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Research Articles

1 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 1424-1432. **OPEN ACCESS** Free Full T

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*]

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2 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):1433-1439 **OPEN ACCESS** Free Full T

Cytological Differences of MV_3 Patchouli Plants (*Pogostemon cablin* Benth.) Derived From Gamma Ray-Irradiation

Muhammad Tahir*[1], Ersan[2], Dewi Riniarti[1], and Jakty Kusuma[2]

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[2]Estate Crop Production, Politeknik Negeri Lampung, **Indonesia**

3 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1440-1448. **OPEN ACCESS** Free Full T

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 T

Erythrocytes response to aerobic exercises in aging versus young anemic women.

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 T**

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 T**

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 T**

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

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[2]Faculty of Public Health, Airlangga University, **Indonesia**

8 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1480-1486 **OPEN ACCESS** Free Full T

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

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9 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1487-1493. **OPEN ACCESS** **Free Full T**

Iron chelation ability and hematological effect of sappan wood (*caesalpinia sappan*, l.) Extract tablet on iron overload condition of rats

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10 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3): 1494-1502. **OPEN ACCESS** **Free Full T**

Assessment and evaluation of serum laminin and interleukin-6 in schistosomiasis patients with chronic active hepatitis c

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11 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1503-1510 **OPEN ACCESS** Free Full T

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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12 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3): 15011-1519. **OPEN ACCESS** Free Full T

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 T

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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14 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(**3**):1528-1541. **OPEN ACCESS** Free Full T

Chemical constituents and yield of*Simmondsia chinensis* plants as affected by foliar application of gibberellic acid and zinc sulphate

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15 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1542-1558. **OPEN ACCESS** Free Full T

Impact of actosol and yeast extract on productivity and essential oil constituents of *Zinnia elegans* plants

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16 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1559-1567 **OPEN ACCESS** Free Full T

Amino acid sequences of local isolates of Duck Hepatitis Virus A type 1 (DHAV-1) in Egypt

Hanaa A. El-Samadony[1], Hoda M. Mekky[2*] and Khaled M. Mahgoub[2]
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17 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1568-1574 **OPEN ACCESS** Free Full T

Construction and testing of job satisfaction of physical therapist questionnaire

Dina Mansour Tawfic, Wadida Hassan Elsayed and Magda Gaid Sedhom
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18 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1575-1582 **OPEN ACCESS** Free Full T

Sugar manufacturingprocess :risk analysis and mitigation using fuzzy fmea and fuzzy ahp method

DwiTresnaChoirul Yusuf, Imam Santoso*and Dhita Morita Ikasari
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19 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1583-1587 **OPEN ACCESS** Free Full T

Cytokines level and oxidative damages in some egyptian patients with alopecia areata

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20 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1588-1600. **OPEN ACCESS** Free Full T

Anti-Ulcerogenic Impact of Cannabis Extract On Experimental Induced Gastric Ulcer

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21 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1601-1609. **OPEN ACCESS** **Free Full T**

Effect of Aerobic Exercise on Depression and Insomnia in Egyptian Geriatrics Parkinson's Population

Tamer I. Abo Elyazed[1], Islam Mahmoud Abd-allah Al-Azab[2], Moataz Mohamed El Semary[2], Moshref A.[3], Sally Said Abd-Elhamed[4] and Amira Mohamed El Gendy[5]

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22 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1610-1620. **OPEN ACCESS** **Free Full T**

Modeling prediction of cation exchange capacity in saline

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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23 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1621-1629 **OPEN ACCESS** **Free Full T**

Application of new models on concentration heavy metal in soil

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

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24 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1630-1637 **OPEN ACCESS** **Free Full T**

Screening of hybrid rice tolerance through stimulated condition of drought stress in rainfed lowland

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 T**

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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26 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1645-1652. **OPEN ACCESS** **Free Full T**

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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27 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1653-1660 **OPEN ACCESS** **Free Full T**

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

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28 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1661-1665 **OPEN ACCESS** **Free Full T**

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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29 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1666-1672 **OPEN ACCESS** **Free Full T**

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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[2]Regional APA R&D Asia Pacific, BASF **South East Asia**

30 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1673-1678 **OPEN ACCESS** **Free Full T**

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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31 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1679-1687 **OPEN ACCESS** **Free Full T**

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

Abd-Allah, S.; M. M. Shoukry; M. I. Mohamed; H. H. Abd- El Rahman and A. A. Abedo
Animal Production Department, National Research Centre, 33 El-Bohouth Street, P.O:12622, Dokki, Giza, **Egypt.**

32 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1688-1694 **OPEN ACCESS** **Free Full T**

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]
[1]Department of Soil Science, Faculty of Agriculture, Halu Oleo University, Kendari Southeast Sulawesi, **Indonesia.**
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33 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1695-1702 **OPEN ACCESS** **Free Full T**

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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[2]Department of Plant Protection, Faculty of Agriculture, Halu Oleo University, Kendari 93232, Southeast Sulawesi, **Indonesia**

34 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1703-1711 **OPEN ACCESS** **Free Full T**
3

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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[2]Department of Biological Science, Faculty of Science, Taif University, Taif, **Saudi Arabia**
[3]Department of Biology, College of Sciences, University of Hail, **Kingdom of Saudi Arabia**

35 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1712-1717. **OPEN ACCESS** **Free Full T**

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]
[1]Department of Biology, Faculty of Mathematics and Natural Sciences, University of Sam Ratulangi, Kampus Unsrat, Manado 95115, North Sulawesi**, Indonesia**
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36 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1718-1728 **OPEN ACCESS** **Free Full T**

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

Neima K. Al-Senosy[1], Ahmed Abou-Eisha*[2] and Ekram S. Ahmad[2]
[1]Department of Genetics, Faculty of Agriculture, Ain Shams University, Cairo, **Egypt**
[2]Department of Cell Biology, National Research Centre, Dokki, Giza, **Egypt**.

37 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3):1729-1738 **OPEN ACCESS** **Free Full T**

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]
[1]Biology Department, College of Science for Women, University of Baghdad, **Iraq**
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38 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1739-1748 **OPEN ACCESS** **Free Full T**

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]
[1]Plant Nutrition and Soil Fertility Dept. Giza**, Egypt**
[2]Water Relations and Field Irrigation Dept. National Research Centre, Giza, **Egypt**

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** BIOSCIENCE RESEARCH,201815(3):1832-1844 **OPEN ACCESS** Free Full T

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 T

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 T

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 T

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 T

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]

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54 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 1892-1904. **OPEN ACCESS** Free Full T

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 T

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, **Egyp**t.

[2]Department of Genetic, Faculty of Agriculture, Cairo University, Giza, **Egypt.**

56 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3): 1917-1924. **OPEN ACCESS** Free Full T

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 T

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]

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[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 T

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]

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[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 T

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 T

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*]

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61 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1962-1968 **OPEN ACCESS** Free Full T

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]

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62 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,201815(3):1969-1974 **OPEN ACCESS** Free Full T

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]

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[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 T

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]

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64 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):1982-1991 **OPEN ACCESS** Free Full T

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]

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65 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3): 1992-2000. **OPEN ACCESS** Free Full T

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 T

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** BIOSCIENCE RESEARCH, 201815(3):2019-2028. **OPEN ACCESS** Free Fu
[PD

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]

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[4]Crop Physiology, Agronomy Study Program of Agriculture Faculty of Jember University, **Indonesia**

68 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3): 2029-2040. **OPEN ACCESS** Free Fu [PD

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** BIOSCIENCE RESEARCH, 201815(3): 2041-2048. **OPEN ACCESS** Free Fu [PD

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]

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[2]Horticulture Research Institute, Agriculture Research Center, **Egypt**

70 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 2049-2059 **OPEN ACCESS** Free Fu [PD

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** BIOSCIENCE RESEARCH, 201815(3): 2060-2067. **OPEN ACCESS** Free Fu [PD

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]*

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72 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3): 2068-2088. **OPEN ACCESS** Free Fu [PD

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,**

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73 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 201815(3): 2089-2103. **OPEN ACCESS** Free Full T

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]

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

74 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 2104-2114. **OPEN ACCESS** Free Fu [PD

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** BIOSCIENCE RESEARCH, 2018 15(3): 2115-2125. **OPEN ACCESS** Free Fu [PD

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** BIOSCIENCE RESEARCH,201815(3):2126-2133 **OPEN ACCESS** Free Fu [PD

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 Fu [PD

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 Fu [PD

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 Fu [PD

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

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80 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 2159-2170. **OPEN ACCESS** Free Fu [PD

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]
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[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 Fu [PD

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]
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[4] Middle East for Vaccines MEVAC® company **Egypt.**

82 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2185-2193. **OPEN ACCESS** Free Fu [PD

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]
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83 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2194-2199. **OPEN ACCESS** Free Fu [PD

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

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84 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2200-2206 **OPEN ACCESS** Free Fu [PD

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

85 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2207-2217 **OPEN ACCESS** Free Fu [PD

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]

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

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86 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018, 15(3):2218-2227 **OPEN ACCESS** Free Fu [PD

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 Fu [PD

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 Fu [PD

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 Fu [PD

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 Fu [PD

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 Fu [PD

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 Fu [PD

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] *

[1]Graduate School of Biotechnology University of Jember Jl. Kalimantan 37 Kampus Tegalboto - Gedung Program Pascasarjana, Jember East, Java **Indonesia**

[2]Study program of Agrotechnology, Faculty of Agriculture, University of Jember, Jl. Kalimantan 37 KampusTegalboto East Java **Indonesia**

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[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 Fu [PD

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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[3]Plant Protection and Bimolecular Diagnosis Department, Arid lands Cultivation ResearchInstitute, City for Scientific Research and Technology Applications, New Borg El-Arab City, Alexandria, **Egypt.**

94 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,2018 15(3):2295-2303 **OPEN ACCESS** Free Fu [PD

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 Fu [PD

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]

[1]Faculty of physical therapy, Cairo University, **Egypt**

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

96 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2312-2317. **OPEN ACCESS** Free Fu [PD

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 Fu [PD

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 Fu [PD

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** BIOSCIENCE RESEARCH,201815(3):2338-2357 .**OPEN ACCESS** Free Fu [PD

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.**

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[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 Fu [PD

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**

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[3]Field Crops Res., Dept.., National Research Centre, 33 El Buhouth St., Dokki, Giza, **Egypt**

101 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,2018 15(3):2364-2373 **OPEN ACCESS** Free Fu [PD

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** BIOSCIENCE RESEARCH, 2018 15(3): 2374-2382. **OPEN ACCESS** Free Fu [PD

Comparative study on one shot Lipid A and Montanide ^{TM} 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** BIOSCIENCE RESEARCH, 2018 15(3): 2283-2392. **OPEN ACCESS** Free Fu [PD

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**

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104 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH,2018 15(3):2393-2400. **OPEN ACCESS** Free Fu [PD

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 Fu [PD

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**

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106 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2408-2415. **OPEN ACCESS** Free Fu [PD

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 Te

DPPD ameliorates renal fibrosis induced by $HgCl_2$ in rats

Mohamed M. Elshemy [1,*], Ahmed E-S AbdEl-mejied [1], Faten Zahran [2], Mohamed M. Omran [3]and Ahmed Nabil [4]

[1]Faculty of Science, Menoufia University, Menoufia, **Egypt**

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[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 Fu [PD

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 Fu

[PD

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 Fu
[PD

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**.

111 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 2452-2462. **OPEN ACCESS** Free Fu
[PD

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 Fu
[PD

Novel mechanistic aspects of formaldehyde–induced hepatotoxicity

Fatehya 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 Fu
[PD

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]

[1]Department of Environmental and Occupational Medicine, National Research Centre, Dokki, Giza**, Egypt.**

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114 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2489-2493 **OPEN ACCESS** Free Fu
[PD

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 Fu
[PD

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 Fu
[PD

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 Fu [PD

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 Fu [PD

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 Fu [PD

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 Fu [PD

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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[3]Nakhon Ratchasima Rajabhat University, Nakhon Ratchasima, 30000, **Thailand**
[4]Rajamangala University of Technology Isan, Nakhon Ratchasima, 30000, **Thailand**
[5]Synchrotron Light Research Institute (Public Organization), Nakhon Ratchasima, 30000, **Thailand**

121 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2551-2557 **OPEN ACCESS** Free Fu [PD

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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[3]Douglas Mental Health University Institute, Montreal, QC, **Canada**

122 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2558-2567. **OPEN ACCESS** Free Fu [PD

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 Fu [PD

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 Fu [PD

First record of *Bordetella avium* in Egyptian turkey flocks

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

[1]Reference Laboratory for Veterinary Quality Control on Poultry Production, Animal Health Research Institute, Dokki- Giza**, Egypt**

[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 Fu [PD

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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[3] Department of Dairy Science, National Research Centre, Dokki 12622, Cairo, **Egypt**

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126 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3):2602-2610 **OPEN ACCESS** Free Fu [PD

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 Fu [PD

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 Fu [PD

Molecular detection and genotyping of herpes simplex virus (1 and 2) in some Iraqi infertile men

Hayder 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.**

129 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 2626-2639. **OPEN ACCESS** Free Fu [PD

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]

[1]Botany Department, Faculty of Science, Mansoura University, Mansoura, **Egypt** [2]Biology Department, Faculty of Science, Tabuk University, Tabuk, **Kingdom of Saudi Arabia**

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

130 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 2640-2650. **OPEN ACCESS** Free Fu [PD

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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[2]Hormones Dept., Medical Research Division, National Research Centre (NRC), Dokki, P.O.12622 Giza, **Egypt,** Affi
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131 **RESEARCH ARTICLE** BIOSCIENCE RESEARCH, 2018 15(3): 2651-2667. **OPEN ACCESS** Free Fu [PD

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

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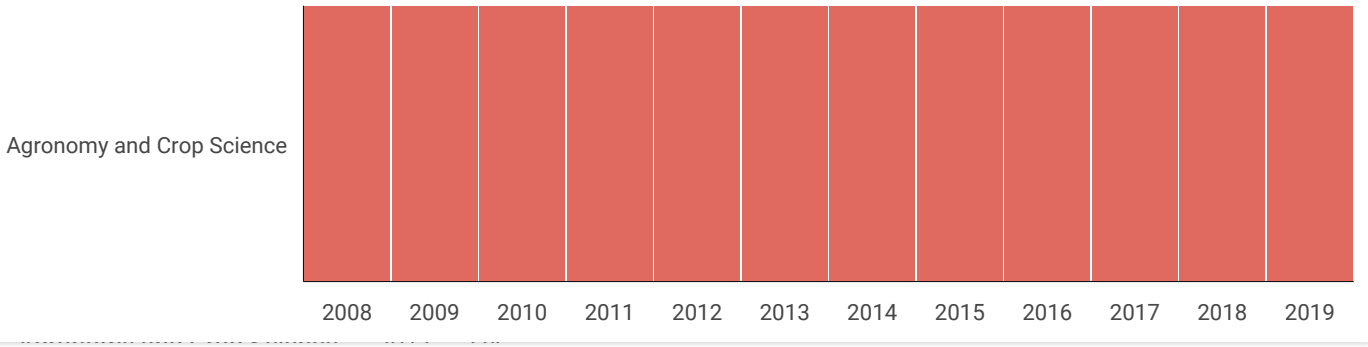

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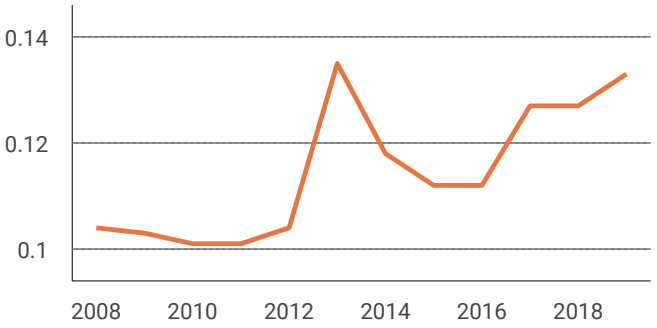

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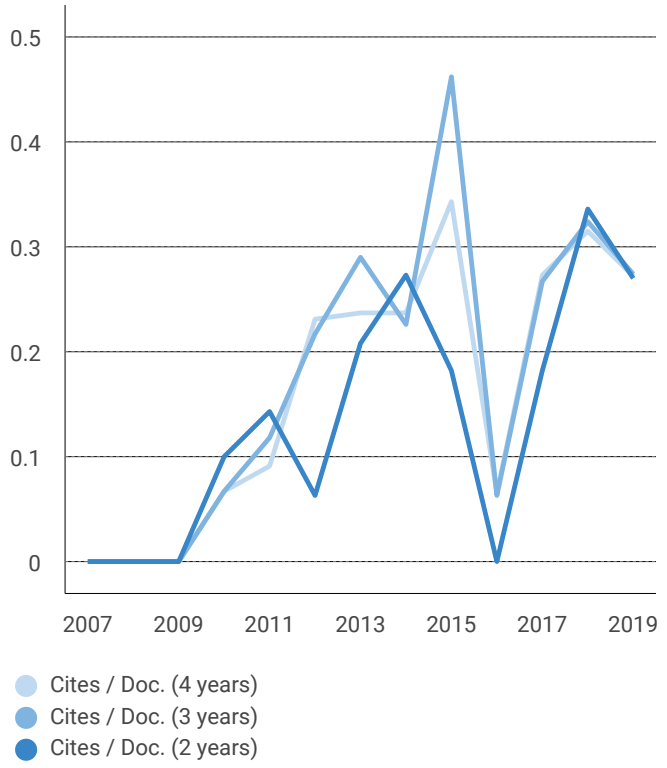

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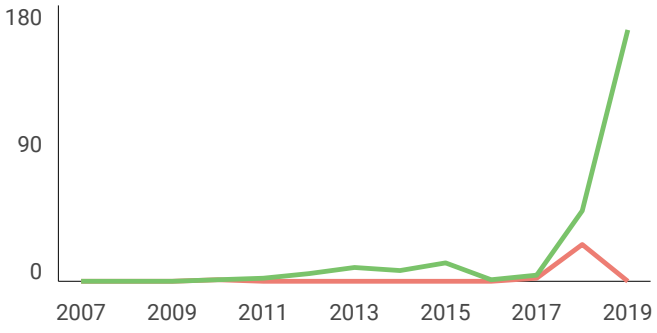

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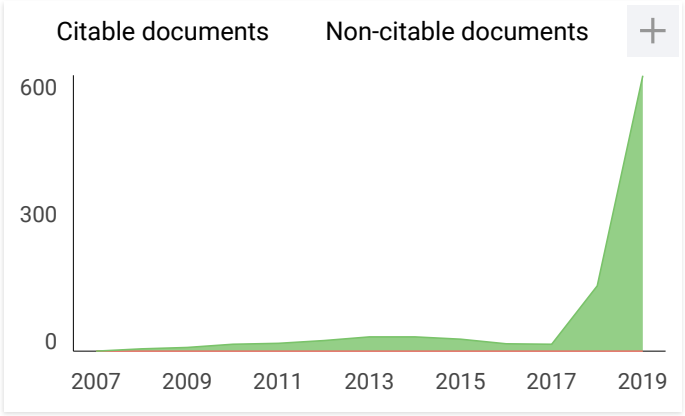

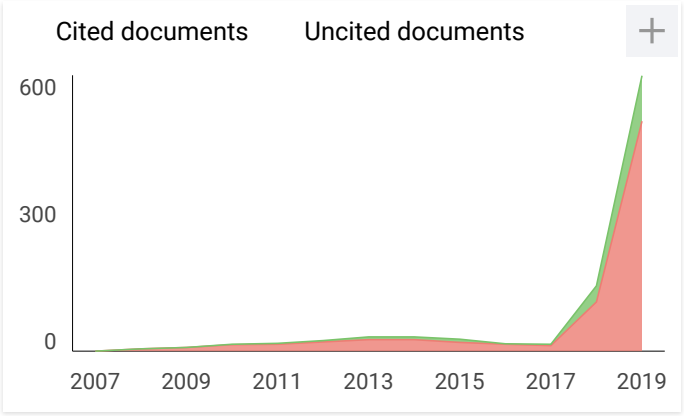

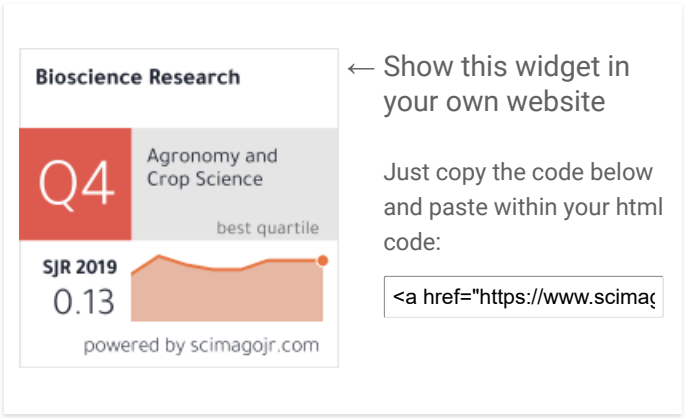

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RESEARCH ARTICLE BIOSCIENCE RESEARCH,201815(3):1472-1479. **OPEN ACCESS**

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

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Black betel (*Piper betle* L. var nigra) is one of endemic Piperaceae species in Indonesia. So far, few information was available about its bioactive compounds content. Thus, this study was designed to identify bioactive compounds contained in n-hexane, ethyl acetate, and methanol extract of *P. betle* L. var. Nigra leaves. Symplicia of black betel was extracted from the leaves using three types of solvent, before being analyzed of its compound types and amounts using Gas Chromatography Mass Spectra (GCMS). Result showed that three main components found in n-hexane extract were 1-pentene (22.57%), 3-butenoic acid (18.29%), and furan (16.83%). Three main components of ethyl acetate extract were acetic acid (58.35%), methylamine (21.5%), and acetic acid (15.29%). In the other hand, methanol extract contained three main components of methylamine (85.08%), acetic acid (4.78%), and pyridine (0.21%).

Keywords: *Piper betle* L. var Nigra, GCMS

INTRODUCTION

Piper is the largest genus comprising the Piperaceae family, consisting of 1000-2000 species distributed in tropical and subtropical area (Santos et al., 2001; Guimarales et al., 2006; Ghosh et al., 2014). Plants in Piperaceae contained various secondary metabolites, such as monoterpene, diterpene, phenylpropanoids, sesquiterpenes, alkaloids,amides, lignans, neolignans, steroids, piperolides, flavones, chalcones, and dihydrochalcones (Santos et al., 2014; Roser et al., 2001; Assis et al., 2013).

Previous study on secondary metabolites of *Piper hymenophyllum*collected from Nallamala forest, Eastern Ghats, India resulted in compounds with bioactivity able to inhibit growth of *Salmonella typhimurium*, *Pseudomonas aeruginosa*, and *Klebsiella pneumonia* (Ratnam et al., 2015). Ethnopharmacological study of *Piper hispidum* from Central America and South America resulted in its potential as antiseptic and medicine for skin ulcers (Flores et al., 2008). Other *Piper* species, *Piper glabratum*, contained benzoic acid which could function as antiparasite, antiseptic, and medicine for skin ulcers (Flores et al., 2008; Braga et al., 2001; Svetaz et al., 2010). Meanwhile methanol extract of Piper nigrum collected from Karayar forest, Tamil-Nadu, was found to have larvicide effect against Aedes aegepty larvae (Escaline et al., 2015).

Secondary metabolites derived from *Piper longum*, *Piper betle*, and *Piper cubeba* had bioactivity as insecticide against fleas and mosquitos (Lee, 2005). Leaf extract of *Piper betle* was found to have high level of antioxidant activity (Battacharya et al., 2005), and potential to treat hypertension, heart, and respiratory disease (Nalina and Rahim, 2007). In the other hand,

essential oil extracted from *Piper cubataonum* possessed anti-proliferative activity (Santos et al., 2014).

Black betel is one member of Piperaceae family known to have a number of benefits and prospects for further development. So far, few information is available on the bioactive compounds content of this plant. Thus, this study was aimed to identify bioactive compounds of n-hexane, ethyl acetate, and methanol extracts of black betel leaf.

MATERIALS AND METHODS

Plant Materials and Extraction

Leaves of *Piper betle* L. var nigra were collected from Flower Market, Kayoon Surabaya. Leaves were first washed and air-dried. Next, black betel leaves were blended into powder. As much as 88.5 g of leaf powder was divided into 3 parts of 29.5 g respectively. Each part was then macerated by dissolving it into either n-hexane, ethyl acetate, or methanol. Maceration was performed for three days, repeated three times. Each step of maceration used 500 ml of solvent, thus total of 1500 ml of respective solvent was used.

GCMS Analysis

Each extract was analyzed for content compound types and amounts using Gas Chromatography Mass Spectra (GCMS) method. Identification of compounds in the extract was performed using GCMS (Agilent 6890 A). As much as 1 µl of each extract sample was injected. GC detector used was MSD Agilent 5973 Inert. GC condition applied was flow acceleration of 1.3 ml/minute, temperature 2800^0C, detector AUX temperature 2800^0C, MS Source 2300^0C, MS Quadrupole 1500^0C. 5% Phenyl metal siloxane was used as stationary phase in analysis while helium ultrapure gas was used as mobile phase. Column type was capillary HP 5 with column size of 30 µm x 320 µm x 0.25 µm.

RESULTS

Result of GCMS analysis of black betel leaves n-hexane, ethyl acetate, and methanol extracts was presented in Figure 1, 2, and 3, and Table 1, 2, and 3 respectively. GC analysis of n-hexane extract showed 53 peaks indicated that it contained about 53 compounds. Chromatogram profile of black betel leaves n-hexane extract was presented in Fig.1, while compounds identified from it were listed in Table 1.

Table1. Chemical compounds identified from black betel leaves n-hexaneextract

Peak	RT	Area (%)	Phytocomponent
1	1.11	8.10	Methylamine
2	1.19	0.02	Pentane
3	1.24	0.06	Butane
4	1.30	16.83	Furan
5	1.33	18.29	3-Butenoic acid
6	1.36	16.02	2-Methylpropenoic acid
7	1.37	14.13	1-Hexene
8	1.47	22.57	1-Pentene
9	1.56	0.06	Pentane
10	1.61	3.21	Cyclohexane
11	1.65	0.09	3-methylhexane
12	1.71	0.02	Tridecane
13	1.73	0.01	Cyclopentane
14	1.79	0.02	Heptane
15	1.88	0.00	Furan
16	1.97	0.02	Cyclohexane
17	2.02	0.02	2-Pentanol
18	2.21	0.02	3-Pentanol
19	2.39	0.01	Methylbenzene
20	2.46	0.01	2-Penten
21	2.60	0.01	3-Hexanone
22	2.66	0.08	Cyclopentanol
23	2.72	0.02	3-Hexanol
24	2.79	0.02	2-Hexanol
25	3.56	0.02	Cyclopentanol
26	3.66	0.01	Cyclopentanone
27	4.78	0.01	1-Butanamine
28	5.50	0.01	Silane
29	5.99	0.01	3-pentanol
30	6.15	0.02	1,3-Cyclohexadiene
31	7.16	0.01	3-butenyl pentyl
32	7.29	0.02	Pyridine
33	7.73	0.01	Propane
34	7.95	0.00	3-Butenamide
35	8.39	0.00	Benzene
36	8.55	0.01	Z-Ocimene
37	9.05	0.00	Methyl ester
38	9.21	0.00	1,3-Dioxolane
39	9.93	0.00	Dipropylamine
40	10.04	0.02	Myrcene
41	10.38	0.00	1-Methylamino-propylamine
42	11.78	0.00	3-butenamide
43	13.20	0.00	Oxetane
44	13.28	0.00	Piperazine
45	14.99	0.01	1,3-Cyclopentadiene
46	15.98	0.00	1-Bromoadamantane
47	16.20	0.00	Benzoin
48	16.73	0.00	Homarine
49	17.04	0.00	Benzyl alcohol
50	20.68	0.03	Tridecanoic acid
51	22.38	0.04	Cyclohexane
52	22.45	0.07	Cyclohexene
53	22.72	0.01	2-Aminoacetamide hydrochloride

Three main components contained were 1-

pentene (22.57%), 3-butenoic acid (18.29%), and furan (16.83%) (Table 1).Based on GC analysis, ethyl acetate extract of black betel leaves resulted in 36 peaks, indicating that about 36 chemical compounds was contained in it. Chromatogram profile of this extract was presented in Fig 2, while compounds were listed in Table 2. This extract contained three main components of acetic acid (58.35%), methylamine (21.15%), and acetic acid (15.29%) (Table 2).

Table 2. Chemical compounds identified from black betel leaves ethyl acetate extract

Peak	RT	Area (%)	Phyto component
1	1.11	21.15	Methylamine-D2
2	1.16	1.84	Ethanol
3	1.24	0.05	Acetic acid
4	1.29	0.10	Pentane
5	1.32	0.15	Pentane
6	1.36	0.16	Hexane
7	1.42	58.35	Acetic acid
8	1.47	15.29	Acetic acid
9	1.50	2.05	Acetic acid
10	1.61	0.06	Acetic acid
11	1.78	0.00	Ethanol
12	1.88	0.42	Propanoic acid
13	2.11	0.02	2-Pentanone
14	4.01	0.01	Aethylbenzol
15	4.21	0.03	p-Xylene
16	4.89	0.01	p-Xylene
17	6.15	0.06	Cyclopropene
18	7.29	0.07	Pyridine
19	1.74	0.00	Methylester
20	8.56	0.01	1,4-Pentadiene
21	10.04	0.02	Pyridine
22	12.48	0.00	Acetic acid
23	13.20	0.00	1-Propanaminium
24	14.40	0.00	Methyl L-alaninate
25	14.59	0.01	Urea
26	14.99	0.03	7-Methylenenorcarane
27	15.12	0.00	Amphetamine
28	15.78	0.00	Benzeneethanol
29	15.98	0.02	Pyridine
30	16.09	0.00	1-Propanol
31	16.20	0.01	Hydroxylamine
32	16.74	0.01	Cyclopropane
33	17.04	0.01	Delta6-bicyclo
34	19.78	0.01	5-hydroxylinalol
35	20.04	0.00	Propanamide
36	20.23	0.01	2,4-Hexadiene

Based on GC analysis, from methanol extract of black betel leaves, 58 peaks were able to be identified, representing about 58 types of chemical compound. Chromatogram profile of methanol extract was presented in Fig. 3, while compounds were listed in Table 3. Three main components identified form this extract including methylamine (85.08%), acetic acid (4.78%), and pyridine (0.21%) (Table 3).

Table 3. Chemical compounds identified from black betel leaves methanol extract

Peak	RT	Area (%)	Phytocomponent
1	1.03	0.13	Carbonic acid
2	1,05	8.52	Methyloamina
3	1.21	85.08	Methylamine
4	1.25	0.19	Ethyl alcohol
5	1.29	0.05	Ethylamine
6	1.35	0.13	Boric acid
7	1.39	4.78	Acetic acid
8	1.54	0.03	Formic acid
9	1.73	0.01	Semicarbazide
10	1.86	0.01	Diisopropylamine
11	1.97	0.00	Acetic acid
12	2.29	0.03	2,2-Dimethoxybutane
13	2.35	0.04	2,2-Dimethoxybutane
14	6.13	0.16	2-Picoline
15	7.29	0.21	Pyridine
16	7.76	0.01	Myrcene
17	7.94	0.01	Undecane
18	8.57	0.03	Cyclobutane
19	10.05	0.06	Myrcene
20	10.48	0.03	Hydrazine
21	13.20	0.01	2-Dodecanone
22	13.86	0.01	1-Methylene-2-vinylcyclopentane
23	14.40	0.02	1,2-Dimethylbenzene
24	14.59	0.02	Cyclopentene
25	14.91	0.00	Ethyl oxamate
26	14.99	0.08	3-Methylene
27	15.11	0.01	Propanenitrile
28	15.43	0.01	7-Methylene
29	15.71	0.01	7-Methylenenorcarane
30	15.78	0.01	p-Xylene
31	15.94	0.01	1H-Pyrrole
32	15.98	0.04	Pyridine
33	16.09	0.01	1-Hydroxymethyl-2 -methyl-4-cyclohexene
34	16.21	0.02	para-Xylene
35	16.29	0.01	Cycloprophylcarbinol
36	16.38	0.01	Pyridine
37	16.67	0.01	Urea
38	16.73	0.03	Myrcene
39	17.04	0.03	Cyclopentane
40	17.83	0.01	Tetrahydro-
41	18.91	0.01	Propanedioic acid
42	19.78	0.01	2,7-Octadiene
43	19.86	0.00	3-Piperidinol
44	20.23	0.01	Piperazine
45	20.63	0.01	Propanamide
46	20.68	0.01	Diazene
47	21.02	0.01	Tetradecane
48	21.64	0.02	Methylimidazole
49	21.76	0.00	Carbamic acid
50	22.27	0.01	Dispermine
51	22.39	0.02	1,2-Epoxy-1-vinylcyclododecene
52	22.45	0.02	1,3-Cyclooctadiene
53	22.59	0.01	Ho-trienol
54	22.78	0.00	Cyclopentane
55	22.84	0.00	4-Allylimidazole
56	23.32	0.00	Dioxolan
57	23.33	0.00	Formamide
58	25.58	0.01	Propanamide

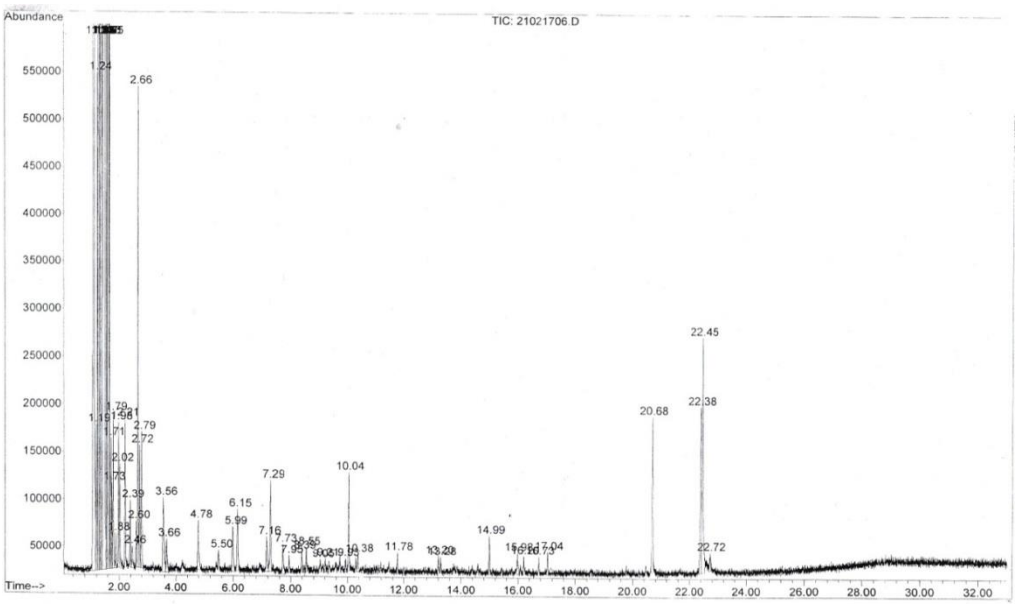

Figure 1. Chromatogram profile of black betel leaves n-hexane extract

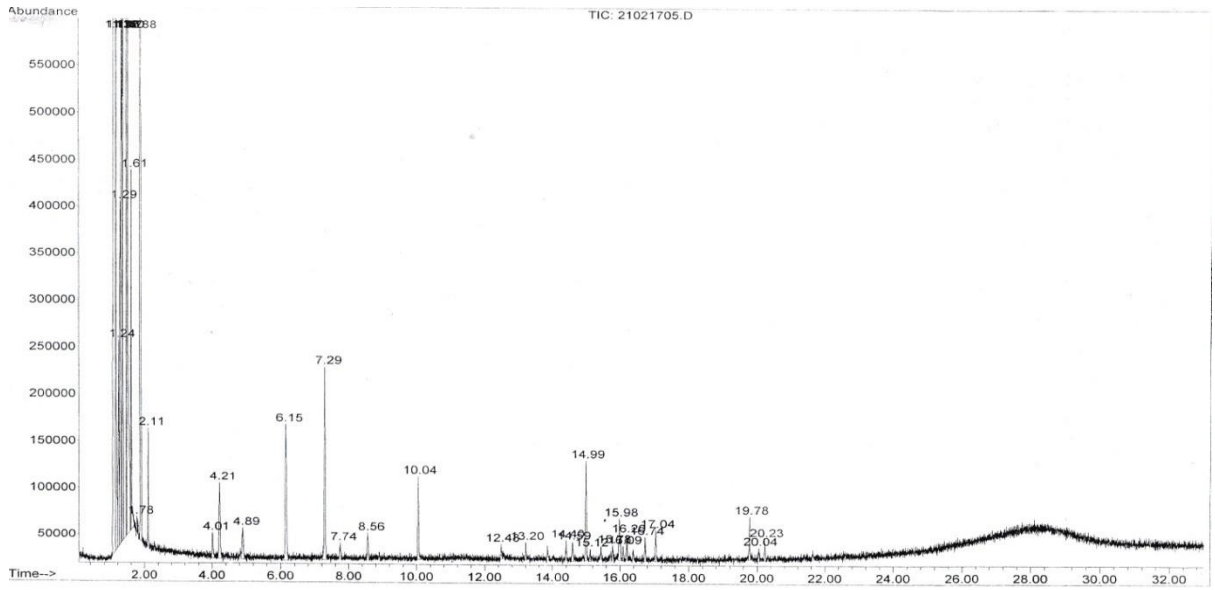

Figure 2. Chromatogram profile of black betel leaves ethyl acetate extract

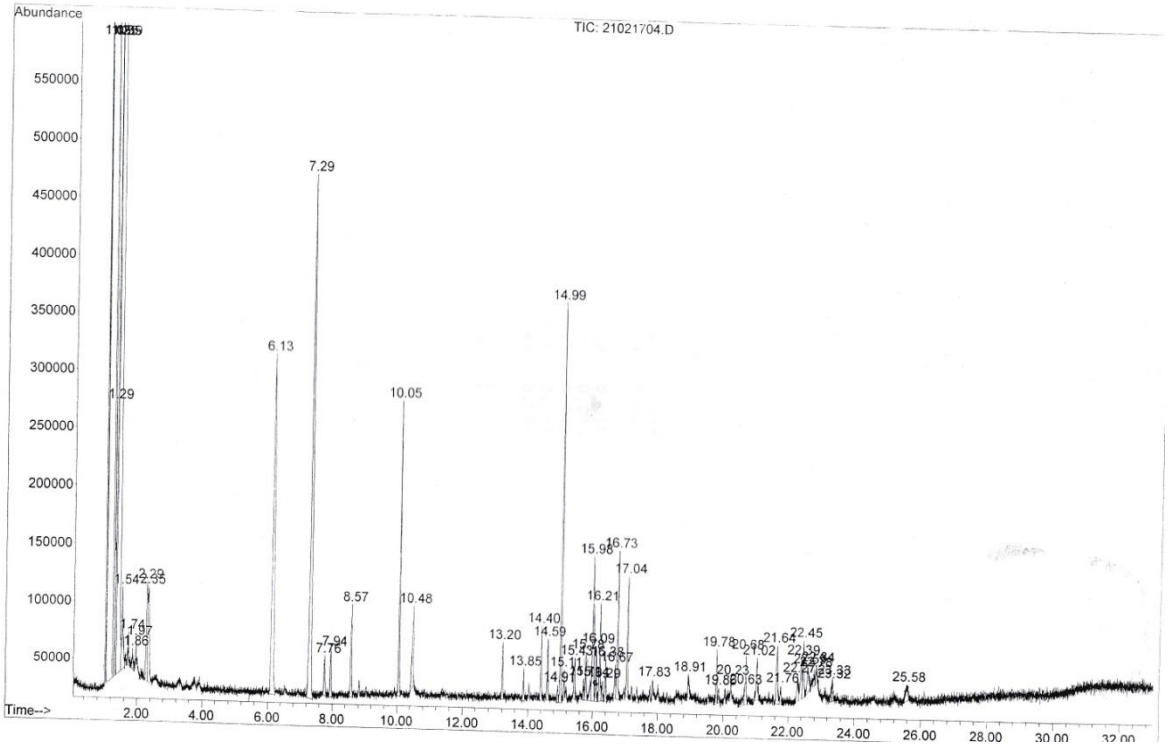

Figure 3. Chromatogram profile of black betel leaves methanol extract

DISCUSSION

Based on result of analysis, compounds contained in the three extract of Piper betle were different from compounds found on other species of Piperaceae family.*Piper longum* contained piplartine (first amide) that was found to possess various pharmacological activities (Bezzera et al., 2013). Amide isolated from *Piper* species including piperine, piperiline, pellitorine, pipercide and guinensine which had insecticide property (Kwute et al., 2013). *Piper arboretum* and *Piper divaricatum* contained safrole, while *Piper caldense*, *Piper marginatum*, *Piper tuberculatum*, *Piper aduncum* were found to contain dillapiole (Paz et al., 2017).

N-hexane extract of *Piper betle* L. var nigra contained 1-pentene, 3-butenoic acid, and furan. This was different from n-hexane extract of *Piper betle* leaf stalk collected from Kolkata, India. The extract was found to contain 3 main components of dodecanoic acid, hexadecanoic acid, and tetradecanoic acid (Dwivedi et al., 2010). 1-pentene belong to alkene or olefin group, which is unsaturated hydrocarbon and volatile compounds (Oleivera et al., 2009). 1-pentenehad also been found from *Ficuscarica*leaf extract (Oleivera et al., 2010). This volatile compound had several biological functions. Volatile compounds isolated from *Mindium laevigatum* had antioxidative, antimicrobial, and cytotoxic properties (Ebrahimabadi et al., 2016). Other plants containing volatile compounds which could function as antioxidant including *Chamerion angustifolium*(Kaskoniene et al., 2016); *Myrtus communis* (Serreli et al., 2017); *bee pollen* (Fatrcova-Sramkova et al., 2015).

In addition, some volatile compounds had also been found to have antimicrobial property (Singh, 2011; Fialho et al., 2011). Several kind of plants which contained volatile compounds and had antimicrobial property were Muscodor albus (Strobel et al., 2001); Mansoa difficilis (Guilhon et al., 2012); *Pinusdensiflora* (Park and Lee, 2012). Other compound contained in n-hexane extract was 3-butenoic acid. Butenoic acid possessed antiproliferative activity (Todorovic et al., 2013). Another compound extracted was furan, which was an organic compound, belong to aromatic heterocyclic which have ring structure with 1 O atom and 4 C atoms. Furan was colorless, volatile, and toxic (Anupam et al., 2011). Biological function of furan including antibacteria, (Choi, 2008), anticonvulsan (Abdel-Wahab, 2009), antinociceptive (Abdel-Wahab, 2009), antifungi (Abdel Aziz, 2009), antitumor, and antiviral (Galal, 2009).

Compared to other *Piper* species, compounds extracted in previous studies was clearly different

from in this study. *Piper hispidum* extract contained 29.0% monoterpene component, while main component of *Piper cernuum* were β-elemene (11.6%) and epicubebol (13.1%). The man components of *Piper glabratum* were β-caryophyllene (14.6%) and longiborneol (12.0%).*Piper hispidum* also contained khusimene (12.1%) and γ-cadinene (13.2%) (Assis et al., 2013). Composition of essential oil derived from Piper hymenophyllum consisted of E-phytol (21.87%), dihydroterpineol (17.42%) and α-terpineol (13.93%) (Ratnam et al., 2015).

Acetic acid is one of the simplest form of carboxylic acids, which have antibacterial property against *Pseudomonas aeruginosa*, *Acinetobacterbaumannii*, *Pseudomonas mirabilis*, *Staphylococcus aureus*, and *Klebsiella pneumonia* (Halstead et al., 2015). Meanwhile methylamine is an organic compound with chemical formula of CH_3NH_2. This compound had activity as anti-microbe (Patel et al., 2016; El Wahab, 2012). Methanol extract of *Piper nigrum* leaves was found to have 3 main components; thymol (20.77%), elemene (10.42%), and octadecanoic acid (6.98%) (Escaline et al., 2015).

One of the compounds contained in black betel methanol extract was pyridine. Pyridine is a heterocyclic compound with shape of simple aromatic ring and chemical formula of C_5H_5N. This compound was found to have important role in drug production. Pyridine had a wide variety of biological activity, such as anti-inflammatory (Pettus et al., 2013), analgesic (Sladowska, 1998), anti hipersensitive (Hoffmann, 1983), antihistaminic (Gore, 2008), antidiabetic (Mylari, 1998), anticancer (Kaizerman, 2010.), antimicrobial (Elassar, 2008), and central nervous system activities (Mitchinson et al., 2006)

CONCLUSION

Main components contained in n-hexane of *Piper betle* L. var Nigra were 1-pentene (22.57%), 3-butenoic acid (18.29%), and furan (16.83%). Ethyl acetate extract had three main components of acetic acid (58.35%), methylamine (21.5%), and acetic acid (15.29%). Methanol extract of black betel leaves contained three main components of methylamine (85.08%), acetic acid (4.78%), and pyridine (0.21%).

CONFLICT OF INTEREST

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

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AUTHOR CONTRIBUTIONS

JUN and NMZ designed and performed the experiments and also write the manuscript. LIS designed experiments and reviewed the manuscript. All authors read and approved the final version.

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