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👤 *Fitri Handajani, Sulistiana Prabowo*

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» Abstract » PDF DOI: 10.31838/srp.2020.10.83

Research Article

Evaluation of *Agaricus* sp. and *Pleurotus* sp. Extracts Efficiency in *Aspergillus Flavus* Growth Inhibition and Aflatoxin B1 Reduction

👤 *Alia Haikal Hussain, Halima Zugher Hussein*

SRP. 2020; 11(10): 564 - 569

» Abstract » PDF DOI: 10.31838/srp.2020.10.84

Review Article

Limits and Restrictions on the Right to Information on One's Health

👤 *Nadiia Milovska, Tetiana Zanfirova, Lesia Vasylenko, Liudmyla Mozoliuk-Bodnar, Yuliia Kamardina*

SRP. 2020; 11(10): 265 - 270

» Abstract » PDF DOI: 10.31838/srp.2020.10.43

Research Article

The Effect of Silver Nanoparticles on BRAF Gene Expression


👤 *Gulboy Abdolmajeed Nasir, Mohammed Ayyed Najm, Ammar Lateef Hussein*

SRP. 2020; 11(10): 570 - 575

» Abstract » PDF DOI: 10.31838/srp.2020.10.85

Research Article

[A Situation Analysis on the Use of Standardized-Herbal Medicines as Supportive Therapies for Dengue Hemorrhagic Fever \(DHF\) patients in Indonesia](#)


 *Amirah Adlia, Ayu Vania Tobing, Auliya A. Suwantika.*

SRP. 2020; 11(10): 844 - 848

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.126

Research Article

[Aqueous Extract of Boswellia against Rifampicin Toxicity in rats](#)

 *Amal Umran Mosa, Ban Hoshi khalaf and Salam Ahmed Abed*

SRP. 2020; 11(10): 576 - 583

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.86

Research Article

[Detection of the Toxin Associated Genes of Methicillin-Resistant Staphylococcus Aureus Using a Multiplex PCR Assay in Wasit General Hospitals](#)


 *Rana Hussein Raheema and Ban Hamid Qaddoori*

SRP. 2020; 11(10): 584 - 589

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.87

Review Article

[Psychological Features of the Development of a Corporate Image](#)

 *Nataliia Nakonechna, Iryna Synhaivska, Yuri Zhyvohliadov, Tatiana Malkova, Olga Vasilchenko*

SRP. 2020; 11(10): 271 - 274

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.44

Research Article

[Effect of VEGF on the Success of Dental Tissue Regeneration in Delayed Replantation of Avulsed Teeth](#)


 *Lobna K Al-khafaji, Mukhaled L Ali, Ammar H. Shaalan, Athraa Y Al-hijazi*

SRP. 2020; 11(10): 160 - 164

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.27

Review Article

[Internet Addiction among University Students and its Associated Factors: A Cross-Sectional Study among College Students in Hanoi, Vietnam](#)


 *Nguyen Thi Mai Lan, Lee Kyesun, Vu Dung, Nguyen Thi Thanh Huyen, Huynh Van Chan, Nguyen Thi Quy, Tran Thu Huong, Nguyen Thi Hoa Mai, Vu Thu Trang, Nguyen Van Hieu*

SRP. 2020; 11(10): 590 - 596

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.88

Research Article

[The Effect of Low-Calorie High Protein Diet on Insulin, TNF- \$\alpha\$ and P38MAPK Levels in Insulin-Resistant PCOS Mice Models](#)

 *Hany Puspita Aryani, Budi Santoso, Bambang Purwanto, Sony Wibisono Mudjanarko, Budi Utomo*

SRP. 2020; 11(10): 597 - 605

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.89

Review Article

[Constitutional Legal Aspects of the Right to Access](#)


 *Nataliya Zaiats, Nataliia Lazniuk, Oksana Gorova, Liudmyla Khoynatska*

SRP. 2020; 11(10): 275 - 277

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.45

Research Article

[Mother's Height and Calcium Intake Against Stunting among Children Aged 3-5 Years and The Impact on Child Development](#)


 *Suryana, Andi Eka Yunianto, Yulia Fitri, Silvia Wagustina, Eva Fitrianiingsih, Nunung Sri Mulyani, Sanya Anda Lusiana, I Rai Ngardita*

SRP. 2020; 11(10): 606 - 611

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.90

Research Article

[Efficacy of Combinations of Piperacilline/Tazobactam, Ceftazidime, Amikacin and Bacteriophage against Enterobacteriaceae Sepsis in Neonates: In Vitro Study](#)

 *Huda Husham Abdul-Jabar, AbdulKareem Hameed Abd, Ahmed Sahib Abdulamir*

SRP. 2020; 11(10): 165 - 170

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.28

Review Article

[Features of Training Cadets in Physical Education in Military Institutions of Higher Education](#)

 *Olena Konokh, Yevhen Karabanov, Nataliia Denysenko, Igor Sukhenko, Mykola Koteliukh, Ruslan Shevchenko*

SRP. 2020; 11(10): 278 - 281

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.46

Research Article

[Overweight and OBES: The Impact of Lactobacillus Casei Strain Shirota on Cholesterol and Weight of Children in the Pandemic Time COVID-19](#)


 *Rudy Hartono, Rusli, Mira Andini, Aswita Amir.*

SRP. 2020; 11(10): 849 - 853

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.127

Research Article

[Spectrophotometric Determination of Micro Amount of Copper \(II\) Using a New of \(Azo\) Derivative, Study of Thermodynamic Functions and Their Analytical Application](#)

 *Mustafa Hamid Atiyah and Alaa Frak Hussain.*

SRP. 2020; 11(10): 171 - 181

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.29

Review Article

Contribution Deposit Compliance: Income and Knowledge of BPJS Health Mandiri Participants

Yeni Riza, Wasis Budiarto, Khairul Anam, Nurul Indah Qariati, Ridha Hayati, Hilda Irianty, Asrinawati, Ahmad Yani.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.128

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IMT AND VO2MAX Analysis on Junior Athletes, Futsal and Football Branches: Literature Scopus

Ruliando Hasea Purba.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.129

Review Article

Features of Exemption from Liability for the Violation of the Right to Information

Tetyana Kurylo, Tetiana Shynkar, Anatolii Prytula, Uliana Andrusiv, Mariya Mykhayliv

SRP. 2020; 11(10): 282 - 285

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.47

Review Article

Microorganism-Based β -Glucan Production and their Potential as Antioxidant

Gemilang Lara Utama, Casey Dio, Elazmanawati Lembong, Yana Cahyana, Roostita L. Balia.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.130

Research Article

The Effect of Infection with Papillomavirus on Tumor Markers, CA 125 and CA 15-3 In a Sample of Women Infected with this Virus in Iraq

Aseel Khalid Hameed

SRP. 2020; 11(10): 182 - 186

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.30

Review Article

Recent Updates on COVID-19 Vaccine Platforms and Its Immunological Aspects: A Review

Reviany V. Nidom, Arif N. M. Ansori, Setyarina Indrasari, Irine Normalina, Muhammad K. J. Kusala, Asep Saefuddin, Chairul A. Nidom.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.121

Review Article

A Review of Salmonella sp. in Tilapia fish (Oreochromis niloticus) : Public Health Importance

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

SRP. 2020; 11(10): 819 - 826

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.122

Review Article

Total Flavonoid Levels of Ethanol Extract and Ethyl Acetate Fraction Dry Shallots (Allium cepa L. var. Garden Onion of Brebes) with Maceration Methods Using UV-Vis Spectrophotometry

Heru Nurcahyo, Sri Adi Sumiwi, Eli Halimah, Gofarana Wilar

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.48

Review Article

Subjects of the Right to Information on One's Health in Private and Public Law

Yurii Kuryliuk, Stanislav Filippov, Iryna Kushnir, Hanna Shvedova, Volodymyr Berizko.

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Research Article

Effects of Hypericum Perforatum on Histology of the Testes and Sex Hormones of Male Rats

Adil Abdulrahman Mustafa, Khalaf Nahar Ahmad, Yasir I Abbass, Azzawi M Hadi.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.124

Research Article

Effect the Extracts of Agaricus Bioporus on Some Biological Aspects of Musca Domestica (Linnaeus1857) (Diptera: Muscidae)

Sarah Kadhim Al-Rahimy, Maysaa Taqi Al-Khazali, Rafid Abbas Al-Essa, Iqbal Khawwam Khshayyish

SRP. 2020; 11(10): 187 - 192

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.31

Review Article

In Silico Study on Antibacterial Activity and Brazilein ADME of Sappan Wood (Caesalpinia Sappan L.) Against Escherichia coli (Strain K12)

Dwi Krihariyani, Eddy Bagus Wasito, Isnaeni Isnaeni, Siswandono Siswodihardjo, Wiwik Misaco Yuniarti, Entuy Kurniawan

SRP. 2020; 11(10): 290 - 296

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Research Article

Study of Correlation between Some Serological Parameters with Brucella Militance Infection


Amidah Ali Atiyah, Asmaa Essa Mahmood, Sahar Abd Al-Wahhab, Nael Mustafa

SRP. 2020; 11(10): 193 - 198

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.32

Research Article

Did Trilogy Leadership Style, Organizational Citizenship Behaviour (OCB) and Organizational Commitment (OCO) Influence Financial Performance? Evidence from Pharmacy Industries


 Harjoni Desky, Mukhtasar, Muhammad Istan, Yeni Ariesa, Inge Bunga Mira Dewi, Mochammad Fahlevi, Muhammad Nur Abdi, Rinto Noviantoro, Agus Purwanto

SRP. 2020; 11(10): 297 - 305

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.50

Research Article

Adaptive Strategy of Women`s Leprosy in Indonesia: Psychic Experience of Women with Leprosy in Living a Community Life


 Abd. Nasir, Ah Yusuf, Muhammad Yulianto Listiawan, Susilo Harianto, Nuruddin, Nuh Huda

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.51

Review Article

Pharmaceutical Business Competition in Indonesia: A Review

 Heri Erlangga, Wa Ode Sifat, Dimas Wibisono, Ade Onny Siagian, Rudi Salam, Mahnun Mas adi, Gunartin, Riri Oktarini, Cornelia Dumarya Manik, Nani, Ahmad Nurhadi, Denok Sunarsi, Agus Purwanto, Gatot Kusjono

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.92

Review Article

Efficacy of Stigma maydis (Corn silk) in Reducing Blood Sugar Level and Subduing Periodontal Inflammation

 Irene Edith Rieuwpassa, Rafikah Hasyim, Dwi Putri Wulansari, Risyah Yulianty, A. St. Asmidar Anas, Sitti Rafiah, Yu Ri Kim.

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Health-Promoting Behaviors and Related Factors in Patients with Chronic Diseases in a Rural Community

 Wanich Suksatan, Jatuporn Ounprasertsuk

SRP. 2020; 11(10): 624 - 627

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.93

Research Article

Analysis of Current Models of the Palliative Medical Care at the level of Separate Subjects of the Russian Federation


 Lyudmila Alexandrovna Ertel, Marina Filippovna Mikaelyan, Irina Nikolaevna Iyro, Gasbulla Suleymanovich Barkaev, Andrey Borisovich Goryachev, Tatyana Gennadyevna Mogilenko, Stella Vazgenovna Mirzoyan, Madina & 1040;liyevna Garumova

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.94

Research Article

Anticancer Activity of Phyllanthus Niruri Linn Extract in Colorectal Cancer Patients: A phase II Clinical Trial

 Muhammad Sayuti, Ignatius Riwanto, B. Parish Boediono, Teuku Ilhami Surya Akbar

SRP. 2020; 11(10): 313 - 317

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.52

Review Article

Did PDCA Cycle, Service Quality and Innovation Capability Influence Private Universities Performance?


 Lukman Hakim, Kemas Imron Rosadi, Minnah El Widdah, Kasful Anwar US, Shalahudin, Mahmud MY.

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Review Article

Dentists Attitudes and Barriers towards Chairside Medical Conditions Screening in a Dental Setting in Makassar, Indonesia

 Rasmidar Samad, Burhanuddin Daeng Pasiga, Rini Pratiwi, Fuad Husain Akbar, Nursyamsi Djamaluddin, Muhammad Hidayat Syahrudin.

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Research Article

The Identification of Pork Contamination on Beef by Polymerase Chain Reaction (PCR)

 Mustofa Helmi Effendi, Shelma Warda Afdilah, Dhandy Koesoemo Wardhana, Fredy Kurniawan,

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Research Article

[The Effect of Gel Abelmoschus Manihot \(L.\) Medik Leaf Extract on Second Degree Burn Wound Healing Process](#)


 *Wiwik Misaco Yuniarti, Erva Fatmareta, Laila Nur Hidayati, Nadhila Arieska, Bambang Sektiari Lukiswanto.*

SRP. 2020; 11(10): 884 - 889

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Research Article

[The Effect of Anthocyanin of Whole-Grain Pigmented Rice Attenuated Visceral Fat, Cholesterol, LDL and PPAR \$\gamma\$ Gene Cascade in Dyslipidemia Rat](#)


 *Fatchiyah Fatchiyah, Anna Safitri, Rista Nikmatu Rohmah, Lidwina Faraline Triprisila, Nia Kurnianingsih, Yudhistira Nugraha, Sisca Fajriani, Hazna Noor Meidinna, James Ketudat Robert-Cairns*

SRP. 2020; 11(10): 318 - 327

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[A Systematic Literature Review of Education Financing Model in Indonesian School](#)


 *Gunartin, Ade Onny Siagian, Khayatun Nufus, Nur aini Yusuf, Hadi Supratikta, Ali Maddinsyah, Awaluddin Muchtar, Widya Intan Sari, Denok Sunarsi, Irfan Rizka Akbar, Nurmin Arianto, Agus Purwanto, Noryani, Hadion Wijoyo.*

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[The Relationship between Chin Pressure and the Severity of TMD in Violin Players](#)

 *Mohammad Dharma Utama, Andi Adytha M.I.R, Ike Damayanti Habar, Acing Habibie Mude, Edy Machmud, Irfan Dammar, Vinsensia Launardo.*

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[The Effect of Adsorbent Composition: Quartz Sand/Andisol Soil/Zeolite/Activated Carbon Against Mn, Fe, BOD, and COD in Citarum River Eater Cleaning Progress](#)

 *Muhammad Sholeh, Pranoto, Sri Budiastuti, Sutarno.*

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[The Role and Place of Information and Communication Technologies in the Formation of Professional Competencies of Higher Education](#)


 *Tetiana Shabelnyk, Nataliia Rotanova, Oksana Diachenko, Maryna Netreba, Liudmyla Tonkykh, Olena Tsilmak.*

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.133

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[A Systematic Review of Population Pharmacokinetics of Carbamazepine](#)


 *Janthima Methaneethorn, Manupat Lohitnavy, Nattawut Leelakanok.*

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.98

Review Article

[Public Management in the Activity of Educational Institutions in the Context of Autonomy of their Work \(Under the Conditions of Crises and Covid-19\)](#)

 *Budanova Liana, Filyanina Nelya, Nosyk Oksana, Andriyenko Mykola, Slepchenko Anzhela, Zastrozhnikova Irina*

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[Attachment Systems for Implant-Supported Overdentures in Edentulous Mandible: A Systematic Review](#)


 *Acing Habibie Mude, Muhammad Ikbal, Irfan Dammar, Vinsensia Launardo, Sutiyo.*

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[Prevalence of Refractive Errors Among Primary School Children \(6-15 Yrs\) In Al-Khartoum- Sudan](#)


 *Noaman Mukbel Ghalib, Samira Mohammed Ibrahim, Nasraddin Othman Bahakim.*

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Review Article

[Evaluation of the Application of Training in Higher Education Institutions as a Technology of Active Learning](#)


 *Nataliia Kanosa, Iana Chaika, Inna Lytvynova, Tetiana Yakovyshyna, Valentyna M. Uspenska, Dmytro Kostyuk*

SRP. 2020; 11(10): 199 - 202

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.33

Review Article

[Effect of ISO 9001, ISO 45001 and ISO 14000 toward Financial Performance of Indonesian Manufacturing](#)

 *Mukhlisshotul Jannah, Mochammad Fahlevi, Julinta Paulina, Budi Sulistiyo Nugroho, Agus Purwanto, Milana Abdillah Subarkah, E. Kurniati, Teguh Setiawan Wibowo, Kasbuntoro, Nawang Kalbuana, Yoyok Cahyono.*

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.134

Review Article

Development of Performance Appraisal Sustainable Theory of Sharia Banks in Indonesia

👤 Ahmad Sodik, Ririn Tri Ratnasari, Imron Mawardi.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.100

Research Article

Combination Therapy of Eurycomanone and Doxorubicin As Anticancer on T47D and MCF-7 Cell Lines

👤 Hanifah Yusuf, Denny Satria, Suryawati Suryawati, Marhami Fahriani

SRP. 2020; 11(10): 333 - 341

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.55

Review Article

Pedagogical Principles of Training Specialists in Public Administration and Management in the System of Vocational Education

👤 Nataliia Bakhmat, Lyudmila Kotliar, Tetiana Zhytomyrska, Volodymyr Slabko, Viktoriia Zhurian, Oksana Pilevych, Iryna Smyrnova

SRP. 2020; 11(10): 203 - 207

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.34

Review Article

Sustainable, Pro-Poor and Humane Waqf Management: A Literature Study of Evidence-Based Success Criteria of Waqf Managers

👤 Siti Nur Indah Rofiqoh, Ririn Tri Ratnasari, Raditya Sukmana, Mohammad Ala uddin, Alimin, Iskandar Ritonga.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.135

Review Article

Anti-Corruption Policy under the Conditions of Overcoming the Consequences of the Coronavirus Pandemic

👤 Anatolii Novak, Vitalii Bashtannyk, Zoriana Buryk, Oksana Parkhomenko-Kutsevil, Mykola Andriyenko.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.136

Review Article

Notch Pathway and its Role in Cardiovascular System: Review

👤 Amira M. Badr, Yasmen F. Mahran

SRP. 2020; 11(10): 342 - 349

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.56

Review Article

Modern Problems of Medical and Pharmacological Education

👤 Olena Malinina, Ganna Gnyloskurenko, Vitalii Chaika, Iryna Borysiuk, Rayisa Yuriy.

SRP. 2020; 11(10): 917 - 922

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.137

Review Article

Comparison of Jatropha curcas (Linn) Leaf Extract and Nystatin Effectivity on Candida albicans Growth Inhibition

👤 Ali Yusran, Fuad Husain Akbar, Fathimah.

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Review Article

The Impact of Using Interactive Boards on Secondary School Students? Learning Outcomes in Egypt in the Computer Skills Course

👤 Mohammed Elmetwali Mohammed Amer.

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.138

Research Article

Study the Glucose Level in Obese Breast Cancer Patients


👤 Sheerin H. Abbas, Rula Dhahir Abdulmohsin.

SRP. 2020; 11(10): 208 - 212

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.35

Review Article

Protection of the Rights of Public Utilities Market Participants (In the Context of Poverty Prevention)


 *Gulnara Dzhumageldiyeva, Inna Zablodska, Irina Yukhymenko-Nazaruk, Vita Dovgaliuk, Irina Suprunova, Ulyana Gylka.*

SRP. 2020; 11(10): 931 - 938

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Research Article

Formulation and in Vitro Evaluation of Valsartan Flash Tablet

 *Mohammed Sattar, Malathe A. Alshawi, Mazin Nadhim Mosa*

SRP. 2020; 11(10): 213 - 219

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.36

Review Article

Dentin Matrix Protein-1 (DMP-1) Expression after Application of Haruan Fish Extract (Channa striata) on Inflamed Wistar Rat Dental Pulp


 *Andi Sumidarti, Christine Anastasia Rovani, Juni Jekti Nugroho, Bulkis Thahir.*

SRP. 2020; 11(10): 31 - 35

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.6

Review Article

Molecular Detection of Parvovirus B19 and Immunohistochemical Localization of Interleukin 6 of Tissues from Thyroid Cancer

 *Jinan MJ Al-saffar, Saad Hasan Mohammed Ali, Shakir H. Mohammed Al-Alwany.*

SRP. 2020; 11(10): 939 - 943

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.140

Review Article

Study the Relationship between Roughness and Stimulus Levels and Their Impact on OAEs


 *Adnan M. A. Al-Maamury, Fatima Q. Al-Rawi*

SRP. 2020; 11(10): 220 - 224

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.37

Review Article

Isolation and Diagnosis of Bacteria from Women with Urinary Tract Infection and Study of Antibiotic Susceptibility


 *Rafal Ahmed Lilo, Dalal mohammed, zahraa M. Al-Tae, Zeena Hadi Obaid Alwan and Rajaa Mahmoud Ibrahim AL-Jasim.*

SRP. 2020; 11(10): 944 - 947

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.141

Review Article

Legal Reforms of the Land Market in the Countries of Central and Eastern Europe and the Development of Their Financial and Credit Institutions


 *Oleksandr Tereshchuk, Mykola Yasynok, Volodymyr & 1050;roitor, Alla Zemko, Dmytro Yasynok, Mykola Danevych.*

SRP. 2020; 11(10): 948 - 953

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.142

Research Article

Effectiveness of Fucoidan Extract from Brown Algae to Inhibit Bacteria Causes of Oral Cavity Damage

 *Nurlindah Hamrun, Sri Oktawati, Asmawati, Irene, Hardianti Maulidita Haryo, Ira Farwiany Syafar, Andi Nurazizah Almaidah.*

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[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.101

Review Article

The Effectiveness of Giving Cork Fish Nugget to Increase Endurance of Toddlers at Community Health Centers Sentani Jayapura Regency


 *Ester Rumaseb, Berliana Tampubolon, Jems K.R. Maay.*

SRP. 2020; 11(10): 954 - 958

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Research Article

CERDIK Behavior as a Risk Factor for Individuals with Non-Communicable Diseases

 *Suprajitno, Sri Mugianti*

SRP. 2020; 11(10): 350 - 360

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.57

Research Article

[Development of a Method for Determination of Diphenhydramine HCl and Ibuprofen in Pharmaceutical Preparations \(Tablets\)](#)


 *Seemaa Hameed Ahmed*

SRP. 2020; 11(10): 225 - 229

[» Abstract](#) [» PDF](#) DOI: 10.31838/srp.2020.10.38

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[The Recurrence Rate of Oral Benign Lesions which Treated with Dredging and Obturator](#)


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A Review of *Salmonella sp.* in Tilapia fish (*Oreochromis niloticus*) : Public Health Importance

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ABSTRACT

Tilapia fish or *Oreochromis niloticus* is a food security commodity from the fisheries sector and is traded internationally, but in Asian countries tilapia aquaculture is mostly maintained using traditional systems, besides that homemade feed is used to reduce production costs. Cultivation of tilapia with traditional systems and artificial feed that is integrated with other livestock has the potential to cause the danger of transmitting zoonotic pathogens from other livestock manure and feed residue. *Salmonella sp.* which is one of the zoonotic pathogens that can be transmitted from tilapia. The use of antibiotics in livestock and cultivation causes *Salmonella sp.* able to withstand some antibiotics. Salmonellosis in humans has become an important public health problem, incurring significant economic and medical costs worldwide. The incidence of salmonellosis due to fish consumption has become a concern of public health agencies in several countries, because increased consumption of fishery products, especially raw products, increases the risk. Pathogen exposure, especially in vulnerable groups, such as the elderly, has increased significantly. pregnant women and babies. The importance of this pathogen in fish can be assessed and evaluated, as records show that most *Salmonella* infections in humans are related to fish consumption.

Keywords: Tilapia fish, *Salmonella sp.*, Zoonotic pathogen, Public health

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INTRODUCTION

Integrated tilapia farming is a traditional practice by small-scale farmers in China as well as in other Asian countries. Fish are usually raised in ponds with livestock units, such as pigs, located on pond embankments, which allow drainage of livestock manure and excess feed into the pond as plankton and other fish feed [1, 2]. Although integrated agricultural systems are sustainable in many ways, they represent potential food safety hazards, for example transmission of zoonotic pathogens from faeces and accumulation of antimicrobials and others. residues originating from pig manure and feed [3, 4]. Tilapia is one of the easiest to cultivate and trade fishery food products internationally in the world, with an estimated 1.45 million tonnes produced in China in 2013 [5, 6].

In the Asia-Pacific region, farmed fish are fed commercial or homemade feed [7]. Homemade feed is used to reduce costs and usually consists of chicken offal and by-products produced during poultry processing, kitchen waste, and other by-products from the food industry [7, 8]. Homemade diets can be a potential source of foodborne pathogens, particularly *Salmonella* bacteria [9, 10], which can then be transmitted to farmed fish [11] and to humans. Salmonellosis in humans has become an important public health problem, creating significant economic and medical costs worldwide. In the United States, nontyphoidal *Salmonella* caused approximately 1 million foodborne illnesses, 13,000 hospitalizations, and 242 deaths in 2011 [12]. In Taiwan, *Salmonella* is one of the most frequently isolated foodborne pathogenic bacteria [13]. *Salmonella* is usually transmitted to humans through consumption of

contaminated food products. According to Bean et al. [14], approximately 7% of cases of human salmonellosis result from ingestion of contaminated food from fishery products, particularly ready-to-eat (RTE) products. In Hong Kong, detected *Salmonella* in smoked fish, salmon sushi, and salted fish products [15, 16, 17], which illustrates that *Salmonella* was continuously contaminated by these RTE products. In addition, human salmonellosis caused by contaminated fish products has been reported in European countries [18, 19], where processing is considered to be one of the important sources of contamination [20, 21]. Martinez-Urtaza and Liebana [21] and Morris et al. [22], who evaluated the incidence of *Salmonella* in seafood processing plants, surveillance of foodborne pathogens during processing is essential to a successful contamination control program. When monitoring *Salmonella* contamination, serotyping and molecular subtypes are often applied to trace the source of bacterial contamination [23, 24].

The incidence of salmonellosis due to fish consumption has become a concern of public health agencies in several countries, because the increased consumption of fish farming, especially raw products, which increases the risk of exposure to pathogens, especially in vulnerable groups, such as the elderly, increases significantly. pregnant women and infants [25, 26]. The importance of this pathogen in fish can be assessed and evaluated, as records show that fish is the source of transmission responsible for 7% of total foodborne outbreaks in Europe in 2016, with the majority of *Salmonella* infections in humans linked to

fish consumption caused by *Salmonella* Typhimurium and Enteritidis serovars [27, 28, 29, 30].

Overview of *Salmonella* sp.

Salmonella spp. are Gram-negative rod-shaped bacteria that cause salmonellosis. In humans, these pathogenic bacteria cause enteric fever and acute gastroenteritis [31]. Symptoms include mild to severe gastroenteritis, with an incubation period of 6–72 hours [31]. Salmonellosis outbreaks due to fish consumption have been reported in several countries. For example, salmonellosis caused by eel consumption, which is linked to fish farming in Italy and has been reported in Germany [32]. Several reports have linked the presence of *Salmonella* spp. in various fishes and shell fishes [33, 34]. Various hazards associated with natural fish farming come from the environment or from human or animal activities. Fish can be a vehicle for transmission of *Salmonella* which can be pathogenic for humans and has a high potential to transmit its antibiotic resistance gene to other pathogens via plasmids [35]. The potential for antibacterial agents to cause the development of resistance in fish pathogens is of worldwide concern [36].

Salmonella grows optimally at 37 °C, but these bacteria are able to grow in a temperature range of 5–47 °C [37]. However, dietary *Salmonella* exhibits varying survival behavior depending on the type of food matrix and storage conditions [37]. Studies show that *Salmonella* can survive for more than 16 weeks in frozen processed chicken products and for more than 9 months in frozen beef without much change in quantity [37]. Studies on the viability of *Salmonella* in chilled and frozen fish and fishery products are very limited. One study reported that *Salmonella* Enteritidis survived but did not grow at 3 °C, whereas bacteria thrived at 10 °C in vacuum packed fish and poultry [38]. The amount of *Salmonella* in raw tuna was reduced by 1 to 2 logs after 12 days of storage at 5–7 °C, whereas in frozen storage *Salmonella* became undetectable after 42 days of storage. In frozen shrimp, populations of *S. Weltevreden* and *S. Senftenberg* decreased but were not eliminated during 12 weeks of storage [39, 40].

Zoonoses in humans

Infection can occur if fishery food contaminated with salmonella is consumed raw or undercooked. Salmonellosis transmitted through food from fisheries is a major cause of human morbidity worldwide [40, 41]. *Salmonella* spp. cause various diseases such as enteric fever and gastroenteritis. The majority of the estimated 1.3 billion annual cases of salmonellosis result from consumption of contaminated food products especially pork, poultry, eggs and vegetables [41]. In comparison, fishery foods are less frequently associated with *Salmonella* infections although reports from Thailand, Malaysia and other Asian countries indicate that certain serovars, eg *S. Weltevreden*, may be primarily associated with aquatic environments and seafood [42]. Prevalence of *Salmonella* spp. may also be higher in seafood from Asia compared to seafood from other geographic regions [43, 44]. However, other studies argue that *Salmonella* spp. can last longer in tropical aquatic environments and should therefore be seen as part of the normal micro-flora of aquaculture products of the area [45]. *Salmonella* can be disseminated as a result of water currents, underground springs and rainwater runoff carrying contaminated material [46–49]. Like *E. coli*, *Salmonella* is continuously released into the environment from infected humans, livestock, domestic animals, and wildlife [50]. Pathogenic and potentially pathogenic bacteria associated with fish

and shellfish include *Mycobacteria*, *Streptococcus iniae*, *Vibrio vulnificus*, *Vibrio* spp, *Aeromonads*, *Salmonella* spp, *Shigella* and others [51, 52, 53]. Human infection by these fish pathogens is usually through contact with infected fish during handling, water or other elements of the fish's living environment [54]. The initial microflora on the surface of the fish is directly related to the aquatic environment whereas the flora in the digestive tract is related to the type of food and condition of the fish [55]. *Salmonella* sp. is a causative agent of pathological diseases in humans, cattle, poultry and other livestock and *Salmonella* infection is a major cause of concern for humans, animals and the food industry. Characterization of more than 2,500 *Salmonella* serovars, the pathogen infects nearly all vertebrates but the severity of infection varies from one serovar to another depending on the specificity of the host [56]. Some *Salmonella* serovars are limited to one or several hosts while others have a wide spectrum of hosts. An understanding of the mechanisms involving host preference by one serovar over another is essential. This is used to increase our knowledge about host adaptability and will be instrumental in designing better prevention models. Methods involving identification of genetic markers for host specificity will prove to play a role in determining virulence factors for other bacterial pathogens that cause systemic infection [54, 56].

The low standard of health in the coastal areas increases the eutrophication process, thus creating a broad conducive environment for the survival of microbes that eventually infect fish. Analysis of fish tissue slurry showed that the fish harvested from the landing beaches along the coast that had been contaminated by Enterobacteriaceae were; *Salmonella*, *Shigella* and *E. coli* [57, 58, 59]. In the Asia-Pacific region, farmed fish are fed commercial or homemade feed [60]. Homemade feed is used to reduce costs and usually consists of chicken offal and byproducts produced during poultry processing, kitchen waste, and other by-products from the food industry [60, 61]. Homemade diets can be a potential source of foodborne pathogens, particularly *Salmonella* bacteria [9, 62], which can then be transmitted to farmed fish [63, 64] and, in turn, to humans. Detailed information on salmonellosis due to consumption of tilapia in Malaysia is lacking, as most cases of food poisoning are not reported to the authorities. However, the Malaysian National Public Health Laboratory reports that the five most common nontyphoidal *Salmonella* serovars are *Salmonella* Enteritidis, *Salmonella* Weltevreden, *Salmonella* Corvallis, *Salmonella* Typhimurium, and *Salmonella* Tshiongwe [65]. In Malaysia, freshwater fish are kept using aquaculture ponds, ex-mining ponds, freshwater cages, cement tanks, canvas tanks, and freshwater cage culture systems. Most of the freshwater cultivated fish are maintained using the aquaculture system (59.5%) and ex-mining ponds (25%). Catfish (58.1%) and tilapia (41.3%) were reared in ground ponds and ex-mining [65].

Transmission of bacteria from tilapia (*Oreochromis* sp.)

Fish is considered to be one of the most nutritious and highly desirable food ingredients due to its high nutritional value and is rich in protein, vitamins and unsaturated fatty acids. Fish contains n-3 polyunsaturated fatty acids which is a very important aspect for health-conscious people especially in affluent countries where the death rate from cardiovascular disease is high. Fish contains more easily digestible protein than protein found from other sources. Fish are of great concern for export

earnings because of their higher nutritional value, low cholesterol levels and presence of essential amino acids [64]. Bangladesh is the 5th in world aquaculture production, which accounted for half of the country's total fish production in 2015-2016 [65, 66]. This sector contributed 3.65% to GDP and 1.97% to foreign exchange earnings through exports [66]. It is the second largest export industry in Bangladesh and accounts for 2.5 percent of global shrimp production [66].

The main pathogens affecting cultivation include bacteria, fungi, viruses, and parasites [67-69]. Bacterial diseases have become a major concern for cultivation, especially with warm water temperatures [70]. Different bacterial species are reported to be pathogens against aquatic tilapia, including *Aeromonas hydrophila*, *Edwardsiella tarda*, *Flavobacterium columnare*, *Francisella* spp., *Yersinia ruckeri*, *Staphylococcus epidermidis*, *Vibrio vulnificus*, and *Streptococcus agalactiae* [71-79].

Fish was associated with 24% of foodborne disease outbreaks and 6% of all food poisoning, or foodborne illness [80]. Levels of pathogenic bacteria in tilapia are related to the environment and its handling before entering food markets and restaurants. The bacteria associated with tilapia fish can be transmitted by direct contact and cause foodborne illness. For example, handling of tilapia has been linked to an outbreak of *Vibrio vulnificus* in a Seattle supermarket [81]. Other foodborne pathogenic bacteria including *Salmonella enterica*, enteropathogenic *Escherichia coli*, *Listeria monocytogenes*, *Yersinia enterocolitica*, and *Klebsiella pneumoniae* were identified from fresh tilapia in the Kenyan freshwater fish chain [82]. Shigatoxigenic and enteropathogenic *Escherichia coli* was isolated from farmed tilapia (*Oreochromis niloticus*) in the northeast region of the state of Sao Paulo [83]. It was reported that the microbial quality of tilapia showed that all the tissues were contaminated by salmonella and fecal coli. Salmonella can spread as a result of water currents, underground springs and rain runoff carrying contaminated material [84, 85]. Human infection by these fish pathogens is usually through contact with infected fish while handing them over, water or other elements of the fish's living environment [86]. These pathogenic organisms have been isolated from freshwater fish such as *Tilapia nilotica* Linn [87]. Tilapia is an important aquaculture production for food supply. Because on a global scale, fish and fish products are the most important sources of protein and it is estimated that more than 30% of the fish consumed by humans comes from aquaculture [88, 89].

Safe consumption of fish and fishery products requires adequate sanitary conditions from harvest to consumption [90, 91]. Consumption of fish and shellfish can also cause illness due to infection or poisoning. Most of the foodborne diseases are caused by *Salmonella* spp., *Staphylococcus* spp. and *Escherichia coli*, usually associated with the consumption of fish infected with these bacterial species especially *Salmonella* and *E. coli* [92, 93]. *Salmonella* usually enters the human intestine with food, *Salmonella* spp. must overcome resistance to colonization mediated by the gut microbiota and the innate immune system. *Salmonella* by inducing inflammation and innate immune defense mechanisms. Many models have been developed to study *Salmonella* spp. interactions with the microbiota have helped to identify the factors needed to overcome colonization resistance and to mediate disease [10, 54, 93]. *Salmonella* infection in humans mainly includes typhoid fever and this infection, known as enteric fever, continues

to be one of the most serious public health problems worldwide. The presence of higher levels of *Salmonella* in fish causes several symptoms in the human body such as diarrhea, nausea, vomiting and abdominal pain. Human salmonellosis caused by contaminated fish products has been reported in European countries [18, 19], where processing is considered to be one of the important sources of contamination [20, 21].

ANTIBIOTIC RESISTANCE

Self-limiting gastroenteritis is the main clinical picture developed by *Salmonella*, which in severe cases may require fluid and electrolyte replacement. The use of antibiotics is reserved for patients with serious illness or a high risk of invasive disease [94]. The antibiotic therapy scheme for typhoid fever includes third generation cephalosporin antibiotics, quinolones and macrolides. However, recently it has developed between typhoid *Salmonellas* and non-typhoid strains with a high degree of resistance to quinolones and cephalosporins [95]. The emergence of several drugs resistant to *Salmonella* (MDR) is currently of worldwide concern, and the occurrence of *Salmonella* MDR in food is a risk condition, indicating an increase in the severity of foodborne disease, leading to increased hospitalization rates and the likelihood of death [96]. In contrast, the epidemiology of antimicrobial resistance of *Salmonella* spp. It is complex and can be influenced by factors such as: consumption of antibiotics, human travel, transmission between patients in hospitals, import and trade in food of animal origin or not, trade in live animals within the country or between countries and exposure through animals or the environment human [97].

The use of antibiotics for therapeutics and growth promoters in feed animals has shown that the main factor for the emergence of resistant isolates [98], has been reported from livestock [99-103], poultry [104-108], pets [109-112], fish [113-116], and from animal products. [117-120]. Several studies have reported that pet food, meat, milk and fishery products contaminated by a multi-resistant *S. aureus* strain which has been one of the common causes of severe nosocomial infection for a long time [121]. In contrast, a large number of studies have reported increased incidence of resistance among *Salmonella* spp. isolated from poultry, beef and fishery products [122].

Antibiotics are used for medicinal purposes and as growth promoters in livestock and aquaculture leading to the development of resistance [123]. Acquired resistance to tetracyclines and chloramphenicol has been associated with extensive use of antibiotics in aquaculture in several Asian countries [124]. Sapkota et al. [125] reported that of the top 13 aquaculture producing countries, 92% used oxytetracycline and 69% used chloramphenicol.

It was reported that antibiotic resistance in Gram-negative bacteria from pond culture was higher in ponds undergoing antimicrobial therapy or with a recent history of treatment than in ponds without antimicrobial treatment recently [126, 127]. In a previous study, it was reported that all *S. enteritidis* strains isolated from tilapia sold in a wet market in Selangor, Malaysia were susceptible to rifampin. The emergence of *Salmonella* serovars with high MAR index indicates that these serovars originate from environments where antimicrobials are often used as therapy or as growth promoters in animal feed [128, 129]. Some drug-resistant *Salmonella* isolates have been suggested to be more virulent than non-multiple drug-resistant *Salmonella*

isolates [130]. *Salmonella* resistance to one or more antibiotics has been reported by many investigators [131]. Horizontal transfer of resistance genes in plasmids has been shown between bacteria in fish pond water [131] and in marine sediments [132]. Plasmids in *Salmonella* spp. has been reported to transfer antibiotic resistance and virulence properties [35].

CONCLUSION

The presence of higher levels of *Salmonella sp.* in tilapia fish causes several symptoms in the human health such as diarrhea, nausea, vomiting and abdominal pain. *Salmonella sp.* in tilapia obtained from the decay of animal waste and feed residue during the traditional cultivation process. *Salmonella sp.* is often resistant to several antibiotics which allow it to be transferred to the surrounding environment, which is because in the process of tilapia pond cultivation it is mixed with disposal from livestock waste where there is a lot of antibiotic residue and while cultivation is still using antibiotics. This is what needs to be a public health concern about antibiotic resistance from isolates obtained in tilapia fish.

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