



**KOMISI ETIK PENELITIAN  
FAKULTAS KEDOKTERAN HEWAN UNIVERSITAS AIRLANGGA  
*Animal Care and Use Committee (ACUC)***

**KETERANGAN KELAIKAN ETIK  
“ ETHICAL CLEARENCE ”**

**No : 1.KE.127.07.2019**

**KOMISI ETIK PENELITIAN (ANIMAL CARE AND USE COMMITTEE)  
FAKULTAS KEDOKTERAN HEWAN UNIVERSITAS AIRLANGGA SURABAYA,  
TELAH MEMPELAJARI SECARA SEKSAMA RANCANGAN PENELITIAN YANG  
DIUSULKAN, MAKA DENGAN INI MENYATAKAN BAHWA :**

- PENELITIAN BERJUDUL** : Revitalisasi Fungsi Sel Beta Pankreas Tikus Putih  
Penderita Diabetes Mellitus Buatan dengan  
Penggunaan Simplisia Kayu Manis (*Cinnamon  
burmanii*) dan Kembang Bulan (*Tithonia diversifolia*)
- PENELITI UTAMA** : Hani Plumeriastuti
- UNIT/LEMBAGA/TEMPAT  
PENELITIAN** : Penelitian Terapan Unggulan Perguruan Tinggi  
Fakultas Kedokteran Hewan Universitas Airlangga
- DINYATAKAN** : LAIK ETIK

Surabaya, 11 Juli 2019

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## Research Article

### Evaluation the Effect of Pulmicort Inhalation on Children with Acute Asthma Attack

👤 *Ahmad Bahrami, Shabahang Jafarnejad, Hamidreza khoshnezhad Ebrahimi, Seyedeh Mahsa Mahmoudinezhad Dezfouli, Rozhin Pahlevani.*

SRP. 2020; 11(9): 905 - 912

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.132

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## Research Article

### Elevated serum levels of Interleukin-13 and Interleukin-17A in Pediatric Asthma

👤 *Sawsan M. Jabbar AL-Hasnawi, Abeer Thaher Naji AL-Hasnawi.*

SRP. 2020; 11(9): 229 - 223

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.37

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## Research Article

### Protein Isolation from Sponge Niphates sp. as an Antibacterial and Antioxidant

👤 *Warsidah, Masrianih, Mega Sari Juane Sofiana, Ikha Safitri, Ajuk Sapar, Anthoni B. Aritonang, Yuges Saputri Muttalib, Dzul Fadly.*

SRP. 2020; 11(9): 518 - 521

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.76

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## Review Article

### Matrix Metalloproteinase-1 (MMP-1) Expression and Density of Collagen Fibers following Application of Haruan Fish (*Channa striata*) Extract in Inflamed Pulp of Wistar Rat

👤 *Juni Jekti Nugroho, Andi Sumidarti, Mufliha Siri, Muhammad Husni Cangara, Nurhayaty Natsir, Maria Tanumihardja, Noor Hikmah, Asrianti.*

SRP. 2020; 11(9): 6 - 9

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.02

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## Research Article

### Did Servant, Digital and Green Leadership Influence Market Performance? Evidence from Indonesian Pharmaceutical Industry

👤 *Khaerul Fahmi, Temmy Kurniawan, Yoyok Cahyono, Afen Sena, Suhadarliyah, Popong Suryani, Agus Sugianto, Dahlia Amelia, Musnaini, Shofia Amin, Husni Hasbullah, M. Jihadi, Hadion Wijoyo, Agus Purwanto.*

SRP. 2020; 11(9): 642 - 653

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.95

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## Research Article

### Juvenile Delinquency Measurement in Indonesian High Schools

👤 *Syariful, Akif Khilmiyah, Siswanto Masruri.*

SRP. 2020; 11(9): 522 - 527

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.77

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## Research Article

### Prevention and Treatment Approaches in Children with the Coronavirus

👤 *Shaqayeq Khosravi, Seyedeh Mahsa Mahmoudinezhad Dezfouli.*

SRP. 2020; 11(9): 913 - 919

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.133

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## Research Article

### Comparative Study for Complications of Otoplasty between Patients under Ten Years and above Ten Years Old

👤 *Ahmed Miri saadoon, Ali Abd-Almer Jwad and Riyadh K. Madloun.*

SRP. 2020; 11(9): 234 - 238

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.38

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## Research Article

### Extract Standardization in Ethyl Acetate Fraction from Sargassum Hystrix as Inhibitor of $\alpha$ -Amylase and $\alpha$ -Glucosidase

👤 *Sovia Indah Nurkhanifah, Siti Ari Budhiyanti, Amir Husni.*

SRP. 2020; 11(9): 528 - 534

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.78

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## Review Article

### A Review of the Presence of Antibiotic Resistance Problems on Klebsiella Pneumoniae Acquired from Pigs: Public Health Importance

👤 *Eka Dian Sofiana, Junianto Wika Adi Pratama, Mustofa Helmi Effendi, Hani Plumeriastuti, Freshindy Marissa Wibisono, Erwan Budi Hartadi, Akvyan Rafi Hidayatullah.*

SRP. 2020; 11(9): 535 - 543

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.79

## Research Article

### Synergistic Effect between Zingiber Officinale Volatile Oil and Meropenem against Acinetobacter Baumannii Producing-Carbapenemase Isolated from Neurosurgery in Iraq

 Safaa A.L. Al Meani, Mohammed M. Ahmed, Ali H. Abdulkareem.


SRP. 2020; 11(9): 920 - 925

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.134

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## Review Article

### Distinctive Therapeutic Strategies against Corona Virus-19 (COVID-19): A Pharmacological Review

 Yousra A. Nomier, Devulapalli S. Rao, Ahmed H. Suhaqi, Rayan A. Ahmed.


SRP. 2020; 11(9): 544 - 561

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.80

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## Research Article

### Effect of Diabetic Ketoacidosis on Some Biochemical and Immunological Variables

 Oqbah Abdul Halim, Qasim Khlaif Abdullah, Asmaa wajah juma.

SRP. 2020; 11(9): 239 - 242

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.39

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## Research Article

### The Effect of Benzo [A] Pyrene on Changes in the Profile of CD11B + IL1 +, CD11B + IL17 +, CD4 + CD25 + in Mice (MUS MUSCULUS, L) after Getting Paramicsovirus Vaccine

 Suwoyo, Lumastari Ajeng Wijayanti, Dwi Estuning Rahayu.

SRP. 2020; 11(9): 926 - 930

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.135

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## Research Article

### Mechanisms for Managing Medical Institutions in Times of Crisis

 Anastasia Barzylavych, Bubalo Volodymyr, Nesterenko G. Valentyna, Rogachevskiy Oleksandr, Chornyi Oleg.


SRP. 2020; 11(9): 562 - 568

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.81

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## Research Article

### Platelets Profile Changes in Patients with COVID 19

 Safaa jawad kadhemi, Ahmed Hasan Raheem, Hassan Salim aljumaily, Ahmed Abdul Haleem Al shammari, Ameer Kadhimi Al-Humairi, Ali Baay.


SRP. 2020; 11(9): 569 - 574

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.82

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## Research Article

### Wives' Perceptions of Husbands with Erectile Dysfunction in Indonesia: The Fulfilment Pattern of the Wife's Sexual Partner Who Experiences Erectile Dysfunction due to Diabetes Mellitus

 Abd. Nasir, Susilo Hariyanto, Nuruddin, Iswatun, Supatmi, Nuh Huda.


SRP. 2020; 11(9): 654 - 660

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.96

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## Research Article

### The Value of Standing X-ray in Detecting Physiological Spondylolisthesis in Patients with Single Disc Prolapse with Normal Intensity MRI Findings

 Najat Adel Hashim, Raad Jawad Kadhim.

SRP. 2020; 11(9): 243 - 247

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.40

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## Research Article

### Effect of Career, Organizational Commitment on Turnover Intention through Mediation of Organizational Culture: Evidence from Indonesian Companies

 Nico Alexander Vizano, Wiwik Utami, Sigmin Johannes, Aty Herawati, Havis Aima, Achmad H Sutawijaya, Agus Purwanto, Joko Supono, Puji Rahayu, Aris Setiyani, C Catur Widayati, Farida Elmi.


SRP. 2020; 11(9): 931 - 937

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.136

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## Research Article

### Social Network for Drug Circulation in Sidenreng Rappang Regency, Indonesia

 Rahmat Pannyiwi, Andi Agustang, Tahir Kasnawi, Andi Tenri Pada, Ahmad Yani, Sadli Syam.

SRP. 2020; 11(9): 575 - 577

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.83

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## Review Article

### The Mucosal Lesions on Removable Denture Wearers: A Systematic Review

 Mohammad Dharma Utama, Acing Habibie Mude, Muhammad Ikbali, Vinsensia Launardo, Adriani Dachri.


SRP. 2020; 11(9): 10 - 14

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.03

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## Research Article

### Evaluation and Comparison of the Optimization Parameters Based on Univariate and Multivariate Techniques for Estimation Atorvastatin Calcium with Novel Reverse Indirect Spectrophotometric Method

 Marwan A. Hasan, Rebwar O. Hasan, Khalid F. Al-Rawi.


SRP. 2020; 11(9): 248 - 259

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.41

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## Research Article

### Effect of pH, Temperature and Metal Salts in Different Storage Conditions on the Stability of Vitamin C Content of Yellow Bell Pepper Extracted in Aqueous Media

 Husni S Farah, Jehad F Alhmod, Atef Al-Othman, Khalid M Alqaisi, Ali M Atoom, Khalid Shadid, Ashok Shakya, Talal AlQaisi.

SRP. 2020; 11(9): 661 - 667

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## Research Article

### The Influence of Organizational Culture, Job Satisfaction, and Professional Commitment on Innovative Behavior of Flight Instructors at the Civil Flight School in Indonesia

 Afen Sena, Yoyok Cahyono, Agus Purwanto.

SRP. 2020; 11(9): 938 - 952

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.137

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## Research Article

### Potential Impact of micro RNA-146a Gene Polymorphisms in Oxidative Stress of Diabetic Mellitus Type 1

 Fulla Abd Alsatat Alriyahee, Noora M. Hameed, Israa Harjan Mohsen, Mona N. Al-Terehi.


SRP. 2020; 11(9): 260 - 263

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.42

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## Research Article

### Testing the Role of Competence and Supervision of Job Satisfaction and Its Impact on Teacher Performance

 Danang Hidayatullah, Anis Eliyana, Hamidah, Tuty Sariwulan, Agung Dharmawan Buchdadi.


SRP. 2020; 11(9): 668 - 675

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### Effectiveness of Finger Held Relaxation on the Decrease in Intensity of Pain in Patient of Post-Sectio Caesarea in RSUD Sorong Regency

 Ariani Pongoh, Adriana Egam, Rizqi Kamalah, Anwar Mallongi.


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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.138

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## Review Article

### Locator or Ball Attachment Systems for Mandibular Implant Overdentures: A Systematic Review

 Muhammad Ikbal, Acing Habibie Mude, Irfan Dammar, Vinsensia Launardo, Ian Afifah Sudarman.

SRP. 2020; 11(9): 15 - 19

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.04

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## Research Article

### Atomic Spectroscopy Technique Employed to Detect the Heavy Metals from Iraqi Waterbodies Using Natural Bio-Filter (*Eichhornia crassipes*): Thera Dejla as a Case Study

 Ghalib Adrees Atiya Ali, Mohammed Nsaif Abbas.


SRP. 2020; 11(9): 264 - 271

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.43

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## Research Article

### The Effect of Substitution of Purple Sweet Potato Flour and Tempeh on Organoleptic Quality of MP-ASI Biscuit

 Radeny Ramdany, Yulia Rachmawati, La Supu, Anwar Mallongi.


SRP. 2020; 11(9): 957 - 961

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## Research Article

### The Effect of Transformational Leadership on Employee Job Satisfaction with the Meditation of Trust to Supervisors

 Bambang Raditya Purnomo, Anis Eliyana, Windra Alfatah Surya.


SRP. 2020; 11(9): 676 - 686

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.99

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## Research Article

### Study the IL6 (C174G) Promoter SNP and Correlation with Physiological Growth Hormone and TNFA levels in Iraqi Subjects with Psoriasis

 Shaimaa H. Ali, Rawaa S. A. AL-Azawi, Hamzah H. Kzar.


SRP. 2020; 11(9): 272 - 276

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.44

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## Research Article

### Effect of Organizational Citizenship Behavior, Work Satisfaction and Organizational Commitment toward Indonesian School Performance

 Budi Sulistiyo Nugroho, Minnah El Widdah, Lukman Hakim, Muh. Nashirudin, Acep Nurlaeli, Joko Hadi Purnomo, Muhammad Aziz, Hendri Hermawan Adinugraha, Mila Sartika, Muhammad Khoirul Fikri, Abdul Mufid, Agus Purwanto, Mochammad Fahlevi.


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## Research Article

### Democratic, Autocratic, Bureaucratic and Charismatic Leadership Style: Which Influence School Teachers Performance in Education 4.0 Era?


 Wahidin, Basri, Teguh Setiawan Wibowo, Aufa Abdillah, Ahmad Kharis, Jaenudin, Agus Purwanto, Abdul Mufid, Suesthi Maharani, Alfi Qonita Badi`ati, Mochammad Fahlevi, Susila Sumartiningsih.

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## Research Article

### Effect of Knowledge Sharing dan Leader member Exchange (LMX) and Organizational Citizenship Behavior (OCB) to Indonesian Lecturers? Performance

 Budi Sulistiyo Nugroho, Suheri, Lukman Hakim, Bambang Irawan, M. Sugeng Sholehuddin, Tatang Ibrahim, Mujib Ridlwan, Laily Hidayati, Gunawan Aji, Abdul Mufid, Nur Ihsan, Agus Purwanto, Mochammad Fahlevi.

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## Review Article

### Prosthetic Rehabilitation of Patient with Ocular Defects using Conventional Technique: A Systematic Review

 Vinsensia Launardo, Rifaat Nurrahma, Rezki Wahyuni Syamsuddin, Acing Habibie Mude, Bashiera Ika Sari.


SRP. 2020; 11(9): 20 - 25

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## Review Article

### A Review of Enterotoxigenic Escherichia coli Infection in Piglets: Public Health Importance

 Erwan Budi Hartadi, Mustofa Helmi Effendi, Hani Plumeriastuti, Eka Dian Sofiana, Freshindy Marissa Wibisono, Akvyan Rafi Hidayatullah.


SRP. 2020; 11(9): 687 - 698

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.100

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## Research Article

### Effect of Compensation and Organization Commitment on Turnover Intention with Work Satisfaction as Intervening Variable in Indonesian Industries

 Nico Alexander Vizano, Wiwik Utami, Sigmin Johannes, Aty Herawati, Havis Aima, Achmad H Sutawijaya, Agus Purwanto, Joko Supono, Puji Rahayu, Aris Setiyani, C Catur Widayati.


SRP. 2020; 11(9): 287 - 298

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.46

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## Research Article

### The Effect of Compensation Strategy Implementation on Knowledge Sharing through Affective Commitment and Psychological Contracts

 Afzil Ramadian, Anis Eliyana, Hamidah, Agung Dharmawan Buchdadi, Randa Rakawuri.


SRP. 2020; 11(9): 699 - 712

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.101

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### Periodontal Status of Drug Abuser in Makassar

 Nursyamsi Djamaluddin, Bagus Setiawan.

SRP. 2020; 11(9): 26 - 30

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.06

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## Research Article

### New Paradigm for the Life Skills Development of Children and Youth in Elementary Education Schools in the Rural Highland of Omkoi District, Chiang Mai, Thailand: Towards Achieving the Sustainable Development Goals (SDGs)

 Priyanut Wutti Chupradit, Pariwit Vitayacheeva, Rattaphol Prommas, Mujalin Prasannarong, Savitree Thummasorn, Sopida Apichai, Waranya Chingchit, Pachpilai Chaiwong, Chalanda Janton, Apiwat Leewattana, Natthanit Joompathong, Jedbordin Kumkronglek, Chanakarn Kumkun, Utumma Maghanemi, Kwanchai Rattanasthien, Natnakorn Kumfang, Thirasak Uppamaiathichai, Supat Chupradit.

SRP. 2020; 11(9): 713 - 718

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## Research Article

### Moderating Role of IT Adoption and Mechanism of Dynamic Capabilities on Indonesian Pharmaceutical Firms Performance

 Juhriyansyah Dalle, Sandu Siyoto, Nita Dwi Astika, Danes Jaya Negara, Teddy Chandra, Khairul Anam.


SRP. 2020; 11(9): 982 - 992

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### The Prevalence of Temporomandibular Joint Disorders in Young Violin Players in Two Orchestras in Indonesia

 Ike Damayanti Habar, Andi Adytha M.I.R, Mohammad Dharma Utama, Bahruddin Thalib, Acing Habibie Mude, Muhammad Ikbal, Eri Hendra Jubhari.


SRP. 2020; 11(9): 31 - 34

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## Review Article


### mHealth Interventions for Cancer Care and Support A Systematic Literature Review

 Samar Zuhair Alshawwa, Rasha Assad Assiri.

SRP. 2020; 11(9): 725 - 744

## Research Article

### [Impact of Complications after Surgical Treatment of Colon Cancer on Survival](#)

 *Bekisheva Aizhan, Makishev Abai, Yoshihiro Noso.*

SRP. 2020; 11(9): 993 - 1002

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.143

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### [Quality of Dental Health Service in Indonesia: A Pilot Pathfinder Survey](#)

 *Fuad Husain Akbar, Selistiani, Abd Hair Awang.*


SRP. 2020; 11(9): 35 - 42

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.08

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## Research Article

### [Did Transformational, Transactional Leadership Style and Organizational Learning Influence Innovation Capabilities of School Teachers during Covid-19 Pandemic?](#)

 *Oding Supriadi, Zulkifli Musthan, Sa'odah, Rizki Nurjehan, Yuyun Dwi Haryanti, M. Rafid Marwal, Agus Purwanto, Abdul Mufid, Rohmad Adi Yulianto, Moh Farhan, Ahmad Asrof Fitri, Mochammad Fahlevi, Susila Sumartiningsih.*

SRP. 2020; 11(9): 299 - 311

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.47

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## Research Article

### [The Role of Folic Acid on Some Physiological Parameters and Efficiency of Sperm in Male Rabbits](#)

 *Rashad Fadhil Ghadhban, Nawras A. Alwan.*

SRP. 2020; 11(9): 1003 - 1007

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.144

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## Research Article

### [Tourism and Original Local Government Revenue in Indonesia Tourism Provinces: The Java Island Experience](#)

 *Yustisia Kristiana, Rudy Pramono, Theodosia C. Nathalia, Vasco Adato H. Goeltom.*

SRP. 2020; 11(9): 745 - 750

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.105

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## Research Article

### [Cytotoxicity Test of Tithonia diversifolia Leaf Extract on Bone Marrow Mesenchymal Stem Cell \(BMSC\) of Rats Using MTT Assay Method](#)

 *Hani Plumeriastuti, Agesti Veva Kalista, Budiastuti; Mustofa Helmi Effendi.*


SRP. 2020; 11(9): 1008 - 1013

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.145

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## Research Article

### [Boosting Organizational Commitment Through Visionary Leadership and Work Life Balance](#)

 *Heni Kesumayani, Anis Eliyana, Hamidah, Maruf Akbar, Karuniana Dianta Sebayang.*


SRP. 2020; 11(9): 312 - 322

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.48

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## Review Article

### [IN-VITRO EVALUATION OF THE ANTICANCER ACTIVITY OF Cu\(II\)AMINA\(CYSTEINE\)DITHIOCARBAMATE](#)

 *Desy Kartina, Abdul Wahid Wahab, Ahyar Ahmad, Rizal Irfandi, Prihantono, And Indah Raya.*

SRP. 2020; 11(9): 43 - 51

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.09

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## Review Article

### [THE ROLE OF FAMILIES CARING FOR PEOPLE WITH MENTAL DISORDERS THROUGH FAMILY RESILIENCE AT EAST JAVA, INDONESIA: STRUCTURAL EQUATION MODELING ANALYSIS](#)

 *Ah Yusuf, Sitti Sulaihah, Hanik Endang Nihayati, M. Suhran, Hari Basuki N, Mundakir, Esti Yunitasari.*


SRP. 2020; 11(9): 52 - 59

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## Review Article

### [Participation in-Service Teacher Training- Creativity Cultivation Program](#)

 *Chen, I-Ju, Lin, Yi-Kai, Wey, Tzong-Ming, Chang, Yu-Heng, Hung, Ming-Kuo.*


SRP. 2020; 11(9): 1014 - 1018

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.146

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## Research Article

### [Observational Learning and Word of Mouth Against Consumer Online Purchase Decision during the Pandemic COVID-19](#)

 *Juliana, Rudy Pramono, Arifin Djakasaputra, Innocentius Bernarto.*


SRP. 2020; 11(9): 751 - 758

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.106

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### [The Role of Organizational Justice Dimensions: Enhancing Work Engagement and Employee Performance](#)

 *Marisi Pakpahan, Anis Eliyana, Hamidah, Agung Dharmawan Buchdadi, Titis Ratih Bayuwati.*

SRP. 2020; 11(9): 323 - 332

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.49



**Review Article**

**HOW DOES APOPTOSIS OF OOCYTES AND GRANULOSA CELLS DUE TO CIGARETTE SMOKE EXPOSURE TO MICE BALB/C ? : EXPRESSION SMAD3, GDF9, APOPTOSIS**

**Eny Susanti, I Ketut Sudiana, Hendy Hendarto.**

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.196

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**Construction and Preliminary Validation of the COVID-19 Pandemic Anxiety Scale**

**V Vineeth Kumar, Geetika Tankha, Shelly, Sylvi Seth, Apeksha, Tanya S. Timple.**

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**ENHANCING EMPLOYEE PERFORMANCE WITH WORK MOTIVATION AS A MEDIATION VARIABLE**

**Qori Al Banin, Anis Eliyana, Eva Risalatul Latifiyah.**

SRP. 2020; 11(9): 333 - 346

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.50

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**Identification of The Positive and Negative Emotions that Appeared among High School Students When Selecting University at Jakarta and Surrounding Area**

**Hendra Achmadi, Ferdi Antonio, Rudy Pramono, Innocentius Bernarto, Agus Purwanto**

SRP. 2020; 11(9): 759 - 766

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.107

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**An Empirical Examination of the Effect of TQM Practices on Hospital Service Quality: An Assessment Study in UAE Hospitals**

**Ahmad Aburayya, Muhammad Alshurideh, Amina Al Marzouqi, Osama Al Diabat, Alanood Alfarsi, Roberto Suson, Mohammad Bash and Said A. Salloum.**

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**The Impact of Motivation Mediation and Its Effect on the Level of Education and Work Facilities on Employee Performance (Case Study of Education Office, West Sumatera Province)**

**Agussalim M, Novi Yanti, Hisar Sirait.**

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**A Review of the Opportunistic Pathogen Citrobacter Freundii in Piglets Post Weaning : Public Health Importance**

**Akvyon Rafi Hidayatullah, Mustofa Helmi Effendi, Hani Plumeriastuti, Freshindy Marissa Wibisono, Erwan Budi Hartadi, Eka Dian Sofiana.**

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.108

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**DISPARITIES OF THE USE OF HORMONAL AND NON-HORMONAL CONTRACEPTIVE DRUGS IN URBAN AND RURAL AREAS IN INDONESIA AND THE WORLD**

**Agustina Abuk Seran, Myrtati Dyah Antaria, Setya Haksama, Ema Setjaningrum, Agung Dwi Laksono, Anita Dewi Prahastuti Sujoso.**

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.12

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**Research Article**

**Antidiabetic Activity of Papaya Leaf Extract (Carica Papaya L.) Isolated with Maceration Method in Alloxan-Induces Diabetic Mice**

**Tridiganita Intan Solikhah, Boedi Setiawan, Dilian Ramdana Ismukada.**

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.109

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**Health Care Professional Attitude and Motivation During COVID-19: A Case of Health Sector of Oman**

**Ismail AlAbri, Rusinah bte Siron.**

SRP. 2020; 11(9): 1035 - 1040

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.149

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**Research Article**

**Develop Leadership Style Model for Indonesian Teachers Performance in Education 4.0 Era**

**Anissa Lestari Kadiyono, Rezki Ashriyana Sulistiobudi, Ikhfan Haris, Mohd Khaidir Abdul Wahab, Idan Ramdani, Agus Purwanto, Abdul Mufid, Muhammad Rikza Muqtada, M. Gufron, Mohamad Nuryansah, Lina Aris Ficayuma, Mochammad Fahlevi, Susila Sumartiningasih.**

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**Review Article**

**EMPOWERMENT OF JUNIOR HIGH SCHOOL STUDENTS IN PREVENTION EARLY-AGE MARRIAGE IN GUNUNG KIDUL DISTRICT**

**Masruroh Masruroh, Soetrisno Soetrisno, Mahendra Wijaya, Sapja Anantanyu.**

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.13

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**The Impact of Social Capital, Entrepreneurial Competence on Business Performance: An Empirical Study of SMEs**


**Ahmad Yani, Anis Eliyana, Hamidah, I Ketut R. Sudiarditha, Agung Dharmawan Buchdadi.**

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.110

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**The Impact of Mass Media and Food Consumption**

 *Abubakar Iskandar, R. Oetje Subagdja, Maria Fitriah, Sukarelawati.*

SRP. 2020; 11(9): 1041 - 1054

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.150

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**More Meat, More COVID-19 Cases? Comparative Study between USA and China in Importing Mutton**

 *Maslichah Mafruchati.*


SRP. 2020; 11(9): 374 - 377

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.53

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**CYP24A1 and AHR Gene Expression in Iraqi Colorectal Cancer Patients**

 *Wathiq Abbas Aldrghi, Alaa Makki Jabbar Shafeea, Nawal Mehdi Alkhalidi.*


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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.15

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**The Effect of Transformational Leadership on Employee Creative Self Efficacy with Creative Role Identity as a Mediation Variables**

 *Barika, Anis Eliyana, Hamidah, Agung Dharmawan Buchdadi, Rengga Zulfiansyah Lakspakarti.*

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.111

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**Cytotoxic Effect of Essential Oil from Cinnamon (*Cinnamomum burmannii*) Bark on Rat Bone Marrow Mesenchymal Stem Cells: In Vitro Study**

 *Budiasuti, Niken Dwi Lestari, Mustofa Helmi Effendi, Arimbi, and Hani Plumeriastuti.*

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.54

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**Privacy Preserving Data Publishing for Heterogeneous Multiple Sensitive Attributes with Personalized Privacy and Enhanced Utility**

 *Jayapradha. J, Prakash. M, Yenumula Harshavardhan Reddy.*

SRP. 2020; 11(9): 1055 - 1066

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.151

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**Management's Initial Thought in the Industrial Era 4.0 and Millennialization, Is It Still Relevant?**

 *Rosa Rilantiana, Anis Eliyana, Djoko Suprayetno, Kresno Eka Mukti.*


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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.112

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**Study the Effect of Gabapentin on the Histology of Some Organs of Male rats**

 *Fakhir M. ALzubaidy, Aymen A Bash, Raad Jasim.*


SRP. 2020; 11(9): 95 - 101

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.16

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**Research Article**

**Bioactivity of Amomum Compactum Soland Ex Maton (Java Cardamom) as a Natural Antibacterial**

 *Tyagita Hartady, Roostita Lobo Balia, Mas Rizky Anggun Adipurna Syamsunarno, Sabri Jasni, Bambang Pontjo Priosoeryanto.*


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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.55

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**Improving White Box Testing Using Bi ? Directional Symbolic Analysis and Test Case Slicing**

 *P. Velmurugan, S. Ganesh Kumar*


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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.152

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**Effect of Protecting Proteins from Degradation in the Rumen on Single Volatile Fatty Acid of Al Awassi Lambs**

 *Dr. Ibrahim S. Jasim.*


SRP. 2020; 11(9): 388 - 397

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.56

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**Improving Kernel Weight and Number in Some Maize Subspecies Crosses**

 *M.M. Elshahookie, Saddam H. Cheyed A.A. Dawood.*


SRP. 2020; 11(9): 803 - 807

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.113

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**Bilingual Education Learning to Engage in Academic Activities**

 *Chen, I-Ju, Chang, Yu-Heng, Wey, Tzong-Ming.*


SRP. 2020; 11(9): 1072 - 1076

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.153

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**Review Article**

**Post-operative Obturator after Maxillectomy: A Systematic Review**


 *Irfan Dammar, Acing Habibie Mude, Muhammad Ikbali, Yusalvi Rivai*

SRP. 2020; 11(9): 1 - 5

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### [Epidemiological Study of Giardia lamblia in Tikrit city, Iraq](#)

 *Turkan Ahmad Hama Hasan, Abdul Khaleq Alwan Muhaimid, Ayhan Rashid Mahmoud.*


SRP. 2020; 11(9): 102 - 106

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.17

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### [Beef, Pork, or Lamb? Comparative Study Between 3 Kinds of Red Meat Consumption in the USA toward the Number of COVID Cases](#)

 *Maslichah Mafruchati.*


SRP. 2020; 11(9): 808 - 812

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.114

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### [ANALYTIC STUDY OF ENDODONTIC WORKING LENGTH VARIATION OF MAXILLARY CANINE IN BASRAH GOVERNORATE](#)

 *Zainab Abdulkareem Maktoof, Zahraa Mazin Al-Hawwaz, Hiyam Salah Ahmed.*


SRP. 2020; 11(9): 107 - 109

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.18

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### [Effect of Protecting Proteins from Degradation in the Rumen on Rumen Fermentations of Al Awassi Lambs](#)

 *Dr. Ibrahim S. Jasim.*

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.57

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### [nCD64, mHLA-DR: Sensitive Diagnostic Markers of Infection in Term Infants Receiving Antibiotic Treatment](#)

 *Nguyen Thi Ngoc Tu, Le Thanh Hai, Truong Thi Mai Hong, Pham Thu Hien, Le Thi Ha, Doan Thi Mai Thanh.*


SRP. 2020; 11(9): 1077 - 1081

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.154

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### [Overview of Metabiotics and Probiotic Cultures During Fermentation of Molasses](#)

 *V.S. Popov, N.V. Vorobyeva, G.A. Svazlyan, N.M. Naumov, O.A. Gryaznova.*

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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.115

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### [The Protective Effect of Omega3 Against Amikacin- Induced Nephrotoxicity in Rats](#)

 *Afrah Thiab Hlail, Hadeel Rashid Faraj, Wafa S. Abdulredha.*

SRP. 2020; 11(9): 110 - 117

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.19

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### [Dynamics of Immune Status in Myofibrillar Myopathy with the T341P DES Mutation](#)

 *Viacheslav Yurievich Pauls.*


SRP. 2020; 11(9): 818 - 824

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.116

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## Research Article

### [Develop Model of Transactional, Transformational, Democratic and Autocratic Leadership Style for Indonesian School Performance in Education 4.0 Era](#)

 *Irjus Indrawan, Evanirosa, Ramsah Ali, Indra, Ramadan, Muh. Hanif, Ihsan Harun, Lathifah Hanum, Agus Purwanto, Abdul Mufid, Siti Nurkayati, Mochammad Fahlevi, Susila Sumartiningsih.*


SRP. 2020; 11(9): 409 - 419

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.58

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### [The Validity of CXR in the Screening & Detection of Endobronchial Lung Cancer in Iraqi Patients](#)

 *Ameer Kadhim Al-Humairi, Safaa jawad Kadhem, Ahmed Hussein jasim, Shahad hamid mekki, Zainab Alaa abd-alhussein, Ali Baay.*


SRP. 2020; 11(9): 578 - 583

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.84

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### [Clinical study of Oral Lichen Planus for a selective sample in Basrah City south of Iraq between 2017-2019](#)

 *Ghaydaa Hashim Al Qudsi, Hussein Sh. Al-Essa and Sundus Abdul Wadood Aljazeera.*


SRP. 2020; 11(9): 1082 - 1090

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.155

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### [Treating Groundwater Salinity using Magnetic Field Technology](#)

 *Yassien H. Owaied AL-Juboory, Aseel H. Mahdi.*


SRP. 2020; 11(9): 118 - 123

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.20

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### The Effect Of Virtual Nutrition Education for The Improvement of Mother's Knowledge About Complementary Feeding: Randomized Control Trial

 *Nadimin, Aswita Amir, Sitti Rahmah, Sirajuddin.*

SRP. 2020; 11(9): 825 - 829

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.117

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#### Research Article

### Synthesis of Heterocyclic Nitrogen Compounds using Cyclohexene Derivative with Various Primary Amines

 *Hamid J. Mohammad, Israa I. Salih, Rabeah T. Mahmood.*


SRP. 2020; 11(9): 124 - 129

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.21

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#### Research Article

### The Oxidative Stress Induced by the Vapours of Electronic- Hookah on Mice Liver Tissues

 *Rasha Shaker Nima, Dhifaf Zeki Aziz.*

SRP. 2020; 11(9): 420 - 423

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.59

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### The Intervention of the Pirfenidone with Pericyst Layer Building of the Hydatid?? Cyst

 *Yousif Tawfeeq, Ahmed A. Mohammed, Yassir Mustafa Kamal.*


SRP. 2020; 11(9): 1091 - 1099

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.156

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### In Vitro Antiviral Activity of Morin Compound against Dengue Virus Type 1 in Vero Cells

 *Anisa Maharani, Teguh H. Sucipto, Harsasi Setyawati, Yovilianda M. Untoro, Novia F. Sholihah, Siti Churrotin, Ilham H. Amarullah, Puspa Wardhani, Aryati, Soegeng Soegijanto.*

SRP. 2020; 11(9): 830 - 833

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.118

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#### Research Article

### Effect of Stick Sweet Cherry (*Prunus aviam*) on the Reproductive System of Male Mice

 *Wasnaa H. Mohammed, Hamssa E. Abdul-Wahed, Zahraa A. Sharba.*


SRP. 2020; 11(9): 130 - 134

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.22

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#### Research Article

### Relative Indicators and Predicative Ability of Some Biological Variables on Cardiac Neural Activity for Volleyball Players

 *Mohammed Nader Shalaby, Marwa Ahmed Fadl.*


SRP. 2020; 11(9): 834 - 840

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.119

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#### Review Article

### Investigate the Strategy of Using Pharmacogenetics and Pharmacometabonomics to the Personalization of Ticagrelor Antiplatelet Therapy

 *Mohammed Ahmed Akkaif, Abubakar Sha'aban, Nur Aizati Athirah Daud, Mei Li Ng, Baharudin Ibrahim.*


SRP. 2020; 11(9): 1100 - 1107

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.157

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### EEG Changes in Patients with Functional Psychosis in Babylon Province

 *Huda Abd Ali Hussien, Waleed Azeez AL-Ameedy, Farah Nabil Abass.*


SRP. 2020; 11(9): 135 - 139

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.23

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#### Research Article

### Comparison of Macro Nutritional Value, Dissolved Protein, Amino Acids and Minerals of Fresh and Crispy-Product of Anchovy (*Stolephorus Commersonii*)

 *Fronthea Swastawati, Putut Har Riyadi, Hersanti Sulistyningrum, Sepsina Resky, Slamet Suharto.*


SRP. 2020; 11(9): 424 - 430

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.60

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#### Research Article

### Defensive Effects of Breberine against Cypermethrin Induced Male Reproductive System Toxicity in Rabbits

 *Hawraa M. Murad, Shurooq Asaad Abdulameer, Dhuha Salman Asker Aljuboory, Dheyaa A. Neamah, Ali Hamza Maktouf.*

SRP. 2020; 11(9): 841 - 846

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.120

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#### Research Article

### The Concept of Illness among Ethnic Groups in Indonesia: A Meta-Ethnographic Study

 *Agung Dwi Laksono, Ratna Dwi Wulandari, Zainul Khaqiqi Nantabah, Zulfa Auliyati Agustina, Ira Ummu Aimanah, Rukmini Rukmini, Yunita Fitrianti, Yurika Fauzia Wardhani, Diyan Effendi, Suharmiati Suharmiati, Lestari Handayani, Niniek Lely Pratiwi*

SRP. 2020; 11(9): 584 - 591

#### Research Article

### Effects of Cinnamon and Their Beneficial Content on Treatment of Oxidative Stress

 *Oras Khalis yaseen, Mustafa Taha Mohammed.*

SRP. 2020; 11(9): 847 - 850

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.121

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### Incidence of Mumps in Hilla City

 *Harith Fathi AL-Asady, Lateef Hussien AL-Khafaji, Safaa Sahib Naji.*


SRP. 2020; 11(9): 140 - 142

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.24

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#### Research Article

### Vitamin D3 for Health and Muscle Functions of Athletes

 *Mohammed Nader Shalaby, Mona Mostafa Abdo Sakoury, Salman Mohammed Harthi, Faleh Mohammed Alshalawi, Marwa Mohammed Alhajji, Zahraa Hassan Alshaikh, Alhanouf Hassan Aljaber.*


SRP. 2020; 11(9): 851 - 854

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.122

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#### Research Article

### Exploration of the Relationship Between Interleukin 37 and Folic Acid in Type 2 Diabetic Patients

 *Anwar A. Hussain, Khalid F. Al-Rawi, Aseel Khalid Hameed.*

SRP. 2020; 11(9): 143 - 148

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.25

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#### Research Article

### The Correlation of Google Trends as an Alternative Information Source in the Early Stages of COVID-19 Outbreak in Indonesia

 *Elly Usman, Ricvan Dana Nindrea.*


SRP. 2020; 11(9): 431 - 438

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.61

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#### Review Article

### The Study of Genetic Variations of Human Testis-Expressed Protein 101 (TEX 101) and Hormonal Levels of Fertile and Infertile (Oligospermia) Men

 *Baraa Ahmed Saeed, Rayah S. Baban, Usama Al-Nasiri.*

SRP. 2020; 11(9): 1108 - 1117

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.158

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#### Research Article

### The Relationship between Vitamin D Deficiency and Interleukins 8 and 10 in Diabetes Mellitus

 *Sura Mustafa Qasim, Alaa Zanza Ra'ad Al-dorri, Mohanad Hasan Mahmood Al-Izzi.*


SRP. 2020; 11(9): 149 - 155

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.26

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#### Research Article

### Enhancing Antimicrobial Properties of Food Packaging Sheets by Incorporating ZnO- Nanoparticles (NPs)

 *Ali R Mulakhudair and Zahraa Reasan Kareem Shati.*

SRP. 2020; 11(9): 592 - 596

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.86

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#### Research Article

### Do Servant Leadership Influence Market Performance? Evidence from Indonesian Pharmacy Industries

 *Yoyok Cahyono, M. Jihadi, Zainal Arifin, Wulan Purnamasari, Musnaini, Hadion Wijoyo, Fitriaty, Riyan Sisiawan Putra, Rizki Amalia Putri, Dadah Muliandyah, Popong Suryani, Agus Purwanto.*

SRP. 2020; 11(9): 439 - 451

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.62

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#### Review Article

### Effect of Xanthium Strumarium Extract on Some Virulence Factor of Proteus Mirabilis Isolated from Patients in Ramadi Hospital

 *Ali Abd Sharad, Omar Almuharib, Najeed Mohammed Hussein.*

SRP. 2020; 11(9): 1122 - 1124

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.160

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#### Research Article

### Assessment of Some Biomarkers Related with Recurrent Miscarriages in Iraq

 *Yahaya M. Jabber, Alaa Jawad Hassan, Hussein N. Abdullah.*


SRP. 2020; 11(9): 156 - 162

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.27

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#### Research Article

### Penicillin for Secondary Prevention of Acute Rheumatic Fever and Rheumatic Heart Disease in Acehnese Children

 *HERLINA DIMIATI, SOFIA SOFIA, BASRI A. GANI.*

SRP. 2020; 11(9): 452 - 457

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.63

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#### Review Article

### The Effect of Microbiology Fertilization on the Nitrogen Fixation of Wheat Plant

 *Fawz A. Al.Saffar, Alaa Hussein Ali Al-Shalal*

SRP. 2020; 11(9): 1125 - 1129

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.161

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#### Research Article

### Distance Education as an Alternative Form of Learning During a Pandemic

 *Nataliia Kaliuzhka, Nelia Samoilenko, Larysa Zdanevych, Olesia Kyselova, Nataliia Terentieva, Diana Koval.*

SRP. 2020; 11(9): 458 - 461

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.64

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#### Research Article

### Correlation between P53 and Ki67 with Aggressiveness Factor in Recurrent Respiratory Papillomatosis


 *Rizka Fathoni Perdana, Sri Herawati, Muhtarum Yusuf, Irwan Kristyono, Pugh Setya Nugroho.*

SRP. 2020; 11(9): 163 - 168

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.28

#### Review Article

### Assessment the Correlation of D-dimer and Ferritin Level in Patients Infected with Covid-19 in Anbar Governorate of Iraq

 Safaa A.L. Al Meani, Ali H. Abdulkareem, Mohammed O. Ibrahim, Mohammed M. Ahmed, Mahmood Yassin Mukhlif.


SRP. 2020; 11(9): 1130 - 1133

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.162

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### Coronavirus: Disrupts the Health of Social Networking Sites (SNS)

 Dahyar Daraba, Ruliando Hasea Purba, Muhammad Faisal, Selfi Ami Susanti.


SRP. 2020; 11(9): 855 - 859

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.123

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#### Research Article

### Intervention Model for Barotrauma Diseases to Improve Health and Safety Diving Behaviors in Traditional Fishermen in Small Islands in Makassar, Indonesia

 Syamsiar S. Russeng, Lalu Muhammad Saleh, Awaluddin, M. Rum Rahim, Anwar Mallongi.


SRP. 2020; 11(9): 597 - 600

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.87

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#### Research Article

### Information and Innovative Technologies in Distance Learning in Higher Education Institutions of Ukraine

 Inna Ivzhenko, Iryna Sokol, Valentyna Kochyna, Margaryta Noskova, Liliia Yeromina, Valentyna Blokhina.


SRP. 2020; 11(9): 462 - 465

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.65

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#### Review Article

### Effect of COVID-19 Virus on Biomass Index of Infected Patients

 Safaa A.L. Al Meani, Mohammed M. Ahmed, Ali H. Abdulkareem, Nihad M. Hamid, Mohammed O. Ibrahim.

SRP. 2020; 11(9): 1134 - 1136

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.163

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### Effect of Adsorbent Composition Variation Quartz Sand/Andisol Soil/Zeolite/Activated Carbon Toward Cu, Pb, Coliform Total and E. coli Treatments on the Citarum River

 Muhammad Sholeh, Pranoto, Sri Budiastuti, Sutarno.


SRP. 2020; 11(9): 169 - 177

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#### Review Article

### Pre-Exposure Prophylaxis for COVID-19 Infection: Current Concepts and Strategies

 Asmaa T Uthman, Noor N Al-Rawi, Natheer Al-Rawi.


SRP. 2020; 11(9): 860 - 865

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### The Effect of Treating Barley Straw with Fungus (*Trichoderma Harzianum*) (1): on Growth and Some Carcasses Characteristics of Awassi Lambs

 S.N. Alwaeli, W.H. Al-Samaraei, M.J.H. Al-Tamemmy and Y.M. Al-Saadi.

SRP. 2020; 11(9): 601 - 605

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### Investigation of the *Trichomonas Hominis* and Some other Parasites in Cases of Diarrhea Accompanying Children Arriving to the Obstetrics and Gynecology Hospital in Ramadi / Iraq

 Abdulkhalik Alwan Mohemeed, Thaer Abdulqader salih, Qutaiba Ali Saleh Khalaf AL- juboori.


SRP. 2020; 11(9): 1137 - 1142

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### Six Sigma Benefit for Indonesian Pharmaceutical Industries Performance: A Quantitative Methods Approach

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SRP. 2020; 11(9): 466 - 473

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### A Novel Pleiotropic Effect of Beta-Blockers: Useful or Not?

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#### Research Article

### Beta-Oxybutyrates: Biological and Pharmacological Effects

 Bokov D.O., Morozova M.A., Beniashvili A.G., Bessonov V.V..


SRP. 2020; 11(9): 866 - 871

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### Behavior of Growth and Yield Bread Wheat by the Influence of Fulvic Acid and Seeding Rate


 Hanaa Khudhaier Mohammed Ali Al-Haidary and Safaa A. Al-Zubaidy.

SRP. 2020; 11(9): 606 - 612

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#### Review Article

### [Studies on microRNA in Pediatric Tuberculosis](#)

 *Ayling Sanjaya, Dwi Yuni Nur Hidayati, Susanthi Djajalaksana, HMS Chandra Kusuma, Sumarno.*


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### [PSMA-Specific Peptide with Inhibitor Cystine Knot for Prostate Cancer Treatment](#)

 *Elena Iurova, Ivan Beloblov, Evgenii Beloborodov, Eugenia Rastorgueva, Evgenia Pogodina, Elizaveta Tazintseva, Aleksandr Fomin.*

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### [Research Activity as a Technology of Activation of Cognitive Activity of Students of Higher Education Institutions](#)

 *Tetiana Aliexsieienko, Yuliia Pivnenko, Hanna Apalat, Lesia Vysochan, Viktoriia Mohilevska, Iryna Androshchuk.*

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### [Molecular analysis of virulence genes of UTI causing bacteria among pregnant women in Baghdad city, Iraq](#)

 *Elaf Sameer and Rawa Abdul Redha Aziz.*

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 *Ratna Dwi Wulandari, Agung Dwi Laksono.*

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### [Effect of Pedagogic, Professional Competency, and Work Motivation Toward Indonesian Primary School Teachers Performance](#)

 *Jihaduddin, Nenden Suciwati Sartika, Desty Endrawati Subroto, Ratu Mauladaniyati, Eka Rosdianwinata, Rusdian Rifa'i, Asep Sujana, Zaenal Abidin, Muhamad Dadi Priadi, Eka Setiawati, Desri Yanti, Agus Purwanto.*


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### [Factors Related to the Choice of Contraceptive Methods among the Poor in Indonesia](#)

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### [Interactive Training Tools in the Modern Educational Process](#)

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### [The Role Of Women In Maintaining The Environment Through Vegetable Development In Rural Agriculture Systems](#)

 *Evi Feronika Elbaar, Beatrixia Barbara, M. Arief Fathuddien Hamdie, Yayuk Puji Lestari.*

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### [Genotype of Potassium Inwardly Rectifying Channel, Subfamily J, Member 11 \(KCNJ 11\) Gene and Glycaemia Control in Diabetic Patients: A Narrative Review](#)

 *Dyah Aryani Perwitasari, Imaniar Noor Faridah, Haafizah Dania, Lalu Muhammad Irham, Fathia Vikri Salsabila, Rita Maliza.*

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### [The Impact of Diabetes Mellitus on the Association of Endothelial Nitric Oxide Synthase Gene Polymorphisms \(4a/4b, G894T, and T786C\) with Clopidogrel Resistance in Coronary Artery Disease Patients Undergoing Percutaneous Coronary Interventions](#)

 *Ali A. R. Aldallal, Bassim I Mohammad, Ahmed N. Rgeeb, Salam Jasim mohammed, Khalid Amber.*

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### [A Review of Salmonellosis on Poultry Farms: Public Health Importance](#)

 *Freshindy Marissa Wibisono, Freshinta Jellia Wibisono, Mustofa Helmi Effendi, Hani Plumeriastuti, Akvyan Rafi Hidayatullah, Erwan Budi Hartadi, Eka Dian Sofiana.*

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### [Molecular Pharmacology Study of Andrographolide Extracted from Andrographis Paniculata on Atherosclerosis Preventive Effect](#)

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### [Adverse Effects of Green Tea on Public Health the Untold whole Medical Story](#)

 *Ameera Kamal Khaleel, Ramizu Bin Shaari, Mohamad Arif Awang Nawwi, Ali Mihsen Hussein Al-yassiri.*

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### [A Review of Bacterial Zoonoses and Antimicrobial Resistant \(AMR\) on Grouper fish \(Epinepholus sp.\)](#)

 *Azhar Muhammad Helmi, Akhmad Taufiq Mukti, Agoes Soegianto, Ketut Mahardika, Indah Mastuti, Mustofa Helmi Effendi and Hani Plumeriastuti.*


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### [The Level of Student`s Creative Thinking Through Solving Open Ended Mathematics from Learning Style](#)

 *Dr. Ardianik, M.Kes., M.Pd, Dr. Edy Widayat, Drs., M.Si, Nailul Izzah, S.Pd., M. Kes, Dr. Kusmiyati, Dra., M. Pd.*


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 *Dmitry G. Kabakov, Margarita A. Vyzhigina, Dmitry V. Bazarov, Svetlana G. Zhukova, Alexey A. Kavochkin, Kulagina T.Yu.*

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### [Effect of Phosphorus Interferon on Some Physiological and Growth of Barley \(Hordeum Vulgare L.\)](#)

 *Warqa a Muhammed Shariff Al-Sheikh.*


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### [Evaluation of the Combination of Sargassum Duplicatum, Sargassum Illicifolium, Abelmoschus Esculentus, and Garcinia Mangostana Extracts for Open Wound Healing in Diabetic Mice](#)

 *Saikhu Akhmad Husen, Muhammad Farraz Syadzha, Muhamad Frendy Setyawan, Pratiwi Pudjiastuti, Arif Nur Muhammad Ansori, Raden Joko Kuncoroningrat Susilo, Suhailah Hayaza, Dwi Winarni, Win Darmanto.*


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### [Slow Released Fertilizer of Fe<sup>2+</sup> and Mn<sup>2+</sup> from Composite Micronutrient Chitosan-Silica](#)

 *Bertha Mangallo, Anwar Mallongi, Ishak MUSAAD, Sartji Taberima.*

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### [Molecular and susceptibility Study of Antibiotic Resistance Genes in E. coli Isolated from Selected Iraqi Patients](#)

 *Wedad Salih Dawood.*

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### [Performance Achievement of Nutritional Programs in Mulyorejo Public Health Center, Surabaya, Indonesia in 2018](#)

 *Shifa Fauziyah, Zukhaila Salma, Serious Miliyani Dwi Putri, Faradila Khoirun Nisa Hakim, Hamidah Retno Wardani, Budi Utomo, Adi Pranoto, Pradika Gita Baskara, Teguh Hari Sucipto.*


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### [Use of Natural Peptides with a Cysteine Knot of Arthropods as a Carrier of a Peptide Tropic to Glutamate Carboxypeptidase II](#)

 *Elena Iurova, Ivan Beloblov, Evgenii Beloborodov, Eugenia Rastorgueva, Evgenia Pogodina, Elizaveta Tazintseva, Yuri Saenko, Aleksandr Fomin.*


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[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.73

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### [Scoring System in Prediction of Stunting Risk Among Children in West Sumatera Province, Indonesia](#)

 *Masrul, Elly Usman, Amel Yanis, Ricvan Dana Nindrea.*


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### [Transvaginal Ultrasound versus Saline Infusion Ultrasound for the Characterization of Intrauterine Lesions in Premenopausal Women with Abnormal Uterine Bleeding](#)

 *Rana Hatem Matrood Alkhazraji, Mohammed Habeeb Hachim and Alaq Saeed Abdulhussain.*

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### Evaluation of the Effect of Massage by the Mother on the Pain of Term Infants after Care Measures

 *Hamidreza Khoshnezhad Ebrahimi, Soroor Sohrabi, Shabahang Jafarnejad, Saeideh Iranmanesh, Somayeh Esmaeilian.*


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## Research Article

### Hepatoprotective Activity of Ethanolic Extract of Fresh and Fermented Clam *Meretrix meretrix* from Kalimantan, Indonesia

 *Dzul Fadly, Andi Hairil Alimuddin, Rukman Abdullah, Lili Amaliah, Rafdinal, Shifa Helena, Syarif Irwan Nurdiansyah, Warsidah.*

**SRP. 2020; 11(9): 514 - 517**

[» Abstract](#)   [» PDF](#)   DOI: 10.31838/srp.2020.9.75

# Cytotoxicity Test of *Tithonia diversifolia* Leaf Extract on Bone Marrow Mesenchymal Stem Cell (BMSC) of Rats Using MTT Assay Method

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## ABSTRACT

The aim of this study was to identify the cytotoxicity effect of *Tithonia diversifolia* leaf extract on bone marrow mesenchymal stem cell using MTT assay. The sample of this research using bone marrow mesenchymal stem cell of rats. The *Tithonia diversifolia* leaf extract divide into 4 concentration (0.5%, 0.25%, 0.125%, and 0.0625%) and given to bone marrow mesenchymal stem cell of rats in each well and incubated for 24 hours. The toxicity result was obtained using the MTT assay method and incubate for 4 hours. The optical density absorbency which indicates cell viability, calculated by ELISA reader with a wavelength of 595nm. Cytotoxicity parameters using LC<sub>50</sub> analyzed by probit analysis. The extract of *Tithonia diversifolia* leaf with the concentration of 0.5%, 0.25%, and 0.125% found to kill cell up to 50% and only the concentration 0.0625 of *Tithonia diversifolia* leaf extract with the highest cell viability. The LC<sub>50</sub> value of *Tithonia diversifolia* leaf extract on bone marrow mesenchymal of rat is 0.167%.

**Keywords:** *Tithonia diversifolia* leaf extract, mesenchymal bone marrow stem cell of rats, cytotoxicity, LC<sub>50</sub>, MTT assay

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## INTRODUCTION

Consumption of herbal or traditional medicines in Indonesia continues until now when referring to basic health research data by the Indonesian Ministry of Health which shows that 30.4% of households in Indonesia use traditional health services, including 49.0% of households using herbs (1). Medicinal plants that are widely known by Indonesians as "insulin leaves" are the leaves of *Kembang Bulan* (*Tithonia diversifolia*) which are famous for their antidiabetic properties (2), besides that there are also plants that produce essential oils that can function as antidiabetic ingredients (3-6). The proven efficacy of *Tithonia diversifolia* leaf extract is also followed by other findings, where the toxicity test of *Tithonia diversifolia* leaf extract by administering *Tithonia diversifolia* leaf extract to rats at a concentration of 400 mg / kgBW and 800 mg / kgBW shows thickening of the tubular wall in the presence of many damage to the tubular cell nucleus and blood vessels began to appear, while at a dose of 1600 mg / kgBW shows widespread tubular necrosis of the kidney, the liver concentration of 400 mg / kgBW has shown significant periportal hepatocyte damage with cellular vacuole with a higher severity of 1600mg / kgBW (7). Toxicity tests were continued to determine the toxic compounds in leaf extracts known to be the compounds responsible for causing cytotoxicity effects are

sesquiterpene lactone (STL) compounds (8). Sesquiterpene lactones (STLs) present a variety of biological activities, based largely on their alkylation abilities. This mechanism is known to be very nonspecific with low selectivity and hence non-specific toxicity is very high (9). Medicinal plants to be consumed and their safety guaranteed must be developed into standardized herbal medicines and phytopharmaca. One of the stages in the development of herbal medicines into phytopharmaca is the preclinical testing stage which consists of toxicity tests that can be carried out in vitro and in vivo (10). Cytotoxicity test is a toxicity test using tissue cells in vitro (11). bone marrow mesenchymal stem cells (BMSC) for screening in vitro toxicology tests related to the realization that mesenchymal stem cells can be easily isolated, ready to be expanded in culture, and well differentiated under suitable stimulation. Bone marrow mesenchymal stem cells (BMSC) are known to be very sensitive in cytotoxicity testing of cancer drugs and some plant extracts are known to have a cytotoxic effect and some cytotoxic drugs are known to cause stromal damage in bone marrow such as cytosine arabinoside (12). This is the reason to support the usefulness of *Tithonia diversifolia* leaf extract which has been used as an antidiabetic treatment, it is necessary to test the leaf extract cytotoxicity. With the hope that the results can be used as reference material.

## MATERIAL AND METHODS

In this study used bone marrow mesenchymal stem cells which were implanted into a 96 well microplate. 36 wells were used for 6 treatment groups and 6 repetitions. The 6 treatments in this study are, K (-) or control media that only contain cell growth media ( $\alpha$  MEM), k (+) or control media that contain bone marrow mesenchymal stem cells and the growth media ( $\alpha$  MEM), 0.5% extract administration, 0.25% extract administration group, 0.125% extract administration group and 0.0625% extract administration group. The treatment of bone marrow mesenchymal stem cells was carried out for 24 hours in a 5% CO<sub>2</sub> incubator at 37 °C. Cells that were incubated 24 hours were then given MTT salt and incubated for 24 hours at 37 °C. Formazan crystals formed by the reductase of living cell mitochondrial dehydrogenase enzymes are added DMSO to dissolve formazan crystals. Absorbance of formazan crystals can be calculated with a spectrophotometer called ELISA reader with a wavelength of 599 nm. The research data obtained in the form of OD (Optical Density) values were

analyzed using the ANOVA test and LC<sub>50</sub> values were calculated.

## RESULTS AND DISCUSSION

The results of observations of MTT salt administration on Bone marrow mesenchymal stem cells (BMSC) rats given moon flower extract with a concentration of 0.5%, 0.25%, 0.125%, 0.0625% were carried out by six replications for each group, then incubated for 24 hour. Cell viability is calculated using the MTT assay method, dehydrogenase enzymes from mitochondria. Bone marrow mesenchymal stem cells (BMSC) that are still alive will reduce yellow MTT salts to formazan salts that are blue-purple that can be observed under a light microscope at an enlargement of 40-100 x . The results obtained showed that the higher the concentration the more mesenchymal cells die, which is indicated by the higher concentration of the extract, the more mesenchymal cells which cannot reduce MTT salt to formazan crystals that are blue-purple in color (figure 1.).

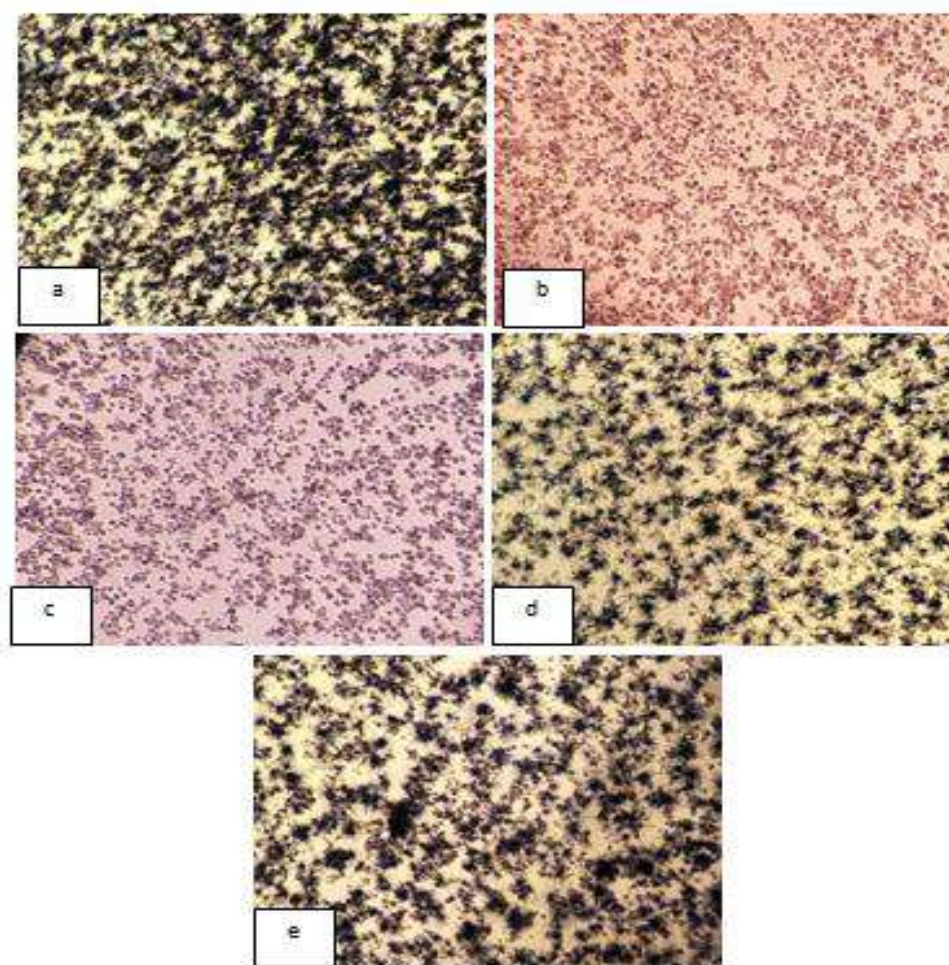


Figure 1. Observations of mesenchymal cells under a light microscope: 40-100x (a) control cells (b) extract concentration of 0.5%, (c) extract concentration of 0.25%, (d) extract concentration of 0.125%, and (e) extract concentration of 0.0625%.

Absorbance Blue-purple formazan crystals by the mitochondria of living mesenchymal cells are quantified by a spectrophotometer called an ELISA reader, to obtain an Optical Density (OD) result. Data in the form of OD (Optical Density) were obtained in order to know the normality of the data and the presence or absence of significant differences in all groups of research results, the data in all treatment groups were analyzed using the ANOVA test and followed by the Duncan test. ANOVA test showed that

the treatment given to each group was significantly different, so that the Duncan test was continued which showed the results of research between cell control, media control, administration of *Tithonia diversifolia* leaf extract concentrations of 0.125% and 0.0625% significantly different from all treatment groups ( $P < 0,05$ ), but did not show a real difference ( $p > 0,05$ ) between treatments giving extracts of the hibiscus leaf extract concentration of 0.5% and 0.25%. Duncan's test results are listed in table 1.

Table 1. Mean and standard deviations of OD value of mesenchymal stem cells (BMSC) that live after being given leaf extract (*Tithonia diversifolia*) for 24 hours.

Group	Mean (Living cell) $\pm$ SD
Media Control	1,78 <sup>e</sup> $\pm$ 0,05
Cell Control	4,30 <sup>e</sup> $\pm$ 0,10
Concentration of 0,5%	2,83 <sup>d</sup> $\pm$ 0,11
Concentration of 0,25%	2,98 <sup>d</sup> $\pm$ 0,26
Concentration of 0,125%	3,28 <sup>c</sup> $\pm$ 0,07
Concentration of 0,0625%	3,76 <sup>b</sup> $\pm$ 0,16

Information: superscript differences in the same column indicate significant differences ( $p < 0,05$ )

OD (Optical Density) in each treatment group is entered into a formula to determine the percentage of living cells by comparing OD treatment - OD media divided by OD values of cell control - OD media and multiplied by 100%. The calculation results found the number of live mesenchymal cell percentage after administration of *Tithonia diversifolia* leaf extract to bone marrow mesenchymal stem cells (BMSC) mice at a concentration of 0.0625% showed a percentage of

live cells 72%. Extract concentration of 0.125% shows the percentage of living cells is 49%. Extract concentration of 0.25% shows the percentage of living cells is 41%. The 0.5% extract concentration shows the percentage of living cells 33%. This shows that the higher the concentration of the extract given, the higher the dead mesenchymal cells as shown in Figure 2.

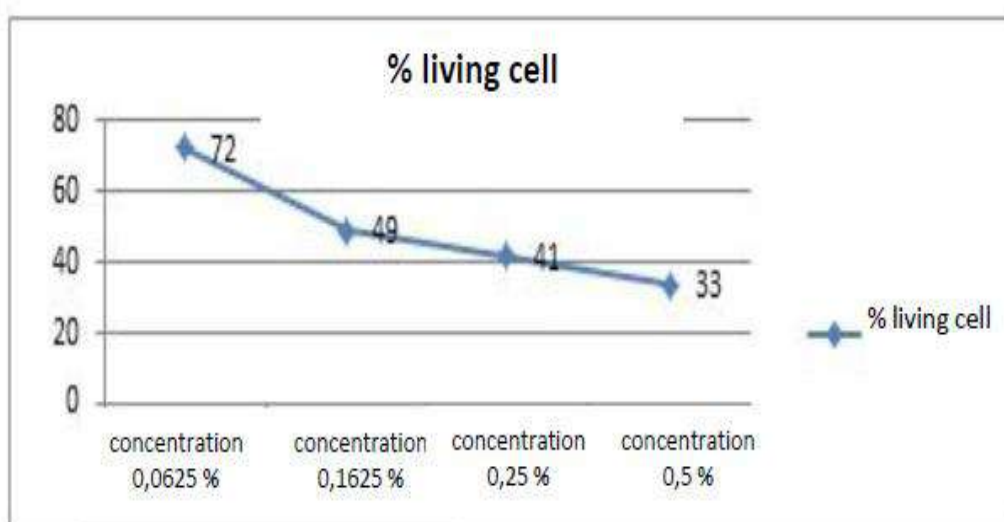


Figure 2. Graph of the number of living mesenchymal bone marrow cells

Data in the form of the percentage of mesenchymal cells that died from 100% of the percentage of living mesenchymal cells, then analyzed probit to determine the value of Lethal Concentration (LC50) of bone marrow mesenchymal stem cell rats that were given *Tithonia diversifolia* leaf extract for 24 hours. The

concentration of *Tithonia diversifolia* leaf extract which can kill 50% of the population of living mesenchymal cells lies in the concentration of 0.167%. Graph of number of mesenchymal cell bone marrow cell death rats (figure 3).

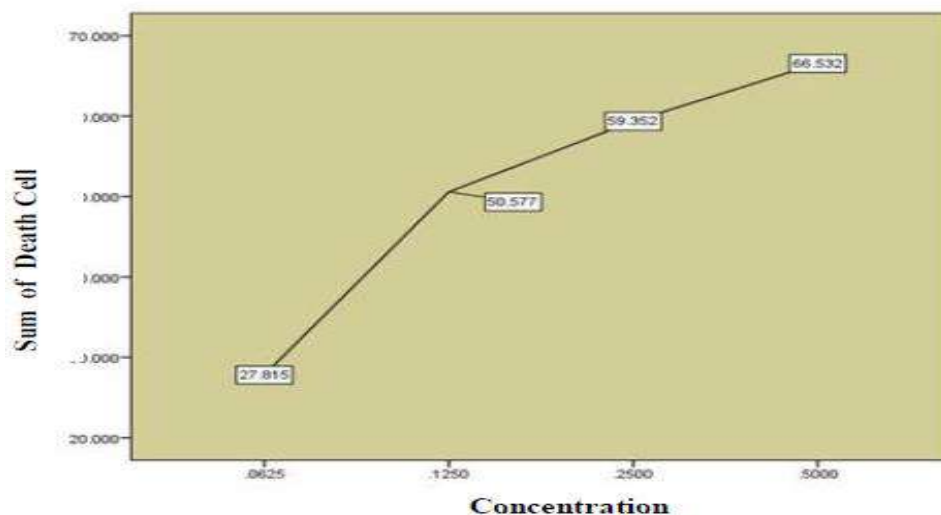


Figure 3. Graph of death cell percentage of mice mesenchymal bone marrow

The observations obtained showed that the higher the concentration of *Tithonia diversifolia* leaf extract, the lower the percentage of mesenchymal cells of living mice, which means the higher the concentration of *Tithonia diversifolia* leaf extract, the higher the cytotoxicity effect of rat mesenchymal cells, so that the lowest concentration 0.0625% produces the highest cell viability, while extracts of the moon flowers with a concentration of 0.5% produce the lowest cell viability. The results obtained are in accordance with the theory which states that the toxicity of an ingredient is directly proportional to the exposure. The determinants of exposure are in the form of material concentration (13). Another factor that causes the higher concentration of extract given, the more mesenchymal cells die due to phenolic compound activity will decrease in administration of extracts with higher doses, this is caused by increased concentrations of extracts at high doses which results in phenolic compounds being difficult to be absorbed, so Antioxidant activity decreases (14). Biological activity exhibited by *Tithonia diversifolia* leaf has been linked to the presence of sesquiterpenen lactones, more than 2% of the dry weight of *Tithonia diversifolia* leaves containing sesquiter-lactone (STL) compounds (15).

Sesquiterpene lactones (STLs) present a variety of biological activities, based largely on their alkylation abilities. Alkylation is the main mechanism of Sesquiterpene lactones, with the formation of covalent bonds with biological macromolecules. The alkylation mechanism of Sesquiterpene lactones (STLs) in addition to presenting many benefits, this mechanism is known to be very nonspecific with low selectivity and hence non-specific toxicity is very high (9). The parameter to show cytotoxicity is LC50 where the concentration of a given substance is lethal to 50% of cells. This amount depends on the time of incubation with the agent (16). In this study the administration of *Tithonia diversifolia* leaf extract to bone marrow mesenchymal stem cells for 24 hours at a concentration of 0.5%, 0.25%, 0.125% killed up to more than 50% mesenchymal cells and only a concentration of 0.0625% killed less than 50% cell.

Probit analysis results from the administration of *Tithonia diversifolia* leaf extract to mesenchymal stem cell bone marrow rats for 24 hours obtained LC50 located at a concentration of 0.167%.

The studies stated that the young stems and leaves of *T. diversifolia* contain lots of glandular trichomes which function as storing sesquiterpene lactones as the main constituent and act as an antidiabetic agent and antimicrobial defense (17, 18). The mechanism of toxicity of *Tithonia diversifolia* leaves is related to the mechanism of sesquiterpene lactone (STL) which includes the mechanism of alkylation and non-alkylation. The mechanism of toxicity of sesquiterpene lactone (STL) alkylation is known to induce accumulation of ROS due to its peroxidic binding (19), and interfere with the function of many cysteine-containing proteins that cause various lesions in different organ systems. ROS accumulation caused by Sesquiterpene lactone (STL) alkylants also causes GSH depletion (20). The depletion of GSH as an endogenous antioxidant causes an imbalance between the amount of free radicals and the amount of antioxidants in the body which leads to oxidative stress and continues to cause cell / DNA damage (20).

The non-alkylating mechanism of sesquiterpene lactone is known to inhibit the class of Ca<sup>2+</sup> + transport enzymes (serca pumps). Calcium is then released from the endoplasmic reticulum (ER) which increases cytosolic calcium levels. Increased Ca<sup>2+</sup> + levels (serca pumps) cause changes in many cellular functions, which can lead to mitochondrial stress and increased ROS release from mitochondria which also leads to oxidative DNA damage (21). Increased cytosolic calcium levels result in the release of several enzymes (ATPase, phospholipase, protease, and endonuclease that can damage cell membranes (phospholipase, and proteases). Endonuclease is known to cause the death of cell nucleus chromatin. Damage to cell membranes and cell nuclei causes cell death (22, 23). The parameter to show cytotoxicity is LC50 in which the concentration of a given substance is lethal to 50% of cells This number depends on the incubation time with the agent (16). In this study the administration of *Tithonia diversifolia* leaf extract to bone marrow

mesenchymal stem cells for 24 hours at a concentration of 0.5%, 0.25%, 0.125% kill up to more than 50% mesenchymal cells and only a concentration of 0.0625% kill less than 50% of cells. Probit analysis of the results of the administration of *Tithonia diversifolia* leaf extract mesenchymal stem cell bone marrow rats for 24 hours obtained LC50 located at a concentration of 0.167%.

### CONCLUSION

The number of living mesenchymal cells shows a significant value. Most living cells in the administration of *Tithonia diversifolia* leaf extract 0.0625%, so that the extract of the *Tithonia diversifolia* leaf shows the highest percentage of cell viability, which means a concentration of 0.0625% is safe to use. The value of Lethal Concentration (LC50) in the administration of *Tithonia diversifolia* leaf extract is at a concentration of 0.167%.

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