406.33 N/ml) in December 2016. The results indicate that the river is highly polluted by various chemical pollutants and pathogenic bacteria. Regular monitoring and immediate measures are required to reduce risks on public health and the environment.

Keyword: Nile River (Roseta Branch), surface water pollutions, physicals, chemicals, Bacteriology, Egypt.

Biography

Hassan Ali Shaldam is currently Manager of water pollutants Department (chemicals, pesticides and Bacteriology), Preventive Affairs, Ministry of Health, Egypt. He accumulated 6-years of experience in water pollutions (chemicals and bacteriology). He has B.Sc. Agriculture Science "Chemistry of Pesticide Department", 2000, Alexandria University, M.Sc. in toxicological studies of pesticides, Department of Chemistry and Toxicology of Pesticides, Alexandria University 2007and PhD. in Adverse effects of pesticides on endocrine system in rats, Chemistry and Toxicology, Department of Plant Protection, Damanhour University 2012. Research interests about water and air pollutions, Pesticide Chemistry and Toxicology,plantprotection.

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Purification and serological reactivity of an isolate of Sweet potato feathery mottle virus from sweet potato

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Sweet potato feathery mottle virus (SPFMV) isolated from sweet potato plants was purified using two methods different in the procedure of extraction and precipitation. Phosphate buffer and polyethylene glycol (PEG) in the first and borate buffer and differential centrifugation in the second were used as extraction buffers and precipitation means, in the order given. The first method yielded about 2.84 mg virus/100 g fresh weight of sweet potato leaves while the second procedure gave a corresponding value of 1.63 mg virus/100 g fresh weight. The Ultraviolet absorption spectra of the purified virus preparations were typical for nucleoproteins. A polyclonal antiserum against the virus was produced by two different protocols of injection (four weekly intramuscular injections versus one intravenous followed by three intramuscular injections) and antisera titre was determined by indirect ELISA. The titre with the first protocol reached up to 1:64000 while with the second one, it was only 1:8000. The antisera raised could detect SPFMV in some naturally infected sweet potato plants using indirect ELISA with high efficiency. Adding cellulase or macerozyme to the extraction buffer enhanced the sensitivity of the test. The highest absorbance values were obtained when SPFMV infected samples were extracted in carbonate buffer and treated with macerozyme followed by cellulase.

Biography

Maha A. Kawanna is currently an assistant professor of Plant Pathology, Department of Plant Pathology, Faculty of Agriculture, Alexandria University. She received her PhD degree in Plant Pathology, Faculty of Agriculture El-Shatby, Alexandria, Egypt at 2007. The main interests include diagnosis of plant viral disease, identification of plant viruses using serological and molecular techniques, studying the distribution of the important plant viruses. She contributes in the agriclinic by detection of the plant viruses affecting the main crops using biological, serological techniques as indirect ELISA and Tissue blot immunoassay (TBIA). She is teaching basics of plant pathology and plant virology courses for undergraduate students.

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Production of natural pigments from native fungi as substitutions of food artificial colorants

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There is worldwide interest in process development for the production of pigments from natural sources due to hazardous effects of many artificial synthetic colorants which have widely been used in food and pharmaceutical industries. Production of pigments by fungi is a very important taxonomic criterion which had been used in classification of fungi in the last century. The present work aimed to study the production of pigment from four taxa of terrestrial fungi. Among four fungal strains namely: *Aspergillus sydowii, Eurotium rubrum, Quambalaria cyanescens and Penicillium purpurogenum. P. purpurogenum* came first by showing the highest yield of red pigment (RP) production after 7 days of incubation in static culture at 20°C in the presence of sucrose and peptone as the sole carbon source and nitrogen source respectively at an initial pH value of 6.5. Statistical experimental designs were applied to optimize the fermentation medium for red pigment production. Plackett–Burman design was applied to identify the significance of different medium variables. The red pigment of fermentation broth was extracted by using petroleum ether. This research was monitored and controlled using spectroscopic analysis including TLC, FT-IR and GC-MS analysis. The anticancer activity of P. Purpurogenum's red pigment was evaluated using four different human cell lines (HepG2, HCT-116, MCF-7,HEP-2) showing inhibitory effects against all of them. The present study revealed that the native isolate of P. purpurogenum can produce a safe red pigment which may have a lot of applications in children food industries with an inhibitory effect on anticancer.

Keywords: anti-cancer, cell line, fermentation, GC-MS, pigment, TLC.

Biography

Nancy A. Ibrahim has an M.Sc. in Microbiology (2016), Faculty of Science, Alexandria University, Egypt. She is currently a microbiology specialist at the Ministry of Health & Population, Central Labs, Damanhour branch, and a part time assistant lecturer of microbiology, Faculty of Dentistry, Pharos University. She accumulated 6-years of experience in food and water analysis and supervision, and participated in a number of regional and international conferences including the International Conference of Genetic Engineering and Biotechnology, April 26 - 29, 2016 (GEBRI) & 7th students` research and innovations conference, Faculty of science, Alexandria University, April 2018.

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Biosynthesis of silver nanoparticles using *Aspergillus oryzae* and its extracellular protein profile

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The biological generation of silver nanoparticles (AgNP) is a straight forward process. However, the mechanism by which this process takes place is unclear. We demonstrate the synthesis of AgNPs using fungal filtrate of *Aspergillus oryzae*. A characteristic peak of AgNP formation was detected at 435 nm. Eight most prominent extracellular protein bands were identified using MALDI/TOF Mass spectrometry. Here, we suggest that proteinaceous molecules such as some amino acids, play an essential role in converting $AgNO_3$ into AgNP. Moreover, this is the first report suggesting that AgNP are stabilized by the chelating agent, 5-hydroxy-2-hydroxymethyl-1,4-pyrone (kojic acid). Our findings suggest that this species would be useful for large scale AgNP production.

Keywords: *Aspergillus oryzae*, MALDI-TOF, Silver nanoparticles

Biography

Marwa R. Obiedallah is currently an assistant lecturer of Microbiology at Faculty of Science, University of Sohag, Egypt. She has MSc in mycotoxins (2011), and gained wide experience in fungal natural products and mycotoxins during her study. She was offered a scholarship from the Egyptian cultural affairs and missions sector for her PhD project at the at School of Biological Sciences, University of Reading, UK, where she had the opportunity to improve her skills and experience. She is a postgraduate member at the British Mycological Society (2017-2019). Her research interests now is focusing on nanotechnology, where she is paying attention for the mechanism by which fungal species can generate nanoparticles of their metal salts. She believes that he findings will direct future researches for proteome studies of promising fungal isolates.

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Over expression of phytoene desaturase and phytoene synthase genes in some species of eukaryotic fresh water alga

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Carotenoids are prooxidant and essential for photosynthetic green plants, algae and cyanobacteria. They serve as regulators of plant growth and development, as accessory pigments in photosynthesis, photo protectors preventing photo-oxidative damage, and precursors of some hormone such as abscisic acid (ABA). The accumulation of carotenes depends on a series of isoprene condensations, followed by a series of desaturations of the polyene chain and subsequent cyclization of the end structures. These processes are regulated by the expression of two genes phytoene synthase (PYS) and phytoene desaturase (PDS).Their activities are regulated by light. The carotenoid biosynthetic is amenable to manipulation by recombinant DNA techniques. Most synthesis carotenoids required sharing of the two enzymes phytoene synthase and phytoene desaturase. In the present study the coding sequences of the two genes PYS and PDS were cloned into two expression vectors and transformed into the unicellular green alga *Chlamydomonas reinhardtii via Agrobacterium tumefaciens*. Analysis of PYS and PDS mRNA transcripts and protein analysis showed that the two genes are functionally expressed in the transformed algal cells. Moreover, the overexpression of the two genes are manifested under some chemicals affecting the process of carotogenesis.

Keywords: Agrobacterium tumefaciens, Carotenoids, *Chlamydomonas reinhardtii*, phytoene synthase, phytoene desaturase, SDS-Electrophoreses, Transformation, RT-PCR.

Biography

Heba Morsy is currently a permanent researcher at the Biotechnology Labs, Faculty of Science, Zagazig University. She has B.Sc. in Chemist-Botany (2002), and M.Sc. in Microbiology (2014), both from the Faculty of Science, Zagazig University, Sharkia, Egypt. She accumulated 13-years of experience working as a chemist in the General Authority for Export and Import Control.

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Mycogenesis of silver nanoparticles using selected strains of opportunistic fungi and their efficacy against asergillosis causal agents

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Four strains of opportunistic fungi isolated from aspergillosis suspected patients at Assiut university chest department, proved to possess high enzymatic ability, were tested for silver nanoparticles producing ability. *Aspergillus niger* EN2 KY6095, *A. flavus* EN1 KY609, *A. terrus* EN3 MF 852635 and *A. fumigatus* filtrates were challenged with 1mM silver nitrate aqueous solution. *C* EN1 KY609, *A. terrus* EN3 MF 852635 and *A. fumigatus* proved to produce silver nanoparticles, whereas, A niger EN2 KY6095 was not able to induce AgNP. The process was fast and stable in the case of *A. terrus* and *A. flavus*. UV-visible spectrum peaks were shown at 445 and 430, respectively; corresponding with the plasmon absorbance of AgNP. TEM micrographs showed well dispersed AgNPs ranging of 50-30 nm. Digital Laser Scattering (DLS), Fourier-transform infrared spectroscopy (FTIR) and X-Ray Diffraction confirmed the production of AgNPs by *A. flavus* and *A. terrus* that showed high and stable production of AgNPs. Silver nanoparticles has an antibacterial effect on different bacterial strains. Its efficacy against gram-negative bacteria is higher than Gram positive bacteria. Antifungal assay of AgNPs showed significant advantages over conventional antifungal compounds.

Keywords: Silver nanoparticles, opportunistic fungi, *A. terrus*, *A. flavus*.

Biography

Alaa A Yasien is currently a Master student at Faculty of Science, University of Sohag, Egypt. She has B.Sc. in microbiology and chemistry (2011), and applied microbiology diploma (2012) from University of Sohag, Faculty of Science, Sohag, Egypt. Through her study, she developed interest in studying the role of fungi in the field of nanotechnology. Her research is based on how nanoparticles are produced in a more stable and effective biological way on pathogenic microorganisms.

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Zinc oxide nanoparticales induced histological, histochemical and genotoxicity effects in kidney of adult male rabbits

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Our aim was to study the histological, histochemical and genotoxic effects of ZnO NPs on the kidney of adult male rabbits. Fifteen adult male rabbits were divided equally into three groups. Group I was the control group; group II was the low dose treated group, in which rabbits were intraperitonial injected with ZnO NPs (100 mg/kg/day) for 14 days; and in group III was the high dose treated group, rabbits were injected intra peritonially with ZnO NPs (250 mg/kg/day) for 14 day. At the end of the experiment, specimens from the kidney were taken and stained by H&E, PAS and Masson trichome stains. Also bone marrows were isolated for flow cytometry to study genotoxicy. ZnO NPs was nephrotoxic and led to prominent histopathological changes in the kidney. There were destructions of the renal tubules, in form of loss of brush border, vacuolation of cytoplasm and intratubular protein depositions. Also there was interstitial infiltration of inflammatory cells. The renal corpuscles were dilated and congested. There was increase in apoptotic cell rate of bone marrow samples and showed greater and distinct fragmentation or shearing DNA. ZnO NPs had cytotoxic and genotoxic effects in the kidney. It increased apoptotic rate of the bone marrow cells and fragmentation of DNA. ROS may be the main cause of cytotoxic effects. ZnO NPs was toxic in dose dependent manner.

Keywords: apoptosis, cell cycle, DNA fragmentation, Histology, Histochemistry, genotoxicity, Zinc oxide.

Biography

Tito N. Habib is currently is the head of molecular genetics' Lab., Zoology department, Faculty of Science, Sohag University, since 2015 till 2018, and a professor of Genetics & molecular Biology. He got his PhD from Texas A& M University, in 1999 as a visiting scholar in the department of Wildlife and Fisheries Science, Bryan-College Station, Texas, USA, in the field of Molecular Genetics. He followed his promotion as assistant professor of molecular Genetics, Zoology department, Faculty of Science, Sohag University, Egypt, (2007-2011), and Head of Biology Department, Faculty of Science, Balgurashi, Albaha University, KSA (2011-2015). He served as HEEPF project council member (B-035-P1) for the development of Genetics' courses, Faculty of Science, Sohag University, Egypt. He was a main advisor for 2 PhD, and 2 Master Thesis in Medical Genetics topics, Faculty of Medicine, Sohag University. He served as a Head of the Egyptian Syndicate of Scientific professions (Sohag-branch) from December, 2017 till February, 2020. He works as a reviewer for journal of Clinical Pathology and Forensic Medicine, Chronicle Journal of Cancer Science. He got an invitation from 7th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2018) which will be hold in October 17th - 20th, 2018, Nanjing, China.

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Transgenic approach towards the enhancement of cyanidase production by *Chlamydomonas* sp algae

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Cyanide is a nitrile, an organic compound that contains a triple-bonded carbon and nitrogen functional group. Most of these compounds are highly toxic, carcinogenic, and mutagenic. The toxicity of cyanide is quite high due to its ability to poison the respiratory system by inhibiting the final transport electrons from cytochrome C oxidase to oxygen, and finally preventing production of ATP. Although chemical and physical treatments provide more rapid detoxification and are less susceptible to environmental upsets biological alternatives are more economical and good for ecological balance. The aim of the present study is to detoxify the toxicity of cyanide to algae through the transformation of some related gene (cyanidase) to *Chlamydomonas reinhardtii*. Via *Agrobacterium tumefaciens*.. Restriction enzymes, gel-electrophoresis and RT-PCR techniques indicate that Chlamydomonas reinhardtii is transgenic and has well overexpression of cyanidase and can be used for bioremediation of nitrile compounds.

Keywords: *Chlamydomonas, Agrobacterium*, P. stutzeri AK61, cyanidase gene

Biography

Noha El-sharkawi is currently a biology teacher at el Awael private school, Zagazig, Egypt. She has pre-MSc in Botany (Microbiology) 2012. She has experience in scientific research. She has a good knowledge in Writing Scientific Thesis. She has a good experience in computer science. She has MCPD, MCTS from IBM training courses,courses of Human Recourses (Dale Carnegie Training), Toefel in English.

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Antitumor effect of scorpion venom peptides *in vivo* of male rabbit and *in vitro* of DU145 cells of prostate cancer model

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The modern approach used to characterize various compounds from animal venoms, using advanced proteomic and genomic tools, has been denominated "venomics". Venoms from various scorpions have been reported to prevent propagation of different cell lines such as prostate cancer (DU-145), human leukemia and neuroblastoma. In the present study, antitumor effect of scorpion venom was detected *in vivo* of male rabbits and *in vitro* of PC-3 cell line using cell cycle profiling analysis, DNA fragmentation assay, and genetic and epigenetic variations by ELISA kits. The results showed that apoptosis was maximum at pre-G1, and cell growth arrest at G1 phase in group IV. Venom differentially up regulated gene expression of P53, BAX, BCL-2. DNA showed greater and distinct fragmentation *in vivo* and *in vitro* of prostate cancer (PC) than venom treated groups. From the previous result we have concluded that *L. quinquestriatus*' scorpion venom induced apoptosis and differentially modulated the expression of tumour suppressor genes and concomitantly repressing the expression of oncogenes *in vivo* of induced male rabbits with PC and *in vitro* of PC-3cell line.

Keywords: antitumor, apoptosis, cell cycle, DNA fragmentation, prostate cancer, scorpion venom, tumor suppressor gene.

Biography

Nadia S Mahrous is currently an assistant lecturer at Molecular genetics' Lab, Faculty of Science, (Qena) South Valley University, Egypt. She has MSc in Parasitology (2012), Faculty of Science, Egypt. She has got an experience in teaching practical section of veterinary genetic and genetic engineering in college of Veterinary Medicine (2013-2018), Sohag University. She participated in different molecular biology and cytogenetics' techniques. She is a member of the Egyptian Syndicate of Scientific professions.

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