

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel) : Anti-proliferative and Apoptosis Effect of Hyptolide from Hyptis pectinata Poit on Human Breast Cancer Cell

Jumlah Penulis : 3 orang (Meiny Suzery, **Bambang Cahyono**, Nur Dina Amalina)

Status Pengusul : penulis ke-2

Identitas Jurnal Ilmiah :

- a. Nama Jurnal : Journal of Applied Pharmaceutical Science
- b. Nomor ISSN : 2231-3354
- c. Vol, No., Bln Thn : Volume: 10, Issue: 2, February, 2020, Pages: 001-006
- d. Penerbit : MediPoeia
- e. DOI artikel (jika ada) : <http://dx.doi.org/10.7324/JAPS.2020.102001>
- f. Alamat web jurnal : https://www.japsonline.com/abstract.php?article_id=3065&sts=2
- Alamat Artikel : https://www.japsonline.com/admin/php/uploads/3065_pdf.pdf
- g. Terindex : Scopus, Q2

Kategori Publikasi Jurnal Ilmiah : ☒ Jurnal Ilmiah Internasional
 (beri ✓ pada kategori yang tepat) ☐ Jurnal Ilmiah Nasional Terakreditasi
☐ Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi jurnal (10%)	2,50	3,00	2,75
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00	9,00	9,00
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00	8,50	8,75
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	8,50	8,50	8,50
Total = (100%)	29,00	29,00	29,00
Nilai Pengusul = (40% x 29,00)/2 = 5,80			

Semarang, 30 Maret 2020

Reviewer 2



Prof. Dr. Edy Meiyanto, M.Si., Apt.
 NIP. 196205021989031006
 Unit Kerja : Kimia Farmasi, F.Farmasi UGM

Reviewer 1



Prof. Dr. Andri Cahyo Kumoro, S.T., M.T.
 NIP. 197405231998021001
 Unit Kerja : Teknik Kimia FT UNDIP

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel) : Anti-proliferative and Apoptosis Effect of Hyptolide from Hyptis pectinata Poit on Human Breast Cancer Cell

Jumlah Penulis : 3 orang (Meiny Suzery, **Bambang Cahyono**, Nur Dina Amalina)

Status Pengusul : penulis ke-2

Identitas Jurnal Ilmiah :

a. Nama Jurnal	: Journal of Applied Pharmaceutical Science
b. Nomor ISSN	: 2231-3354
c. Vol, No., Bln Thn	: Volume: 10, Issue: 2, February, 2020, Pages: 001-006
d. Penerbit	: MediPoeia
e. DOI artikel (jika ada)	: http://dx.doi.org/10.7324/JAPS.2020.102001
f. Alamat web jurnal	: https://www.japsonline.com/abstract.php?article_id=3065&sts=2
g. Terindex	: Scopus, Q2

Alamat Artikel : https://www.japsonline.com/admin/php/uploads/3065_pdf.pdf

Kategori Publikasi Jurnal Ilmiah (beri ✓ pada kategori yang tepat)

☒	Jurnal Ilmiah Internasional
☐	Jurnal Ilmiah Nasional Terakreditasi
☐	Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional	Nasional Terakreditasi	Nasional Tidak Terakreditasi	
	30	☐	☐	
a. Kelengkapan unsur isi jurnal (10%)	3,00			2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00			9,00
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00			9,00
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	9,00			8,50
Total = (100%)	30,00			29,00
Nilai Pengusul = (40% x 29,00)/2 = 5,80				

Catatan Penilaian artikel oleh Reviewer :

- Kesesuaian dan kelengkapan unsur isi jurnal:** Artikel ini mempunyai unsur yang lengkap yang terdiri dari judul, abstrak, bahan dan metode percobaan, hasil pembahasan, kesimpulan, ucapan terima kasih dan daftar pustaka.
- Ruang lingkup dan kedalaman pembahasan:** Isi artikel meliputi pembuatan dan kajian kinetika degradasi termal serbuk fikosianin yang disalut dengan karaginan dan kitosan. Isi artikel masih dalam ruang lingkup Journal of Applied Pharmaceutical Science. Hasil disajikan dengan baik. Dan dibahas dengan cukup jelas dan didukung dengan pustaka yang relevan dan mutakhir. Terdapat 18 (45%) pustaka yang digunakan dalam pembahasan.
- Kecukupan dan kemutakhiran data/informasi dan metodologi:** metodologi percobaan dituliskan dengan cukup lengkap, namun tidak merujuk pada pustaka. Artikel ini menyajikan data percobaan yang disajikan dalam bentuk tabel dan gambar dengan jumlah dan kualitas yang cukup memadai. Terdapat self-citation berupa artikel dalam jurnal nasional terakreditasi Sinta 2. Artikel ini didukung oleh 40 pustaka dan 22 di antaranya bersifat mutakhir (55%)
- Kelengkapan unsur dan kualitas terbitan:** Jurnal ini tergolong **jurnal internasional bereputasi** karena terindeks **Scopus** kategori **Q2** untuk Pharmacology, Toxicology dan Phamaceutics dengan SJR 0,244 dan H Index 24 pada tahun 2018. Anggota editorial Board berasal dari beberapa Negara, terdapat pedoman penulisan yang jelas dan format penulisan konsisten. Penerbitan dilakukan 4 kali dalam setahun dan mempunyai system pengiriman artikel dengan online journal system (OJS). Tampilan tabel pada setiap artikel baik namun tidak seperti pada jurnal ilmiah pada umumnya karena masih menggunakan garis vertikal dan horizontal. Editor masih kurang jeli dalam menyunting artikel karena beberapa gambar dan rumus kimia sangat kecil, sukar dibaca dan ukurannya tidak baku. Pada umumnya, artikel yang diterbitkan merupakan hasil karya penulis dari beberapa negara, terutama India, Indonesia, Thailand, Iran dan negara-negara Asia lainnya. Gaya selingkung yang diterapkan jurnal ini cukup baik dan konsisten, walaupun bahasa inggris yang digunakan banyak yang kurang baik. Penerbit jurnal ini adalah Open Science Publisher LLP, INDIA.

Semarang, Maret 2020

Reviewer 1



Prof. Dr. Andri Cahyo Kumoro, S.T., M.T.
 NIP. 197405231998021001
 Unit Kerja : Teknik Kimia FT UNDIP

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel) : Anti-proliferative and Apoptosis Effect of Hyptolide from Hyptis pectinata Poit on Human Breast Cancer Cell

Jumlah Penulis : 3 orang (Meiny Suzery, **Bambang Cahyono**, Nur Dina Amalina)

Status Pengusul : penulis ke-2

Identitas Jurnal Ilmiah :

- a. Nama Jurnal : Journal of Applied Pharmaceutical Science
- b. Nomor ISSN : 2231-3354
- c. Vol, No., Bln Thn : Volume: 10, Issue: 2, February, 2020, Pages: 001-006
- d. Penerbit : MediPoeia
- e. DOI artikel (jika ada) : <http://dx.doi.org/10.7324/JAPS.2020.102001>
- f. Alamat web jurnal : https://www.japsonline.com/abstract.php?article_id=3065&sts=2
- Alamat Artikel : https://www.japsonline.com/admin/php/uploads/3065_pdf.pdf
- g. Terindex : Scopus, Q2

Kategori Publikasi Jurnal Ilmiah : ☒ Jurnal Ilmiah Internasional
 (beri ✓ pada kategori yang tepat) ☐ Jurnal Ilmiah Nasional Terakreditasi
☐ Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional	Nasional Terakreditasi	Nasional Tidak Terakreditasi	
	30	☐	☐	
a. Kelengkapan unsur isi jurnal (10%)	3,00			3,00
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00			9,00
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00			8,50
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	9,00			8,50
Total = (100%)	30,00			29,00
Nilai Pengusul = (40% x 29,00)/2 = 5,80				

Catatan Penilaian artikel oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi jurnal:

Unsur artikel ini lengkap dan sesuai dimulai dari judul artikel, abstrak, introduction, methods, result, discussion, conclusion, reference, dan acknowledgement.

2. Ruang lingkup dan kedalaman pembahasan:

Ruang lingkup pembahasan cukup mendalam dengan menggunakan pustaka yang mutakhir dalam pembahasan. Artikel ini juga membahas keterbaruan penelitian yang menghadirkan inovasi terapi baru yang dibahas sangat jelas dengan 45% pustaka yang mendukung.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Data dan metodologi yang dituliskan cukup dan mutakhir dengan diperkuat adanya pustaka disertai metode. Hasil penelitian dan keterangan di sajikan dengan kualitas yang baik dan pengantar yang sangat lengkap.

4. Kelengkapan unsur dan kualitas terbitan:

Journal ini diterbitkan secara bulanan, termasuk internasional jurnal terindex scopus Q2 dengan open access system. Jurnal ini menerbitkan penelitian dengan ruang lingkup farmasi, nanoteknologi, target penghantaran obat, kimia farmasi, farmakognosi, fitokimia, farmakologi dan bioteknologi. Penerbit jurnal ini adalah Open Science Publisher LLP, INDIA. Editor jurnal ini terdiri dari beberapa editor yang tersebar di asia. Secara umum penerbit jurnal ini cukup baik.

Semarang, Maret 2020
 Reviewer 2



Prof. Dr. Edy Meiyanto, M.Si., Apt.
 NIP. 196205021989031006
 Unit Kerja : Kimia Farmasi, F.Farmasi UGM



Document details

< Back to results | 1 of 23 Next >

↗ Export Download Print E-mail Save to PDF Add to List More... >

View at Publisher

Journal of Applied Pharmaceutical Science [Open Access](#)

Volume 10, Issue 2, 1 February 2020, Pages 1-6

Antiproliferative and apoptosis effect of hyptolide from hyptis pectinata (L.) poit on human breast cancer cells [\(Article\)](#) [\(Open Access\)](#)

Suzery, M.^a, Cahyono, B.^a, Amalina, N.D.^b

^aChemistry Department, Diponegoro University, Semarang, Indonesia

^bPharmacy Study Program, Chemistry Department, Semarang State University, Semarang, Indonesia

Abstract

View references (41)

Hyptolide was isolated from the leaves of *Hyptis pectinata* (L.) Poit and was studied in order to discover and develop an anticancer drug. Hyptolide was obtained as a crystal of 87°C-88°C melting point. Spectroscopic identification results show a wave number at 1,735 cm⁻¹ indicating the presence of α , β -unsaturated δ -lactone. Gas chromatography-mass spectrometry (GC-MS) analysis provides a single peak in the retention time of 11.701 by m/z value at 239, which indicates explicitly hyptolide. The objective of this research was to evaluate the hyptolide's mechanism of cytotoxic on MCF-7 human breast cancer cells in positive estrogen receptor. The assay test to 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) showed that hyptolide exhibited cytotoxic effects on MCF-7 and T47D breast cancer cells with an IC₅₀ value of 76.76 and 181.55 μ g/ml, respectively. Interestingly, the treatment of hyptolide for 24, 48, and 72 hours decreased cell viability on MCF-7 with dose-and time-dependent manner compared to untreated cells. Results of acridine orange-ethidium bromide multiple staining assay revealed that hyptolide induced apoptosis in a dosedependent manner. It can be concluded that hyptolide possesses antiproliferative effects through apoptosis induction. © 2020 Meiny Suzery et al.

Author keywords

Antiproliferative Apoptosis Cytotoxic *Hyptis pectinata* (L.) poit Hyptolide MCF-7 cells

Funding details

Funding text

We express our gratitude to Fundamental Research Grant Ministry of Research Technology and Higher Education, The Republic of Indonesia who funded this research.

ISSN: 22313354

Source Type: Journal

Original language: English

DOI: 10.7324/JAPS.2020.102001

Document Type: Article

Publisher: Open Science Publishers LLP Inc.

References (41)

View in search results format >

☐ All Export Print E-mail Save to PDF Create bibliography

Metrics View all metrics >



PlumX Metrics

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Set citation feed >

Related documents

Anti-leukaemia of fermented product of methanol extract *Hyptis pectinata* (L.) Poit leaf

Rejeki, D.S. , Aminin, A.L.N. , Suzery, M. (2019) *IOP Conference Series: Materials Science and Engineering*

Evaluation of the cytotoxicity on breast cancer cell of extracts and compounds isolated from *Hyptis pectinata* (L.) poit

Santana, F.R. , Luna-Dulcey, L. , Antunes, V.U. (2020) *Natural Product Research*

Preliminary Study of *Hyptis pectinata* (L.) Poit Extract Biotransformation by *Aspergillus niger*

Rejeki, D.S. , Aminin, A.L.N. , Suzery, M. (2018) *IOP Conference Series: Materials Science and Engineering*

View all related documents based on references

JAPS

Journal of Applied Pharmaceutical Science

An Official Publication of
Open Science Publishers



Abstracting and Indexing

Scopus, Chemical Abstracts, CAB abstracts, Hinari, Global Health, EBSCO Publishing's Electronic Databases, Summon by serial solutions, Abstracts on Hygiene and Communicable Diseases, Proquest, Tropical Diseases Bulletin, Open j-Gate, Google Scholar, Science Central, Ulrich's Periodicals Directory, Scimago Journal Ranking, AYUSH Research Portal, Geneva Foundation for Medical Education and Research, ABC Chemistry, Biblioteca, Necker, Academic Journals Database, InfoTrac Custom & Academic Onefile (Gale), Index Medicus for South-East Asia Region (IMSEAR), CNKI scholar.

This title
is indexed
in **SciVerse
Scopus**

Improving research
results through
analytical power



Archiving In



PORTICO

All the contents published in JAPS are archived in Portico, which provides permanent digital archiving for scholarly journals.



ISSN 2231-3354

Editor in Chief

Dr. Pinaki Sengupta

[Contact editor](#)

Journal of Applied Pharmaceutical Science (JAPS) is a monthly, international, open access, journal dedicated to various disciplines of pharmaceutical and allied sciences. JAPS publishes manuscripts (Original research and review articles Mini-reviews, Short communication) on original work, either experimental or theoretical in the following areas;

- Pharmaceutics & Biopharmaceutics
- Novel & Targeted Drug Delivery
- Nanotechnology & nanomedicine
- Pharmaceutical chemistry
- Pharmacognosy & Ethnobotany
- Phytochemistry
- Pharmacology & Toxicology
- Pharmaceutical Biotechnology & Microbiology
- Pharmacy practice & Hospital Pharmacy

[View all aims & scope](#)

ONLINE FIRST | [READ MORE](#)

CURRENT ISSUE | [APRIL, 2020](#)

PAST ISSUES | [READ MORE](#)

Journal Metrics

Source Normalized Impact per Paper (SNIP): 0.533

SCImago Journal Rank (SJR): 0.244

H-index: 24

CiteScore: 0.69

CiteScore Rank: 39/68

Search Articles

Author

Keyword(s)

search

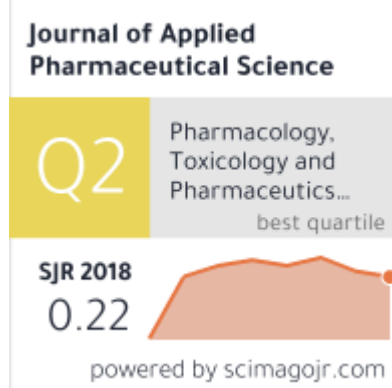
Announcements

- [JAPS is approved by UGC.](#)
- JAPS has implemented the CrossMark, a multi-publisher initiative from CrossRef, to provide a standard way for readers to locate the authoritative version of a document. [\[Read more\]](#)
- All the contents published in JAPS are archived in [Portico](#), which provides permanent digital archiving for scholarly journals.
- [COPE Guidelines for Peer Reviewers.](#)
- Dr. Pinaki Sengupta, has joined as new EIC from Feb, 2019.
- JAPS follows the ICMJE's [Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals.](#)
- Reviewers invited in the following subject areas; Pharmacy Practice, Pharmacology, Medicinal Chemistry.

Most viewed articles

1. Reductant-dependent None-Partial-Complete Degradation of Block Copolymer Disulfide Crosslinked Nanoassemblies
2. Development and Validation Method for Simultaneous Analysis of Retinoic Acid, Hydroquinone and Corticosteroid in Cream Formula by High-Performance Liquid Chromatography
3. Temperature and pH stimuli-responsive polymers and their applications in controlled and selfregulated drug delivery
4. Antioxidant and antimicrobial activity of flowers of *Wendlandia thyrsoidea*, *Olea dioica*, *Lagerstroemia speciosa* and *Bombax malabaricum*
5. Non-Cytotoxic Property and DNA Protective Activity against H₂O₂ and UVC of Thai GAC Fruit Extracts in Human TK6 Cells

[view all most viewed articles](#)



Follow us  



Subscribe to
Table of Contents Alerts



Editorial Board

Editor-in-Chief

Dr. Pinaki Sengupta

Department of Pharmaceutical Analysis,
National Institute of Pharmaceutical Education and Research - Ahmedabad
Gandhinagar, India. [[View Profile](#)]
Email: editor@japsonline.com

Associate Editor

Paras Sharma

BVM College of Pharmacy, Gwalior, India.

Advisory Board

Prof. B. G. Shivananda

Registrar, Karnataka State Pharmacy Council,
Bangalore (Karnataka), India.

Prof. Vinod Kumar Gupta

(Former Vice-Chancellor, Dr. Ram Manohar
Lohia Awadh University, Faizabad, India)
Distinguished Professor, King Abdulaziz University,
Jeddha, Saudi Arabia. [[View Profile](#)]

Prof. Shao Hong-Bo

Qingdao University of Science & Technology,
Qingdao, China.

Dr. Shamarez Ali Mohammed

Associate Director, DR.REDDY's Laboratories,
New Jersey, U.S.A.

Dr. Kirankumar Hullatti

KLE's Colleges of Pharmacy, Belgam, India.

Prof. Saber A. Sakr

Faculty of Science, Menoufia University, Egypt. [[View Profile](#)]

Dr. (Mrs.) Sarasija Suresh

National Institute of Pharmaceutical Education and Research,
SAS Nagar, India.

Editorial Board

Dr. Wenyi Kang

Director, National R & D Center for
Edible Fungus Processing Technology,
Henan University, Kaifeng, China. [[View Profile](#)]

Dr. Emad Mohamed Abdallah

Qassim University, Al-Rass,
Saudi Arabia. [[View Profile](#)]

Dr. Qingwen Zhang

University of Macau, Macau, China.

Dr. Oluwafemi Omoniyi Oguntibeju

Department of Biomedical Sciences,

Prof. Imran Ali

Department of Chemistry, Jamia Millia Islamia,
New Delhi, India. [[View Profile](#)]

Dr. K. Husnu Can Baser

Professor of Pharmacognosy,
Near East University, Faculty of Pharmacy,
Head of the Department of Pharmacognosy,
Lefkoşa (Nicosia) N. Cyprus. [[View Profile](#)]

Prof. K. L. Dhar

I.S.F. College of Pharmacy,
Moga, India.

Prof. (Dr) Mainul Haque

National Defense University of Malaysia,
Malaysia. [[View Profile](#)]

Prof. Deepak Bhagwat

School of Pharmacy, Maharaja Agrasen University, India.

Dr. Khalid Akhter Ansari

Research Scientist, Syngene International Ltd,
Bangalore, India. [[View Profile](#)]

Prof. A. N. Kalia

Director, Herbal Drug Research,
Department of Pharmacognosy,
ISF College of Pharmacy, Moga, India.

Dr. Mohd Nazir Khan

Department of Orthopaedics,
School of Medicine, Emory University,
57 Executive Park South, Atlanta, GA. [[View Profile](#)]

Dr. Subrata Shaw

Vanderbilt University School of Medicine,
Nashville, United States. [[View Profile](#)]

Dr. Radhesh Manduva

Scientist, Lloyd, Inc., Shenandoah, IA, USA.

Dr. Dinesh Kumar Mishra

Indore Institute of Pharmacy, Indore, India.

CURRENT ISSUE

April, 2020

ARCHIVES

[READ MORE](#)

Follow us  

Faculty of Health & Wellness Sciences,
Cape Peninsula University of Technology,
Bellville, [South Africa](#) [[View Profile](#)]

Dr. Teerapol Srichana

Prince of Songkla University, Songkla, [Thailand](#)
[[View Profile](#)]

Dr. Mrinmoy Saha

Laboratory of Bioorganic Chemistry,
NIDDK National Institute of Health, Bethesda, USA.
[[View Profile](#)]

Dr. Shalley N. Kudalkar

Associate Research Scientist, Yale University,
New Haven, CT, USA. [[View Profile](#)]

Dr. Bappaditya Chatterjee

Dept. of Pharmaceutical Technology,
International Islamic University, Malaysia.

Dr. Sanjay Bhivasan Patil

Shri Neminath Jain Brahmacharyashram's
Shriman Sureshdada Jain College of Pharmacy,
Chandwad, India.

Dr. Ajit Shankarrao Kulkarni

Sharadchandra Pawar College of Pharmacy, Junner, India.

Dr. Aysu YURDASIPER

Faculty of Pharmacy, Pharmaceutical Technology Department,
Ege University, Izmir, [Turkey](#).

Dr. Shazia Qasim Jamshed

Department of Pharmacy Practice,
Kulliyah of Pharmacy,
International Islamic University, Malaysia.

Dr. Shireesha Boyapati

Vaagdevi College of Pharmacy, Warangal, India.

Dr. A. M. Krupanidhi

Bapuji College of Pharmacy, Davangere, India.

Dr. S. S. Patil

Ashokrao Mane College of Pharmacy, Kolhapur, India.

Dr. Shantanu Bandyopadhyay

University Institute of Pharmaceutical Sciences
Panjab University, Chandigarh, India.

Dr. Subrahmanya Bhat K

Department of Chemistry, Manipal Institute of Technology,
Manipal Academy of Higher Education, Manipal, India.
[[View Profile](#)]

Dr. R. N. Gupta

Birla Institute of Technology
Mesra, India.

Dr. Jone Stanley

College of Veterinary Medicine & Biomedical Sciences,
Texas A&M University, Texas, USA. [[View Profile](#)]

Dr. Irini Nianiou Obeidat

Aristotle University of Thessaloniki
Thessaloniki, [Greece](#).

Dr. Deepak Kumar

Department of Pharmaceutical Chemistry,
Dolphin (PG) Institute of Biomedical & Natural Sciences,
Dehradun, India.

Dr. Mohammed Gulzar Ahmed

[[View Profile](#)]

Dr. J. R. Gadag

Karnatak University,
Dharwad, India.

Dr. Dipak S. Pisal

CDER, Food and Drug Administration,
Silver Spring, MD, USA.

Dr. Sonam Bhatia

Faculty of Health Science,
Sam Higginbottom University of Agriculture,
Technology and Sciences, Allahabad, India. [[View Profile](#)]

Dr. Manindra Mohan

Scientific Officer,
Uttarakhand Council for Biotechnology, Haldi, India.

Dr. Funda Arslanoglu

Ondokuz Mayis University, Kurupelit-Samsun, [Turkey](#).

Dr. Pawan Kumar Gupta

Department of Research and Development,
Lovely Professional University, Phagwara, India.

Dr. Sai Prachetan Balguri

ORISE Fellow at U.S. FDA CDER/OPQ/OTR,
New Hampshire Avenue Silver spring, MD, USA.

Dr. Sureshbabu Nagarajan

Louisiana State University,
Woodrow Street Shreveport, LA.

Dr. Nipapan Malisorn

Thammasat University, Pathumthani, Thailand.

Dr. Sanjoy Kumar Das

Institute of Pharmacy, Jalpaiguri, India. [[View Profile](#)]

Dr. Dhrubo Jyoti Sen

Shri Sarvajani Pharmacy College, Mehsana, India.
[[View Profile](#)]

Dr. Rama Krishna Raparla

Vaageswari Institute of Pharmaceutical Sciences
Karimnagar, India.

Prof. Shinde Anilkumar J.

Bharati Vidyapeeth, College of Pharmacy
Kolhapur, India.

Dr. Elvis Adrian Fredrick Martis

Bombay College of Pharmacy,
Kalina, [Mumbai](#). [[View Profile](#)]

Dr. Chakraborty. G.S.

Noida Institute of Engineering and Technology
Greater Noida, India.

Dr. Qian Zhong

Koch Institute of Integrative Cancer Research,
Massachusetts Institute of Technology, Cambridge, MA.

Dr. Emad Shalaby

Cairo University,
Cairo, Egypt. [[View Profile](#)]

Dr. A. Lakshmana Rao

Sri Adichunchanagiri College of Pharmacy,
Mandya, India.

Dr. Vivek R. Yadav

Oklahoma University Health Science Center,
Oklahoma, USA.

Dr. Tanveer Ahmed Khan

Department of Pharmacology,
Rashid Latif College of Pharmacy, Lahore, **Pakistan.**

Dr. Gurinder Singh

Department of Pharmaceutics,
Al-Ameen College of Pharmacy, Bangalore, India.

Dr. Devala Rao Garikapati

K.V.S.R. Siddhartha College of Pharmaceutical Sciences,
Vijayawada, India.

Dr. Anoja Priyadarshani Attanayake

Department of Biochemistry,
Faculty of Medicine,
University of Ruhuna, **Sri Lanka.**

Dr. Abdulhadi ALJAWISH

Polytech Lille, Institut Charles Viollette,
Université de Lille1, **France.** [[View Profile](#)]

Dr. Amit D. Kandhare

Manager, Scientific Affairs, Indus Biotech, Pune, India.
[[View Profile](#)]

Dr. Mustafa Uyanoglu

Eskisehir Osmangazi University,
Eskisehir, Turkey.

V.V. Institute of Pharmaceutical Sciences
Gudlavalleru, India.

Dr. Vinay Pandit

Faculty of Pharmacy, Al-Ameen College of Pharmacy,
Bangalore (Karnataka), India.

Dr. Narendar Dudhipala

Department of Pharmaceutics and Drug Delivery,
School of Pharmacy, University of Mississippi, USA.
[[View Profile](#)]

Dr. Pallavi Anand Bafna

Rayat Institute of Pharmacy
Nawanshahar, India

Dr. Pranav Kumar Prabhakar

Lovely Faculty of Applied Medical sciences,
Lovely Professional University, Phagwara, Punjab, India.

Dr. Mrs. Karimunnisa S. Shaikh

Modern College of Pharmacy, Nigdi, Pune, India.
[[View Profile](#)]

Dr. Muhammad Akram

Hamdard University, Karachi, **Pakistan**

Dr. Thirumal Kumar D

Department of Integrative Biology,
School of Biosciences and Technology,
VIT, Vellore, India. [[View Profile](#)]

Dr. Kondawar M. S.

Appasaheb Birnale College of Pharmacy
Sangli, India.

Note: All the above-mentioned editors and editorial board members are serving in their personal capacity and does not represent their affiliating institutions.

Past Issue

Volume: 10, Issue: 2, February, 2020



Rss Feed

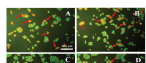
CURRENT ISSUE

April, 2020

ARCHIVES

[READ MORE](#)

Follow us  



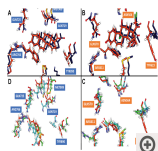
Research Article: Antiproliferative and apoptosis effect of hyptolide from *Hyptis pectinata* (L.) Poit on human breast cancer cells

Meiny Suzery, Bambang Cahyono, Nur Dina Amalina

DOI: [10.7324/JAPS.2020.102001](#) Pages: 001-006



[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)

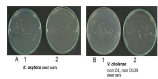


Research Article: Computational study of the potential molecular target for antibreast cancer activity of limonoid derivatives from *chisocheon* sp

Nurlelarsi Nurlelarsi, Ade Rizqi Ridwan Firdaus, Desi Harneti, Nenden Indrayati, Umi Baroroh, Muhammad Yusuf

DOI: [10.7324/JAPS.2020.102002](#) Pages: 007-012

[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)



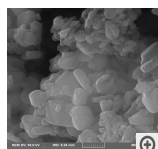
Research Article: Brucyclin, a novel antimicrobial peptide structurally designed from the antibacterial plant peptide, Brucin

Thakorn Sornwatana, Nuanchawee Wetprasit, Somchoke Traewachiwiphak, Thanawat Phongsak, Sittiruk Roytrakul

DOI: [10.7324/JAPS.2020.102003](#) Pages: 013-020



[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)

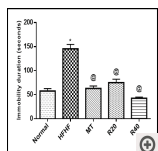


Research Article: Optimum synthesis of CuO nanoparticles with the highest antifungal activity against oral pathogen *Candida albicans*

Mohammad Moslem Imani, Mohsen Safaei, Hedayat Moradpoor, Razieh Rezaei, Amin Golshah, Farzad Rezaei, Ladan Jamshidy

DOI: [10.7324/JAPS.2020.102004](#) Pages: 021-025

[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)



Research Article: Correlation between brain neurotransmitters and insulin sensitivity: Neuro-preservative role of resveratrol against high fat, high fructose-induced insulin resistance

Rania F. Ahmed, Sally A. El Awdan, Gehad A. Abdel Jaleel, Dalia O. Saleh, Omar A.H. Ahmed Farid

DOI: [10.7324/JAPS.2020.102005](#) Pages: 026-036

[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)



Research Article: Antimicrobial evaluation and molecular properties prediction of pyrazolines incorporating benzofuran and pyrazole moieties

Mervat A. Elsherif, Ashraf S. Hassan, Gaber O. Moustafa, Hassan M. Awad, Nesrin M. Morsy

DOI: [10.7324/JAPS.2020.102006](#) Pages: 037-043



[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)

Research Article: Safety evaluation of polysaccharides isolated from the water extract of *Argemone mexicana* L. (Papaveraceae) in *Drosophila melanogaster*

Adama Denou, Abubakar Ahmed, Dalen Gwatau Dafam, Sunshine Ogwu Ochala, Simeon Omale, Kari Tvete Inngjerdengen, Rokia Sanogo, Drissa Diallo, Berit Smestad Paulsen, John C. Aguiyi

Research Article: Pharmacokinetic drug–drug interaction study between clindamycin and cyclosporin in rabbits

Issam Mohammed Abushammala, Lama Attef El Gussein, Badea Elzaman Zomlot, Kamal Fakher Abushammalleh, Mohammed Mahmoud Taha, Mohammed Yousef Miqdad

 DOI: [10.7324/JAPS.2020.102016](https://doi.org/10.7324/JAPS.2020.102016) Pages: 108-111

[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)

Research Article: *Mikania cordata* leaves extract promotes activity against pathogenic bacteria and anticancer activity in EAC cell-bearing swiss albino mice

Md. Mashiar Rahman, Md. Masnoon Kabir, Md. Abdullah AL Noman, Md. Rakibul Islam, Biplab Kumar Dash1, Shahina Akhter, Mohammad Jashim Uddin, Atiqur Rahman

 DOI: [10.7324/JAPS.2020.102017](https://doi.org/10.7324/JAPS.2020.102017) Pages: 112-122

[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)

Short Communication: Identification and antimicrobial activities of *Streptomyces*, *Micromonospora*, and *Kitasatospora* strains from rhizosphere soils

Kingchan Malisorn, Sunantana Embaen, Apinya Sribun, Patcharin Saeng-in, Wongsakorn Phongsopitanun, Somboon Tanasupawat

 DOI: [10.7324/JAPS.2020.102018](https://doi.org/10.7324/JAPS.2020.102018) Pages: 123-128

[\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)

Review Article: Recent advancements in Uracil and 5-Fluorouracil hybrids as potential anticancer agents: A review

Mohit Sanduja, Jyoti Gupta, Tarun Virmani

DOI: [10.7324/JAPS.2020.102019](https://doi.org/10.7324/JAPS.2020.102019) Pages: 129-146

 [\[Abstract\]](#) [\[Full Text HTML\]](#) [\[Full Text PDF\]](#) [\[XML: Abstract + References\]](#)

Antiproliferative and apoptosis effect of hyptolide from *Hyptis pectinata* (L.) Poit on human breast cancer cells

Meiny Suzery^{1*}, Bambang Cahyono¹, Nur Dina Amalina²

¹Chemistry Department, Faculty of Sciences and Mathematics, Diponegoro University, Semarang, Indonesia

²Pharmacy Study Program, Chemistry Department, Faculty of Mathematics and Natural Sciences, Semarang State University, Semarang, Indonesia.

ARTICLE INFO

Received on: 26/09/2019
Accepted on: 24/12/2019
Available online: 05/02/2020

Key words:

Hyptis pectinata (L.)
Poit, hyptolide, cytotoxic,
apoptosis, antiproliferative,
MCF-7 cells.

ABSTRACT

Hyptolide was isolated from the leaves of *Hyptis pectinata* (L.) Poit and was studied in order to discover and develop an anticancer drug. Hyptolide was obtained as a crystal of 87°C–88°C melting point. Spectroscopic identification results show a wave number at 1,735 cm⁻¹ indicating the presence of α,β -unsaturated δ -lactone. Gas chromatography-mass spectrometry (GC-MS) analysis provides a single peak in the retention time of 11.701 by m/z value at 239, which indicates explicitly hyptolide. The objective of this research was to evaluate the hyptolide's mechanism of cytotoxic on MCF-7 human breast cancer cells in positive estrogen receptor. The assay test to 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) showed that hyptolide exhibited cytotoxic effects on MCF-7 and T47D breast cancer cells with an IC₅₀ value of 76.76 and 181.55 μ g/ml, respectively. Interestingly, the treatment of hyptolide for 24, 48, and 72 hours decreased cell viability on MCF-7 with dose- and time-dependent manner compared to untreated cells. Results of acridine orange-ethidium bromide multiple staining assay revealed that hyptolide induced apoptosis in a dose-dependent manner. It can be concluded that hyptolide possesses antiproliferative effects through apoptosis induction.

INTRODUCTION

Breast cancer frequently occurs among women, impacting 2.1 million women each year. It also causes the highest number of women with cancer-related death (Sasco, 2003; WHO, 2018). Breast cancer is the most common cancer in Indonesia and is a leading cause of mortality, where 21.5 deaths in every 100,000 persons are caused by breast cancer (Mardela *et al.*, 2017; Sinaga *et al.*, 2018). The most effective treatments for breast cancer are chemotherapy, radiation therapy, and surgery or in special cases, they used in combination (Takimoto and Calvo, 2005). Unfortunately, long-term effects of these cancer treatments have several side effects such as anemia, appetite loss, fatigue, alopecia, toxicity, and drug resistance (Kayl and Meyers, 2006; Tacar *et al.*, 2013). Over the past 30 years, the estrogen receptor (ER) has been the most critical target and implicated to breast cancer

progression (Ariazi and Jordan, 2006; Paruthiyil *et al.*, 2004; Roy and Vadlamudi, 2012). Blocking the action of estrogen has been shown to reduce breast cancer proliferation and incidence in high-risk women by 50%–75% (Lewis-Wambi and Jordan, 2009; Tian *et al.*, 2018). The previous study also found that estrogen administration causes breast cancer while antiestrogen prevents it (Hollingsworth *et al.*, 1998; Jenie *et al.*, 2019). Those findings provide compelling evidence that estrogen and ER have a significant role in the progression of breast cancer. Therefore, based on this reason, the development of new cytotoxic activity in a natural product is significantly crucial for the discovery of safer and more effective chemotherapy agent on ER-positive breast cancer.

One of the herbal plants *Hyptis pectinata* (L.) Poit – popularly known in Brazil as “sambacaita” or “canundiho” (Franzotti *et al.*, 2001) – belongs to one of the family lamiaceae and easily found in another tropical as America, Africa, India, and Indonesia. *Hyptis pectinata* (L.) Poit has been proven to have several kinds of effects, such as antinociceptive, antiedematogenic, analgesic, anti-inflammatory, and anticancer (Arrigoni-blank *et al.*, 2008; Lisboa *et al.*, 2006; Raymundo *et al.*, 2011). The

*Corresponding Author

Meiny Suzery, Chemistry Department, Faculty of Sciences and Mathematics, Diponegoro University, Semarang, Indonesia.
E-mail: meiny_suzery@yahoo.com

Brucyclin, a novel antimicrobial peptide structurally designed from the antibacterial plant peptide, Brucin

Thakorn Sornwatana^{1*}, Nuanchawee Wetprasit², Somchoke Traewachiwiphak¹, Thanawat Phongsak³, Sittiruk Roytrakul⁴

¹Department of Biochemistry, Faculty of Science, Mahidol University, Bangkok, Thailand.

²Department of Biotechnology, Faculty of Science, Ramkhamhaeng University, Bangkok, Thailand.

³Program of Chemistry, Faculty of Science and Technology, Thepsatri Rajabhat University, Lopburi, Thailand.

⁴National Center for Genetic Engineering and Biotechnology, National Science and Technology Development Agency (NSTDA), Pathum Thani, Thailand.

ARTICLE INFO

Received on: 25/06/2019

Accepted on: 14/11/2019

Available online: 05/02/2020

Key words:

Antibacterial activity,
antimicrobial peptide, Brucin,
Brucyclin, cyclic peptide.

ABSTRACT

A novel antimicrobial cyclic peptide, Brucyclin, was rationally designed from the original antibacterial plant peptide, Brucin. The chemically synthesized Brucyclin consists of amino acid sequence; (NH₂-Gln-His-Thr-Leu-Cys-Met-Cys-Gly-Gly-Ala-Thr-Trp-COOH), with a molecular mass of *m/z* 1290. In the antimicrobial assay with 31 strains of pathogenic microorganisms, the peptide exhibited the most antimicrobial activity with a minimum inhibitory concentration (MIC) values ranging from 50 to 100 µg/ml against two strains of Gram-negative bacteria (*Vibrio cholera* non O1, non O139 and *Klebsiella oxytoca*), one strain of Gram-positive bacterium (*Bacillus subtilis*), and one strain of yeast (*Candida albicans*), respectively. Structural analysis of Brucyclin indicated that it has a neutral charge with a hydrophobicity ratio of 50% and pI value of 6.72, respectively. The results from this study suggested that the Brucyclin is a new antibiotic peptide that might be an alternative potent drug for treatment of various infectious diseases caused by pathogenic microorganisms.

INTRODUCTION

In the modern medical treatments, the infectious diseases caused by the microbial pathogens can be cured with a wide variety of antibiotics. However, a rapid increase of bacterial strains with the capability of antibiotics resistance widespread both in the clinical and veterinary medicine has triggered worldwide efforts in developing new alternative compounds to deal with such the problem (Aslam *et al.*, 2018). *Vibrio cholerae*, the Gram-negative bacteria, is an important human pathogen causing the diarrhea disease (Jers *et al.*, 2018) and can be isolated from a variety area of extra-intestinal infections (e.g., fresh wound, ear, sputum, urine, and cerebrospinal fluid) (Morris and Black, 1985). *Klebsiella* spp., the non-motile Gram-negative bacteria, was reported as one of the major bacterial groups which can be found in the nosocomial

infection in Thailand (Danchaivijitr *et al.*, 2007). Either the infection with the well-known Gram-positive bacterium *Bacillus subtilis* or yeast strain *Candida albicans* can cause the septicemia in an immunocompromised individual leading to the end-organ damage and finally the death within a few days (Lei *et al.*, 2019). Generally, the treatment of these infections relies on penicillin antibiotics (Zwart *et al.*, 2000). Even the successfulness in bactericidal property, the side effects of penicillin causing allergic symptoms in some patients need to be concerned. In order to avoid such effects, macrolide antibiotics are alternatively selected to treat the patients instead; however, the problem has arisen with the case of increasing of macrolide-resistant bacterial strains which minimizes drug's efficiency (Fair and Tor, 2014).

To establish an alternative compound to be used in common, antimicrobial peptides (AMPs) have been interested since 1980s due to their potential as the novel antibiotic compounds. With broad-spectrum, antimicrobial activity and specificity in bacteria over eukaryotic cells or patients, it makes them as the attractive candidates for novel drug compounds. AMPs are typically rich in hydrophobic residues, including leucine, isoleucine, valine, phenylalanine, and tryptophan, and their net positive charge

*Corresponding Author

Thakorn Sornwatana, Department of Biochemistry, Faculty of Science,
Mahidol University, Bangkok, Thailand.
E-mail: thakorn.sor@mahidol.ac.th

Optimum synthesis of CuO nanoparticles with the highest antifungal activity against oral pathogen *Candida albicans*

Mohammad Moslem Imani¹, Mohsen Safaei^{2*}, Hedaiat Moradpoor³, Razieh Rezaei^{2,4}, Amin Golshah¹, Farzad Rezaei⁵, Ladan Jamshidy³

¹Department of Orthodontics, School of Dentistry, Kermanshah University of Medical Sciences, Kermanshah, Iran.

²Advanced Dental Sciences Research Laboratory, School of Dentistry, Kermanshah University of Medical Sciences, Kermanshah, Iran.

³Department of Prosthodontics, School of Dentistry, Kermanshah University of Medical Sciences, Kermanshah, Iran.

⁴Medical Biology Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran.

⁵Department of Oral and Maxillofacial Surgery, School of Dentistry, Kermanshah University of Medical Sciences, Kermanshah, Iran.

ARTICLE INFO

Received on: 08/02/2019

Accepted on: 26/11/2019

Available online: 05/02/2020

Key words:

Antifungal activity, CuO nanoparticles, oral pathogen, *Candida albicans*, Taguchi method, biomedical application.

ABSTRACT

This research was aimed to optimize the synthesis of copper oxide (CuO) nanoparticles with the highest antifungal properties against *Candida albicans* as an oral fungal pathogen. To this end, nine experiments involving different synthesis conditions were designed using the Taguchi method and the copper oxide nanoparticles synthesized by coprecipitation method. The antifungal activity of synthesized nanoparticles against *C. albicans* was evaluated using the colony forming unit and disk diffusion methods. According to the results, the synthesized copper oxide nanoparticles under the five experimental conditions (CuCl₂ 0.1 M, NaOH 0.1 M, and a 75 minutes stirring time) showed the highest antifungal activity against *C. albicans* (71.72%). The optimization results demonstrated that all three studied factors were effective in improving the antifungal activity of copper oxide nanoparticles and the antifungal activity in the proposed conditions can be improved by 77.85%. The synthesis of nanoparticles in optimal conditions confirmed the improved antifungal activity of the nanoparticles. The results of this study proved that CuO nanoparticles have a potential ability as an antifungal agent against oral fungal pathogens of *C. albicans*.

INTRODUCTION

Tremendous progress has been achieved in the treatment of diseases over the recent decades. However, we still struggle with challenges in the treatment of certain diseases such as cancers (Mozaffari *et al.*, 2016; 2017), chronic pains (Sharifi *et al.*, 2017), autoimmune diseases (Mozaffari *et al.*, 2018), and microbial infections (Safaei and Taran, 2017a). It is believed that the microbial pathogens found in the oral cavity, which produce biofilms, are the main cause of dental caries and the destruction of enamel (Struzycka, 2014). The uncontrolled increase in the amount of oral microbial agents' results in the penetration into the dentin

and tooth pulp infection, causing severe pain, tooth pulp necrosis, loss of teeth, and systemic infections (Cura *et al.*, 2012; Farges *et al.*, 2015). Untreated dental caries is seen as a major global challenge in many countries (Frencken *et al.*, 2017). Dental caries is considered as the fourth chronic disease with costly treatment according to the World Health Organization, which can cause severe pain and oral infections if it is left untreated (Petersen *et al.*, 2005). Many dental caries cases are not treated in many developing countries and a large number of people in the community suffer from their complications. Untreated dental caries can make changes in the body's health status, quality of life, patterns of growth, and the performance of individuals (Fallahi *et al.*, 2014).

Given the priority of prevention to treatment, making efforts to identify and generalize the dental caries prevention methods seems necessary. The use of antimicrobial mouthwashes is one of the most important ways to prevent caries, which can be effective in controlling tooth decay. Commercial antiplaque compounds cause a change in the bacterial flora of the mouth

*Corresponding Author

Mohsen Safaei, Advanced Dental Sciences Research Laboratory, School of Dentistry, Kermanshah University of Medical Sciences, Kermanshah, Iran.
E-mail: mohsen_safaei@yahoo.com

Safety evaluation of polysaccharides isolated from the water extract of *Argemone mexicana* L. (Papaveraceae) in *Drosophila melanogaster*

Adama Denou^{1,2,3,*}, Abubakar Ahmed^{1,4}, Dalen Gwatau Dafam¹, Sunshine Ogbu Ochala², Simeon Omale², Kari Tvete Inngjerdingen⁵, Rokia Sanogo³, Drissa Diallo³, Berit Smestad Paulsen⁵, John C. Aguiyi²

¹Department of Pharmacognosy and Traditional Medicine, Faculty of Pharmaceutical Sciences, University of Jos, Jos, **Nigeria**.

²Africa Centre of Excellence in Phytomedicine Research and Development (ACEPRD), University of Jos, Jos, Nigeria.

³Département des Sciences Pharmaceutiques, Faculté de Pharmacie, Université des Sciences, des Techniques et des Technologies de Bamako, Bamako, Mali.

⁴Department of Pharmacognosy and Drug Development, Faculty of Pharmaceutical Sciences, Ahmadu Bello University, Samaru Zaria, Nigeria.

⁵Department of Pharmacy, Section Pharmaceutical Chemistry, University of Oslo, Oslo, Norway.

ARTICLE INFO

Received on: 01/07/2019

Accepted on: 12/11/2019

Available online: 05/02/2020

Key words:

Polysaccharides, safety, *Argemone mexicana*, aerial parts, *Drosophila melanogaster*.

ABSTRACT

Recently, the plant polysaccharides have attracted attention due to their important bioactivities. The literature has shown several pharmacological activities of *Argemone mexicana* extracts and its components but very few data on its polysaccharides. The current study aimed to evaluate the safety of polysaccharides from *A. mexicana*. Five polysaccharides [High molecular weight (polysaccharide fraction) of the water extract from *Argemone mexicana* 1 (HMAm1), HMAm2, HMAm3, HMAmA1, and HMAmA2] were fractionated from *A. mexicana* aerial parts by using accelerated solvent extractor procedure followed by ion exchange chromatography of the water decoction extract. The safety assay was carried out using *Drosophila melanogaster* exposed to the polysaccharides at 12.5 and 25 µg/ml for 72 hours against a negative control (1% DMSO). After the exposure period, the survival rate and the locomotor capacity of flies were determined. At the end of 72 hours of treatment, all polysaccharide fractions at both doses presented a survival percent of more than 94%. In addition, these polysaccharide fractions affected very little the locomotor performance of the flies. At both doses, HMAm2 presented the highest safety for the flies, while HMAm3 was the least. These findings revealed that polysaccharides from *A. mexicana* are nontoxic.

INTRODUCTION

Polysaccharides are polymers which are present in several organisms, including tissues of seeds, stems, and leaves of herbal plants, body fluids of animals, shells of crustaceans

and insects, cell walls, and extra cellular fluids of bacteria, yeast, and fungi (Singh *et al.*, 2012). Scientists give a huge attention to polysaccharides from the medicinal plants due to their significant bioactivities, such as anti-tumor, antioxidant, anticoagulant, antidiabetic, radioprotection, anti-viral, hypolipidemic, and immunomodulatory activities. No side effects reported yet for plant polysaccharides (Xie *et al.*, 2016). There is a need to perform further investigations on these polymers.

Argemone mexicana, an annual herb belonging to family Papaveraceae, is commonly found in tropical and subtropical regions of the world (Husna and Reddy, 2017). Native of tropical America, this species is known as Mexican poppy or Mexican prickly poppy (Sharanappa and Vidyasagar, 2014). It is a prickly and annual herb with 1.2 m in high. In Mali, the plant is locally known in Bamanan as “Bozobo” or “Nienidjeni”. In Northern

*Corresponding Author

Adama Denou, Department of Pharmacognosy and Traditional Medicine, Faculty of Pharmaceutical Sciences, University of Jos, Jos, Nigeria;

Africa Centre of Excellence in Phytomedicine Research and Development (ACEPRD), University of Jos, Jos, Nigeria;

Département des Sciences Pharmaceutiques, Faculté de Pharmacie, Université des Sciences, des Techniques et des Technologies de Bamako, Bamako, Mali.

E-mail: denouadamab @ gmail.com