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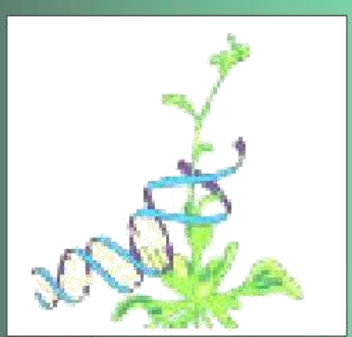

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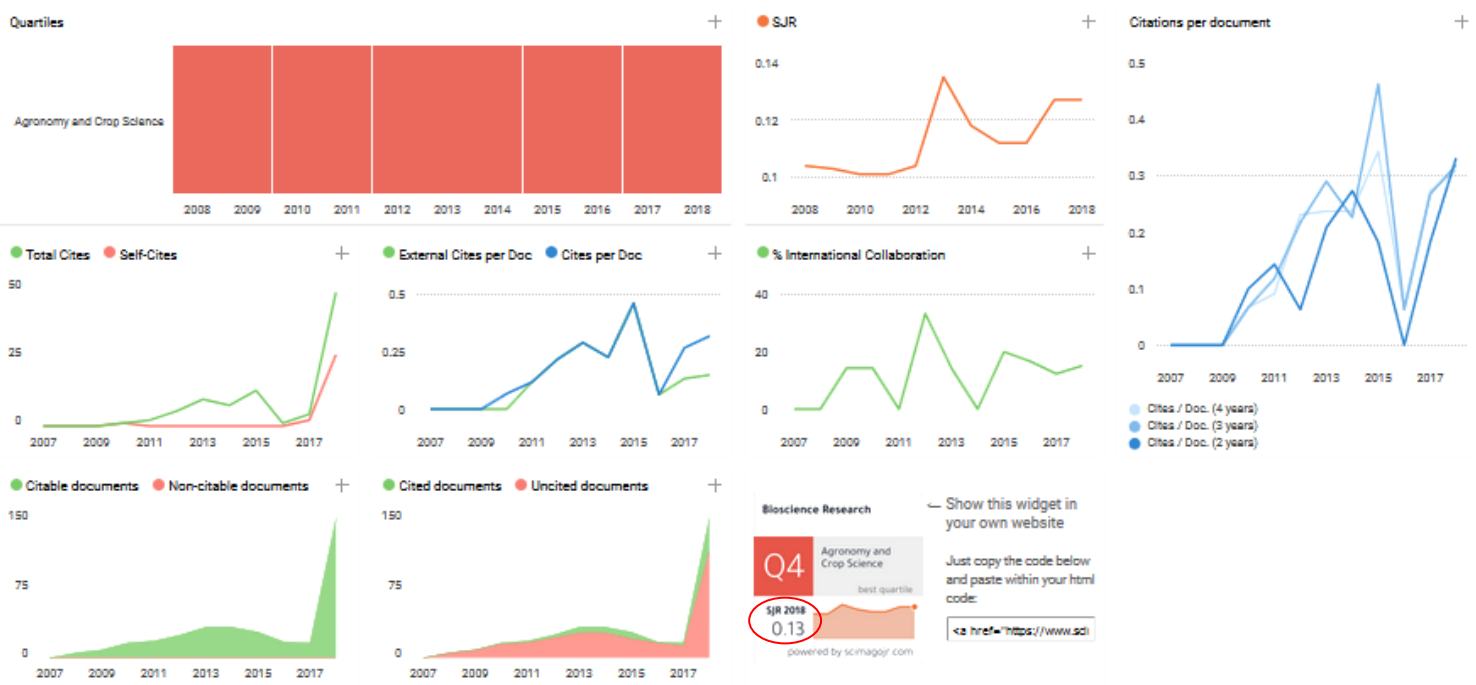

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Sr. #	Titles, Authors & affiliation (s)			Download
1	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 2018 15(3): 1424-1432.	OPEN	Free Full Text [PDF]
	Effect of using tiger nuts (*Cyperus esculentus*) on nutritional and organoleptic characteristics of beef burger. Irina Vladimirovna Bobreneva[1] and Ahmed Adel Baioumy[1, 2*] [1]Department of Technology and biotechnology of food products of animal origin, Moscow State University of Food Production (MGUPP), Moscow, Russian Federation. [2]Department of Food Science, Faculty of Agriculture, Cairo University, Giza, Egypt.			
2	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 2018 15(3):1433-1439	OPEN	Free Full Text [PDF
	Cytological Differences of MV3 Patchouli Plants (*Pogostemon cablin* Benth.) Derived From Gamma Ray-Irradiation Muhammad Tahir*[1], Ersan[2], Dewi Riniarti[1], and Jakty Kusuma[2] [1]Management and Industrial Estate Crop Production, Politeknik Negeri Lampung, Indonesia. [2]Estate Crop Production, Politeknik Negeri Lampung, Indonesia			
3	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3):1440-1448.	OPEN	Free Full Text [PDF
	Response of Lycopene, β-carotene and yield of determinate and indeterminate type tomatoes in various of paranet colors at plastic house Dwi Setyorini[1,2], Yogi Sugito[3], Nurul Aini[3] and Setyono Yudo Tyasmoro[3]			

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4	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,201815(3):1449-1455	OPEN ACCESS	Free Full Text [PDF

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Heba M. Mady[1], Hala M E Hamed[2], Mona M. Taha[3] ,Mohammed A. Shendy[4] and Shawky A. Fouad[5]

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[5]Department Internal Medicine, Kasr Alaini, Faculty Medicine, Cairo University Egypt

5	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):1456-1461.	OPEN ACCESS	Free Full Text [PDF

Preliminary studies to clarify the relationship between potassium sulphate fertilizer and peach fly *Bacterocera zonata* (Saunder) infestations in citrus plantations.

Salem S. A.[1]; El-Kholy, M.Y.[1, 2] and A. M. E. Abd-El Salam[1]

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6	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3): 1462-1471.	OPEN ACCESS	Free Full Text [PDF

A correct combination of pruning, spacing and organic fertilizer improve development and quality of fruit in watermelon cultivar: Case of Ecuadorian littoral

Julio Muñoz-Rengifo[1,2,3ϕ];Ronald Villamar-Torres[1,4ϕ];John Molina-Villamar[1,5,6]; Luz Garcia Cruzaty[7];Bolier Torres Navarrete[8,9];Bella Crespo Moncada[1,10]; Jessenia Castro Olaya[7];Alexis Matute Matute[1,11]; Diego Ortega-Guevara[12]; and Seyed Mehdi Jazayeri [13]

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7	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,201815(3):1472-1479.	OPEN ACCESS\	Free Full Text [PDF

GCMS analysis of bioactive compounds in n-hexane, ethyl acetate, and methanol extract of *Piper betle* L. var. nigra.

[1]Junairiah, [1]Ni'matuzahroh and [2]Lilis Sulistyorini
[1]Department of Biology, Faculty of Science and Technology, Airlangga University, Indonesia
[2]Faculty of Public Health, Airlangga University, Indonesia

8	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,201815(3):1480-1486	OPEN ACCESS	Free Full Text [PDF

Eco-friendly dyeing of wool and silk fabrics using mixed synthesized acid and natural dyes and antibacterial activity for the dyed fabrics

Fatma A. Mohamed[1,2*]
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Iron chelation ability and hematological effect of sappan wood (*caesalpinia sappan*, l.) Extract tablet on iron overload condition of rats

Ratu Safitri[1] and Ani Melani Maskoen[2,3,4*]
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Assessment and evaluation of serum laminin and interleukin-6 in schistosomiasis patients with chronic active hepatitis c

Tamer E. Mosa[1*], Hatim A. EL-Baz[1,2], Ahmed S. Elharoun[3,4], Khaled Hamed[5,6], Ahmed M. Asmali[2], Mostafa Abo-Zeid[7]

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[7]Gastroenterology Center, Faculty of Medicine, Mansoura University, Mansoura, Egypt.

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Effects of re-feeding on metabolic fuels and enzyme activities in starved Broadhead catfish (*Clarias macrocephalus* Gunther, 1864)

Rattanasuda Chaiyachate[1], Bundit Yuangsoi[1], Thongchai Champasri[1], Chamaiporn Champasri[2] and Siripavee Charoenwattanasak[1,*]
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Nutritional and sensory evaluation of the ginger emulsion sausage production from *Pangasius bocourti*

Ananya Simmalee, Bundit Yuangsoi, Sutee Wongmaneeprateep and Siripavee Charoenwattanasak*
Department of Fisheries, Faculty of Agriculture, Khon Kaen University, 40002 Thailand

13 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 201815(3):1520-1527. OPEN ACCESS Free Full Text [PDF

Effect of bokashi fertilizer on growth and yield of local maize from muna island under net house treatment in west muna southeast sulawesi, indonesia

Resman[1], Muhammad Tufaila[1] Azhar Ansi[2], Halim[2], Makmur Jaya Arma[2] and Wa Ode Harlis[3]
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Amira K. G. Atteya[1], Esmail A. E. Genaidy[2] and Hamdy. A. Zahran[3]
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Amira K. G. Atteya[1*] and Abd El-Nasser G. El Gendy[2]
[1]Horticulture Department, Faculty of Agricultural, Damanhour University, Egypt.
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Dina Mansour Tawfic, Wadida Hassan Elsayed and Magda Gaid Sedhom
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DwiTresnaChoirul Yusuf, Imam Santoso*and Dhita Morita Ikasari
Agroindustrial Technology Department,Faculty of Agricultural Technology, Universitas Brawijaya Jl. Veteran - Malang,indonesia

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Sherief Mahdy Hussein[1], Ragia Hany Weshahy[1], Hany Ahmed Shehata[1], Hanan Farouk Aly[2*] and Eman Refaat Youness[3]
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Neveen Salem[1, 2*] and Marwa El-Shamarka[2]
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El-Hassanin[1]A.S.,Samak[1],M.R,Amira,SH.Soliman[1],Maghrabi[2],T.and Fatma,M. Abu Elamaium[2]

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El-Hassanin, A.S.[1], Amira, Sh. Soliman[1], Maghraby, T.[2] and Nashwa, M. El-Sheikh[2]

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La Ode Afa[1*], Bambang Sapta Purwoko[2], Ahmad Junaedi[2], Oteng Haridjaja[3] and Iswari Saraswati Dewi[4]

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25	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,201815(3):1638-1644	OPEN ACCESS	Free Full Text [PDF

Yield of monocrop winter wheat sowing

Demidov A.A[1]., Vakhnyi S.P[2]., Siroshtan A.A[1]., KhakhulaV.S[2*] and Gudzenko V.M[1].

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The effectiveness of *azotobacter* sp. In increasing grown of local maize and sorghum in the intercropping system in ultisols

Andi Nurmas[1*], La Karimuna[1], Laode Sabaruddin[1], Andi Khaeruni[2], Muhidin[1], Rahayu M[2], Rachmawati Hasid[1] and Robiatul Adawiyah[1]

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Effect of herbal mixture on selected rumen and serum constituents in sheep

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Citrus reticulata extract as biocides to control *Aedes aegypti*, the vector of dengue

Arif Nur Muhammad Ansori[1], Muhammad Khaliim Jati Kusala[1], Heri Irawan[1], Naimah Putri[1],Amaq Fadholly[1], Annise Proboningrat[1], Siti Rukmana[1], Ine Karni[1], Agri Kaltaria Anisa[1]and Hebert Adrianto[2]

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The pyraclostobin effect on in vitro rooting of potato tissue culture

Karuniawan Puji Wicaksono[1]*, Kuswanto[1], Paramyta Nila Permanasari[1], Akbar Saitama[1], Akbar Hidayatullah Zaini[1]and Edson Begliomini[2]

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Yield potential improvement of upland red rice using gamma irradiation on local upland rice from southeast sulawesi indonesia

Ni Wayan Sri Suliartini[1*], Teguh Wijayanto[1], Abdul Madiki[1], Dirvamena Boer[1], Muhidin[1]and Muh Tufaila[2]

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Some descriptive characteristics and linear body measurements of Assaf sheep reared in Southern Sinaiin Egypt

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Effect of vegetation types on soil erosion in Endanga watershed, southeast sulawesi, indonesia

Sitti Leomo[1*], Sahta Ginting[1], Laode Sabarudin[2], Muh Tufaila[1] and Muhidin[2]

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Selection of deleterious rhizobacterial isolate as bioherbicide to control of weed *paspalum conjugatum* and *ageratum conyzoides* on soybean cropland

Tresjia Corina Rakian[1*] Muhidin[1], GustiAyuKade Sutariati[1*], Gusnawaty HS[2], Asniah[2] and Uli Fermin[1]

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Bio-Ethanol Production from Fruit and Vegetable Waste by Using *Saccharomyces Cerevisiae*

Mohammad Moneruzzaman Khandaker[1*], KhadijahBinti Qiamuddin[1], Ali Majrashi[2], Tahir Dalorima[1],Mohammad Hailmi Sajili[1]and ABM Sharif Hossain[2]

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Shoot elongation rate in North Sulawesi local rice (*Oryza sativa* L.) under flooding and drought stress at the vegetative phase was different from the reproductive phase

Song Ai Nio[1], Ratna Siahaan[1]and Daniel Peter Mantilen Ludong[2]

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Cytotoxic effects of *Atriplex halimus* extract on human cancer cell lines

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Correlation of nan1 (Neuraminidase) and production of some type III secretion system in clinical isolates of *Pseudomonas aeruginosa*

Zina Hashem Shehab[1] and Bahaa Abdullah Laftah[2]

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Alleviation of salt stress on roselle plant using nano- fertilizer and organic manure

Yassen, A. A[1]; Abdallah, E.F[2]. M.S. Gaballah[2] and Sahar, M. Zaghloul[1]
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[2]Water Relations and Field Irrigation Dept. National Research Centre, Giza, Egypt

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Biochar as a carrier for nitrogen plant nutrition: 2.The growth of maize (*Zea mays* L.) applied with nitrogen enriched biochar on different soil texture

WaniHadi Utomo[1], Titiek Islami[2], Erwin Ismu Wisnubroto[3] and Suhartini[1]
[1]International Research Centre for Management of Degraded and Mining Land,
University of Brawijaya, Malang, Indonesia. [2]Research Centre for Tubers and
Root Crops, University of Brawijaya, Malang, Indonesia.
[3]Tribhuwana Tunggadewi University, Malang, Indonesia

40	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3):1757-1762	OPEN	Free Full Text [PDF

Improving growth,yield,physiological characteristics and nutrients uptake of growing sunflower (helianthus annuus l.) Plants in saline soil by using ascorbic acid

Abd El-RheemKh. M.[1], Hayam A. A. Mahdy[2], Entsar M. Essa[3] and Yasser A. El-Damarawy[1]
[1]Soils and Water Use Dept, National
Research Centre, Dokki, Giza, Egypt. [2]Plant
Dept,National Research Centre, Dokki, Giza,
Egypt.
[3]Plant nutrition Dept. National Research Centre, Dokki, Giza, Egypt.

41	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):1763-1768	OPEN	Free Full Text [PDF

Enhance sunflower productivity by foliar application of some plant growth bio-stimulants under salinity conditions

Sona Salem El-Nwehy, Adel Badr El-Nasharty* and AbdElHalim Ibrahim Rezk
Department of Fertilization Technology, National Research Centre, 33 El Bohouth St.,
P.O. Box 12622, Dokki, Giza, Egypt.

42	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):1769-1777	OPEN	Free Full Text [PDF

Competition between *Chrysoperla carnae* (Neuroptera:Chrysopidae) and *Neoseiulus californicus* (Acari: Phytoseiidae) feeding on *Tetranychus urtica* (Acari: Tetranychidae) as a prey

Amany Ramadan Ebeid, Shimaa Fahim, Fahim and Mohamed Ahmed Gesraha.
Pests and Plant Protection Department, National Research Centre, Dokki, Egypt

43	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):1778-1786	OPEN	Free Full Text [PDF

Effect of ethinylestradiol on sperm quality of the tropical fish *Barbodes binotatus*

Alfiah Hayati*,Ari Sofiyanti ,Dhea Sanggita Armando,Erika Wulansari ,Nurul Faridah , and Listijani Soehargo.
Department of Biology, Faculty of Science and Technology, University of Airlangga, Surabaya, Indonesia, .

44	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3):1787-1795.	OPEN	Free Full Text [PDF

Land evaluation of old and recent cultivated reclaimed desert sandy soils in Egypt.
Th. K. Ghabour; Amal, M. Aziz and I. S. Rahim
Soils and Water Use Dept., National Research Centre, Dokki, Cairo, Egypt

45	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):1796-1804.	OPEN	Free Full Text [PDF

Improving the availability of phosphorus from rock phosphate in calcareous soils by natural materials
Monier Morad Wahba.*, Fawkia, L. Bahna and Amal, M.A.
Soils & Water Use Dept., National Research Centre (NRC), Cairo, Egypt.

46	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3):1805-1815.	OPEN	Free Full Text [PDF

Improvement of some chemical properties of an Ultisol of East Kalimantan through application of combined coal fly ash and oil palm empty fruit bunch Fahrunsyah[1,2], Zaenal Kusuma[3], Budi Prasetya[3], Eko Handayanto[4*]
[1] Postgraduate Program, Faculty of Agriculture, Brawijaya Univercity, Jl. Veteran, Malang 65145, Indonesia
[2] Faculty of Agriculture, University of Mulawarman, Jl. Paser Belengkong. Kota Samarinda, East Kalimantan, Indonesia [3] Departement of Soil Science, Faculty of Agriculture, Brawijaya University, Jl. Veteran, Malang 65145, Indonesia
[4] Research Centre for Management of Degraded and Mining Lands, Brawijaya University, Jl. Veteran, Malang 65145, Indonesia

47	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):1816-1825.	OPEN	Free Full Text [PDF]

The effect of gypsum formation and content on barley growth and yield under drip irrigation system
Abd El-Hady, M.[1]; Amal M. Aziz[2]; Ebtisam I. El-Dardiry[1] and Wahba, M.M.[2]
[1]Water Relations and Field Irrigation Dept. National Research Centre, El-Buhouth St., Dokki, Cairo, Egypt [2]Soils and Water Use Dept. National Research Centre, El-Buhouth St., Dokki, Cairo, Egypt.

48	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):1826-1831	OPEN	Free Full Text [PDF

Agricultural wastes as a potent adsorbing agent for some organic pollutants from aqueous solutions
A.M. Allam[1]; M. K. Mohamed[1]; H.F. Zahran[2]*; M.H. El Sheikh[2] and G.B. Abdelnour[1]
[1]Evaluation of Natural Resources and Planning for their Development Department, Institute of Environmental Studies and Research, University of Sadat City, Elmonofeih, Egypt
[2]Plant Production Department, Arid Lands Cultivation Research Institute, SRTA City, Alexandria, Egypt

49	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):1832-1844	OPEN	Free Full Text [PDF

Flaxseed alleviates toxic effects of some environmental pollutants on pregnant rats and their foetuses
Abdelgawad Ali Fahmi[1]; Mohamed Aly El-Desouky[1]; Khairy A. Ibrahim[2] and Hala Abdelazeem Abdelgaid[*1]
[1]Chemistry Department, Faculty of Science, Cairo University, Giza, Egypt.
[2]Mammalian Toxicology Department, Central Agriculture Pesticides Lab, Agriculture Research Center, Dokki, Giza, Egypt.

50 RESEARCH ARTICLE BIOSCIENCE RESEARCH,201815(3):1845-1851. OPEN ACCESS Free Full Text [PDF

Economic analysis of the effect of climate change on yield of wheat crop in Egypt: case study temperature change

Zainab El Khaliefa[1], H.F. Zahran[2]*and M.H. ElSheikh[3]
[1]Project Management and Sustainable Development Department. Egypt.
[2,3]Plant Production Department. Egypt.
[1,2,3]Arid Lands Cultivation Research Institute, SRTA City, Alexandria, Egypt.

51 RESEARCH ARTICLE BIOSCIENCE RESEARCH,201815(3):1852-1866 OPEN ACCESS Free Full Text [PDF

Statistical bioprocessing strategy for cellulases production by endophytic *Trichoderma harzianum* utilizing lignocellulosic wastes Shahira H. EL-Moslamy* and Yasser R. Abdel-Fattah*

Bioprocess development department, Genetic Engineering and Biotechnology Research Institute (GEBRI), City of Scientific
Research and Technology Applications (SRTA city), New Borg El-Arab City, Alexandria, Egypt

52 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 201815(3):1867-1878 OPEN ACCESS Free Full Text [PDF

Scaling-up production of endophytic *Aspergillus fumigatus* bioactive metabolites as anti-phytopathogenic agent

Shahira H. EL-Moslamy* and Ahmed H. Rezk
Bioprocess Development Dept., Genetic Engineering and Biotechnology Research Institute, City of Scientific Research and Technology Applications, New Borg El-Arab city, Alexandria, Egypt

53 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 201815(3):1879-1891. OPEN ACCESS Free Full Text [PDF

Effect of Nitrogen and Zinc Levels on Yield and Technological Characters of Some Promising Flax Genotypes

Elayan Sohair E.D[1]; Amany M. Abdallah[1]; S.H.A. Mostafa[2] and Riham H.H. Ahmed[2]
[1]Agronomy Department, Faculty of Agriculture, Cairo University, El-Gamaa Street, Giza, Egypt
[2]Fiber Crops Research Section, Field Crops Research Institute, Agricultural Research Center, Giza, Egypt

54 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 1892-1904. OPEN ACCESS Free Full Text [PDF

Photo-Biosynthesis and Biological Evaluation of Silver Chloride Nanoparticles Using *Pseudomonas aeruginosa* and *Rhizobium leguminosarum*

Hanaa M.S. Ibrahim[1]; Mahmoud W. Sadik[1*]; Yasser A. Attia[2]; and Michael R. Gohar[1]
[1]Microbiology Department, Faculty of Agriculture, Cairo University, Giza 12613, Egypt
[2]National Institute of Laser Enhanced Sciences, Cairo University, Giza 12613, Egypt.

55 RESEARCH ARTICLE BIOSCIENCE RESEARCH,201815(3):1905-1916. OPEN ACCESS Free Full Text [PDF

Characterization of salt tolerance in four halophytic bacteria strain isolated from solar saltern at Alexandria-Egypt

Reham F.M. AL-Gozyer*[1]; Reda E.A. Moghaieb[2]; Abdelhadi A. Abdallah[2]; Ahmed N. Sharaf[2] and Naglaa Abdallah[2]
[1]Genetic Engineering Research Department, VACSERA Holding Company, Agouza, Giza, Egypt. [2]Department of Genetic, Faculty of Agriculture, Cairo University, Giza, Egypt.

56	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 201815(3): 1917-1924.	OPEN ACCESS	Free Full Text [PDF

Effects of *Moringa oleifera* L. Herb and its extract on indomethacin-induced gastric oxidative stress in rats

Hany M.A. Wahba[1*] and Lobna A. Shelbaya[2]
[1]Nutrition and Food Science Dept., National Research Centre, Dokki, Giza, Egypt.
[2]Home Economics Department, Faculty of Specific Education, Mansoura University, Egypt.

57	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 201815(3):1925-1930.	OPEN ACCESS	Free Full Text [PDF

Salmonella infection in Broiler flocks in Egypt

Salem Soliman[1]*; Ahmed Adel Seida[2]*; Sahar Zou El-Fakar[3]; Youssef Ibrahim Youssef[3]; and Jakeen El-Jakee[2]
[1]Faculty of Veterinary Medicine, Cairo University, Giza 11221, Egypt
[2]Department of Microbiology and Immunology, Faculty of Veterinary Medicine, Cairo University, Giza 11221, Egypt
[3]Department of Diseases of Poultry and Rabbits, Faculty of Veterinary Medicine, Cairo University, Giza 11221, Egypt

58	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3): 1931-1942.	OPEN ACCESS	Free Full Text [PDF

Amyloid beta-peptide (1-42) induced neurotoxicity in experimental rats: Effect of Donepezil

Yasser M. Moustafa[1], Dalia Medhat[2*], Sawsan A. Zaitone[1,4], Zakaria El-Khayat[2], Omar M. E. Abdel-Salam[3] and Alhammali A.M. Abdalla[1]
[1]Pharmacology and Toxicology Department, Faculty of Pharmacy, Suez Canal University, Egypt.
[2] Medical Biochemistry Department, National Research Center, 33 El Behouth St., 12622, Dokki, Cairo, Egypt. [3]Toxicology and Narcotics Department, National Research Centre, Tahrir St., Dokki, Cairo, Egypt.
[4] Pharmacology and toxicology Department, Faculty of Pharmacy, University of Tabuk, Saudi Arabia.

59	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 201815(3):1943-1951.	OPEN ACCESS	Free Full Text [PDF

Wheat Yield Versus Seed Bed Conditions

Tayel, M.Y.; S. M. Shaaban; Ebtisam A. Eldardiry and H.A. Mansour
Water Relations & Field Irrigation Department ,National Research Centre, Cairo, Egypt

60	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,201815(3):1952-1951	OPEN ACCESS	Free Full Text [PDF

Phenotypic and molecular marker analysis off1 population derived from crossing of gogo-dryland x paddy-field rice varieties

ZaimDzoelHazmy[1], NoerRahmi Ardiarini[2], Respatijarti[2], Damanhuri[2], and Afifuddin Latif Adiredjo[2*]
[1]Postgraduate Program, Faculty of Agriculture, Brawijaya University, Jl. Veteran, Malang 65145, Indonesia
[2]Department of Agronomy, Faculty of Agriculture, Brawijaya University, Jl. Veteran, Malang 65145, Indonesia

61	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,201815(3):1962-1968	OPEN ACCESS	Free Full Text [PDF

Identification of secondary metabolites and activity test of *Ganoderma lucidum* methanol extract as anti-termite (*Coptotermes curvignathus)* biopesticide

Surahmaida[1*], Tri Puji Lestari Sudarwati[1] and Junairiah[2]

[1]Academy of Pharmacy Surabaya, Surabaya, Indonesia
[2]Department of Biology, Faculty of Science and Technology, Airlangga University, Surabaya, Indonesia

62 RESEARCH ARTICLE BIOSCIENCE RESEARCH,201815(3):1969-1974 OPEN ACCESS Free Full Text [PDF

Effect of dried tomato waste powder on pH, water holding capacity, and water activity of Frankfurter made from Thai native beef

So Sarong[1], Suthipong Uriyapongson[1]*, Juntanee Uriyapongson[2], Ronnachai Prommachart[1], Thassawan Somchan[1], Tanom Tathong[3], Julakorn Panatuk[4],Suthipong Pimsri[1], and Khanya Phonsaen[1]
[1]Department of Animal Science, Faculty of Agriculture, Khon Kaen University, Khon Kaen 40002, Thailand
[2]Department of Food Technology, Faculty of Technology, Khon Kaen University, Khon Kaen 40002, Thailand
[3]Department of Food Technology, Faculty of Agriculture and Technology, Nakhon Phanom University, Nakhon Phanom 48000, Thailand
[4]Department of Animal Science, Faculty of Animal Science and Technology, Maejo University, Chiang Mai 50290, Thailand

63 RESEARCH ARTICLE BIOSCIENCE RESEARCH,201815(3):1975-1981 OPEN ACCESS Free Full Text [PDF

Effect Of Carrier Media for Biofertilizer of Phospate Solublizing Bacteria *Bacillus* sp to Peanut (*Arachis hypogea*) Growth

Tutik Nurhidayati[1], Wirdhatul Muslihatin[1], N.Firdausi[1], E.P. Setyaningsih[2], A.P.D Nurhayati[1]andEkoPrasetyoKuncoro[3]
[1]Department of Biology, Faculty of Sciences, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia [2]Department of Chemistry, Faculty of Sciences, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia [3]Department of Biology, Faculty of Sciences and Technology, Universitas Airlangga, Surabaya, Indonesia

64 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):1982-1991 OPEN ACCESS Free Full Text [PDF

In vitro germination of *Moringa oleifera* synthetic seed on different composition of medium

Wirdhatul Muslihatin[1], Nurul Jadid[1], Chusnul Eka Safitri[1] and Eko Prasetyo Kuncoro[2]
[1]Department of Biology, Faculty of Sciences, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia
[2]Department of Biology, Faculty of Sciences and Technology, Universitas Airlangga, Surabaya, Indonesia

65 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 201815(3): 1992-2000. OPEN ACCESS Free Full Text [PDF

The effect of mung bean (*Phaseolus radiatus* L.) sprout on lovastatin and red pigments production of red mold rice

Elok Zubaidah, Lestari Puji Astuti and Teti Estiasih*
Department of Food Science and Technology, Faculty of Agricultural Technology, Brawijaya University, Jl. Veteran, Malang, Indonesia.

66 REVIEW ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2001-2018. OPEN ACCESS Free Full Text [PDF]

Green Nanoparticles: Biogenerators; Mechanistic Aspects of Biosynthesis; Potential Applications and Future Prospective

Nouf Mohammed Al-Enazi
Biology Department, College of Science and Humanity Studies, Prince Sattam Bin Abdulaziz University, Alkharj, Saudi Arabia

67	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3):2019-2028.	OPEN	Free Full Text [PDF]

The performance of soybean genotypes as the result of hybridization on leaf rust disease

Mohammad Setyo Poerwoko[1], Nurul Sjamsijah[2], Kacung Hariyono[3], Slameto[4]
[1]Plant Breeding, Agronomy Study Program of Agriculture Faculty of Jember University, Indonesia
[2]Plant Breeding, Seed Technology, Polytechnic State Jember, Indonesia
[3]Plant Breeding, Agro technology Study Program, Faculty of Agriculture, Jember University, Indonesia
[4]Crop Physiology, Agronomy Study Program of Agriculture Faculty of Jember University, Indonesia

68	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3): 2029-2040.	OPEN	Free Full Text [PDF]

Effect of growing media, bio and organic fertilization on the flowering and chemical constituents of *Calendula officinalis* l. Plants.

El-Sayed, A.A[1]., El-Leithy, A. S[1]., Bazraa, W. M.[2] and Abdel-Latef, M. S.[2]
[1]Ornamental Horti., Dept., Fac. of Agric., Cairo Univ., Giza, Egypt. [2]Ornamental Horti., Dept., Agriculture research center Giza Egypt.

69	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3): 2041-2048.	OPEN	Free Full Text [PDF]

Effect of post harvest treatments on *Gladiolus grandiflorus* cut flowers.

Mona Ahmed Darwish[1], Atef Mohamed Zakareia Sarhan[1], Khaled Abdl-Mohsen Emam[2] and Reham Emam Ahmed Alm-Eldeen[2]
[1]Department of Ornamental Horticulture, Faculty of Agriculture, Cairo University, Egypt
[2]Horticulture Research Institute, Agriculture Research Center, Egypt

70	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 2018 15(3): 2049-2059	OPEN	Free Full Text [PDF]

Prevalence of ESBL genes in ESBL producing *Klebsiella pneumoniae* isolated from patients with urinary tract infections in Baghdad, Iraq

Riham Adday Salman and Kais Kassim Ghaima*
Institute of Genetic Engineering and Biotechnology for Postgraduate Studies, University of Baghdad, Baghdad, Iraq.

71	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3): 2060-2067.	OPEN	Free Full Text [PDF]

Effect of pollination time and proportion of females flowers to males flowers in yield and seed quality of melon (*Cucumis melo* L.)

Respatijarti[1], Mochammad Roviq[2] and Afifuddin Latif Adiredjo[1*]
[1]Plant Breeding Laboratory, Department of Agronomy, Faculty of Agriculture, Brawijaya University, Veteran street, Malang, East Java, Indonesia,
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72	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3): 2068-2088.	OPEN	Free Full Text [PDF]

Role of arbuscular mycorrhiza, α-tocopherol and nicotinamide on the nitrogen containing compounds and adaptation of sunflower plant to Water stress

Hala Mohamed Safwat El-Bassiouny[1*], Amany Attia Abd El-Monem[1], Maha Mohamed-Shater Abdallah[1] and Kawther Mohamed Soliman[2].

[1]Botany Department, Agriculture and Biology Division, National Research Centre, Dokki, Giza, Egypt,

[2]Food Toxicology and Contaminants Department, Food Industries and Nutrition Division, National Research Centre, Dokki, Giza, Egypt

73	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 201815(3): 2089-2103.	OPEN	Free Full Text [PDF]

Improving nutritional value of Roselle seeds by arginine, Fe-EDTA and hemin applications

Mervat Shamoon Sadak[1], Hala Mohamed Safwat El-Bassiouny[1*], Maha Mohamed-Shater Abd Allah[1] and Bakry Ahmed Bakry[2]

[1]Botany Department, Agriculture and Biology Division, National Research Centre, Dokki, Giza, Egypt

[2]Agronomy Department, Agriculture and Biology Division, National Research Centre, Dokki, Giza, Egypt, 33 El Bohouth st P.O. 12622

74	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 2018 15(3): 2104-2114.	OPEN	Free Full Text [PDF]

Effects of Fermentation and Storage on bioactive activities of cow-Milk supplemented with soymilk.

Kawthar Belkaaloul*, Hanane Kaddouri, Djamel Saidi, Omar Kheroua.

Laboratory of Physiology of Nutrition and Food Safety, Faculty of Science of Nature and Life, University of Oran1 Ahmed Ben Bella, Oran, Algeria.

75	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 2018 15(3): 2115-2125.	OPEN	Free Full Text [PDF]

Combination of type, time of interplanting of plant crops and weed extract on growth and yield of tomato plant (*lycopersicum esculentum,* mill.)

Olivina S. Messakh and Laurensius Lehar

Department of Food Crops and Horticulture, State Agricultural Polytechnic of Kupang, Indonesia.

76	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):2126-2133	OPEN	Free Full Text [PDF]

The efficiency of *Syzygium aromaticum* essential oil against renal intoxication by lead in rats during development.

Djallal Eddine Houari Adli ,Kadda Hachem,Mokhtar Benreguieg, Mustapha Brahmi, KAHLOULA Khaled and Slimani Miloud

Laboratory of Biotoxicology, Pharmacognosy and Biological recovery of plants, Department of Biology, Faculty of Sciences,

University of DrMoulayTahar, Saida, Algeria;.

77	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3): 2134-2140.	OPEN ACCESS	Free Full Text [PDF]

Jatropha tree productivity, seed oil content and oil quality as feed stock for biodiesel production

Dorria Mohamed Ahmed[1]; Hamdy Abdel-Hady Zahran[2]; Ferial Abass Zaher[2]; Mohamed Abd El-Hady Abd El-Hamid[3] and Mona Abbas El-Hamidi[2]

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3 Water Relations and Field Irrigation Dept., Agriculture and Biological Division, National Research Centre, 12622 Dokki, Cairo, Egypt

78 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2141-2150. OPEN ACCESS Free Full Text [PDF]

The relationship between HPV and genes expression (*miRNA-744*, *BCL-2*, *CASPASE*-3) in epithelial cervical abnormalities

Tabark Sabah Jassim and Abdul Hussein Moyet AlFaisal
Institute of Genetic Engineering and Biotechnology-University of Baghdad Iraq.

79 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2151-2158. OPEN ACCESS Free Full Text [PDF]

The effect of Beauvericin comparing with nano Beauvericin against *Palpita unionalis* (Lepidoptera: Pyralidae)

Magda Mahmoud Sabbour M.M[1] and Nayera.Yehia Solieman[2]
[1]Department of Pests and Plant Protection, National research center 33rd El-Bohouth St. - Dokki, Giza, Egypt
[2]Agriculture Economic Dept. Agriculture Division. National research center 33rd El-Bohouth St. - Dokki, Giza, Egypt

80 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2159-2170. OPEN ACCESS Free Full Text [PDF]

Novel rapid green fabrication of ZnO nps using mycofiltrate by local fungus *Aspergillus Parasiticus* Ap4

Mohammed A.S. Issa[2*] ,Ali A.R. Taha Al-Sheikhly[3], Mazin K. Hamid[4] and Mohammad I. Nader[1]
[1]Institute of Genetic engineering and Biotechnology for postgraduate studies, University of Baghdad, Iraq. [2]Department of Biology, College of science, University of Thi_Qar, Iraq.
[3]Department Applied Science, University of Technology, Iraq.
[4]College of medicine, University of Al-Nahrain.Iraq.

81 RESEARCH ARTICLE BIOSCIENCE RESEARCH,2018 15(3):2171-2184 .OPEN ACCESS Free Full Text [PDF]

Evaluation of Some Vaccination Programs Against Field Strain of Genotype VIID of Newcastle Disease in Broilers.

Moustafa A. Bastami[1]; Manal A. Afifi[1]; Mohamed A. El-Beheiry[1];Sahar A.ZouElfakar[1]; Rafik, H Sayed[2] ; Kawkab A. Ahmed[3] and Magdy E. ELSayed[4 1]
Department of poultry diseases, Faculty of Veterinary Medicine, Cairo University, Egypt. [2] Central laboratory for evaluation of Veterinary biologics, Egypt.
[3] Department of pathology, Faculty of Veterinary Medicine, Cairo University, Egypt.
[4] Middle East for Vaccines MEVAC® company Egypt.

82 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2185-2193. OPEN ACCESS Free Full Text [PDF]

Photorhabdus and *xenorhabdus* for biocontrol of the leaf miner *tuta absoluta*

Jihan Muhammad S. Ahmed[1]; Azazy A.M.[1]; Manal Farouk M. Abdelall[2]; Waleed D. Saleh[3] and M.A. Ali[3]
[1]Dept. Pest Physiology, Pant Protection Research Institute, Agricultural Research Center, Giza, Egypt. [2]Dept. Microb. Molec. Biol., Agric., Genetic Engin. Res. Inst., Agric. Res. Center , 12619,

Giza, Egypt. [3]Agric. Microbiology Dept., Faculty of Agriculture, Cairo University, Giza 12613, Egypt.

83	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):2194-2199.	OPEN ACCESS	Free Full Text [PDF]

The effect of thoracic spine mobilization and core stability exercise on chronic mechanical back pain patients

Hanaa Ali Hafez[1], Salwa Fadl[2], Lilian Albert Zaki[3], and Atef Mohamed Morsi[4]

[1]Beni Suef Universal Hospital, BeniSuef University, BeniSuef, Egypt [2]Faculty of Physical Therapy, Cairo University, Giza Egypt, Egypt [3]Faculty of Physical Therapy, BeniSuef University, BeniSuef, Egypt

[4]Faculty of Medicine, BeniSuef University, BeniSuef, Egypt

84	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):2200-2206	OPEN ACCESS	Free Full Text [PDF]

Assessement of dynamic postural control in plantar fasciitis

Dina S. Abd Allah[1], Salwa Fadl[1], Lilian A. Zaki[1] and Aly M. El Zawahry[2]

[1]Physical therapy department for musculoskeletal disorders and its surgery, Faculty of physical therapy, Cairo University, Egypt.

[2]Orthopedic surgery, Faculty of Medicine, Cairo University, Egypt.

85	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):2207-2217	OPEN ACCESS	Free Full Text [PDF]

Arsenate phytoremediation-linked genes in Egyptian rice cultivars as soil pollution dna geno-sensor

Mohamed A. Rashad[1], Ebtesam A. El.Bestawy[2], Fatma El nakieb[3], Sayed M. Hassan[4] and Elsayed E. Hafez[5]

[1]Department of Land and Water Technologies, Arid Lands Cultivation Research Institute, City for Scientific Research and Technology Applications, New Borg El-Arab City, Alexandria, Egypt.

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[3]Enviromental Biotechnology Department, Genetic Engineering and Biotechnology Research Institute, City for Scientific Research and Technology Applications, New Borg El-Arab City, Alexandria, Alexandria, Egypt.

[4]Laboratory for Environmental Analysis, Georgia University, USA.

[5]Department of Plant Protection and Bio molecular Diagnosis, Arid Lands Cultivation Research Institute, City for Scientific Research and Technology Applications, New Borg El-Arab City, Alexandria, Alexandria, Egypt.

86	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018, 15(3):2218-2227	OPEN ACCESS	Free Full Text [PDF]

Application of immobilized bioagents in lactose hydrolysis

Osama A. Ibrahim[1], Hayam M. Fathy[2], Gamal A. Ibrahim[1], Olfat S. Barakat[2], Mahmoud A. El- Hofi[1] and Hassanein A. Hassanein[3]

[1]Dairy Sciences Department, National Research Centre, Cairo, Egypt.

[2]Microbiology Department, Faculty of Agriculture, Cairo University, Egypt. [3]Averroes Pharma for Pharmaceutical Industries, Cairo, Egypt.

87	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):2228-2236	OPEN ACCESS	Free Full Text [PDF]

Characterization of the First Aquaporin Gene from the Egyptian Cotton Leafworm, *Spodoptera littoralis*

Shimaa M. El-Gamal[1], Sawsan Y. Elateek[2], S. A. Ibrahim[2] and Sayed M. S. Khalil[1,3]

[1]Agricultural Genetic Engineering Research Institute, Agricultural Research Center, Egypt. [2]Department of Genetics, Faculty of Agriculture, Ain Shams University, Egypt.
[3]Plant Protection Department, College of Food and Agriculture Sciences, King Saud University, Riyadh, Saudi Arabia.

88 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2237-2246 OPEN ACCESS Free Full Text [PDF]

Gamma irradiation and gibberellic acid for improving of seed germination and seedling growth of *koelreuteria paniculata* laxm

Hamdy M.A. El-Bagoury[1], Mohamed M. M. Hussein[1], Magdy A. El-Essawy[2], Mahmoud F. Noby[2] and Noha K. El-Shahawy[2]*
[1]Department of Ornamental Horticulture, Faculty of Agriculture, Cairo University, Egypt.
[2]Plant Research Department, Nuclear Research Center, Atomic Energy Authority, Egypt.

89 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2247-2252 OPEN ACCESS Free Full Text [PDF]

The correlation between pain and proprioception in mechanical lowback pain

Dina Mohamed Ali Al-Hamaky; Alaa Eldin Abdelhakim Balbaa; Lilian Albert Zaki Shehata and Aly M.E. Elzawahry[2]
[1]Faculty of Physical Therapy, Cairo University, Egypt.
[2]Faculty of medicine, Cairo University, Egypt.

90 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2253-2259. OPEN ACCESS Free Full Text [PDF]

Extraction of RB51 rough lipopolysaccharide antigen for evaluation of locally prepared RB51 vaccine

Sally,M.Abd Elsalam[1*], Khaled Al-Amry[2], khaled,A,Abd-el-Azeem[1], Noha,A. Helmy[1], Abd EL Hamid M,I[1]and Ahmed Samir[2]
[1]Department of Bacterial Sera and Antigens Research, Veterinary Serum and Vaccine Research Institute, Cairo, Egypt [2]Department of Microbiology, Faculty of Veterinary Medicine, Cairo University, Cairo, Egypt.

91 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2260-2271. OPEN ACCESS Free Full Text [PDF]

Ethidium Bromide Induced Spinal Cord Demyelination in a Dog a model of Multiple Sclerosis

Ahmed N. Abdallah[1] MVSc, Ashraf A. Shamaa[2]and Omar S. El-Tookhy[2]
[1]Pathology department, Animal Health Research Institute, Dokki, Giza, Egypt.
[2]Surgery, Anesthesiology and Radiology Department, Faculty of Veterinary Medicine, Cairo University, Egypt.

92 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2272-2285 OPEN ACCESS Free Full Text [PDF]

Introgression blast resistance gene (*pita, pik-s, pib, piz-t, and pi54*), and blight resistance gene (*xa4* dan *xa7*) into transgenic plant 940302-2 golden rice through marker-assisted selection

Khozim Maksal Mina[1,3], Bambang Sugiharto[1,2,3], Kyung-Min Kim[4#] and Mohammad Ubaidillah[1,2,3 *]
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[2]Study program of Agrotechnology, Faculty of Agriculture, University of Jember, Jl. Kalimantan 37 KampusTegalboto East Java Indonesia [3]Center Development Of Advanced Sciences and Technology, Jember University, Jl. Kalimantan 37 Kampus Tegalboto Jember East Java Indonesia
[4]Division of Plant Biosciences, School of Applied Biosciences, College of Agriculture & Life Science, Kyungpook National University,

Daegu-702-701, Korea

93	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):2286-2294.	OPEN ACCESS	Free Full Text [PDF]

The Effect of Recycling Different Wastes (as a substrate) on Mushroom *(Pleurotus ostreatus)* Fruit Bodies, Morphologically, Genetically and its Metabolites

Ayman S. Daba[1]; Fatma El nakieb*[2] and Elsayed E.Hafez[3]

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94	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,2018 15(3):2295-2303	OPEN ACCESS	Free Full Text [PDF]

Genotoxic effect of flonicamid and etofenprox on mice.

Al-Kazafy Hassan Sabry[1],Lamiaa Mohamed Salem[2], Neama Ibrahim Ali[2] and Sahar Saad EL Din Ahmed[2*]

[1]Pests and Plant Protection Department, National Research Centre, Cairo, Egypt.

[2]Department of Cell Biology, Division research ofGenetic Engineering and Biotechnology, National Research Centre, Cairo, Egypt.

95	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3): 2304-2311.	OPEN ACCESS	Free Full Text [PDF]

Quality of life response to resistive airflow training in patients with chronic obstructive pulmonary disease

Nadia Saad Sayed Ahmed El Gressy [1] ,*Zahra Mohamed Hassan Serry[1], Nesreen Ghareeb Mohamed El Nahas [1] , Nahed Husseiny Taha [2] and Moheb Wadea El Faizy[2]

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[2] El Sahel Teaching Hospital ,Cairo ,Egypt.

96	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):2312-2317.	OPEN ACCESS	Free Full Text [PDF]

Molecular characterization of *Clostridium perfringens* isolated from broiler chickens in Egypt

Heidy Abo El-Yazeed[1],Amal Nader A.[2], Eman Fathy F.[2]Mahmoud El Hariri[1], Rehab Elhelw[1] and Rafik Soliman[1]

[1] Microbiology Department, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt [2]Anaerobic unit, bacteriology department, AHRI' Egypt .

97	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 201815(3):2318-2326	OPEN ACCESS	Free Full Text [PDF]

Hydrolysis of *imperata cylindrica* (L.) Beauv. By *penicillium* sp., *aspergillus niger* and *trichoderma viride* as bioethanol basic ingredient production

Tini Surtiningsih, Dyah Agustina and Yosephine Sri Wulan Manuhara
Department of Biology, Faculty of Sciences and Technology, Universitas Airlangga,Surabaya, 60115.Indonesia

98	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,2018 15(3):2327-2337	OPEN ACCESS	Free Full Text [PDF]

Progressive model of multiple sclerosis following ethidium bromide injection in dogs' spinal cord: failure of endogenous remyelination

Ashraf A. Shamaa[1], Omar S. El-Tookhy[1] and Ahmed N. Abdallah[2]

[1]Surgery, Anesthesiology and Radiology Department, Faculty of Veterinary Medicine, Cairo University, Egypt.

[2]Pathology department, Animal Health Research Institute, Dokki, Giza, Egypt

99	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,201815(3):2338-2357	.OPEN	Free Full Text [PDF]

Botanical features and Lipid contents of *Cinnamomum verum* J.Presl, *Cinnamomum camphora* L. and *Melissa officinalis* L. cultivated in Egypt

Seham Elhawary[1], Ahmed O. Hudhud [2], Rabab Mohammed[3] and Walid baker[4]
[1]Pharmacognosy department, Faculty of Pharmacy, Cairo University, Cairo 11936, Egypt. [2]Pharmacognosy department, Faculty of Pharmacy, Beni-Suef University, Beni-Suef, 62514, Egypt. [3]Pharmacognosy department, Faculty of Pharmacy, Beni-Suef University, Beni-Suef, 62514, Egypt. [4]Microbiology department, Faculty of Pharmacy, Beni-Suef University, Beni-Suef, 62514, Egypt.

100	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,2018 15(3):2358-2363.	OPEN ACCESS	Free Full Text [PDF]

In vitro study on the effect of hydrogel on rooting and acclimatization of pine apple (*Ananas comosus* cv. Smooth cayenne)

Hassan,S.A.M[1].; Waly, A. I[2]., Bakry, A. B.and[3]and El-Karamany, M. F[3]
[1]Tissue culture technique Lab, Pomology Dept., National Research Centre, 33 El Buhouth St., Dokki, Giza, Egypt [2]Textile Div, National Research Centre, 33 El Buhouth St., Dokki, Giza, Egypt
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101	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH,2018 15(3):2364-2373	OPEN	Free Full Text [PDF]

Fumigant potential of some essential oils against the cowpea beetle "*callosobruchus maculatus*" (F.) Under laboratory conditions

Nadia Z. Dimetry, S.S.Ibrahim, Hala M. Metwally and H.El-Behery
Pests and Plant Protection Department, National Research Centre, Giza, Egypt

102	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 2018 15(3): 2374-2382.	OPEN	Free Full Text [PDF]

Comparative study on one shot Lipid A and Montanide™ ISA 70 adjuvanted Pasteurella Vaccines for Rabbits

Mahmoud T. A. Ismail[1*], Mona I. EL-Enbaawy[2], Eman Mohamed El Rawy[1] and Mai A. Fadel[3]
[1]Veterinary Serum and Vaccine Research Institute (VSVRI), Abbasia, Cairo, Egypt [2]Microbiology department, Faculty of veterinary medicine, Cairo University, Egypt [3]Animal Health Research Institute, Dokki, Giza, Egypt

103	RESEARCH ARTICLE ACCESS	BIOSCIENCE RESEARCH, 2018 15(3): 2283-2392.	OPEN	Free Full Text [PDF]

Evaluation of regeneration, active ingredients and antioxidant activities in jojoba tissue cultures as affected by carbon nanotubes

Alaa A. Gaafar[1], Rania A. Taha*[2,3], Nesreen H. Abou-Baker[4], Esam A. Shaaban[5], Zeinab A. Salama[1]
[1]Department of Plant Biochemistry, National Research Centre (NRC), Dokki, Giza, Egypt [2]Biotechnology and Micropropagation Lab., Pomology Department, NRC, Dokki, Giza, Egypt [3]Tissue Culture Technique Lab., Central Laboratories Building, NRC, Dokki, Giza, Egypt [4]Soils and Water Use Department, NRC, Dokki, Giza, Egypt
[5]Pomology Department, NRC, Dokki, Giza, Egypt

104	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,2018 15(3):2393-2400.	OPEN ACCESS	Free Full Text [PDF]

Extraction and evaluation of the anti-inflammatory activity of six compounds of *marrubium vulgare* L.

Shamil I. Neamah[1*], Ismail A. Sarhan[2], Oqba N. Al-Shaye'a[1,3]
[1]Center of Desert Studies, University of Anbar, Ramadi, Anbar, Iraq. [2]College of Agriculture, University of Anbar, Ramadi, Anbar, Iraq.
[3]College of Pharmacy, University of Anbar, Ramadi, Anbar, Iraq.

105	RESEARCH ARTICLE	BIOSCIENCE RESEARCH,2018 15(3):2401-2407.	OPEN ACCESS	Free Full Text [PDF]

Effect of pulsed electromagnetic field on ejection fraction after induced myocardial infarction

Mona Abdelraouf Ghallab[1,*], Aziz Guirguis Aziz[1], Ashraf AlyShamaa[2] and Fatma Aboelmaged Mohamed[1]
[1]Department of Physical Therapy for Cardiovascular, Respiratory Disorder and Geriatrics, Faculty of Physical Therapy, Cairo University, Egypt
[2]Department of Surgery, Anathesiology and Radiology, Faculty of Veterinary Medicine, Cairo University, Egypt
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106	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):2408-2415.	OPEN ACCESS	Free Full Text [PDF]

Effect of different level of solar ultra violet radiation on the vegetative growth, yield and quality of cherry tomatoes.

Huda A. Ibrahim[1]; Mohamed A. A. Abdullah[2]; Nagwa M. K. Hassan[1] and Heba S. El-Batran[1]
[1]Vegetable Research Dept., National Research Center, Dokki, Giza, Egypt.
[2]Vegetable Handling Dept., Horticulture Research Institute, Agriculture Research Center, Giza, Egypt.

107	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3):2416-2425.	OPEN ACCESS	Free Full Text [PDF]

DPPD ameliorates renal fibrosis induced by $HgCl_2$ in rats

Mohamed M. Elsherif[1,*], Ahmed E-S AbdEl-mwjood[1], Faten Zahran[2], Mohamed M. Omran[3] and Ahmed Nabil[4]
[1]Faculty of Science, Menoufia University, Menoufia, Egypt [2]Faculty of Science, Zagazig University, Zagazig, Egypt [3]Faculty of Science, Helwan University, Cairo, Egypt
[4]Faculty of Postgraduate Studies for Advanced Sciences, Beni-Suef University, Beni-Suef, Egypt

108	RESEARCH ARTICLE	BIOSCIENCE RESEARCH, 2018 15(3): 2426-2432.	OPEN ACCESS	Free Full Text [PDF]

Comparative Means for Treatment of Respiratory Distress in Preterm Neonates

Amira Ahmed[1], Hala Atta[1], Ashraf Mohamed Azmy[2] and Sonia Adolf Habib[3]
[1]Departments of: [1]Neonatology, El-Galaa Teaching Hospital, Egypt, [2]Child Health National Research Center, Egypt,

[3]Pediatrics, National Research Center, Egypt.

109 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2433-2440 OPEN ACCESS Free Full Text [PDF]

Risk factors predicting insulin resistance in obese adolescents

Moushira Zaki[1*], Ramy Mohamed[1], Sanaa Mohamed[1] and Ragaa Abd-elsalam Mohamed[2]
[1]Biological Anthropology Department, Medical Research Division, National Research Centre, Cairo, Egypt.
[2]Pediatric Department, Faculty of Medicine (Girls), Al-Azhar University, Egypt.

110 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2441-2451. OPEN ACCESS Free Full Text [PDF]

Prevalence of some virulence associated-genes in methicillin resistance *Staphylococcus aureus* isolates from patients infected with septic arthritis and antimicrobial resistance patterns of these isolates. Israa Abduljabbar Jaloob Aljanaby

University of Kufa, College of pharmacy, Department of Clinical Laboratory Sciences, Iraq.

RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2452-2462. OPEN ACCESS Free Full Text [PDF]

Distribution behavior of Parlatoria pergandii Comstock, Aonidiella aurantii Maskell and Crysamphalus dictyospermi Morgan (*Hemiptera: Diaspididae*) on the canopy of citrus trees

Haddad N* and Sadoudi Ali-Ahmed D

Production, safeguarding, threatened species and crops, Influence of climatic variations (PSEMRVC) laboratory, Faculty of Biological and Agricultural Sciences, M. Mammeri University of Tizi-Ouzou, 15000, Tizi Ouzou, Algeria.

112 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3) 2463-2480 OPEN ACCESS Free Full Text [PDF]

Novel mechanistic aspects of formaldehyde–induced hepatotoxicity

Fateheya M. Metwally[1], Amina A. Gamal el Din[2], Soheir E. Kotob[3*], Wagdy K.B. Khalil[4], Fatma A. Morsy[2], Enayat A. Omara[2] and Hanaa H. Ahmed[3]
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113 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2481-2488 OPEN ACCESS Free Full Text [PDF]

Bio-geometrical shapes: a new option for protection against neurodegenerative insult of Wi-Fi radiation

Nevin E. Sharaf[1], Mohammed S. El-Sawy[2], Hanaa H. Ahmed[3*], Fatehya M. Metwally[1], Noha M. Hegazy[1]and Annan M. El-Mishad[1]
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[3]Department of Hormones, National Research Centre, Dokki, Giza, Egypt.

114 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2489-2493 OPEN ACCESS Free Full Text [PDF]

Yield and quality components on two tomato varieties as influenced by phosphorus fertilizer application

Aldila Putri Rahayu, Deffi Armita, Anna Satyana Karyawati, and Aditya Ronafani
Department of Agronomy, Faculty of Agriculture, University of Brawijaya, Jl. Veteran Malang, 65145, Indonesia.

115 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 201815(3):2494-2501. OPEN ACCESS Free Full Text [PDF]

Toxicity effect of Imidacloprid and nano-Imidacloprid particles in controlling *Bactrocera oleae* (Rossi) (Diptera: Tephritidae) under laboratory and field conditions

Magda Mahmoud Sabbour*[1] and El-Sayed Hassan Shaurub[2]

1 Department of Pests and Plant Protection, Agriculture Division. National Research Center, Dokki, Giza, , Egypt
,2 Department of Entomology, Faculty of Science, Cairo University, Giza, , Egypt

116 RESEARCH ARTICLE BIOSCIENCE RESEARCH,2018 15(3):2502-2506 OPEN ACCESS Free Full Text [PDF]

Relationship between x-ray findings of knee osteoarthritis and foot posture

Ahmed Ahmed Basheer, Alaa Eldin A.balbaa, Maha Mostafa Mohammed and Suzan Mohammed Samy

Department of Orthopedic Physical Therapy, Faculty of Physical Therapy, Cairo University, Egypt

117 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2507-2519 OPEN ACCESS Free Full Text [PDF]

The effectiveness of the social cognition intervention among the patients with schizophrenia

Al-shymaa M. Abdeltawab[1], Enayat A. Khalil[1], Zeinab A. Osman[1] Zeinab M. Abdelsalam[1] Aya M. Hussien[2] and Mona Y. Rakhawy[3],
[1]Department of Psychiatric Mental Health Nursing, Faculty of Nursing, Cairo University. Egypt. [2]Department of Adult Psychiatry, Dar El Mokattam for Mental Health Hospital. Cairo. Egypt
[3]Department of Psychiatry, Faculty of medicine, Cairo University. Egypt.

118 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2520-2533 OPEN ACCESS Free Full Text [PDF]

Effect of Potassium Fertilization and Salicylic Acid Foliar Application on Growth, Yield and Quality of Bean Plants

E.H. Abd El-Samad*, M.R. Shafeek, Faten S. Abd El-Al, Safia M. Adam and Awatif G. Behairy
Vegetable Research Department, Agricultural and Biological Research Division, National Research Centre (NRC), 33 El-Buhouth St. (former El-Tahrir St.), Dokki, Giza, Egypt

119 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2534-2541 OPEN ACCESS Free Full Text [PDF]

Evaluation of multi-temporal sentinel-2 capabilities for estimation of leaf chlorophyll concentration

R. S. Morgan[1], M. Faisal[2], Y. Atta[2] and I.S. Rahim[1]
[1]Soils and Water Use Department, Agricultural and Biological Research Division, National Research Centre, Dokki, Cairo, Egypt. [2]Drainage Research Institute, National Water Research Center, Egypt.

120 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2542-2550 OPEN ACCESS Free Full Text [PDF]

Changes in soil organic carbon composition resulting from long- term application of biochemical contrasting organic residues monitoring by synchrotron-based FTIR microspectroscopy

Saowalak Somboon[1&2], Bhanudacha Kamolmanit[3], Weravart Namanusart[4], Kanjana Thammanu[5] and Phrueksa Lawongsa[1&2*]

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121 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2551-2557 OPEN ACCESS Free Full Text [PDF]

Investigating the association between perceived stress and some biochemical, socio-demographic and work-related predictors of stress

Mai S. Saleh[1], Asmaa F. Galal[2*], Salwa F. Hafez[1] and Sally Mustafa[3]

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122 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2558-2567. OPEN ACCESS Free Full Text [PDF]

Effect of kinetin on growth parameters and genetic diversity among some coleus cultivars by RAPD markers

Sami A. Metwally[1], ShoaibR.M[2]., Ibrahim M.M[2].,Bedour H. Abo-Leila[3] Aboud K.A[2]. and Sharbat L Mohamed[3]

[1]Ornamental Plants and Woody Trees Dept., National Research Centre, Dokki, Egypt.

[2]Genetics and Cytology Department, National Research Centre, Dokki, Egypt.

[3]Water Relations and Field Irrigation Dept., National Research Centre, Dokki, Egypt.

123 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2568-2582 OPEN ACCESS Free Full Text [PDF]

Novel micro-composites based on phosphorylated biopolymer/polyethyleneimine/clay mixture for cotton multi-functionalities performance

Ahmed G. Hassabo, Amina L. Mohamed, Sahar Shaarawy and Ali Hebeish

National Research Centre (Scopus affiliation ID 60014618), Textile Industries Research Division, Pre-treatment and Finishing of Cellulosic based Textile Department, 33El-Behouth St. (former El-Tahrir str.), Dokki, P.O. 12622, Giza, Egypt

124 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2583-2590 OPEN ACCESS Free Full Text [PDF]

First record of *Bordetella avium* in Egyptian turkey flocks

Ahmed Erfan[1], Jihan Badr[2] and Mahmoud Abd-elhalim[3]

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[2]Poultry Diseases Department, Animal Health Research Institute, Dokki- Giza, Egypt

[3]Brucella department, Animal Health Research Institute, Dokki- Giza, Egypt

125 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 201815 (3):2591-2601 OPEN ACCESS Free Full Text [PDF]

Micro-nano encapsulation of black seed oil ameliorate its characteristics and its mycotoxin inhibition

Abdel-Razek A.G[1], Badr A.N[*2], El-Messery T.M[3], El-Said M.M[3] and Hussein A.M.S[4]

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126 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2602-2610 OPEN ACCESS Free Full Text [PDF]

Protective and curative treatments of entomopathogenic nematodes against the potato tuber moth, *phthorimaea operculella* (zell.)

Moawad S.S, Saleh M.M.E., Metwally H.M., Ebadah I.M.and Mahmoud Y.A.

Pests and Plant Protection Department, National Research Centre, Giza, Egypt.

127 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2611-2618. OPEN ACCESS Free Full Text [PDF]

Phytochemical, antibacterial and antioxidant activities of *Capparis spinosa* L. Cultivated in iraq

Ahmed H. AL-Azawi, Kais Kassim Ghaima and Hawazen H. Salih

Institute of Genetic Engineering and Biotechnology for Postgraduate Studies, University of Baghdad, Baghdad, Iraq.

128 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2619-2625. OPEN ACCESS Free Full Text [PDF]

Molecular detection and genotyping of herpes simplex virus (1 and 2) in some Iraqi infertile menHayder Mazin Rasool AL-Haboobi, Mohammed Ibrahim Nader and Mohammad Ibrahim Mezaal .

Institute of Genetic Engineering and Biotechnology for Postgraduate Studies, University of Baghdad, Baghdad, Iraq.

RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2626-2639. OPEN ACCESS Free Full Text [PDF]

Ecological Risk Assessment of Heavy Metal Pollution in Top soil of Mediterranean Coast: A Case Study of Mareotis Coast, Egypt

Yasser A. El-Amier[1*] ; Suliman M. Alghanem[2] and Muhammad A. El-Alfy[3]

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[3]Marine Pollution Department, National Institute of Oceanography and Fisheries, Egypt

RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2640-2650. OPEN ACCESS Free Full Text [PDF]

Implementation of biotechnology for production of hypericin as antibladder cancer photosensitizer compound from egyptian *hypericum sinaicum*

Heba D. Khlifa[1], Hanaa H. Ahmed [2], Ibrahim A. Ibrahim[3], M.H. Bekhit[3] and Hussein S. Taha[1]

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RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2651-2667. OPEN ACCESS Free Full Text [PDF]

Anaplasmosis in ruminants and infesting ticks vectors settling Egyptian desert: Epidemiological updates regarding genetic profiles

Sayed Mohamed Mahmoud Abd El-Baky[1] and Nesreen AllamTantawy Allam[2*]

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132 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2668-2674. OPEN ACCESS Free Full Text [PDF]

Stress among parents of children with attention deficit hyperactivity disorder

Shymaa Aly Hamed and Nefissa M. AbdAlkader

Psychiatric Mental Health Nursing, Faculty of Nursing, Cairo University, Egypt.

133 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2675-2678. OPEN ACCESS Free Full Text [PDF]

Abdominal fat thickness response to low level laser therapy

Marwa Elhelali Elsherbeni[1], Hala Mohmed Ezz Eldeen Hamed[2], Elhadidy Elhadidy Mohamed[3], Maha Mohamed Saber[4], Fatma Aboelmagd M. Hamid[5] and Eitedal Daoud[6]

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134 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2679-2685. OPEN ACCESS Free Full Text [PDF]

Growth response of *Lactuca sativa* to plant number per pocket and irrigation interval in planting bag wall

Sitawati

Department of Agronomy, Faculty of Agriculture, Universitas Brawijaya Jl. Veteran, Malang 65145, Indonesia.

135 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2686-2692. OPEN ACCESS Free Full Text [PDF]

Effect of rigid tape on hip joint proprioception in patients with sacroiliac joint dysfunction

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Effect of vegetable powders as nitrite sources on the quality characteristics of cooked sausages

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Food Science Department, Faculty of Agriculture, Cairo University, Giza 12613, Egypt.

137 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2702-2710 OPEN ACCESS Free Full Text [PDF]

Finite element analysis (FEA) for potato crop harvester blade suitable for small holdings.

Nasr G. E.[1], Rostom M. N.[2], Hussein M. M.[3], Farrag A. E.[4] and Morsy M. F.[5]

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138 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2711-2720 .OPEN ACCESS Free Full Text [PDF]

Application of *Trichoderma harzianum* and essential oils as seed dressing against charcoal rot disease incidence of sunflower under field conditions Nehal Samy El-Mougy and Mokhtar Mohamed Abdel-Kader*

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139 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2721-2732. OPEN ACCESS Free Full Text [PDF]

Botanical features and genetic profiling of *Bauhinia retusa* Roxb. growing in Egypt

Seham Elhawary[1], Rabab Mohammed[2], Abeer Moawad[2] and Hebatallah Bahr[3]

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140 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2733-2740. OPEN ACCESS Free Full Text [PDF]

Polycystic ovary syndrome: Pro12Ala polymorphism, hormonal and metabolic profiles

Wafaa Ghoneim Shousha[1], Moushira Erfan Zaki[2], Hala T. El Bassyouni[3], Sara Mohamed Abdo[1], Salwa Mahmoud Mohamed Ali[4]

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Assessment of safety climate among nurses at selected hospital

Soher Mohammed Ahmed[1], Nehad Fekry[2] and Fatma Ahmed Abed[3].
Faculty of nursing, Cairo University, Egypt.

142 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2748-2455 OPEN ACCESS Free Full Text [PDF]

Effect of main stem pruning and plant spacing on yam bean (*pachyrhizus erosus* L.)

Eko Widaryanto *, Denys Aggrina Desyndia, Akbar Saitama and Akbar Hidayatullah Zaini Department of Agronomy, Faculty of Agriculture, Brawijaya University Jl. Veteran, Malang 65145 East Java, Indonesia

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Exopolysaccharides production and optimization by *halomonasvenusta* using response surface method

Ghada S. Ibrahim *[1], Mostafa M. Abo Elsoud[2] and Mohsen M. S. Asker[3]
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Minor components and thermal stability of butter, wheat germ and corn oils in the russian market

Samh Sobhy El-Hadad[1,2,*] and Natalia Aleksandrovna Tikhomirova[1]
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Effect of polygamy on egg production and longevity of the predatory mite *Agistemus exsertus* Gonzalez (Acari : Stigmaeidae)

Amira A. Abdel-khalek and Aly H. Rasmy
Pests and Plant Protection Department, National Research Centre, Cairo, Egypt

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Input-output ratio of energy used on rice under convensional and organic farming

Bambang Kusmanadhi [1] and Mohammad Setyo Poerwoko [2]
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Diversity of indigenous fungi during ruminant feed fermentation made of water hyacinth *(eichhornia crassipes)* and corn *(zea mays)* cob

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Isolation, screening and optimization of L-asparaginase producing bacterial strains inhabiting agricultural soils

Osama M. Darwesh, Mohamed F. Eida and Ibrahim A. Matter *
Agricultural Microbiology Department, National Research Centre, Cairo, Egypt

149	SHORT COMMUNICATIONBIOSCIENCE RESEARCH, 2018 15(3):2813-2815. OPEN ACCESS Glomus organs in the skin of mammary glands of one humped- camel (*camelus dromedarius)* Razia Kausar[1], Zafar Iqbal[2] and Sami-Ullah-Khan[1] [1]Department of Anatomy, Faculty of Veterinary Science, University of Agriculture, Faisalabad, Pakistan. [2]Department of Biosciences, Faculty of Veterinary Science, Bahauddin Zakariya University, Multan, Pakistan.		Free Full Text [PDF]
150	RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2816-2827. OPEN ACCESS Biological activity and physicochemical quality of different types of kombucha yoghurt VS traditional yoghurt during storage Ayah, B. Abdel-Salam[1] and Gehan, F. Galal [2] [1]Department of Food Hygiene & Control, Faculty of Veterinary Medicine, Cairo University, Egypt. [2]Department of Microbiology, Faculty of Agriculture, Ain shams University, Egypt. .*Correspondence: setelkol2003@yahoo.com Accepted:12 Jun 2018 Published online: 30 Sep2018		Free Full Text [PDF]
151	RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2828-2839 OPEN ACCESS Improving maize yield by cultivars selection and sowing time alteration under changing climate Asim Muhammad*, Abdul Basit and Misbahullah Department of Agronomy, Faculty of Crop Production Sciences, the University of Agriculture Peshawar, Khyber Pakhtunkhwa, Pakistan		Free Full Text [PDF]
152	RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2840-2847. OPEN ACCESS Analysis of genetic polymorphisms in somaclonal variants of strawberry by RAPD markers Md. Shahidul Haque Bir[1], Md. Samiul Haque[2], M. Mahbubul Haque[2], Uzzal Kumar Nath[3], Roushan Ara Khatun[4], Mohammad Ali[2],EunHee Soh[5]*, and Kee Woong Park[1]* [1]Department of Crop Science, Chungnam National University, Daejeon 34134, Korea [2]Bangladesh Institute of Nuclear Agriculture (BINA), Mymensingh, Bangladesh [3]Department of Genetics and Plant Breeding, Bangladesh Agricultural University, Mymensingh, Bangladesh [4]Department of Agricultural Extension, farm gate, Dhaka, Bangladesh 5 ~~Seobu Province~~ Office, Korea Seed & Variety Service, Iksan54521, Korea		Free Full Text [PDF]
153	RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3): 2848-2853. OPEN ACCESS Effect of biochar types and sprinkling water volume on seed production and seed protein and fat content of red bean under lowlands dry climates Yosefina Lewar, Mochammad Hasan and Laurensius Lehar* Department of Food Crops and Horticulture – State Agricultural Polytechnic of Kupang, East Nusa Tenggara, Indonesia		Free Full Text [PDF]

154 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2854-2859 OPEN ACCESS Free Full Text [PDF]

The application of cattle bio-urine to the back sandy soils characteristics and cauliflowers (brassica *oleraceae* var. Botrytis) during rainy seasons

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155 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2860-2870 .OPEN ACCESS Free Full Text [PDF]

Health educational program for family caregivers of children with phenylketonuria' knowledge and practices

Rehab Fouad Abd-Elkodoos[1*], Effat Mohammed Alkarmalawy[1], Laila Kamal El Din Effat[2] and Heba Magdy Sharaa[1]

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156 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2871-2879 . OPEN ACCESS Free Full Text [PDF]

Cucumber growth, yield and quality of plants grown in peatmoss or sand as affected by rate of foliar applied potassium

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157 RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):2880-2892 OPEN ACCESS Free Full Text [PDF]

Mean performance, drought tolerance indices and water use efficiency of some Egyptian wheat genotypes

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RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2018 15(3):1778-1786 **OPEN ACCESS**

Effect of ethinylestradiol on sperm quality of the tropical fish *Barbodes binotatus*

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This study was aimed to evaluate the in vitro toxicity of ethinyl estradiol (EE_2) in different concentrations (0; 10; 15; 25; 50 IU/mL) using sperm cells of model organism tropical fish, *Barbodes binotatus*. Sperm quality parameters, including mass and individual time of sperm motility (second), viability (%), and sperm velocity (µm/s) were measured by digital inverted microscope and DNA fragmentation of sperm after exposure to EE_2 was examined with fluorescence microscopy.*Barbodes binotatus* sperm was collected by stripping then exposed to EE_2. The results showed that EE_2 exposure could negatively affect some sperm quality parameters, which might significantly reduce the mass and individual time of sperm motility, sperm viability and sperm velocity rate of this animal. DNA fragmentation in sperm of *B. binotatus* was increased after EE_2 exposure compared to the control group. We conclude that administration of EE_2 concentration 10 IU/mL decreased mass and individual motility time, velocity, viability of sperm and increased DNA fragmentation in sperm of *B. binotatus*

Keywords: ***Barbodes binotatus*** **ethinyl estradiol, fish, sperm quality.**

INTRODUCTION

Over the last 50 years, the use of chemical pollutants and their releases in the environment has increased and affected the wildlife, such as fishes. Industrial development, agrochemicals and human chemical consumption produce an increasing amount of chemical pollutants into the environment, especially in surface water (Lecomte et al., 2017). Among these contaminants, estrogenic compound represent a significant proportion.

Estrogenic chemicals synthesized in pharmaceuticals raise exposure levels of estrogenic chemical in living things to the naturally occurring estrogen. The most pronounced effect occurred in aquatic species that make their homes in waters with elevated levels of estrogens. Many researchers have found estrogenic compound in streams, rivers, and lakes throughout the world, as well as in the effluent of wastewater treatment plants in the United States, Europe, Asia, South America, and Australia. Synthetic estrogens from contraceptive pills, hormone-replacement therapy all end up in wastewater and can be discharged into rivers and lakes (Lundgren and Novak, 2010). Estrogens have been detected in numerous studies of wastewater influents and effluents, specifically estrone (E_1), 17β-estradiol (E_2), estriol (E_3), and ethinylestradiol (EE_2) (Caldwell et al., 2010).

Ethinyl estradiol is an active component of drugs including oral contraceptives. This compound is also used as a cattle growth regulator and can be used to evaluate the estrogenic effects on the reproductive system. Ethinyl estradiol affects the reproductive system through the mediation pathway of the estrogen receptor (Metcalfe et al., 2001).

In fish, E_2 promotes spermatogonium to reform. In some fishes species, high concentrations of synthetic estrogens produce inhibitory effects. However, E_2 itself is unable to induce all stages of spermatogenesis. Interestingly, in some species, E_2 levels correlate with spermatogenesis and spawning, when spermatogonia are the main cell type in the testes. Receptors of reproductive hormones in fish leukocytes have provided evidence supporting the role of immunoregulatori for these steroids in fish. In fish, E_2 was injected to inhibit the immune response (Wang and Belosevic, 1994; Watanuki, 2002), while E_2 affect the function of fish in vitro leucocytes (Chaves et al., 2001).

Ethinyl estradiol is distributed on the water surface as a waste with concentrations ranging from 1-831 ng/L (Wise et al., 2011). The limit of international bargaining quality standards for EE_2 was 0.035 ng/L (Gilbert, 2012; Owen and Jobling, 2012). Humans and farm animals excrete EE_2 in waters through urine and feces in conjugated form with sulfate and glucoronide (Heberer, 2002). Then directly reach the aquatic environment or waste treated at waste treatment stations (Wu et al., 2014; Esteban et al., 2014; Jin et al., 2013). It is important to note that conventional waste treatment technologies have limited ability to remove estrogens (Mills et al., 2015; Chong et al., 2014; Fent et al., 2006). The situation is exacerbated by the fact that EE_2 has a half-life in water about 17 days and low levels of photo degradation that make it persistent estrogenic (Jurgens et al., 2002).

Sperm fish can be used as a bio monitor and an indicator of toxicity parameters (Kime et al., 2001), so that in this study, we used sperm of *Barbodes binotatus* fish to analyze the effect of EE_2 in vitro. *Barbodes binotatus* lives in fresh water. The population of *B. binotatus* in nature or in aquaculture is affected by the quality of sperm (Ochokwu et al., 2015). The quality of fish sperm was determined by the motility of spermatozoa. According to Wolf and Smital (2009), the factors that affect egg quality and fish sperm are environmental conditions.

This fish do external fertilization (Islam and Akhter, 2011). The sperm is inactive and immotile in the seminal fluid, but moves when the water contacts. When it is activated, it will move only a few minutes (Chapman, 2016). The sperm that is ejaculated into the waters will be in contact with EE_2 which reduces of the sperm motility and then causes the failure of fertilization. The early stages of embryonic development are very sensitive to pollutants (Brion et al., 2004). Due to dangerous effect of EE_2, this study was conducted to examine the sperm quality of *Barbodes binotatus* exposed with to EE_2.

MATERIALS AND METHODS

Animals

Male *Barbodes binotatus* (8-12 cm in body length and 12-18 g in body weight) were chosen and purchased from Fish Cultivation (Pandaan-Indonesia). In this study, *B. binotatus* were not anesthetized, but they remained quiet out of the water by using a cloth to cover their eyes while stripping. After rinsing with distilled water, the genital area was careful dryed. Sperm was collected in 1-ml syringes by a gentle pressure along the anterior and posterior abdomen until the pore of urogenital. After that, the sperm was placed in 1.5 ml micro tubes. The sperm suspension was made by mixing fish sperm with 0.9% physiological saline solution with a ratio of 1:6 (v:v). Sperm was activated using water dissolved in Ethinylestradiol (EE_2) with five different concentrations (0; 10; 15; 25; 50 IU/mL).

Motility

The sperm motility was examined by determination of the mass and individual sperm motility time (seconds) and the velocity of motility (µm/s) with different EE_2 concentrations. Sperm suspension were pipetted into a single concave microscope glass slides (depth 0.5 mm to 0.8 mm) and immediately assessed. Each slide was measured by digital inverted microscope (Olympus). Motility parameters were analyzed and 5x100 sperms were evaluated per sample. Motion parameters included mass and individual time of sperm motility (second) and straight line velocity of sperm (µm/s).

Viability

The percentage of viability of sperm was assessed with 40 magnification of objective lens under light microscope. Sperm viability was examined by supravital staining with 1% aqueous eosin Y and 10% aqueous nigrosin solution (Sigma, USA). A drop of fish sperm suspension was placed on a spot plate and mixed with one drop of eosin solution. After 15 seconds, two drops of 10% nigrosin solution was added and thoroughly mixed. A drop of this mixture was transferred to a clean glass slide. A thin smear was made and then air dried. The smears were examined under light microscope. Viable sperm

cells were appeared white and dead sperms were appeared pink. At least 5x100 spermatozoa were counted and the result was expressed as the percentage of viable sperm.

DNA fragmentation

For assessment of sperm DNA fragmentation, Acridine Orange (AO) staining was used. In brief, for AO staining, a dried smear fixed in Carnoy's solution (methanol and glacial acetic acid in 3: 1 proportions) for core fixation (Sigma Chemicals, St Louis, MO, USA) for at least 2 hours and air dried again. Then the sperm smears were stained with AO solution (10 mL AO 1%, 40 ml of citric acid, 2.5 mL $Na_2HPO_4.7H_2O$ 0.3 M pH 2.5). After 5 minutes, the smear was washed with distilled water, covered with a coverslip and sealed with a nail polish to protect the smear from drying. Smears were examined using a fluorescence microscope (Olympus-FSX100, Japan) with the following filter combination: 450-490 nm excitation, 510 nm reflector and 520 nm barrier filter. The nuclei of 200-300 spermatozoa from each smear were examined and scored as green or red. Normal sperm heads showed green tingle whereas fragmentation or single stranded DNA was stained red and the result was expressed as percentage of unchanged nucleus sperms (green).

Data analysis

The data was analyzed using ANOVA followed by LSD test by Statistical Package for Social Studies (SPSS software version 17). A comparison was considered significantly different when $p<0.05$.

RESULTS

Effect of EE_2 on sperm time motility

Sperm was exposed to EE_2 in different concentrations (0; 10; 15; 25; 50 IU/mL) in vitro. Control group showed significantly difference of mass sperm motility time compare to other group ($P<0.05$). Mass sperm motility time in control group was the highest (310±26 seconds). The higher of the concentration exposed, the lower time of mass motility. They were 205; 179; 143; and 131 seconds, respectively.

Similarly, individual sperm motility time in the control (153.08±19.07 seconds) was higher than the treatment groups. There was a significant decrease in the time of individual motility after exposed of EE_2 in different concentrations ($P<0.05$). Significant decreases occured from concentrations of 10 to 50 IU/mL (119; 99; 85; 66; and 63 seconds, respectively) (Figure 1).

The time of mass sperm motility after exposure of 10 IU/mL EE_2 showed significant difference with control ($P< 0.05$), but when exposed with increased concentration (more than 10 IU/mL), there was a significant difference too. Increased EE_2 concentration exposure to sperm caused a decrease in time of mass sperm motility. Likewise with the time of individual sperm motility after EE_2 exposure, the higher the concentration of EE_2 decreased the time of individual sperm motility.

Effect of EE_2 on sperm velocity

The velocity of sperm motility was calculated by measuring the distance of movement per second using an inverted microscope. The observed sperm motility was a straight forward movement. The result showed that sperm velocity of control group was 173.43±10.54 µm/s. When exposed to 10 IU/mL EE_2, the result showed a decrease in motility velocity significantly ($P<0.05$). When the EE_2 concentration was increased (15, 25 and 50 IU/mL), the motility velocity of sperm were decreased (73.92 ± 17.89; 68.64 ± 11.44; 58.82 ± 13.95; and 48.81 ± 5.76 µm/s, respectively) (Figure 2).

Effect of EE_2 on sperm viability and DNA fragmentation

The viability of sperm effectively measures the number of live sperm. Measurement of viability is very important because sperm viability is an important parameter of fertility. The results of the collection of sperm fish showed that control group contained many live, but not all of these sperm will live. The percentage of live sperm is determined by identifying sperm with intact cell membranes. This determination is made using the dye method (eosin and nigrosin), in which the dye (red or pink) enters the non-vital cell (die) due to the damaged plasma membrane. Therefore, the viable cell will be clear, but the dead cells will absorb the color (Figure 3).

Exposure of different EE_2 concentrations caused many dead sperm, the higher EE_2 concentration, lower percentage of live sperm. The sperm viability of the controls was 97±0.5% and decreased to be 94±1.2% after 10 IU/mL EE_2 exposure. The result showed a significant different ($P <0.05$) and the sperm viability continued to decrease at the higher concentrations of 15, 25, and 50 IU/mL EE_2. They were 83±1; 82±2.2; and 72±1%, respectively

(Figure 4).

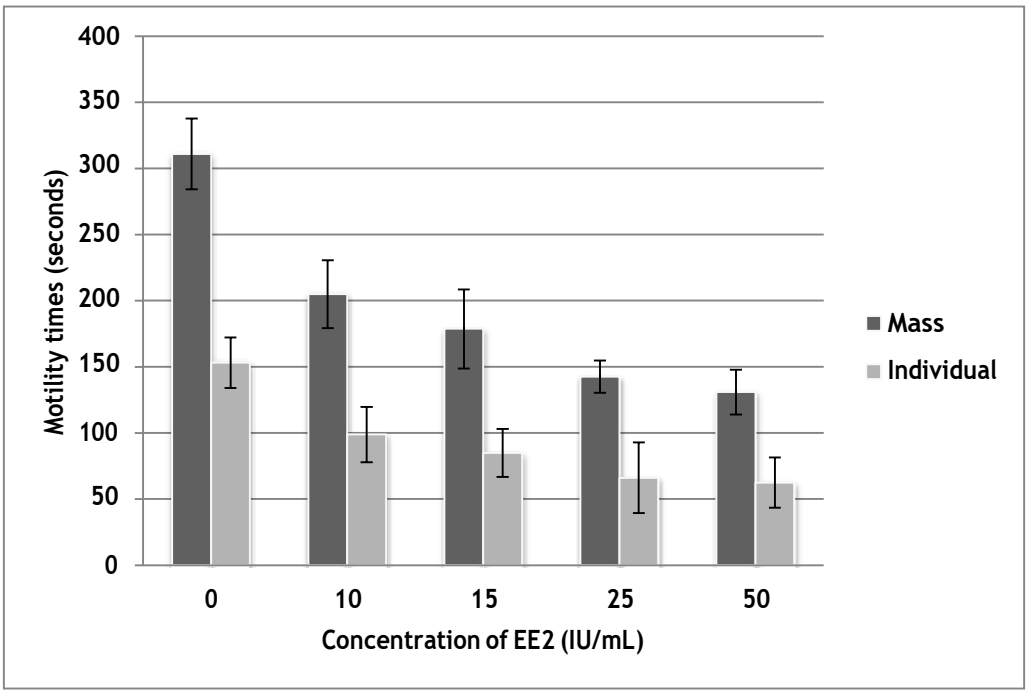

Figure. 1 The time of mass and individual motility of *B. binotatus* sperm after exposure to EE_2

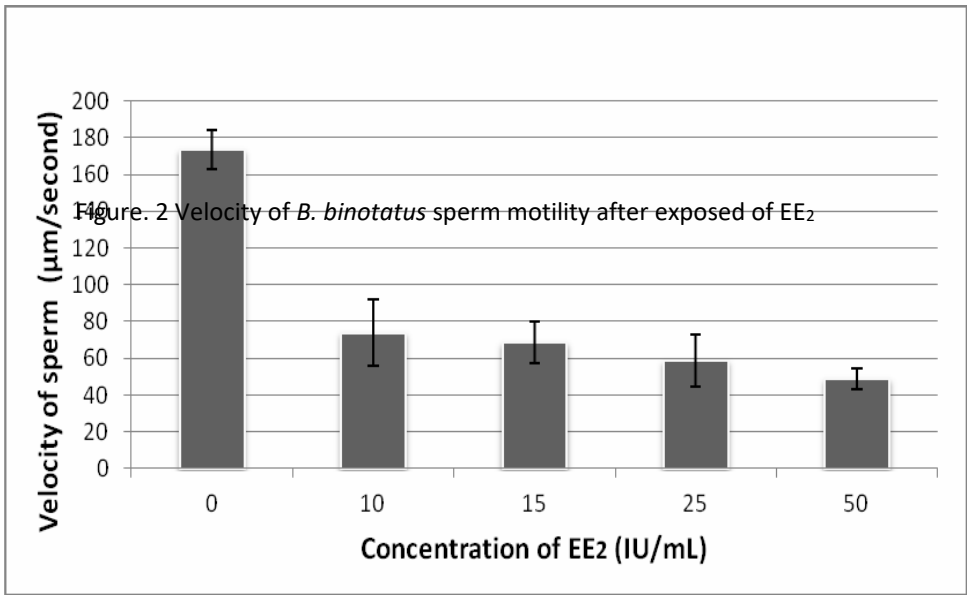

Figure. 2 Velocity of *B. binotatus* sperm motility after exposed of EE_2

Figure. 2 Velocity of *B. binotatus* sperm motility after exposed of EE_2

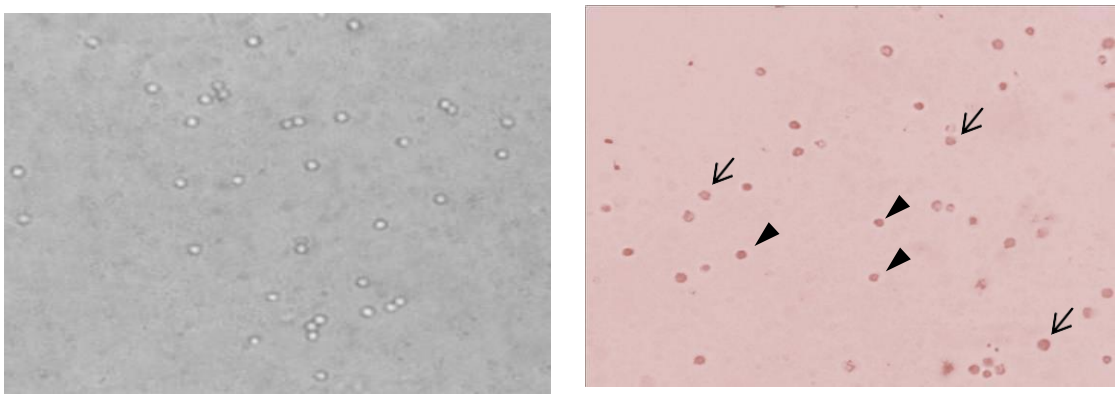

Figure. 3. Sperm viability of *B. binotatus* after exposed of EE_2. Live sperm (◄, clear) and dead sperm (↓, red or pink), 400x

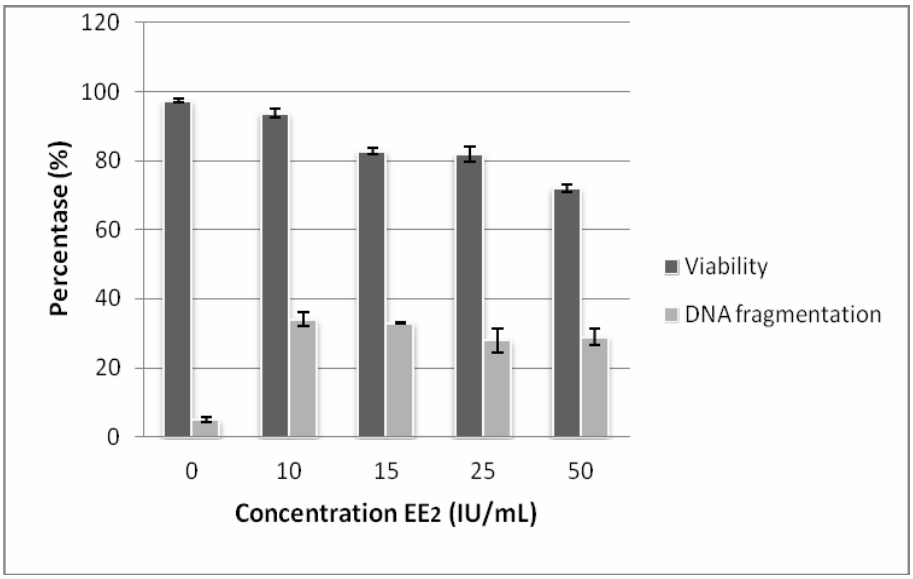

Figure. 4 Viability and DNA fragmentation of *B. binotatus* sperm after exposed of EE_2

The results of evaluation of DNA fragmentation showed that EE_2 exposure increased DNA fragmentation of sperm. Exposure of 10 ppm EE_2 (34±1.9%) increased fragmentation significantly ($P<0.05$) compared to control group (5±0.7%). Increase of EE_2 concentrations (15, 25, and 50 ppm) caused rising percentage of sperm DNA fragmentation, 33±0.2; 28±3.5; and 29±2.5%, respectively. There was no significant difference ($P> 0.05$) against DNA fragmentation for all EE_2 treatment groups (Figure 4).

Many studies have shown high levels of estrogen in aquatic environments could affect adverse reproductive effects in fish populations. The exposure of these compounds would affect the reproductive behavior of male fish and the expression of gonad aromatase, as well as the quality of sperm in fish species. Study using fluorescent microscope, observed the damage or fragmentation of sperm DNA of fish after EE_2 exposure (Figure 5).

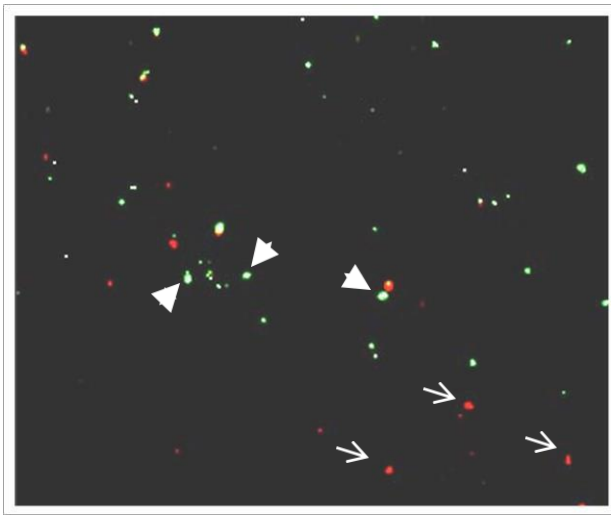

Figure. 5 DNA fragmentation of *B. binotatus* sperm after exposed to EE_2. Normal sperm DNA (◄, green) and DNA fragmentation (↓, red), 400x

DISCUSSION

Ethinylestradiol (EE_2) was an estrogen that was used extensively in regulating the number of child births. EE_2 waste contaminated freshwater and affected the reproductive health of freshwater biota including *B. binotatus*. Based on the research, the presence of EE_2 affects the quality of fish sperm. EE_2 exposure has resulted in decreased sperm motility. The effect of EE_2 as an estrogenic compound inhibits the motility of spermatozoa by binding to estrogen receptors. Estrogen receptor was ESR_1 and ESR. Estrogen receptor was strongly expressed in the middle piece of the sperm. Assuming that ESRs were present in sperm mitochondria, their mitochondria function can be affected by estrogen. (Gavrilova et al., 2007; Tavares et al. ,2009; Rajender et al., 2010).

It has been observed previously that once estrogen binds to receptors, it stimulates increased concentrations of free calcium ions (Ca^{2+}) in mitochondrial spermatozoa. As a consequence of increased concentrations of free calcium ions in the mitochondria, activity of mitochondrial nitric oxidase synthase (mtNOS) is stimulated which leads to increase the synthesis of reactive oxygen species (ROS) such as superoxide anions (O_2^-), hydrogen peroxide hydrogen peroxide (H_2O_2) and hydroxyl OH^-) and cause cytochrome c oxidase activity inhibition. Cytochrome-c-oxidase was an essential enzyme for cellular respiration processes in the electron transport chain in the mitochondria. Inhibition of this enzyme will lead to decreased ATP production and decrease sperm motility.

The binding of estrogens to estrogen receptors that increase the concentration of free calcium ions and increase ROS synthesis is responsible for mitochondrial and cell membrane damage. Mitochondrial damage results in the formation of canals in mitochondrial membranes called mitochondrial permeability transition pore. The opening of this channel causes loss of mitochondrial potential membrane loss. Research conducted by Kotwicka, et al. (2016) stated that 17β-estradiol causes significant changes in mitochondrial membrane potential. 17β-estradiol concentrations of 10-6 M induce a significant decrease in the percentage of mitochondria sperm function. It has been previously described that there is a positive correlation between decreased effectiveness of mitochondria with sperm motility and poor egg fertilization capacity. The sperm cells exposed to 17β-high concentrations of estradiol decreased mitochondria function while increasing the superoxide anion level. Decrease of mitochondrial function will decrease oxidative phosphorylation processes thereby decreasing ATP synthesis (Gharagozloo and Aitken, 2011; Kim et al., 2010).

The live sperm is a healthy sperm and without any kind of defect that might prevent conception. This defect may include damage to DNA and its substrate, or other chemical problems that will prevent sperm fertilization. To get an accurate fertility picture, a decent fish sperm is usually seen

from the time and speed of motility and sperm viability.

In this study, spermatozoa viability parameters presented EE_2 decreased significantly at 10 IU/mL concentration. Damage to spermatozoa membranes can be caused by phospholipase and protease enzymes that are activated by increased concentrations of free calcium ions. Phospholipase degrades the membrane phospholipids and proteases degrade the membrane proteins. Increased ROS can also cause damage to lipids, proteins, and DNA so that the viability of sperm cells decreases.

Ethinyl estradiol was a group of estrogen steroid hormones used as birth control drugs also found in fresh water. The presence of these compounds in waters affects the reproductive behavior of fish and other biota. The presence of an estrogenic signal will be passed on by the estrogen receptor (ER) to the mitochondria. Mitochondria are organelles that play a role in energy synthesis, in sperm help for motility. Existence of estrogen receptors in this mitochondrion could relate with aging. In ideal concentrations, these steroid hormones trigger complex molecular mechanisms involving mitochondria, nuclei, and plasma membranes, and the cytoskeleton that plays a role in cell life. The result of this signaling was protection against mitochondria. Therefore, the molecular component of a pathway activated by a sexual steroid can protect cells from the aging process (Vasconsuelo et al., 2013).

This steroid affects the growth and function of different cells in some organs, because ER could be found everywhere. Estrogen receptor also has intracellular localization in the plasma membrane, mitochondria and endoplasmic reticulum. In addition to the modulation of gene transcription by direct interaction with its receptors, steroids can rapidly activate the signal pathway by a non-genomic mechanism mediated by ER that were identical or different from steroid receptors. Among the various functions, EE_2 could regulate apoptosis through the pathway. In mitochondria, the presence of ER could protect mitochondria against cell death due to apoptosis (Vasconsuelo et al., 2011). However, when estrogenic levels increase, it was thought to affect mitochondrial function, thus increasing the production of ROS. Increased ROS caused the oxidation of proteins, lipids, and sperm DNA. The oxidized DNA causes damaged or DNA fragmentation.

CONCLUSION

Based on the results of this study was concluded that in vitro administration of 10 IU/mL concentration of EE_2 exposure to *Barbodes binotatus* sperm decreased the mass and individual motility duration, velocity of motility, and viability of sperm, but DNA fragmentation increased after EE_2 exposure at concentrations of 10 IU/mL.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

AH and LS designed the experiments. AS, DSA, EW, and NF performed animal treatment, motility assessment, viability assessment and DNA fragmentation assessment. All authors collected and performed data analysis. AH and LS wrote the manuscript. All authors read and approved the final version.

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