

## Holy Cross College (Autonomous)

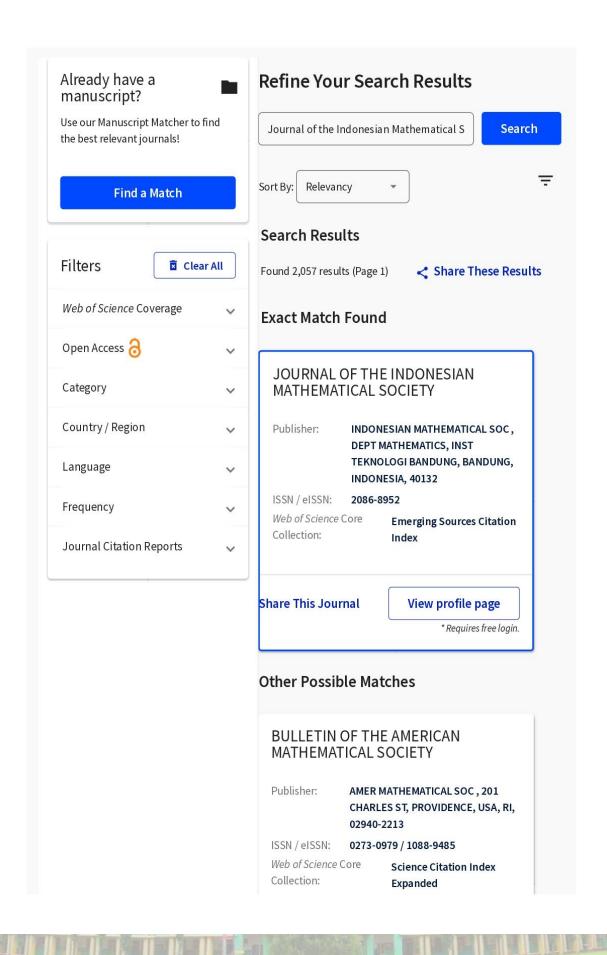
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SSR 2019-2020 to 2023-2024

3.4.6 Bibliometrics of the publications during the last five years based on Scopus/Web of Science - h-index of the Institution

Scopus Preview			Q	=
Source details				
Journal of the Indonesian Mather Scopus coverage years: from 2019 to Present	natical Society	CiteScore 2022 <b>0.8</b>		0
Publisher: The Indonesian Mathematical Society ISSN: 2086-8952 E-ISSN: 2460-0245 Subject area: (Mathematics: General Mathematics)		SJR 2022 <b>0.231</b>		0
Source type: Journal  SNIP 2022  View all documents > Set document alert  Source Homepage  0.539				0
i Improved CiteScore methodology CiteScore 2022 counts the citations received in 2019-	-2022 to articles, reviews, conference papers, book chapters and data he number of publications published in 2019-2022. Learn more >			×
CiteScore 2022 ~  0.8 = 81 Citations 2019 - 2022  Colculated on 05 May, 2023  CiteScore rank 2022 ①	O.6 = 63 Citations to date  97 Documents to date  Last updated on 08 November, 2023 - Updated monthly			
Category Rank Percentile				
Mathematics #300/387 22nd Mathematics				
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#### Journal of the Indonesian Mathematical Society (JIMS):

Journal of the Indonesian Mathematical Society (JIMS) is a publication of the Indonesian Mathematical Society (IndoMS). It publishes original res contributions of broad interest on hot topics, from distinguished mathematicians from across the world. The Journal provides a platform for present research in most areas of mathematics.



#### Journal Description

Journal title : Journal of The Indonesian

Mathematical Society

Initials: JIMS

Abbreviation: J. Indones. Math. Soc.

Frequency: 3 issues per year (March, July, and

November)

DOI prefix: 10.22342 (https://search.crossref.org

/?q=2086-8952) byscrosset

ISSN: 2086-8952 (http://u.lipi.go.id/1274193789) (p)

[ 2460-0245 (http://u.lipi.go.id/1432110804) (e)

Editor-in-chief : Indah Emilia Wijayanti

(https://www.scopus.com/authid /detail.uri?authorld=16053675900)

Executive Editor : Fajar Adi Kusumo

(https://www.scopus.com/authid

/detail.uri?authorld=24480624100)

Managing Editor : Hazrul

(https://www.scopus.com/authid

/detail.uri?authorld=57050754900)

Journal Rank : CiteScore (https://www.scopus.com

/sourceid/21101064980) - Q4 (General

Mathematics) & JCI (https://mjl.clarivate.com

/search-results?issn=2086-8952&

hide\_exact\_match\_fl=true&utm\_source=mjl&

utm\_medium=share-by-link&utm\_campaign=journal-

profile-share-this-journal) - Q4 (Mathematics)

Publishing Model : Open Access, Author(s) Pay

(http://jims-a.org/index.php/jimsa/apc)

Publisher: The Indonesian Mathematical Society

(https://indoms.id/en/home/)



(http://sinta2.ristekdikti.go.id/journals/detail?id=3739)

(https://www.scopus.com/sourceid

/21101064980?origin=resultslist) Clarivate (http://mil.clarivate.com

/cgi-bin/jmlst/jfresults.cg/?PC=MASTER&ISSN=2086-8952) ZDMATH =

(https://zbmath.org/journals/?s=0&q=journal+of+the+indones)



(https://scholar.google.co.id/citations?hl=id&btnA=1&

authorid=15123057491121882332&authuser=2&user=1xyTLLUAAAAJ)

(https://jims-a.org/index.php/jimsa /about/submissions)

### Article Template



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- Open Access Policy (https://jims-a.org/index.php /jimsa/OAP)
- Editorial Team (https://jims-a.org/index.php /jimsa/about/editorialTeam)

J. Indones. Math. Soc. Vol. 28, No. 01 (2022), pp. 1–7.

### k-PRODUCT CORDIAL BEHAVIOUR OF UNION OF GRAPHS

K. Jeya Daisy<sup>1</sup>, R. Santrin Sabibha<sup>2</sup>, P. Jeyanthi<sup>3</sup>, and Maged Z. Youssef<sup>4,5</sup>

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<sup>2</sup>Manonmaniam Sundaranar University, Tirunelveli, Tamilnadu, India, sanithazhi@gmail.com

<sup>3</sup> Research Centre, Department of Mathematics, Govindammal Aditanar College for Women, Tiruchendur 628215, Tamilnadu, India, jeyajeyanthi@rediffmail.com

<sup>4</sup>Department of Mathematics, Ain Shams University, Abbassia, Cairo, Egypt <sup>5</sup>Department of Mathematics and Statistics, College of Science, Imam Mohammad Ibn Saud Islamic University, Riyadh 11623, Saudi Arabia, mzyoussef11566@yahoo.com

**Abstract.** Let f be a map from V(G) to  $\{0,1,...,k-1\}$  where k is an integer,  $1 \le k \le |V(G)|$ . For each edge uv assign the label  $f(u)f(v)(mod\ k)$ . f is called a k-product cordial labeling if  $\big|v_f(i)-v_f(j)\big|\le 1$ , and  $\big|e_f(i)-e_f(j)\big|\le 1$ ,  $i,j\in\{0,1,...,k-1\}$ , where  $v_f(x)$  and  $e_f(x)$  denote the number of vertices and edges respectively labeled with x (x=0,1,...,k-1). In this paper, we investigate the k-product cordial behaviour of union of graphs.

 $Key\ words\ and\ Phrases$ : cordial labeling, product cordial labeling, k-product cordial labeling

#### 1. INTRODUCTION

While studying graph theory, one that has gained a lot of popularity during the last 60 years is the concept of labelings of graphs due to its wide range of applications. Labeling is a function that allocates the elements of a graph to real numbers, usually positive integers. In 1967, Rosa [10] published a pioneering paper on graph labeling problems. Thereafter, many types of graph labeling techniques have been studied by several authors. Gallian [2] in his survey beautifully classified them into graceful labeling and harmonious labelings, variations of graceful

2020 Mathematics Subject Classification: 05C78 Received: 07-07-2021, accepted: 05-03-2022.



### Q

## Source details

### South East Asian Journal of Mathematics and Mathematical Sciences

CiteScore 2022

0.2

SJR 2022

0.133

SNIP 2022

0.152

Scopus coverage years: from 2019 to Present

Publisher: Ramanujan Society of Mathematics and Mathematical Sciences

ISSN: 0972-7752 E-ISSN: 2582-0850
Subject area: (Mathematics: Algebra and Number Theory) (Mathematics: Applied Mathematics) (Mathematics: Analysis)

(Mathematics: Algebra and Number Theory) (Mathematics: Applied Mathematics) (Mathematics: Analysis

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i Improved CiteScore methodology

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O.2 = 64 Citations 2019 - 2022

340 Documents 2019 - 2022

Calculated on 05 May, 2023

CiteScoreTracker 2023 ①

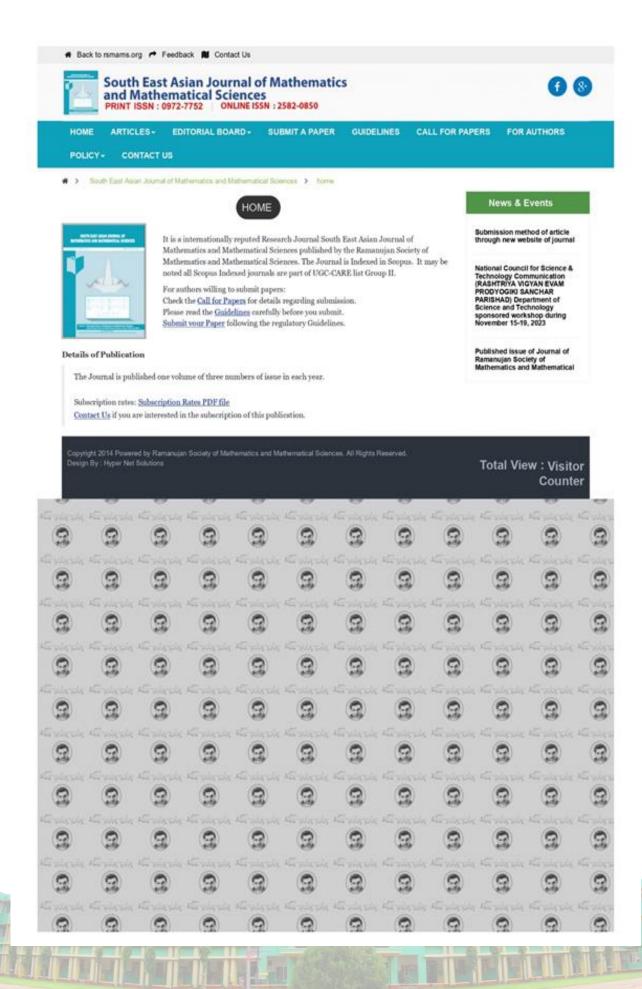
0.3 = 112 Citations to date
365 Documents to date

Last updated on 08 November, 2023 • Updated monthly

#### CiteScore rank 2022 ①

Category	Rank Percentile	
Mathematics  Algebra and Number Theory	#114/117	2nd
Mathematics Applied Mathematics	#597/609	2nd
Mathematics	#184/187	lst





South East Asian J. of Mathematics and Mathematical Sciences Vol. 18, No. 1 (2022), pp. 397-408

ISSN (Online): 2582-0850

ISSN (Print): 0972-7752

### THE CHROMATIC DETOUR NUMBER OF A GRAPH

### R. Suganya and V. Sujin Flower

Department of Mathematics, Holy Cross College (Autonomous), Nagercoil - 629004, Tamil Nadu, INDIA

E-mail: suganya.maths34@gmail.com, sujinflower@gmail.com

(Received: May 18, 2021 Accepted: Apr. 14, 2022 Published: Apr. 30, 2022)

Keywords and Phrases: Chromatic detour number, chromatic number, detour number.

2020 Mathematics Subject Classification: 05C12, 05C15.

#### 1. Introduction

Throughout this paper all graphs are simple. Let G = (V, E) be a graph with V(G) is the vertex set of G and E(G) is the edge set of G. For basic graph theoretic terminology, we refer to [2]. In a connected graph G, for any two vertices  $u, v \in V(G)$ , let  $d_G(u, v)$  denote the length of the shortest path between u and v in G. The diameter of graph is the maximum distance between the pair of vertices of G. The subgraph induced by a set S of vertices of a graph G is denoted by G[S] with V(G[S]) = S and  $E(G[S]) = \{uv \in E(G) : u, v \in S\}$ . A set  $S \subset V$  is called



## Journal of the Indonesian Mathematical Society

CiteScore 2022 8.0

0

0

Scopus coverage years: from 2019 to Present

Publisher: The Indonesian Mathematical Society

ISSN: 2086-8952 E-ISSN: 2460-0245 Subject area: (Mathematics: General Mathematics) SJR 2022

0.231

Source type: Journal

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SNIP 2022 0.539

CiteScore

CiteScore rank & trend

Scopus content coverage

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CiteScore 2022 counts the citations received in 2019-2022 to articles, reviews, conference papers, book chapters and data papers published in 2019-2022, and divides this by the number of publications published in 2019-2022. Learn more >

CiteScore 2022

81 Citations 2019 - 2022

100 Documents 2019 - 2022

Calculated on 05 May, 2023

CiteScoreTracker 2023 ①

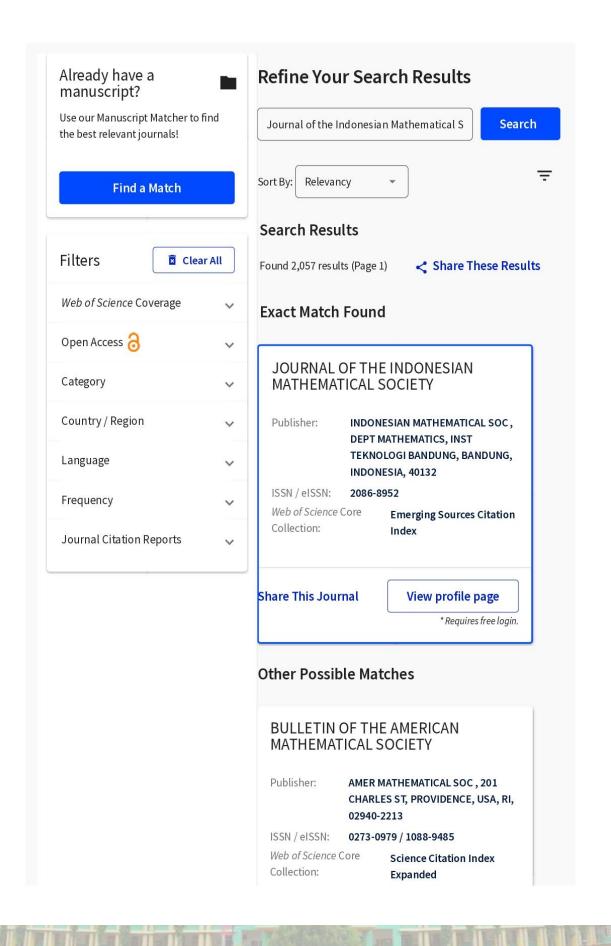
63 Citations to date 97 Documents to date

Last updated on 08 November, 2023 - Updated monthly

### CiteScore rank 2022 ①

Category	Rank	Percentile		
Mathematics General Mathematics	#300/387	22nd		





#### Journal of the Indonesian Mathematical Society (JIMS):

Journal of the Indonesian Mathematical Society (JIMS) is a publication of the Indonesian Mathematical Society (IndoMS). It publishes original res contributions of broad interest on hot topics, from distinguished mathematicians from across the world. The Journal provides a platform for present research in most areas of mathematics,



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/7g=2086-8952) byscrosset

ISSN: 2086-8952 (http://u.lipi.go.id/1274193789) (p)

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Editor-in-chief : Indah Emilia Wijayanti

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Executive Editor : Fajar Adi Kusumo

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Journal Rank: CiteScore (https://www.scopus.com /sourceid/21101064980) - Q4 (General

Mathematics) & JCI (https://mjl.clarivate.com

/search-results?issn=2086-8952&

hide\_exact\_match\_fl=true&utm\_source=mjl&

utm\_medium=share-by-link&utm\_campaign=journalprofile-share-this-journal) - Q4 (Mathematics)

Publishing Model : Open Access, Author(s) Pay

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Publisher: The Indonesian Mathematical Society

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/21101064980?origin=resultslist) Clarivate (http://mjl.clarivate.com



/cgi-bin/jmlst/jfresults.cg/?PC=MASTER&ISSN=2086-8952) ZDMATH



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authorid=15123057491121882332&authuser=2&user=1xyTLLUAAAAJ)

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J. Indones. Math. Soc. Vol. 28, No. 01 (2022), pp. 69–74.

### SUPER EDGE CONNECTIVITY NUMBER OF AN ARITHMETICS GRAPH

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jeni.mathematics@gmail.com

Abstract. An edge subset F of a connected graph G is a super edge cut if G-F is disconnected and every component of G-F has at least two vertices. The minimum cardinality of super edge cut is called super edge connectivity number and it is denoted by  $\lambda'(G)$ . Every arithmetic graph  $G=V_n,\ n\neq p_1\times p_2$  has super edge cut. In this paper, the authors study super edge connectivity number of an arithmetic graphs  $G=V_n,\ n=p_1^{a_1}\times p_2^{a_2},\ a_1>1,\ a_2\geq 1$  and  $G=V_n,\ n=p_1^{a_1}\times p_2^{a_2}\times \cdots \times p_r^{a_r},\ r>2,\ a_i\geq 1,\ 1\leq i\leq r.$ 

Key words and Phrases: arithmetic graph, super edge cut, super edge connectivity number.

#### 1. INTRODUCTION

Theorem 1.1. [5] For an arithmetic graph  $G=V_n$ ,  $n=p_1^{a_1}\times p_2^{a_2}$  where  $p_1$  and  $p_2$  are distinct primes,  $a_1, a_2 \ge 1$  then  $\epsilon = 4a_1a_2 - a_1 - a_2$ , where  $\epsilon$  is the size of the graph G.

**Theorem 1.2.** [5] For an arithmetic graph  $G=V_n$ ,  $n=p_1^{a_1}\times p_2^{a_2}$  where  $p_1$  and  $p_2$  are distinct primes,  $a_1, a_2 \ge 1$  then G is a bipartite graph.

Theorem 1.3. [5] Let  $G = V_n$  an arithmetic graph  $n = p_1^{a_1} \times p_2^{a_2} \times \cdots \times p_r^{a_r}$ , for any vertex  $u = \prod_{i=1}^{n} \lim_{i \in B} p_i^{a_i}$  where  $B \subseteq 1, 2, 3, ..., r, 1 \le \alpha_i \le a_i \forall i \in B$ .

If u = p<sub>j</sub> where j ∈ {1, 2, 3, ..., r}, then

$$deg(u) = \left[a_j \prod \lim_{i=1, i \neq j}^r (a_i + 1) - 1\right] - |a_j - 1|.$$

2020 Mathematics Subject Classification: 05C40.
Received: 27-07-2021, accepted: 16-03-2022.



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(i)

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## Source details

### **Graphs and Combinatorics**

Scopus coverage years: from 1985 to Present

Publisher: Springer Nature

ISSN: 0911-0119 E-ISSN: 1435-5914

Subject area: (Mathematics: Discrete Mathematics and Combinatorics) (Mathematics: Theoretical Computer Science)

Source type: Journal

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SJR 2022

CiteScore 2022

0.9

0.642

SNIP 2022 **0.991** 

<u>CiteScore</u>

CiteScore rank & trend

Scopus content coverage

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CiteScore 2022

2022

 $0.9 = \frac{528 \text{ Citations } 2019 - 2022}{591 \text{ Documents } 2019 - 2022}$ 

Calculated on 05 May, 2023

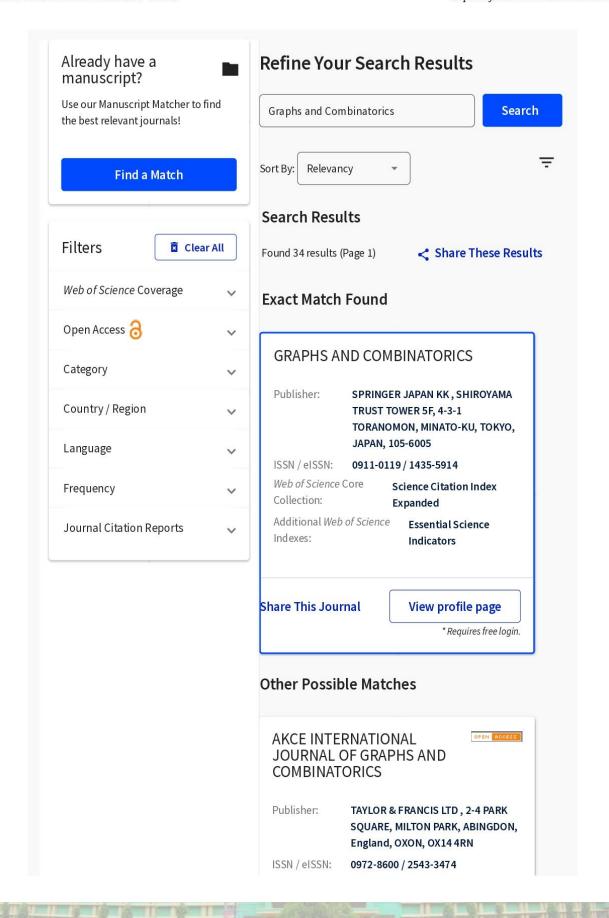
CiteScoreTracker 2023 ①

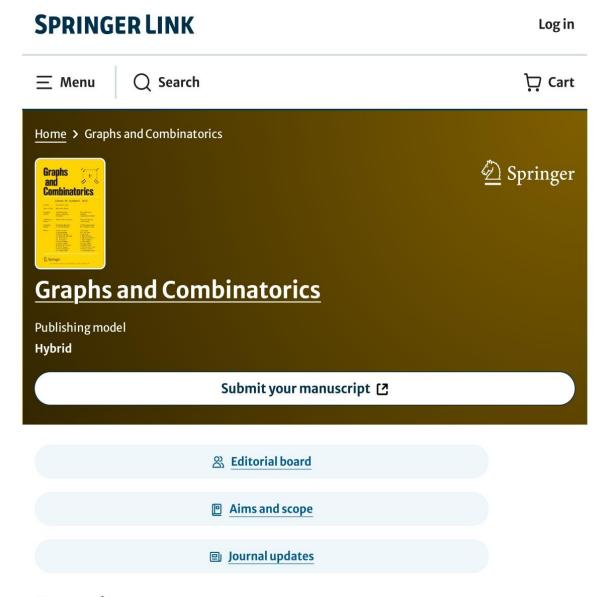
 $1.0 = \frac{614 \text{ Citations to date}}{606 \text{ Documents to date}}$ 

Last updated on 05 April, 2024 • Updated monthly

#### CiteScore rank 2022 ①

Category	Rank	Percentile	
Mathematics  Discrete  Mathematics and  Combinatorics	#65/89	27th	
Mathematics Theoretical Computer Science	#119/127	6th	





## **Overview**

Graphs and Combinatorics is an international journal, which was established in 1985.

It is devoted to research concerning all aspects of combinatorial mathematics, especially graph theory and discrete geometry. In addition to original research papers, the journal also publishes one major survey article each year. Notable survey articles include

- Ronald J. Gould, Advances on the Hamiltonian Problem A Survey (2003)
- Bert Randerath and Ingo Schiermeyer, Vertex Colouring and Forbidden Subgraphs A

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Graphs and Combinatorics (2022) 38:142 https://doi.org/10.1007/s00373-022-02521-y

#### ORIGINAL PAPER



### On the Forcing Domination and the Forcing Total Domination Numbers of a Graph

J. John 10 · V. Sujin Flower2

Received: 16 July 2019/Revised: 21 June 2022/Accepted: 24 June 2022/

Published online: 14 August 2022

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#### Abstract

Let G be a connected graph with at least two vertices and S a  $\gamma_t$ -set of G. A subset  $T \subseteq S$  is called a *forcing subset* for S if S is the unique  $\gamma_t$ -set containing T. The *forcing total domination number* of S, denoted by  $f_{\gamma_t}(S)$ , is the cardinality of a minimum forcing subset of S. The *forcing total domination number* of G, denoted by  $f_{\gamma_t}(G)$  is defined by  $f_{\gamma_t}(G) = \min \{f_{\gamma_t}(S)\}$ , where the minimum is taken over all minimum total dominating sets S in G. Some general properties satisfied by this concepts are studied. The forcing total dominating number of certain standard graphs are determined. It is shown that for every pair a, b of integers with  $0 \le a < b$  and  $b \ge 1$ , there exists a connected graph G such that  $f_{\gamma_t}(G) = a$  and  $\gamma_t(G) = b$ , where  $\gamma_t(G)$  is total domination number of G. It is also shown that for every pair a, b of integers with  $a \ge 0$  and  $b \ge 0$ , there exists a connected graph G such that  $f_{\gamma_t}(G) = a$  and  $f_{\gamma_t}(G) = b$ , where  $f_$ 

Keywords Domination number · Total domination number · Forcing domination number · Forcing total domination number

Mathematics Subject Classification 05C69

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Department of Mathematics, Government College of Engineering, Tirunelveli 627 007, India



### South East Asian Journal of Mathematics and Mathematical Sciences

CiteScore 2022 0.2

Scopus coverage years: from 2019 to Present

Publisher: Ramanujan Society of Mathematics and Mathematical Sciences

ISSN: 0972-7752 E-ISSN: 2582-0850

SJR 2022 0.133

0

0

×

Subject area: (Mathematics: Algebra and Number Theory) (Mathematics: Applied Mathematics) (Mathematics: Analysis)

SNIP 2022

Source type: Journal

(Mathematics: Discrete Mathematics and Combinatorics) (Mathematics: Computational Mathematics)

0.152

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Calculated on 05 May, 2023

Category	Rank Percentile	
Mathematics  Algebra and Number Theory	#114/117	2nd
Mathematics Applied Mathematics	#597/609	2nd
Mathematics	#184/187	lst



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South East Asian J. of Mathematics and Mathematical Sciences Vol. 19, Proceedings (2022), pp. 25-34

ISSN (Online): 2582-0850

ISSN (Print): 0972-7752

### RANDIC MATRIX AND ENERGY OF A $T_2$ HYPERGRAPH

### S. Sujitha, D. Sharmila\* and Angel Jebitha M. K.

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E-mail: sujitha.s@holycrossngl.edu.in, angeljebitha@holycrossngl.edu.in

\*Department of Mathematics, Manonmaniam Sundaranar University, Abishekapati, Tirunelveli - 627012, Tamil Nadu, INDIA

E-mail: sharmilareegan10@gmail.com

(Received: Apr. 20, 2022 Accepted: May 27, 2022 Published: Jun. 30, 2022)

#### Special Issue

Proceedings of International Virtual Conference on "Recent Trends in Applied Mathematics, ICRTAM - 2022"

Abstract: Let H be a  $T_2$  hypergraph of order n > 3. The Randic matrix of H, denoted by R(H) is defined as the square martix of order n, whose  $(i, j)^{th}$  entry is  $\frac{1}{\sqrt{d_i d_j}}$  if  $v_i$  and  $v_j$  are adjacent and zero for other cases. The Randic energy RE(H) of H is the sum of the absolute values of the eigenvalues of R(H). It is shown that, for a  $T_2$  hypergraph  $RE(H) < \sqrt{\frac{n^3 + 7n^2 + 11n}{16}}$ .

Keywords and Phrases: T<sub>2</sub> hypergraph, Randic matrix, Randic energy. 2020 Mathematics Subject Classification: 05C65, 05C50.

#### 1. Introduction

The basic definitions and terminalogies of a hypergraph are not given here and we refer it [1] and [18]. The concept of hypergraph was introduced by Berge in 1967. In 2017, Seena V. and Raji Pilakkat were introduced Hausdroff hypergraph,  $T_0$ hypergraph and  $T_1$  hypergraph. Based on [13] and [14] S. Sujitha and D. Sharmila



### Jordan Journal of Mathematics and Statistics

CiteScore 2022 0.6

0

0

Scopus coverage years: from 2018 to Present

Publisher: Yarmouk University

ISSN: 2075-7905 E-ISSN: 2227-5487

SJR 2022

0.163

Subject area: (Mathematics: Mathematics (miscellaneous)) (Mathematics: Applied Mathematics) (Mathematics: Statistics and Probability)

SNIP 2022

0.670

Source type: Journal View all documents >

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CiteScore

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CiteScore 2022

88 Citations 2019 - 2022 156 Documents 2019 - 2022

Calculated on 05 May, 2023

CiteScoreTracker 2023 ①

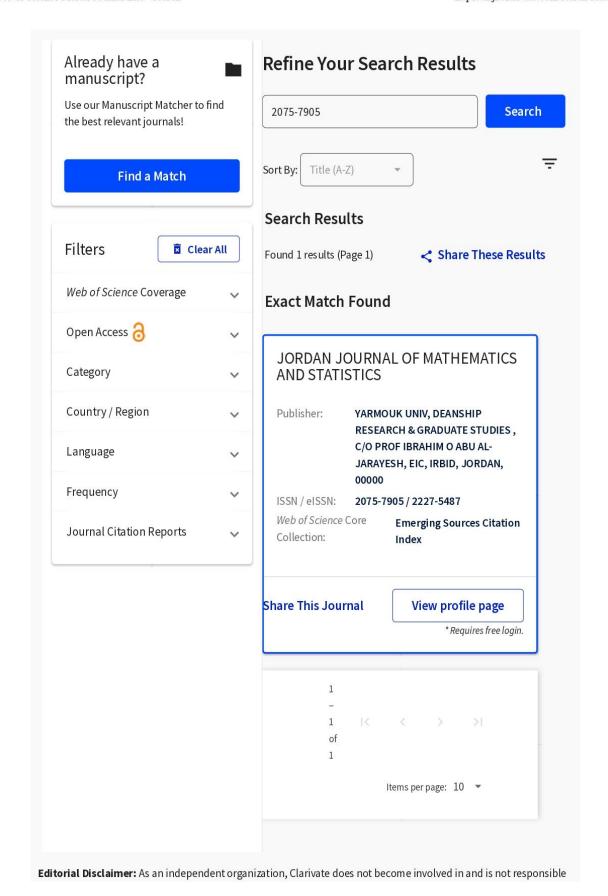
111 Citations to date 189 Documents to date

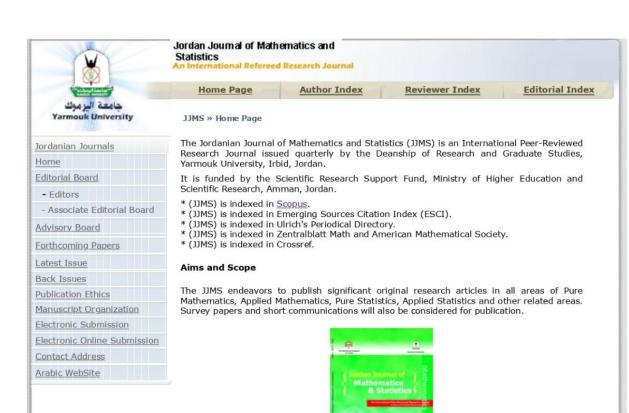
Last updated on 08 November, 2023 • Updated monthly

### CiteScore rank 2022 ①

Category	Rank Percentile	
Mathematics Mathematics (miscellaneous)	#56/74	25th
Mathematics Applied Mathematics	#550/609	9th
Mathematics	#240/262	8th







#### P-ISSN 2075 -7905, E-ISSN 2227-5487

miller

#### Last Issue



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Jordan Journal of Mathematics and Statistics (JJMS), 15(4A), 2022, pp 911 - 924
DOI: https://doi.org/10.47013/15.4.8

#### K-PRODUCT CORDIAL LABELING OF POWERS OF PATHS

K. JEYA DAISY<sup>(1)</sup>, R. SANTRIN SABIBHA<sup>(2)</sup>, P. JEYANTHI<sup>(3)</sup> AND MAGED Z. YOUSSEF<sup>(4)</sup>

ABSTRACT. Let f be a map from V(G) to  $\{0, 1, ..., k-1\}$ , where k is an integer and  $1 \le k \le |V(G)|$ . For each edge uv assign the label  $f(u)f(v)(mod\ k)$ . f is called a k-product cordial labeling if  $|v_f(i) - v_f(j)| \le 1$ , and  $|e_f(i) - e_f(j)| \le 1$ ,  $i, j \in \{0, 1, ..., k-1\}$ , where  $v_f(x)$  and  $e_f(x)$  denote the number of vertices and edges, respectively labeled with x (x = 0, 1, ..., k-1). In this paper, we add some new results on k-product cordial labeling and prove that the graph  $P_n^2$  is 4-product cordial. Further, we study the k-product cordial behaviour of powers of paths  $P_n^3$ ,  $P_n^4$  and  $P_n^5$  for k = 3 and 4.

#### 1. Introduction and Terminology

All graphs considered here are simple, finite, connected and undirected. We follow the basic notations and terminology of graph theory as in [4]. The concepts of labeling of graph has gained a lot of popularity in the field of graph theory during the last 60 years due to its wide range of applications. Labeling is a function that allocates the elements of a graph to real numbers, usually positive integers. In 1967, Rosa [16] published a pioneering paper on graph labeling problems. Thereafter, many types of graph labeling techniques have been studied by several authors. All these labelings are beautifully classified by Gallian [3] in his survey. Cordial labeling is a weaker version of graceful and harmonious labeling was defined by Cahit [1]: Let fbe a function from the vertices of G to  $\{0,1\}$  and for each edge xy assign the label |f(x) - f(y)|. f is called a cordial labeling of G if the number of vertices labeled 0 and the number of vertices labeled 1 differ by at most 1, and the number of edges

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<sup>2010</sup> Mathematics Subject Classification. 05C78.

Key words and phrases. cordial labeling, product cordial labeling, k-product cordial labeling, 3-product cordial labeling, 4-product cordial labeling.

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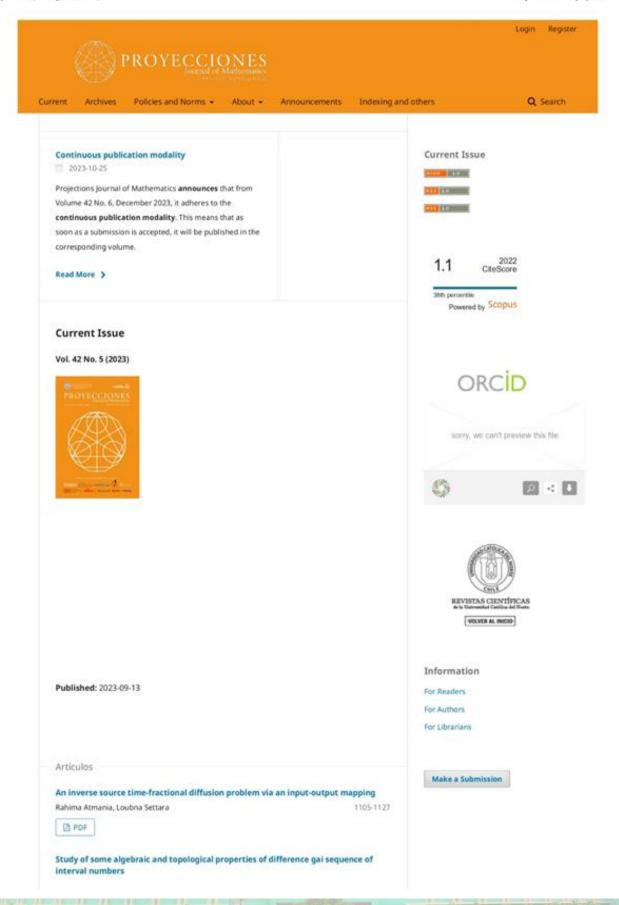
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## k-super cube root cube mean labeling of some corona graphs

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Received: October 2021. Accepted: March 2022

#### Abstract

Let G be a graph with |V(G)| = p and |E(G)| = q and  $f:V(G) \rightarrow \{k, k+1, k+2,..., p+q+k-1\}$  be an one-to-one function. The induced edge labeling  $f^*$ , for a vertex labeling f is defined by

$$f^*(e) = \left[\sqrt[3]{\frac{f(u)^2 + f(v)^2}{2}}\right] \quad or \quad \left[\sqrt[3]{\frac{f(u)^3 + f(v)^2}{2}}\right]$$

for all  $e = uv \in E(G)$  is bijective. If  $f(V(G)) \cup \{f^*(e) : e \in E(G)\} = \{k, k+1, k+2, \ldots, p+q+k-1\}$ , then f is known as a k-super cube root cube mean labeling. If such labeling exists, then G is a k-super cube root cube mean graph. In this paper, I prove that  $T_n \odot K_1$ ,  $A(T_n) \odot K_1$ ,  $A(T_n) \odot 2K_1$ ,  $A(Q_n) \odot K_1$ ,  $P_n \odot K_{1,2}$  and  $P_n \odot K_{1,3}$  are k-super cube root cube mean graphs.

**Keywords:** K-Super cube root cube mean labeling, Alternate snake graph,  $A(T_n) \odot K_1$ ,  $A(T_n) \odot \mathcal{E}K_1$ ,  $T_n \odot K_1$ ,  $A(Q_n) \odot K_1$ ,  $P_n \odot K_1$ , s.

MSC (2020): 05C78.



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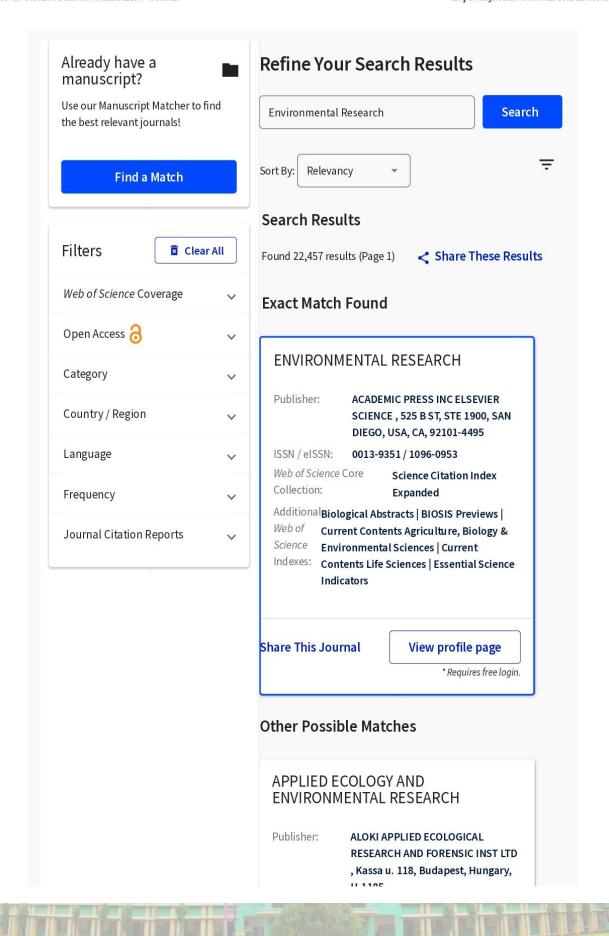
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Volume 210, July 2022, 112979

## Synthesis and physicochemical characteristics of Ag-doped hydroxyapatite nanoparticles, and their potential biomedical applications

Saleth Sebastiammal a , Arul Sigamani Lesly Fathima , Saud Alarifi , Shahid Mahboob , Johnson Henry , M.R. Kavipriya d , <u>Marimuthu Govindarajan</u> ef 🙎 🔯 , <u>Marcello Nicoletti <sup>g</sup>, Baskaralingam Vaseeharan</u> h

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#### Highlights

- Silver (Ag) doped hydroxyapatite nanoparticles (Ag-HApNPs) were synthesized.
- · Ag-HApNPs were characterized by XRD, FTIR, SEM, TEM, Raman and UV-DRS analysis.
- Ag-HApNPs possess excellent antibacterial and antifungal activities.
- Ag-HApNPs exhibit free radical quenching activity as effective antioxidants.
- · Ag-HApNPs kill HeLa cells and are effective anticancer agents.

#### Abstract

In this present scenario, hydroxyapatite (HAp) nanostructures were synthesized through green routes for biomedical applications, particularly remediation towards human pathogens and cancer cells. The present study aims at forming non-toxic and eco-friendly silver (Ag<sup>+</sup>) doped HAp using Polyethylene glycol (PEG), Cetyl Trimethyl ammonium bromide (CTAB) and curcumin. Ag+ doped HAp nanoparticles (NPs) were prepared by the sol-gel method with a cube and rodlike morphology. Ag-HApNPs showed a sharp and well-defined diffraction peak, which possesses the hexagonal crystalline structure with space group P63/m. The Fourier-transform infrared spectroscopy and Raman spectra confirmed the formation of Ag-HApNPs, and the bandgap values were obtained using UV-DRS analysis. The Ag-HApNPs with PEG, CTAB and curcumin might be fabricated materials were examined against antibacterial, antifungal, antioxidant, and cytotoxic activities, which provided exemplary biomedical applications. Overall, Ag-HApNPs can be used as potential drug delivery and perspectives to control multidrug-resistant pathogens.

Introduction



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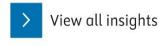
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#### Materials Today: Proceedings

Volume 68, Part 3, 2022, Pages 294-298

### NiO-CdO nanocomposite for photocatalytic applications

E.J. Vishaka <sup>a</sup> 🙎 🔀 , M. Priya Dharshini <sup>b</sup> , <u>V. Shally</u> <sup>b</sup> , <u>Sr. Gerardin Jayam</u> <sup>b</sup>

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#### **Abstract**

The cost-effective and highly convenient co-precipitation technique has been used to synthesize NiO nanoparticles and NiO-CdO nanocomposites. The structural, morphological, optical and photocatalytic studies of the as-prepared samples are carried out. PXRD confirms the structure of NiO nanoparticles and NiO-CdO nanocomposites as cubic. FESEM image shows that the NiO nanoparticles and NiO-CdO nanocomposites possess spherical shaped structure. The UV-Vis analysis reveals strong absorption peaks in the visible region. The absorption peaks are found at 327nm and 424nm. In the PL spectra, blue and green emissions are observed. The photocatalytic studies reveal that the as-prepared NiO nanoparticles and NiO-CdO nanocomposites has 88.86% and 83.01% efficiency to degrade methylene blue dye.

#### Introduction

Nowadays, quality of water has become a major concern worldwide due to increasing population. Due to this reason, the proficient treatment of wastewaters has attracted major attentions among researchers around the globe to solve those problems. Recently, the utilization of oxide semiconductor nanomaterials as effective photocatalysts in wastewater treatment has become a subject of major concern [19]. Nanostructured metal oxide materials have been a fascinating field of current study and development due to its multifunctional activities including optical, magnetic, electrical and catalytic capabilities, which boost the materials wide applicability to many prospective applications [1]. In recent years, nanoparticles attracted a great deal of interest owing to their distinctive size dependent physical and chemical properties and device grade applications [2]. Their enhanced properties are mainly due to large surface-to-volume ratio and the effect of quantum confinement. Among those nano-engineered materials, nickel oxide (NiO) is a highly active p-type oxide with a broad band gap (3.6-4.0eV) that have attracted considerable interest as a strong candidate for many applications such as gas sensors [3], catalysis [6], battery cathodes [20], electrochromic films [21], chemical sensors [4], photovoltaic devices [5], solar cells [7] and magnetic material [8]. Nanoparticles of NiO and many other materials have shown unique behavior based on the size scale of the material [9], [10]. Cadmium oxide (CdO), which is an n-type semiconductor with band gap of 2.5 eV, has attracted considerable attention for various applications such as solar cells and photodiodes [11], [12]. The NiO-CdO nanocomposites exhibit better material possession and are promising candidate compared to individual NiO nanoparticles, there by widening their applications range. CdO also finds application in photocatalysts for dye degradation due to its favorable visible light absorption and high charge carrier mobility [13].



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Formerly known as: Biological Wastes

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Publisher: Elsevier

ISSN: 0960-8524 E-ISSN: 1873-2976

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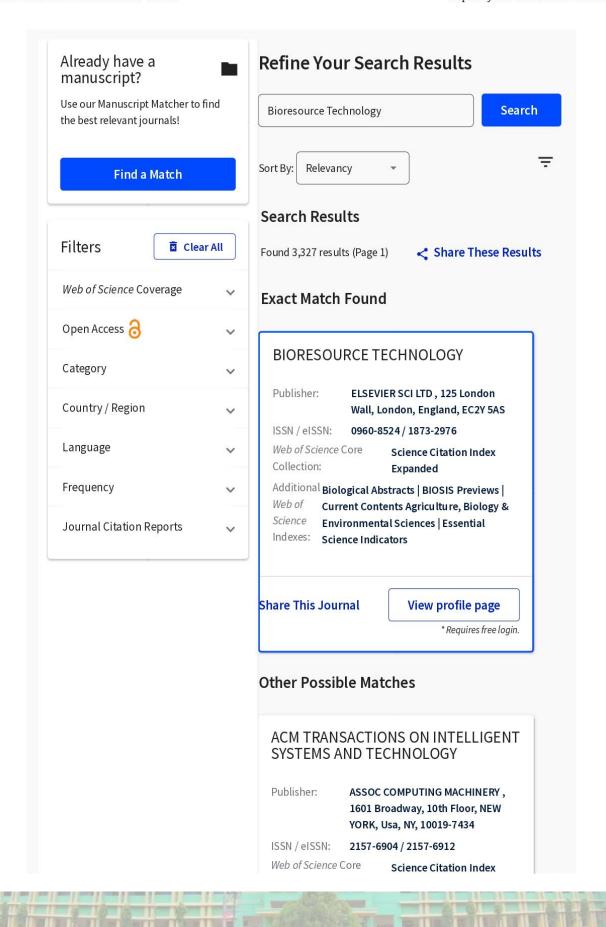
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#### Bioresource Technology

Volume 364, November 2022, 128084

Review

# Lignocellulose biohydrogen towards net zero emission: A review on recent developments

Chyi—How Lay <sup>a 1</sup>, Jeyaprakash Dharmaraja <sup>b 1</sup>, Sutha Shobana <sup>c</sup>, Sundaram Arvindnarayan <sup>d</sup>, Retnam Krishna Priya <sup>e</sup>, Rajesh Banu Jeyakumar <sup>f</sup>, Rijuta Ganesh Saratale <sup>g</sup>, Young-Kwon Park <sup>h</sup>, Vinod Kumar <sup>i</sup>, Gopalakrishnan Kumar <sup>j</sup> A

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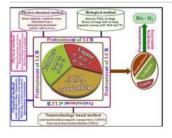
#### Highlights

- · Recent lignocellulosic pretreatments have been documented.
- · Radiation energy based pretreatment techniques were discussed.
- Role of nanotechnology in bio-H<sub>2</sub> production has been highlighted.
- · Challenges in the development of pretreatments and remedies are suggested.

#### **Abstract**

This review mainly determines novel and advance physical, chemical, physico-chemical, microbiological and nanotechnology-based pretreatment techniques in <u>lignocellulosic</u> biomass pretreatment for bio-H2 production. Further, aim of this review is to gain the knowledge on the lignocellulosic biomass pretreatment and its priority on the efficacy of bio-H2 and positive findings. The influence of various pretreatment techniques on the structure of lignocellulosic biomass have presented with the pros and cons, especially about the cellulose digestibility and the interference by generation of inhibitory compounds in the bio-enzymatic technique as such compounds is toxic. The result implies that the stepwise pretreatment technique only can ensure eventually the lignocellulosic biomass materials fermentation to yield bio-H2. Though, the mentioned pretreatment steps are still a challenge to procure cost-effective large-scale conversion of lignocellulosic biomass into fermentable sugars along with low inhibitory concentration.

#### Graphical abstract



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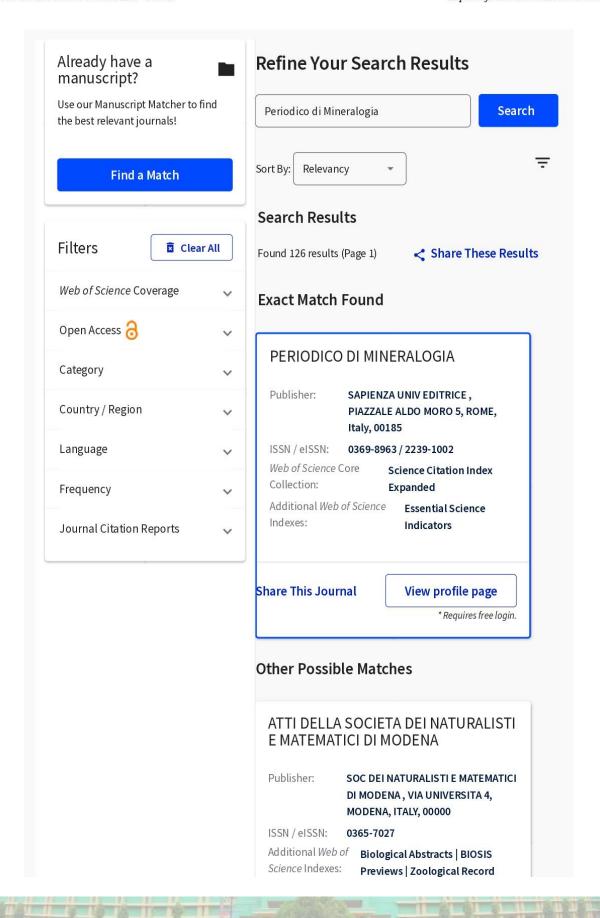
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Volume 91, No. 5, 2022

## Tribological Behavior of AA7075 Nanohybrid Composites at High Temperature

#### M.L.AJINP, J.JEBEEN MOSESPI, M.PRIYA DHARSHINIPI

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Corresponding author- J. JEBEEN MOSES

#### Abstract

In this research work, an attempt was made to reinforce A47075 aluminium alloy with nanosized Boron Carbide (BAC) and Silicon Carbide (SiC) particles through stir casting technique. The manufactured composites were tested for wear utilizing pin on disc apparatus at high temperature by varying %reinforcement, applied load, sliding distance and applied velocity. The results revealed that the composites exhibit lower wear rate owing to the formation of Mechanically Mixed Layer (MML) due to third body abrasion as confirmed through EDAX. At low temperature, wear occurred through abrasion; whereas at high temperature, it was due to shearing, wear shift from mild to severe when the load exceeds 20N. When the temperature exceeds 225°C, no MML was formed as most of the materials were removed from composites owing to its reduction in hardness, hence the pin exhibit severe wear. The composites were produced with the objective of reducing the wear rate which was achieved using the WASPAS and VIKOR optimization technique. Cracks, pits and resolidified materials are some of the features observed on the worn surface morphology.

Keywords—Stir Casting · High Temperature Wear · VIKOR · WASPAS · Worn surface morphology

### INTRODUCTION

Aluminum Metal Matrix Composite (AMMC) is gaining its importance in acrospace sector owing to its enhanced are made using a variety of processes including power sintering, in-situ manufacturing and liquid metallurgy [2]. Manufacturing through liquid stir casting is the most cost-effective and suitable for large production of these processes [3]. The homogenous distribution of composites is influenced by numerous parameters such as particle size, volume percentage, particle shape and surface treatment [4]. The most often utilized reinforcing materials were Boron Carbide (B4C), Silicon Carbon Nanotubes (CNT) [5]. The major issue of AMMC is wettability of particles over the matrix material [6]. The wettability of composites is improved by adding flux. In comparison to untreated particles, heat-treated particles mix uniformly [29].

The existence of a mechanical mixed layer enhances the wear resistance of composites by preventing direct metal-tometal contact [7]. The weight % and counter face stiffness have a negative impact on the wear rate, but the load and speed applied have a beneficial impact [8]. The duct surface has no influence on wear rate due to the presence of tribo substrate [9]. At lower loads, composite materials show abrasion and delamination wear, but at greater loads, they show severe wear [10]. The slowing of the subsurface increases with increased rush in the moderate wear area, but decreases when reinforcing particles are applied [11]. The presence of graphite activates the self-lubrication feature, which is required for components that frequently require lubrication [12].

Basavarajappa et al. [13] investigated the tribological

The results demonstrated that the composites outperform unreinforced composites in terms of wear resistance. Surappa et al. [14] investigated the effect of the strengthening percentage, sliding velocity, loading and sliding distance on wear using complete factor design. They presented a regression equation that material properties and strength to weight ratio [1]. Composites showed wear reinforcing dependency, sliding velocity, load and sliding lengths and wear dependence.

The challenge of determining and picking the best answer based on contradicting characteristics in a large variety of possibilities is constantly present in the manufacturing industry. WASPAS (Weighted Aggregated Sum-Product Assessment) and VIKOR was a Multi Criteria Decision Making approach (MCDM) that is used to choose the best choice from a set of options. Each classification issue consists primarily of four main components: Carbide (SiC), Aluminum exide (AlsO1), Graphite (Gr), and (a) equivalents, (b) abilities, (c) a significant weight for each attribute and (d) different output measures in connection to various characteristics [15, 16]. According to the results of the survey, a great deal of effort has gone into improving the material qualities by adding reinforcing particles. However, only a little amount of research has been done to improve the properties of the AA7075 aluminium alloy at high temperature reinforced with nanoparticles. The current study used a Stir casting approach to strengthen AA7075 aluminium alloy with Silicon Carbide (SiC) and Boron Carbide (B<sub>1</sub>C) nanoparticles. The WASPAS and VIKOR techniques were used to improve the findings. The worn surface morphology was analyzed using the Scanning Electron Microscope (SEM).

## Experimental Procedure Material Preparation

The matrix material, AA7075 aluminium alloy with the chemical composition shown in Table 1, was obtained from Perfect Metal Alloys in Bangalore. As reinforcement, SiC and characteristics of silicon carbide and graphite enhanced hybrid B<sub>2</sub>C particles with an average particle size of 5nm were chosen composites. Stir casting was used to make the AA2219 hybrid from the Bhukanvala sectors. The moisture content in the selected composites with different volume fractions. Variations in reinforcing particles was removed by heating them to a sliding speed and load were carried out to conduct the wear test. Temperature of 250°C. In an electric furnace, a graphite crucible

https://doi.org/10.37896/pd91.5/91514

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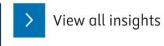
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Volume 64, Part 5, 2022, Pages 1671-1678

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K. Tamilarasi a Q, P. Aji Udhaya b, M. Meena c

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#### Abstract

The present study aimed to investigate the behavior of nano Zinc Ferrite particles by copper substitution in various concentrations in order to fabricate novel material for future use in optoelectronic and electromagnetic shielding devices. To that end, Nano crystalline Zn-Cu ferrites ( $Cu_{(1-X)}Zn_XFe_2O_4$ : x=0, x=0.25, x=0.5, x=0.75 and x=1) were prepared using combustion technique with egg white as a fuel. The prepared powder samples were investigated by various characterization methods such as X-ray diffraction analysis (XRD), High resolution scanning electron microscope analysis (HRSEM), UV-Vis-DRS spectra and electrical analysis. The physical investigations of the final product revealed that the lattice structure of Cusubstituted at Znsites developed the spinel ferrite particles with single crystalline phase at room temperature (RT), with morphological, optical and temperature dependent electric properties. Substitution of transition metals has a significant impact on the microstructure, crystal structure, electrical parameters and <u>optical properties</u> of zinc ferrite <u>nanoparticles</u>, according to the findings. Furthermore, the <u>dielectric</u> constant ( $\epsilon_{\text{T}}$ ) and dielectric loss (tanδ) are investigated and found to be strongly dependent on frequency and temperature. Enhancements of electrical resistivity of mixed ferrites suggest the use of these ferrites in EM shielding devices.

#### Introduction

Spinel ferrites have recently fascinated the attention of many researchers due to their valuable electrical and magnetic properties, application in information storage systems, microwave absorbers, high frequency devices, and environmental cleanser [1]. Semiconducting ferrites are thought to be excellent dielectric materials with high resistivity and a wide range of application areas. Because nanoparticle size, shape, crystallinity, and particle size distribution all have an impact on the physical, chemical, and electrical properties of particles [2]. The distinctive properties of ferrites are heavily influenced by the stoichiometric composition and synthesis techniques [3]. Between several ferrites, zinc ferrite has a high electromagnetic achievement, excellent chemical stability, moderate thermal co-efficient, moderate energy transfer efficiency, and a low coercivity. However, replacing transition metals in ferrites is a hopeful method of controlling their physical properties, potentially improving their catalytic and magnetic properties. Due to the widespread usage of electronic equipment such as electrical and telecommunication devices in various applications, the problem of electromagnetic interference (EMI) has exploded in recent years. Materials with highlighted magnetic properties are the choice of material for the above mentioned issues [4]. Because of their unique magnetic properties, mixed ferrites are now the desired materials for EM shielding or EM absorption. Even though so many researchers reported mixed ferrites nano particles for EM shielding applications, Single step cost effective unique behavioral ferrites



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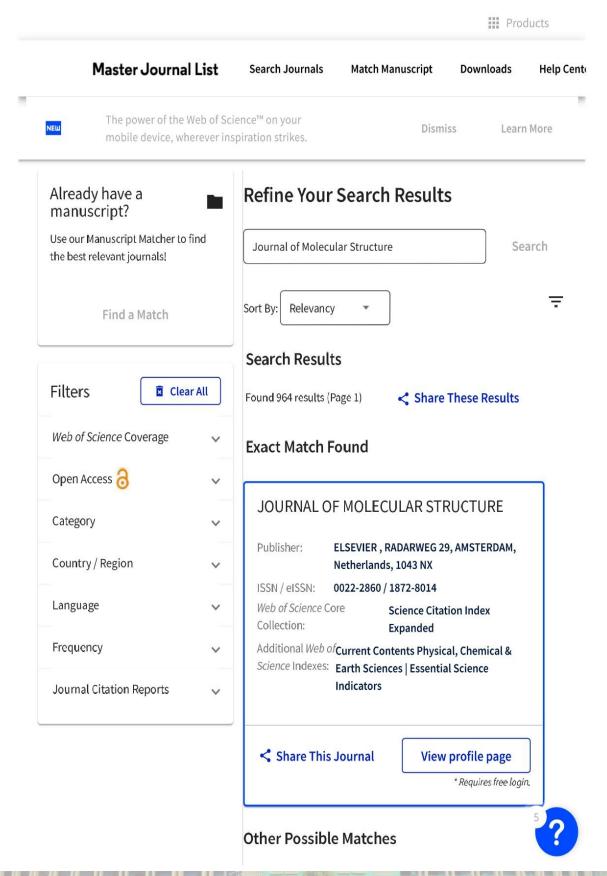
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## Journal of Molecular Structure

Volume 1253, 5 April 2022, 132214

# Raman spectroscopic study of cinnamyl-1 diphenylmethyl-4 piperazine (Cinnarizine) at high pressure

Jaimin U. Trivedi <sup>a</sup>, Pallavi Ghalsasi <sup>a</sup> △ ☒, Somnath Ganguly <sup>b</sup> △ ☒, S.J. Jenepha Mary <sup>c</sup>, C. James <sup>d</sup>

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### Highlights

- High pressure Raman <u>spectroscopic measurements</u> have been carried out on <u>Cinnarizine</u> up to 15.3 GPa.
- The compound develops broader bands with pressure with some modes changing from ~0.9 GPa.
- Change in d $\omega/dP$  values indicate phase changes around  $\sim$ 2.7,  $\sim$ 5,  $\sim$ 7.5  $\sim$ 9 and  $\sim$ 1112 GPa.
- Most of the modes show irreversible changes with pressure with pressure and
  do not recover at all after <u>decompression</u> of the sample whereas other
  vibrational modes involving rings 1,2 and 3 do show partial recovery after
  <u>decompression</u>.
- Pressure induced phase transition below 1 GPa and ensuing disorder could have an effect on the solubility, dissolution and <u>pharmacokinetics</u> of the solid drug.
- As tableting pressures are around 0.20.5 GPa, it is likely that a tableted form
  could have a different profile and they need to be checked for physicochemical
  behavior and PK/PD.

## Abstract

Raman spectra of Cinnarizine in the 35–3400cm $^{-1}$  region were studied at high pressures up to 15.3 GPa, using a Diamond Anvil Cell. Broadening of bands is observed starting from  $\sim$ 0.9 up to  $\sim$ 11–12 GPa pressures as evidenced by the changes in the Raman spectra of some modes. Plots of frequency vs pressure of bands, show increase of frequency with pressure for most of the bands and the slopes,  $d\omega/dP$ , of some bands show clear changes around  $\sim$ 2.7,  $\sim$ 5,  $\sim$ 7.5  $\sim$ 9 and  $\sim$ 11–12 GPa indicating phase transformation caused by changes in structure and chemical bonds at these pressures. The present article describes high pressure effects on cinnarizine studied by Raman Spectroscopy and is supported by



## Source details

## Spectroscopy Letters

CiteScore 2022 2.4

(i)

Scopus coverage years: from 1968 to Present

Publisher: Taylor & Francis

ISSN: 0038-7010 E-ISSN: 1532-2289

SJR 2022 0.249

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Chemistry: Spectroscopy

Subject area: (Physics and Astronomy: Atomic and Molecular Physics, and Optics) (Chemistry: Analytical Chemistry)

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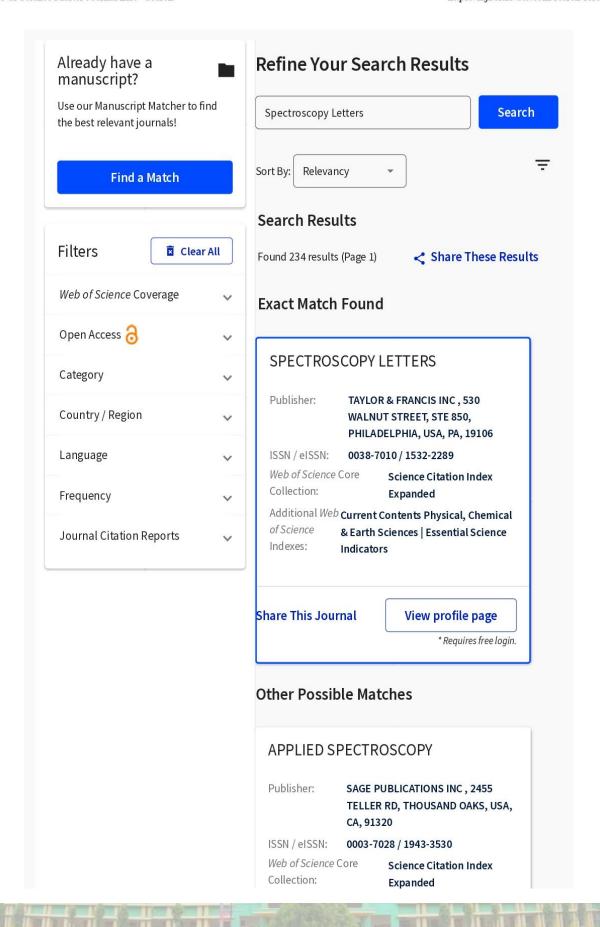
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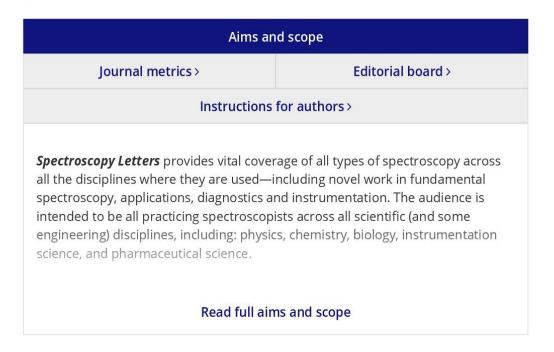




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## Abstract

The antiviral active molecule N-(4-chlorophenyl)-2-[(4,6-di-aminopyrimidin-2-yl)sulfanyl] acetamide has been characterized to obtain vibrational signatures via Raman and Fourier transform infrared spectroscopy, comparing the results generated by ab initio calculations. The density functional theory model, performed by GAUSSIAN 09 packages, based on the Becke, 3-parameter, Lee-Yang-Parr exchange correlation functions augmented with 6-311++(d,p) basis set. The geometric equilibrium, inter and intra-molecular hydrogen bond, and harmonic vibrational wavenumbers of N-(4-chlorophenyl)-2-[(4,6-di-aminopyrimidin-2-yl)sulfanyl]acetamide were explored with density functional theory. The stereo-electronic interactions, leading to stability were confirmed using natural bond orbital analysis, which has been further substantiated by vibrational spectral analysis. Hirshfeld surface gives an insight into intermolecular contacts within the Crystal structure. The optimized geometry shows a non-planar structure between the phenyl ring and the pyrimidine ring. Differences in the geometries due to the substitution of the electronegative chlorine atom, intramolecuar and intermolecular contacts due to the amino pyrimidine were analyzed. NBO analysis reveals the formation of two strong stable hydrogen bonded N-H···N intermolecular interactions and weak intramolecular interactions C-H···O and N-H···O. The Hirshfeld surfaces and consequently the 2D-fingerprint confirm the nature of intermolecular interactions and their quantitative contributions toward the crystal packing. The red shift in N-H stretching frequency exposed from IR substantiate the formation of N-H···N intermolecular hydrogen bond. The pharmacokinetic properties were investigated from adsorption, distribution, metabolism, excretion and toxicity results. In-silico docking shows the inhibition activity against virus.

Q Keywords: Density functional theory (DFT) FT-IR and Raman spectra hyperconjugation molecular docking rehybridization SARS-CoV-2



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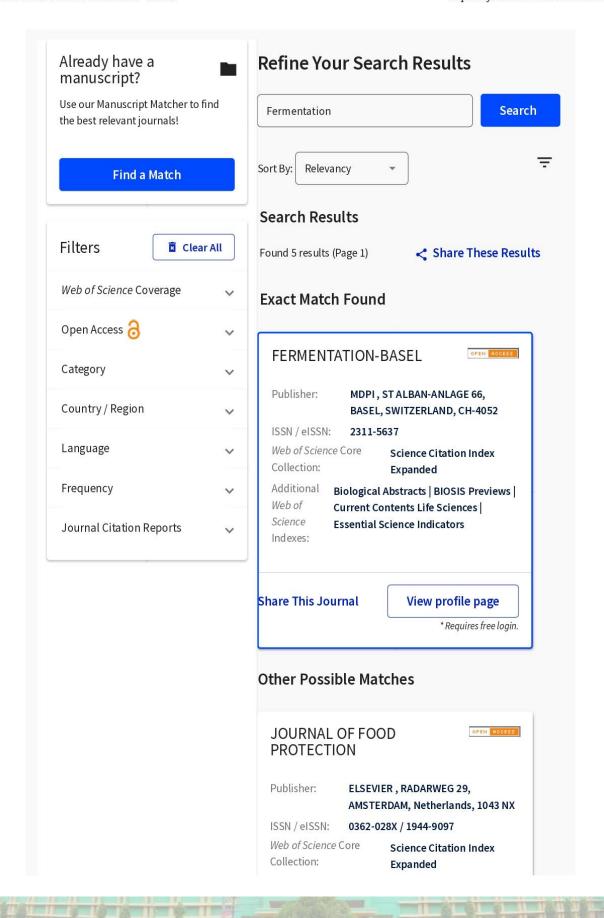
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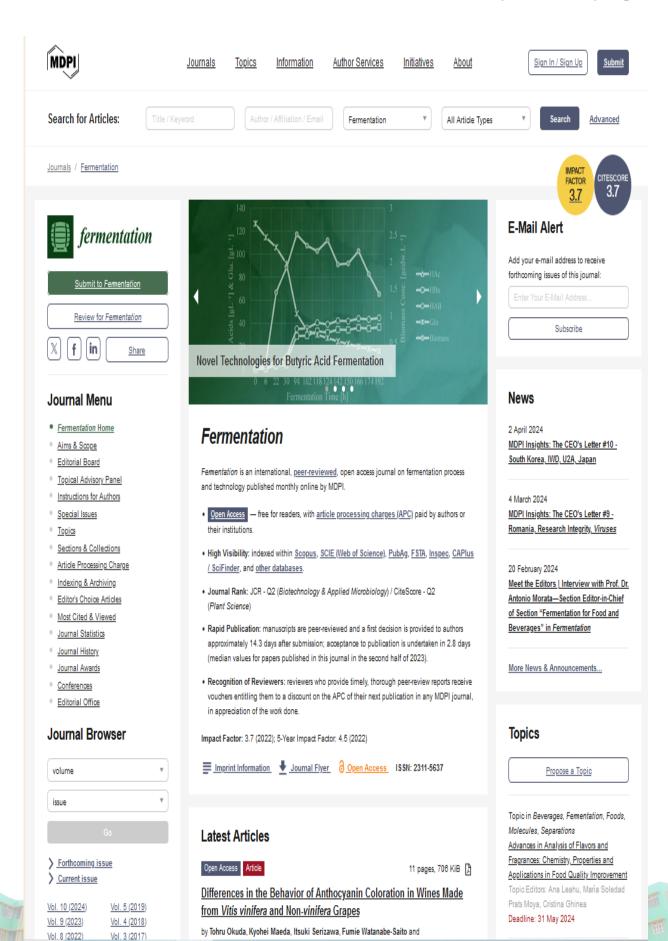
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Article

# Synthesis, Characterization, Antibacterial, Antifungal, Antioxidant, and Anticancer Activities of Nickel-Doped Hydroxyapatite Nanoparticles

Saleth Sebastiammal <sup>1,\*</sup>, Arul Sigamani Lesly Fathima <sup>1</sup>, Johnson Henry <sup>2</sup>, Mohammad Ahmad Wadaan <sup>3</sup>, Shahid Mahboob <sup>3</sup>, Arwa Mohammad Wadaan <sup>4</sup>, Irfan Manzoor <sup>5</sup>, Kasi Gopinath <sup>6</sup>, Mohan Rajeswary <sup>7</sup> and Marimuthu Govindarajan <sup>8,9,\*</sup>

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Abstract: The purpose of this research was to investigate the possible antibacterial, antifungal, antioxidant, and anticancer effects of nickel (Ni<sup>2+</sup>)-doped hydroxyapatite (HAp) nanoparticles (NPs) synthesized using the sol-gel approach. X-ray powder diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy (Raman), field-emission scanning electron microscopy (FESEM), and elemental analysis were used to characterize the Ni<sup>2+</sup>-doped HApNPs. X-ray diffraction investigation showed that the nanoscale structure of Ni<sup>2+</sup>-doped HApNPs was hexagonal, with an average crystallite size of 39.91 nm. Ni<sup>2+</sup>-doped HApNPs were found to be almost spherical in form and 40-50 nm in size, as determined by FESEM analysis. According to EDAX, the atomic percentages of Ca, O, P, and Ni were 20.93, 65.21, 13.32, and 0.55, respectively. Ni<sup>2+</sup>-doped HApNPs exhibited substantial antibacterial properties when tested in vitro against several pathogens, including Escherichia coli, Shigella flexneri, Klebsiella pneumoniae, Pseudomonas aeruginosa, and Staphylococcus aureus. Antibacterial activity, at 50 mg tested concentration, demonstrated superior effects on G-ve bacteria than G+ve pathogens. The antifungal activity of Oidium caricae, Aspergillus flavus, and A. niger revealed a zone of inhibition of 23, 11, and 5 mm, respectively. These actions rely on the organism's cell wall structure, size, and shape. Incorporating Ni<sup>2+</sup> into HApNPs allows them to function as powerful antioxidants. Ni<sup>2+</sup>-doped HApNPs had a good cytotoxic impact against the HeLa cell line, which improved with increasing concentration and was detected at a 68.81 µg/mL dosage. According to the findings of this study, the  $\mathrm{Ni}^{2+}$ -doped HApNPs are extremely promising biologically active candidates owing to their improved functional features.

**Keywords:** green synthesis; bionanomaterials; hydroxyapatite; antimicrobial activity; cytotoxic effect; HeLa cell line



Citation: Sebastiammal, S.; Fathima, A.S.L.; Henry, J.; Wadaan, M.A.; Mahboob, S.; Wadaan, A.M.; Manzoor, I.; Gopinath, K.; Rajeswary, M.; Govindarajan, M. Synthesis, Characterization, Antibacterial, Antifungal, Antioxidant, and Anticancer Activities of Nickel-Doped Hydroxyapatite Nanoparticles. Fermentation 2022, 8, 677. https://doi.org/10.3390/fermentation8120677

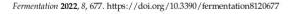
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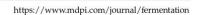
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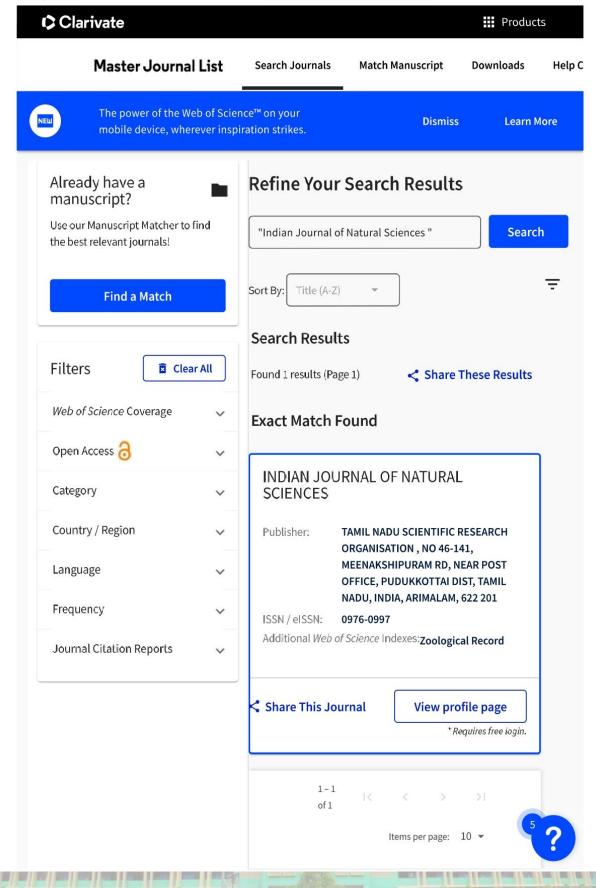
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RESEARCH ARTICLE

## Anti-Diabetic Activity of Chelating Bis N- Propylethylenediamine Zinc Complex

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## ABSTRACT

Metals are an integral part of many structural and functional components in the body, and the critical role of metals in physiological and pathological processes has always been of interest to researchers. Metals have been used in the treatment of diseases of humans since ancient time. The primary objective of the study was to describe anti-diabetic activity by bis N-propylethylenediamine zinc (II) complex. The synthesised complex was characterised by elemental analysis, FTIR, powder X-ray diffraction and EDAX. Stability of the complex was determined by TGA & DTA. Anti-Diabetic activity was studied by invitro alpha glucosidase and alpha amylase assay.

Keywords: Chelate complex, Charge Transfer Transition, Thermal analysis, Co-ordination Compound, Alpha glucosidase and Alpha amylase

#### INTRODUCTION

It is also known as simply diabetes, is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. This high blood sugar produces the symptoms of frequent urination, increased thirst, and increased hunger. The common symptom of diabetes includes poly urea (frequent urination), polydipsia (increased thirs() and poly phagia (increased appetits). [1] Diabetes is due to either the pancreas not producing enough insulin, or the cells of the body not responding properly to the insulin produced. [2] Metal complexes are playing an







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Scopus coverage years: from 1967 to Present

Publisher: Elsevier ISSN: 0022-2860

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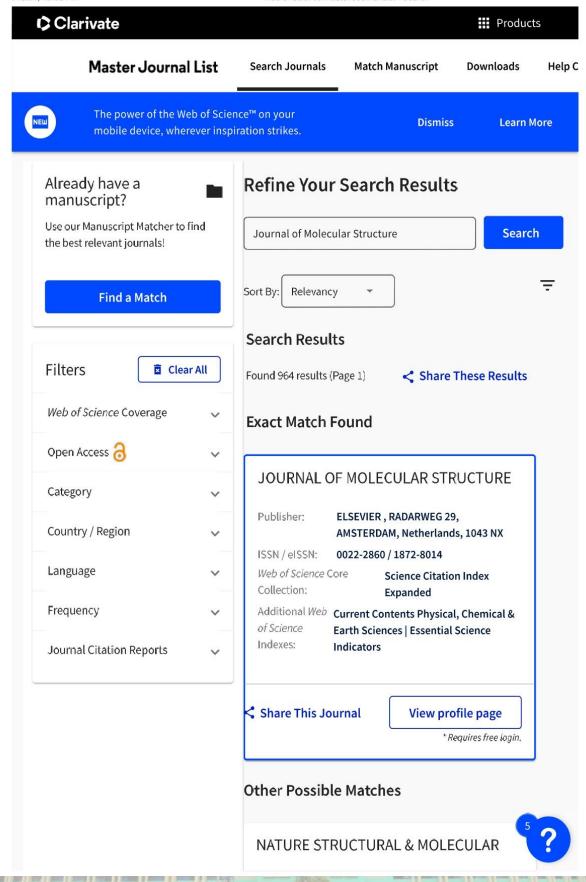
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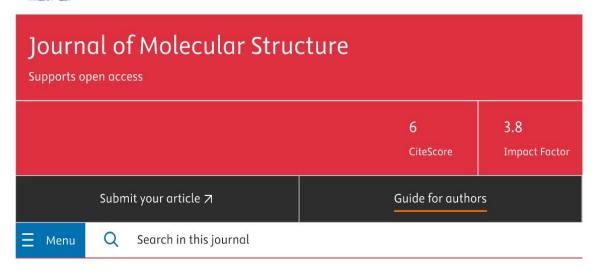
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Computational and biological efficacy of stigmasterol against HeLa cells and Vero cells- first time isolated from the ethanolic e...



### Journal of Molecular Structure

Volume 1252, 15 March 2022, 132186

# Computational and biological efficacy of stigmasterol against HeLa cells and Vero cells- first time isolated from the ethanolic extract of *Annonamuricata* Linn leaves

J. Irshad Ahamed <sup>a</sup> 🙎 🖾 , Francy K <sup>a</sup>, A. Vini Priya <sup>b</sup>, J. PremaKumari <sup>c</sup>, R.P. Steiny <sup>d</sup>, P. Kamalarajan <sup>e</sup>, B. Venkatadri <sup>f</sup>

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## Highlights

- <u>Stigmasterol</u> (abbreviated as STML) is the first report on the isolation of STML from the leaves of <u>Annona muricat</u>.
- Structural and Spectral studies have been completed for STML by experimental and *ab initio* <u>DFT</u> theoretical methods at the <u>B3LYP</u> level with 6–311++G (d, p) basis sets.
- STML confirmed excellent <u>biological activities</u> for various *in vitro* studies of <u>antioxidant</u>, anti-inflammatory, and <u>cervical cancer</u> cells (HeLa).
- STML are showed great in silico molecular docking activity.

### **Abstract**

The present study was aimed to analyze the *in vitro* antioxidant, anti-inflammatory and cytotoxicity activities of isolated bioactive compound stigmasterol (abbreviated as STML) from the leaves of *Annonamuricata*. Extraction was done using Soxhlet apparatus, TLC, column chromatography and STML in the extracts were identified by Gas-Chromatography and Mass-Spectroscopy (GC–MS) analyses. Characterizations of isolated bioactive compound stigmasterol for purity verified were performed using High-performance liquid chromatography (HPLC) technique. Stigmasterol compound was estimated by DPPH scavenging and ABTS assay, it showed significant values. *In vitro* cytotoxicity activity of stigmasterol was also tested HeLa cells and Vero cells and IC<sub>50</sub> values found that 11.58µg/ml and 173.8µg/ml, respectively. The different spectral analysis were also characterized by experimental and well deal with the theoretical *ab* initio Density functional theory (DFT) method at <u>B3LYP</u> level with 6–311++G(d,p) basis set of provides for the different spectral studies, respectively by using UV-Visible, <sup>1</sup>Hand <sup>13</sup>C nuclear magnetic resonance (NMR) spectroscopy studies. Fourier-transform infrared (FTIR) spectral analysis was carried out. Density Function Theory (DFT) computations enabled us to get different reactive properties of STML. The Rf of STML isolated from the



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## Biomedical and Biotechnology Research Journal

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Scopus coverage years: 2017, from 2019 to Present

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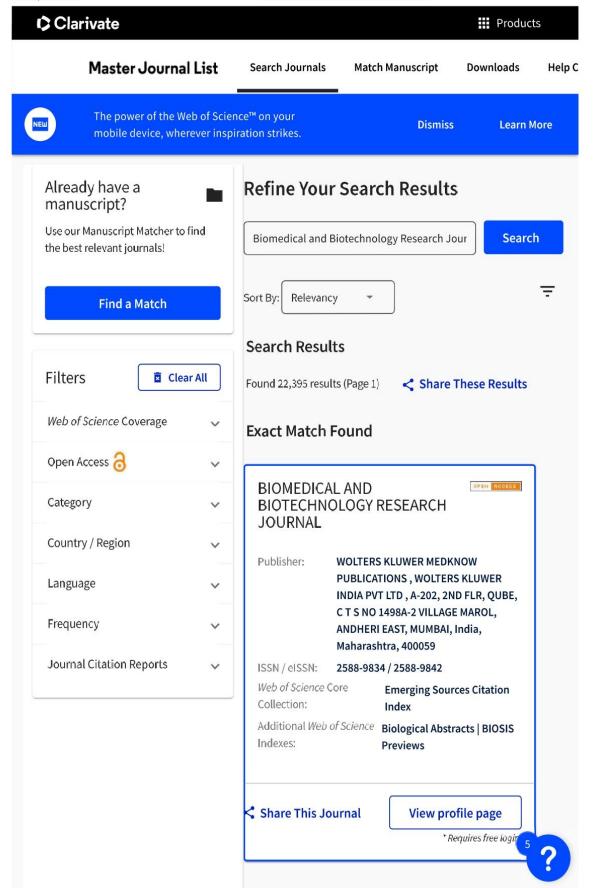
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## Original Article

# Structural Characterization of Inclusion Complex of Stigmasterol with Alpha-Cyclodextrin using Spectroscopy and Molecular Modeling

Kuruz Francy', Johnson Prema Kuman', Simon Lity Reselet'

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## Abstract

Background: Stigmasterol possesses numerous physiological effects and is used as food supplements and behaves as a pharmaceutical agent. It exhibits anticancer effects against various cancers. The usefulness of the stigmasterol is restricted due to its poor solubility. To overcome this and enhance the solubility and bioavailability of this phytosterol, molecular encapsulation is utilized to augment the desirable properties of stigmasterol. This research work aims to investigate the interaction between stigmasterol and alpha-cyclodestrin (cr-CD) in aqueous solution as well as in solid state and experimentally examined by spectral techniques. Methods: The liquid complexes are characterized by ultraviolet (UV)-visible spectroscopy and solid inclusion-complexes are characterized by Fourier transformer infrared resonance and 'H nuclear magnetic resonance spectroscopy. The thermal behavior of the complex is analyzed by differential scanning calorimeter. Phase solubility and tudies are done to learn the solubility of the newly synthesized complex. Results: Formation constant from UV-visible analysis is found to be 569 M<sup>-1</sup> by Benesi-Hildebrand equation. The solubility constant is calculated to be 52 M<sup>-1</sup>. The results obtained prove the inclusion which is confirmed through molecular docking studies. Conclusion: The newly synthesized inclusion complex is a potent pharmaceutical agent in drug formulation as stigmasterol solubility is enhanced when included in the cavity of cr-CD.

Keywords: Alpha-cyclodextrin, formation constant, inclusion complex, stigmasterol

#### INTRODUCTION

Stigmasterol, known as stigmasterin found in various medicinal plants, is an unsaturated phytosterol resembling cholesterol in both structure and function. The molecule constitutes a rigid tetracyclic backbone (6-6-6-5) with one secondary hydroxyl group at one end and one C,, branched hydrocarbon chain at the other end.[1] It is a secondary metabolite used in health-enhancing constituents of natural food.[3] According to Song et al.[3] stigmasterol possesses pharmacological properties such as cytotoxicity, antioxidant, anti-inflammatory, antimutagenic, hypoglycemic, antiosteoarthritic, and antitumor activity. Despite a wide range of potential attractiveness, stigmasterol is poorly used by the pharmaceutical industry due to its low solubility, high melting point, and chalky taste.[4] To overcome this problem, stigmasterol may be complexed with different compounds, which would enhance their physicochemical properties.[1] One such is to form an

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inclusion complex with alpha-cyclodextrin (α-CD). CDs are water-soluble, nonreducing, and macrocyclic oligosaccharides that have glucose units formed by an α-1,4 linkage with a lipophilic central cavity and a hydrophilic outer surface. <sup>[6]</sup> CDs enhance the delivery of low water-soluble and chemically unstable drugs to the body through biological membranes by improving the bioavailability of drug molecules. In this research, we evaluate the interaction between stigmasterol and

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B. Jone Magadelin Z; S. Ajith Sinthuja; Y. Christabel Shaji



+ Author & Article Information

AIP Conf. Proc. 2393, 020112 (2022)

https://doi.org/10.1063/5.0074379

In this review, Diversified The key that is available for catalysis with regard to synthetic approaches in nanotechnology A brief survey is provided, and for applications like this Here are some examples of their usefulness. We begin by discussing applications of nano-structured materials for catalysis Well Defined Sizes, With patterns and lyrics along with heterogeneous solid supports for nanocatalysts. And, then of Let's explore functions Finally, we consider applications in heterogeneous catalysis which Plays an important role in field of catalysts. This review is about the nano structure Perspectives on future developments in the field of research and concludes the overview, in practice to dateAchievements will continue to face challenges It also summarizes the detailed set of tasks undertaken in the order.

**Topics** 

Nanomaterials, Nanotechnology, Catalysts and Catalysis, Review

## REFERENCES

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# Synthesis, Characterization, *In vitro* Antiproliferative and Cytotoxic Effect of Ruthenium(II)-Bipyridine-Benzoylpicolinic Acid Complex on SK-MEL-28 and Normal L6 Cell Lines

## Santhiya Sivaraman1 and Sheeba Daniel2,\*

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#### Abstract

The most seriously spread malignant tumor of melanocytes throughout the body is a melanoma type of skin cancer. SK-MEL-28 cell line is one of a series of melanoma cell lines. The objective of the present investigation is to study the anticancer activity and cytotoxicity of novel  $[Ru(bpy)_2(bzpic)_2]^{2+}$  (bpy = 2,2′-bipyridine and bzpic = 3-Benzoylpicolinic acid) complex on SK-MEL-28 and normal L6 cell lines using MTT assay method. The morphology of the cancerous SK-MEL-28 cell line at various concentrations of the  $[Ru(bpy)_2(bzpic)_2]^{2+}$  complex is assessed by 2-fold dilution method, and the *in vitro* antiproliferative effect of the complex on the cancerous SK-MEL-28 cell line is analyzed by direct microscopic observation method. The percentage viability of the complex on cancerous SK-MEL-28 cell line at various concentrations is determined. The IC50 value of the complex against the SK-MEL-28 cell is found to be 39.109 µg/mL which shows good antiproliferative effect. The IC50 value of the complex against normal L6 cell line is found to be 55.315 µg/mL. The results revealed that the percentage of growth inhibition of the cell is based on dose-dependent manner and the formation of formazan crystal indicates this. The fluorescent microscopy observation clearly determines that the synthesized  $[Ru(bpy)_2(bzpic)_2]^{2+}$  complex shows late apoptosis on SK-MEL-28 cell line and early apoptosis on L6 cell line. Hence, it is evident that the synthesized complex exhibits good *in vitro* antiproliferative effect with lower cytotoxicity.

Keywords: [Ru(bpy)<sub>2</sub>(bzpic)<sub>2</sub>]<sup>2+</sup> complex, SK-MEL-28 and L6 cell lines, MTT assay, Antiproliferative effect, Fluorescence microscopy, Anti-skin cancer activity

#### Introduction

Skin cancer is the most common form of human cancer, and one of the types of skin cancer is melanoma. The primary cause of premature death from cancer is melanoma. Early detection of the primary melanoma developed is associated with improved survival. The changes in the skin such as soreness, unusual growth or a change in an existing mole, skin appearance, and new growth lead to basal cell and squamous cell carcinoma. Melanocytes produce the dark pigment melanin, which are normally present in the skin [1]. Superficial spreading of melanomas that lack melanin pigment can be treated by *in vivo*, and *in vitro* methods with an attractive therapeutic target, chemotherapy agents, make an important contribution to melanoma in the future [2]. Apoptosis is a self-destruction complex and a biochemical process of cells in a multicellular organism. A programmed cell death maintains tissue homeostasis, fetal development, and aging [3]. During apoptosis, the surrounding cells and cellular macromolecules are digested into smaller fragments. In a controlled fashion, the cells are collapsed into smaller intact fragments and are removed by phagocytosis without damaging [4].

Due to the rapid increase in cancer cases, researchers make many efforts to produce effective chemotherapeutic and diagnostic agents to inhibit and detect cancer cells. Cisplatin has been established as an antineoplastic agent for the treatment of various cancer cells since the 1960s. Later it was identified that cisplatin has significant side effects and some limitations. Consequently, these limitations induce the researchers to develop novel therapeutic and diagnostic agents for cancer therapy, drug delivery, biosensing, and imaging [5,6].





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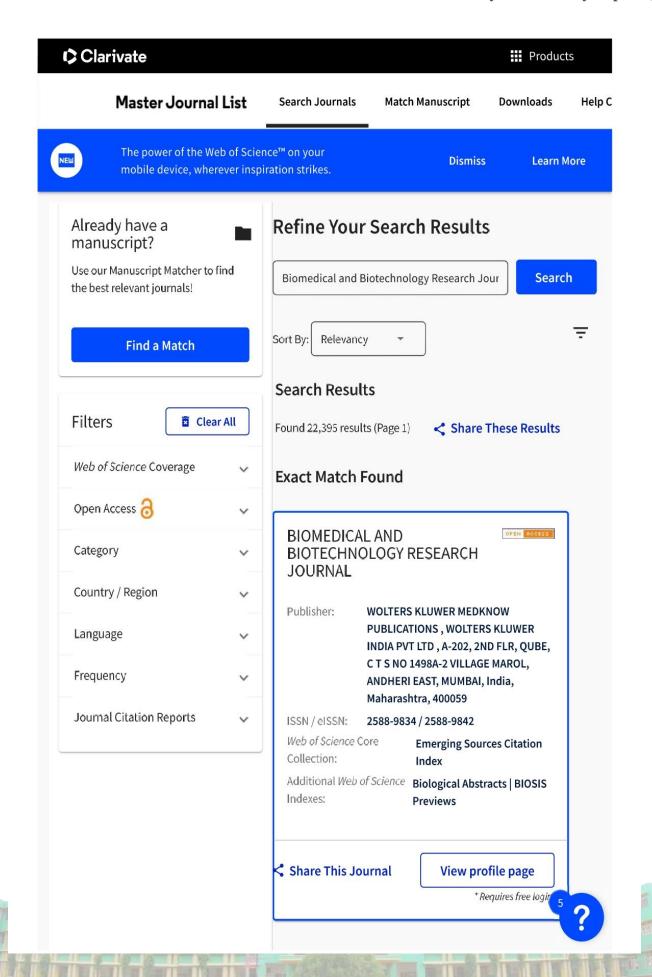
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#### **Original Article**

# DNA Binding and Cleavage Study of Novel Ruthenium (II)-Polypyridine-5-(3-pyridyl)-4H-1,2,4-Triazole-3-Thiol Complex on *Escherichia Coli* Genomic DNA

Santhiya Santhiya<sup>1</sup>, Sheeba Daniel<sup>2</sup>

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\*Department of Chemistry, Holy Cross College (Autonomous), Nagercoll, Tamil Nadu, India

#### **Abstract**

Background: Transition metal complexes especially Ruthenium-Polypyridyl complexes interact with multidentate ligands considered as a new therapeutic agent to make the possible DNA probes and conformers due to several interests owing to their potential applications. The aim of the present work is to concentrate on the binding and cleavage activity of [Ru(bpy),[pytrzSH),]<sup>2+</sup> (complex 1) and [Ru(phen),[pytrzSH),]<sup>2+</sup> (complex 2) (bpy = 2,2\*-bipyridine, phen = 1,10-phenanthroline, pytrzSH = 5-(3-pyridyl)-4H-1,2,4-triazole-3-thiol) on Escherichia coli genomic DNA (gDNA). Materials and Methods: DNA binding and cleavage activity is carried out using ultraviolet-Visible spectral technique and Agarose gel electrophoresis method at three different concentrations against the standard genomic DNA isolated from E. coli bacteria. Results: The changes in the absorbance and wavelength upon incremental addition of the complexes on gDNA clearly depict the binding nature of complexes. The binding constant values for ligand centered and metal to ligand charge transfer transitions obtained from the Benesi Hildebrand plots are found to be 1.560 × 10<sup>4</sup> and 9.586 × 10<sup>4</sup> M<sup>-1</sup> for complex 1 and 3.594 × 10<sup>4</sup> and 9.801 × 10<sup>5</sup> M<sup>-1</sup> for complex 2. The results revealed that complex 2 shows better binding property than complex 1 on E. coli gDNA. The extent of DNA cleavage activity of the synthesized complexes on E. coli gDNA is determined from the band intensities, complex 2 shows full cleavage in all the three concentrations, whereas complex 1 exhibits full cleavage at 100 µg/mL. The cleaving ability depends on the nature of the ligands present in the complexes. Conclusion: The synthesized [Ru(bpty),[pytrzSH),]<sup>2+</sup> (complex 1) and [Ru(phen),[pytrzSH),]<sup>2+</sup> complex 2 shows better cleavage activity than [Ru(bpty),(pytrzSH),]<sup>2+</sup> complex 1.

Keywords: Binding constant, DNA binding, DNA cleavage, E. coli genomic DNA, ruthenium(II)-polypyridine complexes

#### INTRODUCTION

Bacterial genomic DNA (gDNA) is a highly condensed and functionally organized nucleus-like structure without a nuclear membrane resides inside the cells. The first important genome which gets completely sequenced and contributes major to recombinant DNA technology is E. coli.[1-5] It survives when released to the natural environment and gets colonized in the lower gut of animals allowing widespread dissemination to new hosts.<sup>[4]</sup> Therefore, Escherichia coli is frequently used as a model organism in microbiology and molecular biology studies.<sup>[5]</sup> The E. coli chromosome is composed of the gDNA, RNA and protein.<sup>[6,7]</sup>

Nowadays, research is focused toward the introduction of novel and biologically safe therapeutic agents. Metal complexes play

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a vital role in pharmaceutical and medicinal chemistry and are used as therapeutic agents. [8-10] Researchers have reported that the binding of a drug to a metal complex increases its activity. [11] Among the transition metal complexes, particularly ruthenium(II)-polypyridyl complexes have significant interest for developing new diagnostic and therapeutic agents that can

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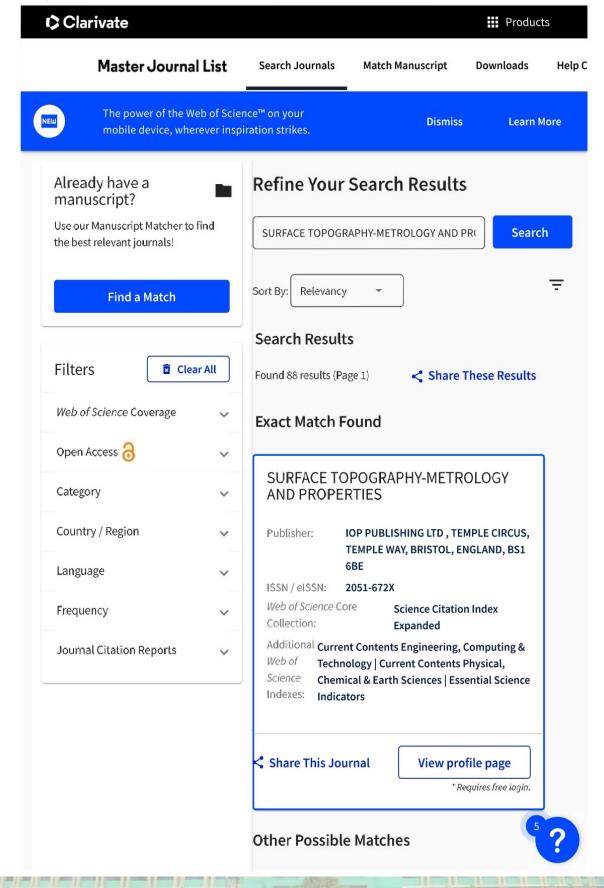
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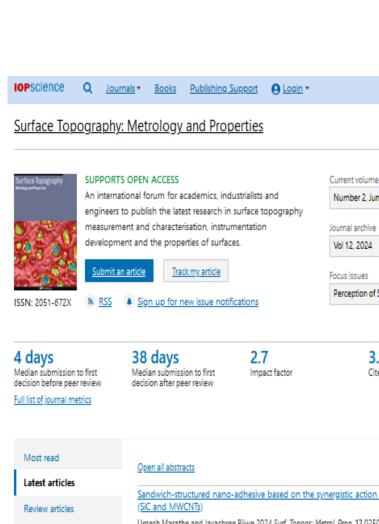
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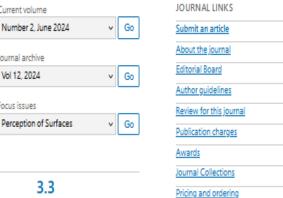


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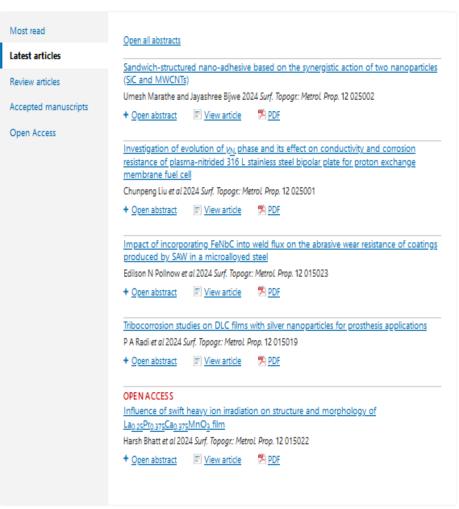


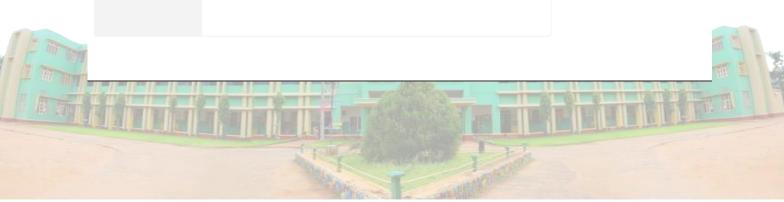
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# Online acoustic emission measurement of tensile strength and wear rate for AA8011-TiC- ZrB2 hybrid composite

Y Brucely<sup>5,1</sup> [iii], Y Christabel Shaji<sup>2</sup>, A Bovas Herbert Bejaxhin<sup>3</sup> and Abeens M<sup>4</sup> [iii] Published 28 October 2022 • © 2022 IOP Publishing Ltd

Out of Taxaban Matalana and Dana dia Mahara 40 North

<u>Surface Topography: Metrology and Properties, Volume 10, Number 4</u>
Citation Y Brucely et al 2022 Surf. Topogr.; Metrol. Prop. 10 045009

DOI 10.1088/2051-672X/ac9acf

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- 4. Published 28 October 2022



Method: Single-anonymous

Revisions: 1

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#### Abstract

In current scenario the aircraft industry in need of a lightweight connecting material that persuade the technical and technological standards, but also need superior mechanical qualities. In this work the major objective is to enhance the strength behaviour of stir cast composites. Aluminum 8011 (Al 8011) titanium carbide (TiC) and zirconium boron (ZrB2) hybrid composites are stir cast in this work, and their microstructure, mechanical, and tribological properties are investigated. The matrix material was Al 8011, which was supplemented with stronger TiC to boost mechanical strength and softer ZrB2 to improve thermal and corrosion resistance without significantly changing electrical properties. According to the findings, the reinforced alloy's mechanical qualities outperform those of the unreinforced alloy. Acoustic energy generated during deformation of composite materials has been monitored and early fracture measurements has been achieved using the Acoustic emission (AE) approach in tensile test specimens. As a result of the experiment, Al8011 + 10% TiC + 2% ZrB2 composites outperform the Al8011 matrix alloy in terms of wear resistance, coefficient of friction, and surface smoothness, as well as other characteristics. The AFM representation of Al8011 + 10% TiC + 2% ZrB2 matrix reveals that the wear surface smoothness of the AMMC is significantly improved as compared to the Al8011 matrix alloys.

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# Synthesis, characterization and catalytic activity of platinum nanoparticles ≒

B. Jone Magadelin; S. Ajith Sinthuja 2; S. Christabel Shaji



+ Author & Article Information

AIP Conf. Proc. 2446, 130001 (2022)

https://doi.org/10.1063/5.0113185

The present work focuses on the synthesis and characterization of spherical, cubical and tetrahedral platinum nanoparticles. The catalytic activity in shape-dependency of Pt NPs is studied by comparing the catalytic activity of cubical Pt NPs (Pt cNPs) with tetrahedral (Pt tNPs). The Pt cNPs/Pt sNPs are synthesized by water-based process and Pt tNP is synthesized by hydrogen reduction method. The morphology of Pt colloidal particles was studied with the help of transmission electron microscopy (TEM). The reused catalyst of TEM images show modification in structure from cubical to spherical nanoparticles, imputed to the significant leaching susceptibility of Pt {100} surface facets. Tetrahedral Pt NPs are the most catalytically active, with a minimum activation energy of 12 kJ mol-1. In contrast, cubic Pt NPs are the least catalytically active, with an uplifted activation energy of 23.4 kJ mol-1. The reason is difference in amount of catalytically active surface atoms.

**Topics** 

<u>Colloids, Nanoparticle, Catalysts and Catalysis,</u> <u>Transmission electron microscopy</u>

#### REFERENCES

1. J. Z Zhang, World Scientific. 6, 303–309, (2009). Google Scholar

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Scopus coverage years: 2005, from 2014 to Present

E-ISSN: 2214-7853

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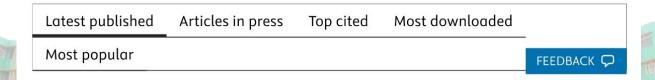
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Materials Today: Proceedings

Volume 68, Part 3, 2022, Pages 640-645

# A novel synthesis of phyto-mediated silver nanoparticles and its bacterial performance against microbes

B Jone Magadelin 2 🗴 👼 , S. Ajith Sinthuja b, S. Begila David c, A. Yardily c

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#### Abstract

Green chemistry is the design, development, and execution of chemical products and processes to minimize or eliminate the use and procreation of substances unsafe to human health and the environment.

Nanoparticles are often mentioned as clusters, nanospheres, nanorods, and nano cups are just a few of the shapes at the small end of the size ranges from 1 to 100nm. The development of an eco-friendly process through various biological means helps to traverse various plants for their ability to interpret silver nanoparticles. In this investigation, we delineate the synthesis of silver nanoparticles using the leaf elicits of Euphorbia hirta and Cardiospermum halicacabum. Synthesized particles are characterized by UV– Spectrophotometer and FT-IR analysis. The antibacterial effects of Ag salts have been noticed since antiquity and Ag is currently used to control bacterial growth in a variety of applications, including dental work, catheters, and burn wounds. It is illustrious that Ag ions and Ag-based compounds are highly venomous to microbes, revealing strong biocidal effects. Further, the interpreted silver nanoparticles were tested against common bacterial pathogens.



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#### Keywords

Characterization; Euphorbia hirta, Cardiospermum halicacabum; Leaf extract; Silver nanoparticles; Antimicrobial activity

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SJR 2022

0.163

**SNIP 2022** 

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## Source details

Source type: Journal

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Scopus coverage years: from 1968 to 1990, from 1993 to 2023

Publisher: INSIO Scientific Books and Periodicals

ISSN: 0022-2755

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Editor : Dr. Jayanta Bhattacharya Print ISSN : 0022-2755 Prequency : Monthly Published since : 1952

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<u>1023-09-20</u>

Pradip Kumar Chanda, an esteemed editor, visionary leader, and cherished colleague, passed away on 4th August, 2023 at the age of seventy. The world of mining, sustainable energy, power, energy has lost a true luminary, and his contributions will be remembered for generations to come.

Born on 21st, January, 1955 in Kolkata, P.K. embarked on a lifelong journey of literary and intellectual exploration. He was a dedicated scholar, passionate about business management, helping scholars, engaged his total liveliness for the development and enhancement of this journal. His remarkable academic achievements and profound insights reshaped the landscape of mining journal universe during his illustrious career. He himself was a patron of knowledge, wisdom that he channelized into the form of blassoming development for those who have the same hunger.

His unwavering commitment to excellence and his remarkable editorial skills propelled him to the position of MANAGING EDITOR at JOURNAL OF MINES METALS AND FUELS & INDIAN JOURNAL OF POWER AND RIVER VALLEY DEVELOPMENT. Under his guidance, JMMF became a beacon of knowledge and a respected platform for scholars worldwide. His editorial vision transformed countless research papers into insightful and impactful articles, enriching the academic discourse in the field of mining, metallurgy, minerals & fuels.



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## Journal of Mines, Metals and Fuels

Contents available at: www.informaticsjournals.com/index.php/jmmf

# ZnO Polymer Nano Composites Synthesis, Characterization, and Thermo-Mechanical Property Comparison

J. C. Chrislin Mario<sup>1</sup>, Y. Christabel Shaji<sup>1</sup>\*, Y. Brucely S<sup>2</sup>. Ajith Sinthuja<sup>3</sup>, A. Bovas Herbert Bejaxhin<sup>4</sup> and N.Ramanan<sup>5</sup>

#### Abstract

Both the polyester resin matrix-based polymer ZnO nano composites and pure polyester sheet were synthesised using the solution casting method. The crystalline structure of the nano-particles was examined inside using X-ray diffraction (XRD). The fundamental polymer composition, additives, organic contaminants, and purity were all assessed by FTIR. A minor alteration in the absorption bands was seen in the polyester system with ZnO added. The thermal properties were examined using differential scanning calorimetry (DSC) and thermo gravimetric analysis (TGA), and the results unmistakably demonstrated the creation of a highly cross-linked polyester molecular structure or improved free volume fractions in polymer nano composites. A mechanical analyzer's tensile and flexural strength tests revealed the potential for nanoparticle aggregation due to a strong interaction with resin. To calculate the relative permittivity and the loss of tangents (tan), dielectric studies had been used. Analysis of the hydrophobic properties of the pure and ZnO polyester nano composite.

Keywords: Polyester resin, Polymer ZnO Nano composites, Pure polyester sheet, Thermal, Mechanical properties, Dielectric spectroscopy, Hydrophobic character.

#### 1.0 Introduction

Thermosetting resins and the composites made from them are widely used in a number of applications due to their remarkable properties and low cost [1-3]. In order to preserve the resins from environmental deterioration, inorganic particles are also added; nevertheless, the addition of several common inorganic particles has a tendency to decrease the material's strength and transparency. The strength of the material is not in any way diminished by this binding process because nano-particles typically have a more active surface and bind to the resins with sufficient strength. As a result, a sizable amount of research has focused on using nanoparticles to improve thermosetting resins [4]. ZnO nanoparticles, also referred to as ZnO NPs, have a strong absorption ability. It can be used on matrices to protect them from environmental effects and increase the tensile strength of the materials [5]. The material's smaller diameter and the

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<sup>&</sup>lt;sup>5</sup>Assistant Professor, PSN Engineering College, Tirunelveli. Ramananinjs2020@gmail.com.





## International Journal on Interactive Design and Manufacturing

CiteScore 2022 5.0

(1)

Scopus coverage years: from 2008 to Present

Publisher: Springer Nature

ISSN: 1955-2513 E-ISSN: 1955-2505

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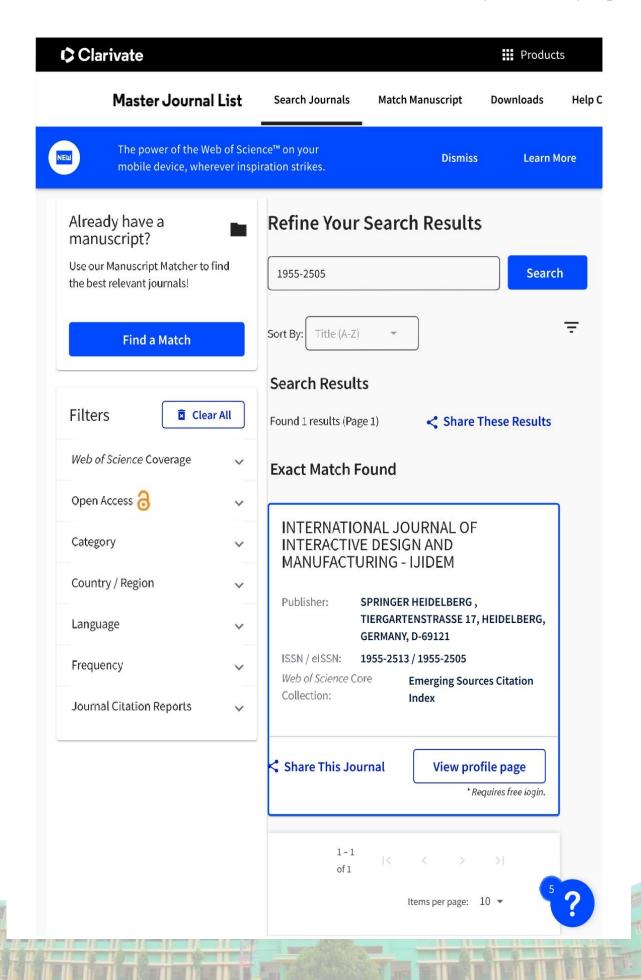
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Original Paper | Published: 29 August 2022

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## **Abstract**

The applications of nanocomposites are not limited to a single field but are widely spread across a wide range. The application of nanocomposites embraces automotive, solar panels, sporting goods, aerospace, structural, cryogenic vessels, structural gas and oil pipelines. The polyester resin matrix-based polymer ZnO nanocomposites will be synthesized by the solution casting method. Manufacturing of nanocomposite is recommended by adding nano ZnO and nano coconut shell filler in polyesters at various weight ratios using the hand layup process. The crystalline structure of both nanoparticles will be investigated using the X-ray diffraction method. Purity and base polymer



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Scopus coverage years: from 2001 to Present

Publisher: Science China Press

ISSN: 1001-2400

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## Comparative Evaluation of Antimicrobial Efficacy of AgNPs synthesized from leaf extracts of Laurus nobilis and Persea americana

S.Lizy Roselet1\* and K.Francy2 1\* Corresponding Author, 1\*,2 Department of Chemistry, Holy Cross College (Autonomous) Nagercoil.

#### Abstract

Silver nanoparticles (AgNPs) possess a broad spectrum of antibacterial, antifungal and antiviral properties. Silver nanoparticles have the ability to penetrate bacterial cell walls, changing the structure of cell membranes and even resulting in cell death. Their efficacy is due not only to their nanoscale size but also to their large ratio of surface area to volume. They can increase the permeability of cell membranes, produce reactive oxygen species, and interrupt replication of deoxyribonucleic acid by releasing silver ions. In this investigation, we have synthesized nanoparticles from the leaf extracts of Laurus nobilis and Persea americana and characterize the final product, and evaluated their antimicrobial activities. Both the leaf extracts were found to be effective against the Escherchia coli, Staphylococcus aureus, Bacillus aureus and Pseudomonas aeruginosa

#### Key Words

Silver nanoparticles, Laurus nobilis, Persea americana, antimicrobial activity

#### Introduction

Silver nanoparticles are one of the promising products in the nanotechnology industry. AgNPs can be biosynthesized by bacteria, fungi, yeast, actinomycetes and plant, thus avoiding the use of toxic substances and enabling for further application in medical and pharmaceutical industries1. Plants contain a wide range of metabolites that can aid in reducing silver ion, stabilizing and capping AgNPs2, therefore the concentration and composition of AgNPs will vary depending on the plant type3. this is particularly the medicinal plant's case, given that it is a rich source of phytochemicals and antioxidants. The Polyphenols, carotenoids, and vitamins are the principal antioxidant components of medicinal plants, the curative plants. The medicinal plants display a wide range of anti-inflammatory, antibacterial, antiviral, anti-aging, and anti-cancer activities4 The intricate biomolecules in medicinal plants help to reduce metal ions and nanoparticle stabilisation into the correct form and size5. The production of AgNPs by plants involves the process of reduction. It is quite easy to do because all that is needed is plant extract and silver salt, and then

VOLUME 16, ISSUE 12, 2022 http://xadzkjdx.cn/



## Research Journal of Chemistry and Environment

CiteScore 2022 0.4

**(i)** 

Scopus coverage years: from 2007 to Present

Publisher: International Congress of Chemistry and Environment

ISSN: 0972-0626

SJR 2022 0.123

1

(1)

Subject area: (Earth and Planetary Sciences: General Earth and Planetary Sciences)

(Chemistry: General Chemistry) View all 🗸

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General Earth and Planetary Sciences			
Chemical Engineering	#249/272	8th	
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## Green synthesis and characterization of chitosan doped nickel oxide nanocomposites using *Euphorbia hirta* and its antimicrobial activity

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#### Abstract

Chitin is extracted from shells of shrimps and characterized using UV-drs spectroscopy.It is converted to chitosan by the process of deacetylation the and to nanochitosan by process nanochitosan sonication.Chitosan and characterised using UV-Vis and FTIR spectroscopy. Nickel oxide nanoparticles (NiO) are green synthesised from Nickel chloride crystals using Euphorbia hirta medicinal plant leaf extract which contains alkanes, triterpenes, phytosterols, tannins, polyphenols and flavanoids as reducing agent. E.hirta serves as a good medicine for treating female disorders, respiratory ailments, worm infestations in children, dysentery, jaundice, pimples, gonorrhea, digestive problems and tumors. The formation of nano NiO is characterised by UV-Vis, FTIR and XRD spectroscopic techniques.

The nano NiO particles are doped with nanochitosan and the antimicrobial activity of the resulting composite is analysed with Staphylococcus aureus and Pseudomonas aeruginosa bacterium using amikacin as the control. The results shows the enhancement in the antibacterial nature of the composite.

Keywords: Chitin, chitosan, E. hirta, nickel oxide, antimicrobial properties.

#### Introduction

Chitin is a waste product obtained from fish processing company. It has limited applications due to its poor solubility in water, however its properties can be modified by converting it into chitosan by deacetylation<sup>5,9,11</sup>. Chitins present in the shells of crustaceans are abundant sources of chitosan. Chitosan is a natural polymer obtained by deacetylation of chitin. Both chitin and chitosan possess antimicrobial activity<sup>4</sup>. The biomedical applications of chitin and chitosan are restricted because of its insoluble nature in most solvents, low mechanical properties <sup>13,21</sup>. The physicochemical and biological properties of chitosan can be improved by surface modification by doping with metal oxide nanoparticles. Enormous work is available in the literature about the preparation and doping of chitosan with nanometal oxide, synthesised using various methods <sup>19</sup> which

contribute to environmental pollution. Only limited work is reported related to preparation of metal nanoparticles using green methods<sup>16,18</sup>, utilising medicinal plant extracts as reducing agents<sup>3,15</sup>. This study compares antibacterial activity of the resulting NiO doped and undoped chitosan with that of NiO nanoparticles alone<sup>2</sup>.

This study reveals that the method of preparation of nickel oxide nanoparticles from Nickel (II) chloride hexahydrate using ethanolic extract of E.hirta medicinal plants is cheap, environmentally friendly and easily available. It also proves that doping of nickel oxide nanoparticles in chitosan improves its antibacterial activity and hence chitosan nickel oxide nanocomposite can be used as a good antibacterial reagent.

#### Material and Methods

Materials: The raw material chitin required for the present study is prepared from the shells of shrimps collected from fish market, Nagercoil, Kanyakumari District. Chitosan was synthesised from chitin by deacetylation. Euphorbia hirta leaves were collected from Kurusady, Nagercoil, Kanyakumari District.India. Shells of shrimps were selected as primary source for chitosan in the present study. The shells were collected from Ramanputhoor, (Nagercoil, Tamilnadu, India) fish market.

Methods: The shells were cleaned, washed with water and dried in sunlight for 15 days and UV-drs spectroscopy of chitin in absorbance & reflectance mode was recorded and demineralised by adding 1:1 HCl solution. The demineralised chitosan was heated with 1M HCl for 15 minutes near to 100°C and decolourised using H<sub>2</sub>O<sub>2</sub>Deacetylation was done by treatment with 50% NaOH at 100 - 150°C for one hour and was washed well with distilled water and then dried at hot air oven at 60°C for 4 hours.

Euphorbia hirta leaves were shade dried for 15 days, powdered and the Ethanolic extract of the leaves was obtained using Soxlet extractor. Nickel chloride hexahydrate was obtained from Merck, India. Only deionised water was used in the entire study.

Preparation of nickel oxide nanoparticles: Nickel oxide nanoparticles are synthesised by the reduction of Nickel (II)



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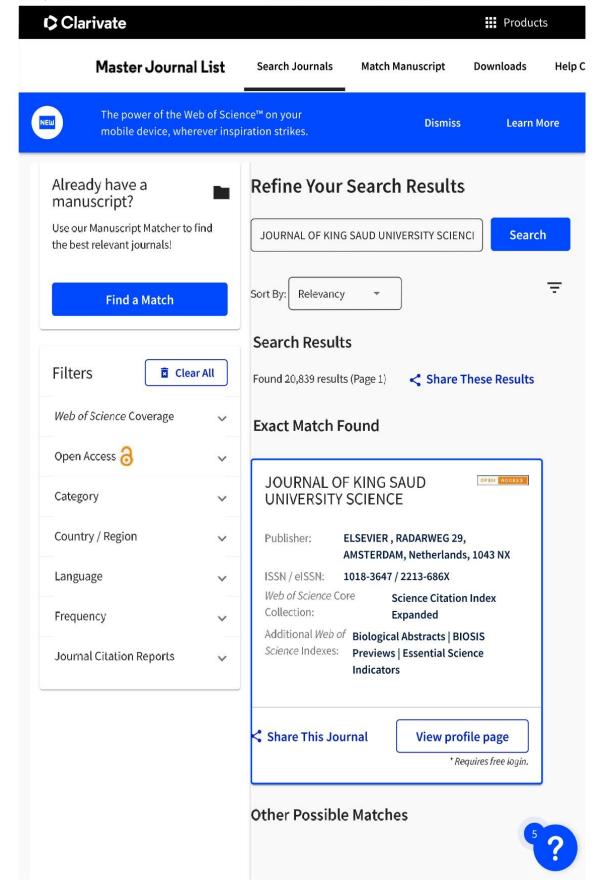
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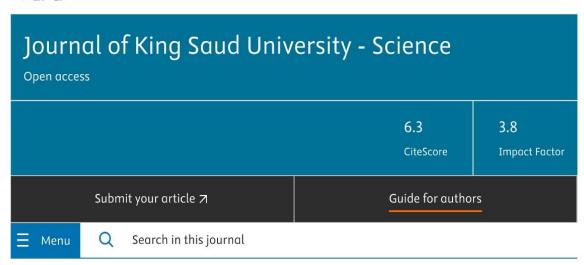


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Original article

## Green synthesized ZnO NPs as effective bacterial inhibitor against isolated MDRs and biofilm producing bacteria isolated from urinary tract infections



Manavalan Murugan a, K.R. Beula Rani b, J. Albino Wins C, Govindan Ramachandran d, Feng Guo e,\*, Ramzi A. Mothana f, Omar M. Noman f, Fahd A. Nasr f, Muhammad Zubair Siddigi g

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#### ABSTRACT

Based on the importance of multi drug resistant and biofilm forming bacterial spread, the current research work aimed on synthesizing the nanoparticles of zinc oxide from the plant parts of Limonia acidissima. They were assayed for their antibacterial activities against biofilm forming urinary tract infected pathogens including Salmonella paratyphi, Shigella, Streptococcus, Staphylococcus and Klebsiella pneumonia which was confirmed by anti-microbial susceptibility test, 24-well polystyrene plate and modified tube test methods. The formulation of nanoparticles was confirmed by UV–Visible spectrophotometry. Fourier transform infrared spectroscopy revealed the formation of biomolecules that has great involvement in stabilizing the zinc oxide. The size as well as the shape with high resolution was confirmed with electron microscopical studies. It is very clear that zinc oxide nanoparticles have great antimicrobial effect because of its inhibition role against tested urinary tract bacteria by various invitro experiments. This provides a positive thinking on novel drug discovery, in which human health can be improved. Hence, this study provides a scientific support to the medicinal uses of zinc oxide nanoparticles for the treatment of microbial infections.

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#### 1. Introduction

Worldwide, most prevalence infections are urinary tract infection, and it affected>10% peoples every day among the total of 150 million (Abad et al., 2019). Recent years, the most of the physicians reported that the urinary tract infection is the most recognized bacterial infection and the treatment is failure (Soto et al., 2006). In women, it is very complicated infection due to the sud-

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den increase of pregnancy diabetics, functional abnormalities, immunocompromised nature and failure of existing drugs (Hashemzadeh et al., 2021; Katongole et al., 2020). More reports are pointed out about urinary tract infection and it account 80% of multi drug resistant behavior (AL-Mahfoodh et al, 2021; Rajivgandhi et al., 2018). Recently, multiple reports are evidenced that bundles of virulence factors are the important specific reasons for developed multi drug resistant in urinary tract infection (Baiou et al., 2021; Govindan et al., 2018). Especially, extended spectrum beta lactamses, quorum sensing and biofilm formation by exopolysaccharide are the more possible reason (Jafarzadeh et al., 2020; Cheng et al., 2015). Among the urinary tract infection, these three virulence factors contributed almost 75% and developed more resistant against existing drugs (El mekes et al., 2020; Chitra et al., 2010). Almost all the beta lactum antibiotics are ineffective or more susceptible to multi a drug resistant bacterium which leads to biofilm formation.





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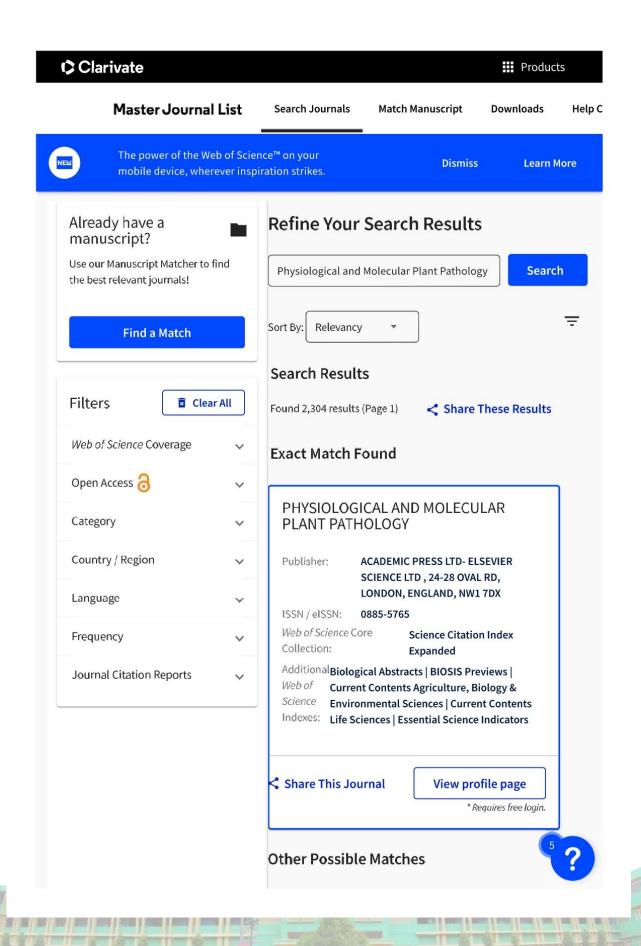
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#### Physiological and Molecular Plant Pathology

Volume 119, May 2022, 101816

## Phytopathogenic bacterial and nematicidal activity of extracts and powder of Adhatoda vasica on Meloidogyne incognita

N. Benit 🙎 🖂 , T.S.J. Kumar, Khalid S. Almaary, Mohamed S. Elshikh, Rabab Ahmed Rasheed, Paulrayer Antonisamy

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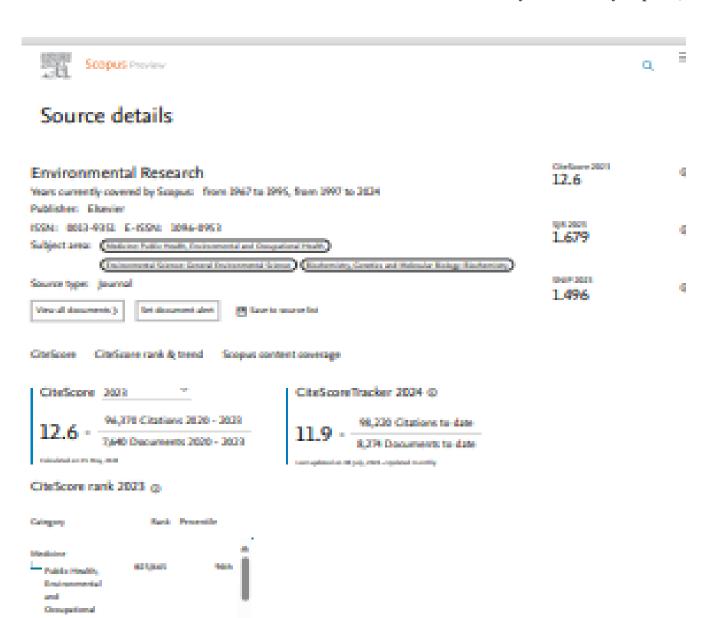
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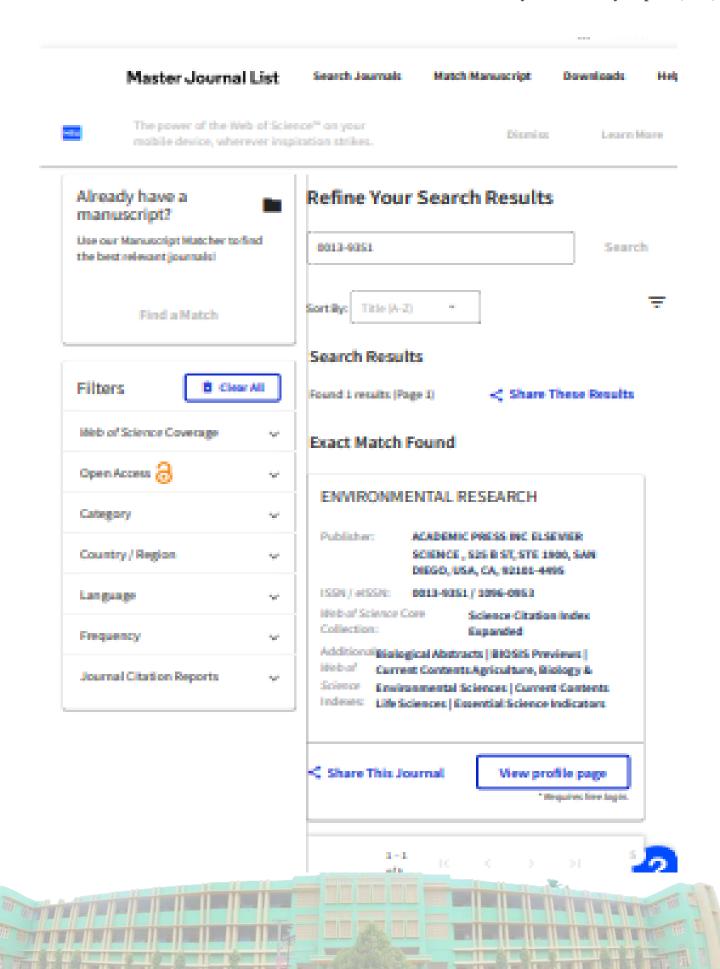
The undesirable application of synthetic pesticides to control nematode pests increased phytotoxicity, environmental pollution, and resistance to nematodes, in addition to its very high cost [1]. The growing environment coupled with ban on many nematicides needed a decrease in chemical nematicides usage and the search of natural pesticides. The utilization of natural antibacterial and nematocidal compounds in crop production and protection has attracted much more attention from consumers and farmers [2]. Plant-parasitic nematodes (PPN) are significant agricultural pests capable of creating yield losses to a great extent. The nematode pests affected roots of agricultural crops and involved in root dysfunction, decreased rooting volume and decreased efficiency in utilization of nutrients and water [3]. The rootknot nematodes Meloidogyne spp. involve economic loss in horticulture crops [4,5]. The application of plant secondary metabolites as an alternative route for management of root-knot nematode has become increasing significant [7]. The implementation of successful nematode pesticide control programme requires integrated approach that combines various factors [6]. Plants secrete secondary metabolites that help them to be more competent in their own system. Moreover, these small molecules exert a wide range of effects on the plant and on other living organisms. They involved in abscission, flowering, fruit development, controlling perennial growth through signal deciduous behaviour etc. [8]. They act as antimicrobials and perform the role of attractants or, conversely, as repellents. Nematicidal compounds such as phenols, alkaloids, polyacetylenes, sesquiterpenes, isothiocyanates, diterpenes, thienyls, fatty acids and glucosinolates were determined from the plants [[9], [10], [11], [12]].

Medicinal plants have various biologically active secondary metabolites. These medicinal plants contain phenolic compounds, flavonoids, steroids and other bioactive compounds [13,14]. These phytochemicals have antimicrobial, anticancer, haemolytic, photocatalytic and antioxidant activities [[15], [16], [17], [18], [19], [20]]. Plants are richest organic reservoirs of nature are receiving increasing attention to treat or kill various plant-parasites [21]. Much awareness of the health hazards and environmental risks by chemical agents, the development of phyto insecticides and antibacterial agents has imparted great interest among research communities all over the world [22]. The antibacterial activity of medicinal plants against phytopathogen was reported in recent years. Phenolic compounds from medicinal plants, including tea extract have broad spectrum antimicrobial properties against plant pathogens [[23], [24], [25]]. Generally, biopesticides or biological antibacterials from plants are non-persistent in the field scenario as they are readily converted by microorganisms, oxygen and light into less toxic products [26]. Plant extracts are potential alternate for the toxic synthetic nematocidal agents. Adhatoda vasica is one of the medicinal plants and has effective antibacterial and antifungal properties. Adhatoda vasica is a common medicinal plant in Asia of family Acanthaceae and well known widely previously for its mucolytic properties [27,28]. In the current study, the antimicrobial potency of ethanol extract of Adhatoda vasica against phyto pathogenic bacteria was studied. The aqueous extract was used to investigate juvicidal and ovicidal potential against M. incognita under green house condition and field trials.



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Volume 209, June 2022, 112822

# Immobilization of Halomonas halodurans and Bacillus halodurans in packed bed bioreactor for continuous removal of phenolic impurities in waste water

N. Benit \* A. S., A. Amala Lourthuraj \*, K. Barathikannan \*, Ashraf Abdel-Fottah Mostafa \*, Hissah Abdulrahman Aladaini \*, Mohamed Taha Yassin \*, Ashraf Atef Hatamleh \*

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## Highlights

- Phenol degrading bacteria were isolated from the coir retting wastewater.
- Bacteria produced laccases and pectinase involved in phenol removal.
- Dual biocatalyst immobilized and applied in packed bed bioreactor.
- Immobilized biocatalyst on alginate beads improved phenol removal.
- Considerable phenol-degradation was achieved after several catalytic cycles.





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ISSN: 2096-3246 Volume 54, Issue 02, November, 2022

#### EVALUATION OF BIODEGRADABLE WASTE AS MANURE FOR TERRACE GARDEN

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#### **ABSTRACT**

Communities will grow more congested as civilizations become more wealthy and urbanized. As a result, trash disposal, particularly biodegradable waste, will become more difficult since it will be thrown in the streets, having a detrimental effect on both human health and the environment. This biodegradable waste can be turned into vegetable manure for the terrace garden, which would lessen the immediate family needs. Terrace gardening not only helps households obtain fresh produce free of chemicals but also returns some land to agriculture.

Keywords: Negative impact, Manure, Chemical-free, Biodegradable waste

#### 1. INTRODUCTION

The need for the production of organic food in agriculture, which is quickly becoming an appealing source of income generating, is the result of an increased awareness of health and environmental challenges in agriculture. These days, cultivating vegetables has evolved into an economic activity that may be classified as a company. Products labeled as organic have been produced in accordance with a method of agriculture that forgoes the use of chemical fertilizers and pesticides in favor of tending to one's social and environmental responsibilities. This type of farming is effective at the grass roots level, preserving the reproductive and regenerative capacity of the soil. It also produces nutritious food rich in vitality that is resistant to diseases. Good plant nutrition and sound soil management are also important components of this type of farming (Thiripurasundari 2015). When purchasing veggies at the grocery store, you run the risk of ingesting traces of pesticides and other agricultural pollutants. The cultivators employ an excessive amount of chemical fertilizers and pesticides in order to increase their yield and hence their income. The majority of farmers aren't able to determine the precise amount of fertiliser or pesticide to use, so they just throw it on, assuming that the more fertiliser they use, the better the crop will turn out. As a direct consequence of this, the vast majority of the vegetables that are offered for sale in the market contain hazardous compounds. however, the vegetables that you cultivate yourself on your terrace at home won't be exposed to any of those chemicals. It is simple to convert all biodegradable garbage into organic manure that can





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# Review on the Medicinal Applications of Zinc Oxide Nanoparticles

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#### Abstract

Nanotechnology has advanced dramatically over the last several decades. Zinc oxide (ZnO), which can have a wide range of nanostructures, has unique semiconducting, optical, and piezoelectric properties and has thus been studied for a wide range of applications. Low toxicity and biodegradability are important characteristics of ZnO nanomaterials. Zn2+ is an essential trace element for adults (a daily dose of 10 mg is recommended) and is involved in many aspects of metabolism. ZnO's surface is chemically rich in -OH groups, which can be easily functionalized by various surface decorating molecules. We summarised the current state of the use of ZnO nanomaterials for biomedical applications such as biomedical imaging (including fluorescence, magnetic resonance, positron emission tomography, and dual-modality imaging), drug delivery, gene delivery, and biosensing of a wide range of molecules of interest in this review article. Over the next decade, research in biomedical applications of ZnO nanomaterials will flourish, and much effort will be required to develop biocompatible/biodegradable ZnO nanoplatforms for potential clinical translation.

Keywords: Zinc oxide, nanomaterials, drug delivery, gene delivery.

#### Introduction

Nanomaterials are nanometer-sized falls with diameters ranging from 1 to 100 nm, and these materials have enhanced unique properties. Physical, chemical, and

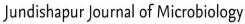


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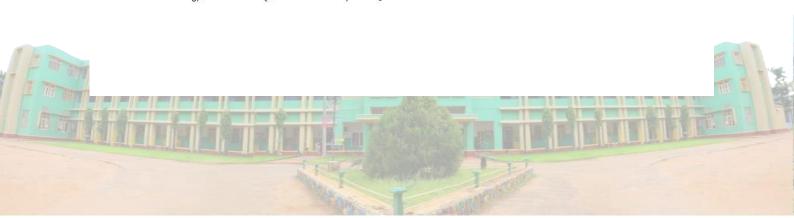
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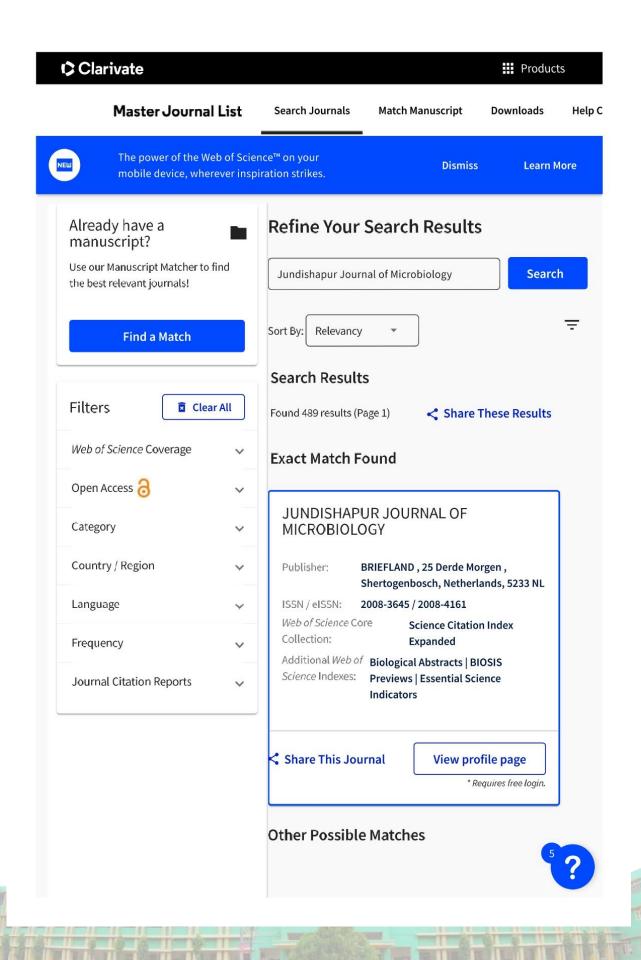
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Jundishapur Journal of Microbiology Published online 2022 April Research Article Vol. 15, No.1 (2022)

# Comparative Phytochemical Screening and Antibacterial Activity of *Azadirachta Indica* and *Cassia Auriculata*.

# R. Jacklin Jemi<sup>1</sup>, A. Iren Amutha<sup>2</sup>, S. Ani Besant<sup>3</sup>, P. Shasheela<sup>4</sup>, J. Celin Pappa Rani<sup>5</sup> and S. Suga<sup>6</sup>.

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- <sup>3</sup> 18113042262003, Research Scholar, Department of Botany, Holy Cross College (Autonomous), Nagercoil.
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Affliated to Manonmaniam Sundaranar University, Abisekapatti, Tirunelveli, Tamil Nadu, India.

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#### ABSTRACT:

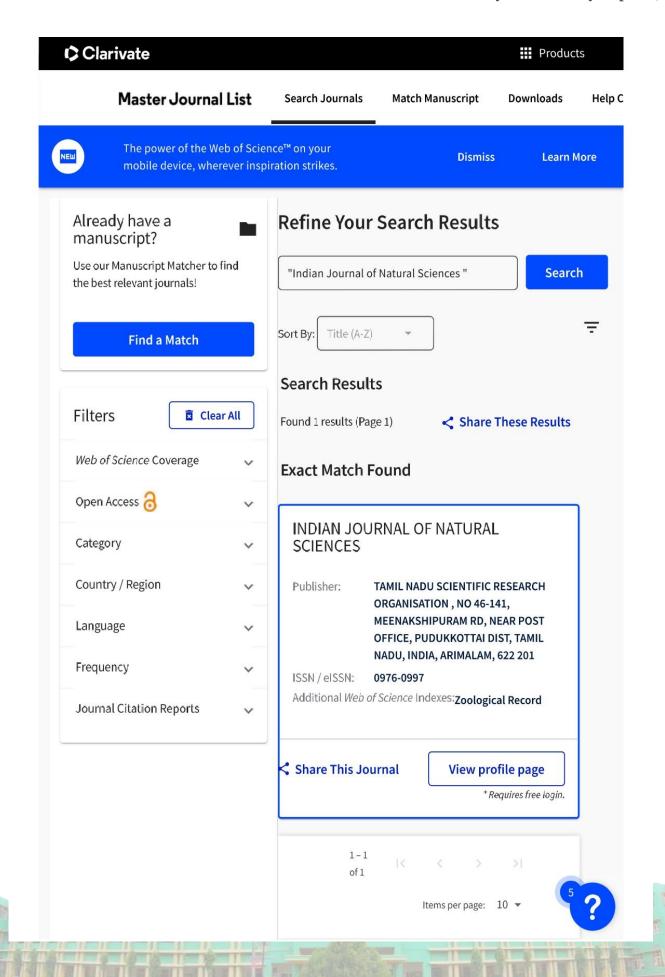
The present study of phytochemical screening and antibacterial activity done to identify potential drugs. The flower extracts of *Azadirachta indica* and *Cassia auriculata* were chosen for a comparative study. It resulted that *Azadirachta indica* flower extract proved to be highly potent against all most of the tested organisms and can treat different aliments

Keywords: Phytochemical, Antibacterial activity, drugs.

#### INTRODUCTION:

Medicinal plants have been of age long remedies for human diseases because they contain components of therapeutic value. They are rich sources of ecologically developed secondary metabolites, which are potential remedies for different ailments. In many developing countries, traditional medicine is one of the primary health care systems. Natural products of higher plants may give a new source of antimicrobial agents with possibly novel mechanisms of action.

Microorganisms harmful to human beings are termed as pathogens. In the recent past, due to the emergence and increase of such pathogenic strains resistant to multiple antibiotics and the continuing emphasis on health care costs, many researchers have tried to develop new, effective antimicrobial reagents free of resistance and cost. The antimicrobial activity is known to be a function of the surface area in contact with the microorganisms. Drug resistance is a serious global problem, and spread of resistance poses additional challenges for clinicians and the pharmaceutical industry. The use of plant extracts and phytochemicals, both with known antimicrobial properties, can be of great significance in therapeutic treatments. There is a continuous and urgent need to discover new antimicrobial compounds with diverse chemical structures and novel mechanism of action because there has been an alarming increase in the incidence of new and emerging infectious diseases (Parekh and Chanda, 2008). The world





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RESEARCH ARTICLE

## Ethnomedicinal plants used by the Vetans of Kanniyakumari District, Tamil Nadu, India

S. Jayakumar<sup>1</sup>, M.S. Kala Swarna<sup>2</sup>, T.S. ShyninBrintha<sup>3</sup>, C. Domettila<sup>4</sup>, R. Mary Sujin<sup>5</sup>, A. R. Florence<sup>6</sup>, A. AyunVinuba<sup>7</sup>, V. Sathia Geetha<sup>8</sup> and S. Jeeva<sup>3\*</sup>

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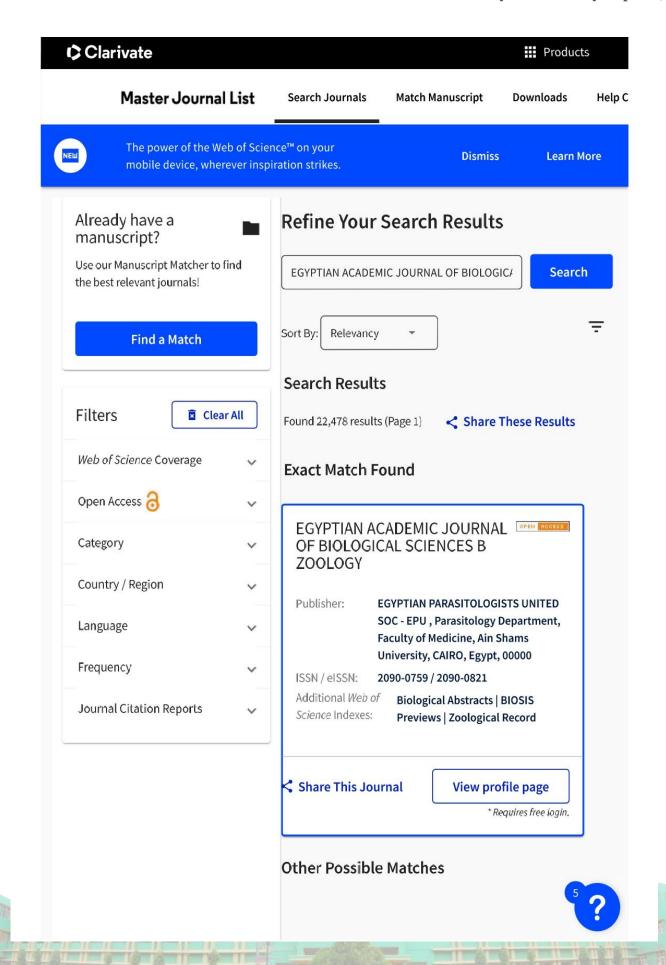
#### **ABSTRACT**

An ethnobotanical survey was carried out among the Vetan community peoplewho inhabit in periphery of the southern Western Ghats of Kanniyakumari district. A total of 153 plant species distributed in 134 genera belonging to 60 families were identified as commonly used ethnomedicinal plants used by the Vetan communities for the treatment of various ailments. The documented ethnomedicinal plants were mostly used to cure skin diseases, fever, ulcer, cold and cough and rheumatism. Leaves were the most frequently used plant parts. Herbs (70 taxa) were the primary source of medicine, followed by shrubs (52 taxa) trees (30 taxa), climbers (8 taxa). Medicinal plants are arranged alphabetically to their botanical names, vernacular names, family, part of the plant used and ethnomedicinal uses are tabulated along with their major phytochemical constituents. This finding reveals that the study area rich in medicinal flora and the community people still using medicinal plants in their daily life. Traditional knowledge of



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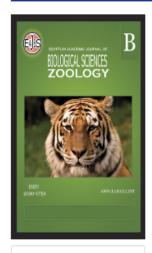
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Alleviative Role of Hemin on Reproductive Functions of Adult Male Rats

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Survey of Natural Agglutinins in Two Species of Marine Crabs

#### Rathika, R.K., Mary Mettilda Bai, S. and Vinoliya Josephine Mary, J.

Department of Zoology, Holy Cross College (Autonomous), Nagercoil, Affiliated to Manonmaniam Sundaranar University, Tirunelveli, Tamil Nadu, India. E-mail\*: metti.silvester@gmail.com

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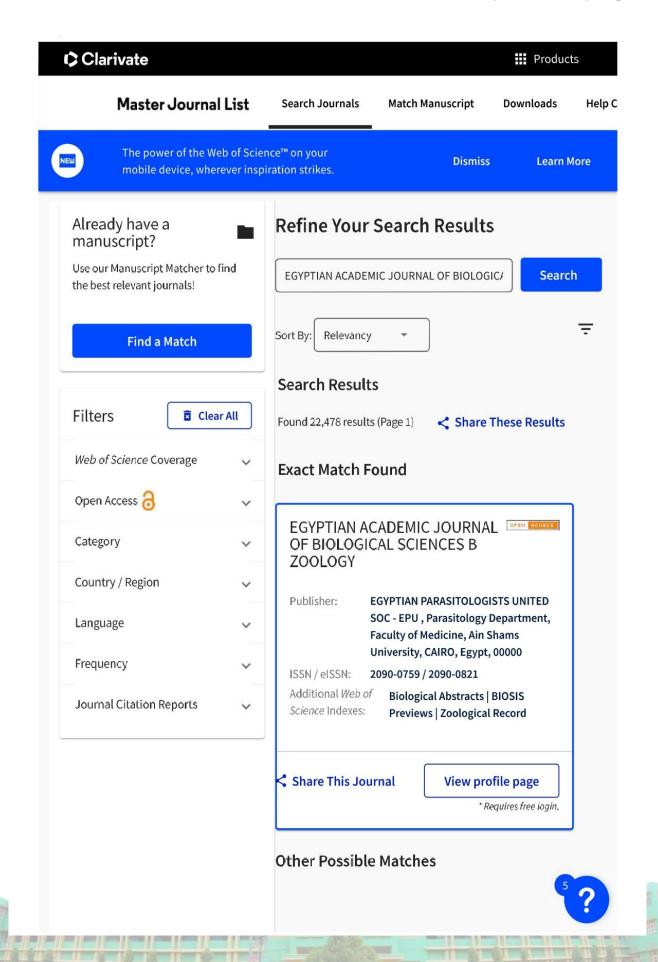
#### ABSTRACT

Agglutinins/lectins are conventionally defined as proteins/ glycoproteins of non-immune origin with a remarkable ability to specifically and reversibly interact with carbohydrate ligands. Lectins from different sources may essentially exhibit common biological activities. This study was therefore undertaken to survey naturally occurring agglutinins in two species of marine crabs by hemagglutination assay using mammalian erythrocytes. Hemagglutination assay results showed that the hemolymph of the marine crab Grapsus albolineatus showed the highest HA titer with rat erythrocytes. HA titer of the crab Leptodius sanguineus varied from 0 to 32 with all the tested erythrocytes. Among the various tissues of Grapsus albolineatus analyzed for the presence of agglutinins, hemagglutination activity was observed in the hemolymph and hepatopancreas with rat erythrocytes. HA was determined by both male and female crabs of Grapsus albolineatus. HA activity increased with an increase in animal size. Biochemical factors like water, protein and calcium content of the hemolymph did not have any influence on the HA

#### INTRODUCTION

Invertebrate lectin seems to participate in the innate immune response by inducing bacterial agglutination or activation of phagocytosis through binding to sialic acids on foreign cells (Iwanga and Lee 2005). Invertebrate innate immunity relies on both cellular and humoral components. Humoral molecules are mainly found in hemolymph plasma and cell hemocytes. The hepatopancreas and hemocytes of crustaceans are regarded as the most important tissues involved in crustacean immunity (Grass et al., 2001). Lectins are proteins with diverse molecular structures that share the ability to recognize and bind specifically and reversibly to carbohydrate structures without changing the carbohydrate moiety. Lectin is described as a substance that can agglutinate cells or precipitate glycoconjugates, with a structure resembling a carbohydrate-binding protein or glycoprotein and is not of immune origin (Vasconcelos et al., 2004). Due to its capacity to react selectively on a specific sugar group (Marques and Barraco 2000), lectins are considered a biomolecule of interest in glycobiology. Lectins have gained much attention for biomedical applications owing to their antimicrobial and anticancer potential (Silvester Mary Mettilda Bai et al., 2022). Along with their biological role, they are documented as

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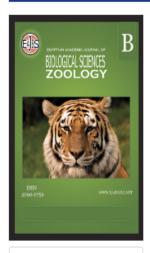
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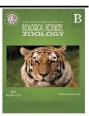
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In vitro Evaluation of Antioxidant, Antibacterial and Anticancer Activities of Phyla nodiflora Aqueous Leaf Extract

#### Regis Freeda R.1\* and Dr. Jeni Chandar Padua2

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P. nodiflora, Antibacterial, Antioxidant, Anticancer, DPPH.

#### **ABSTRACT**

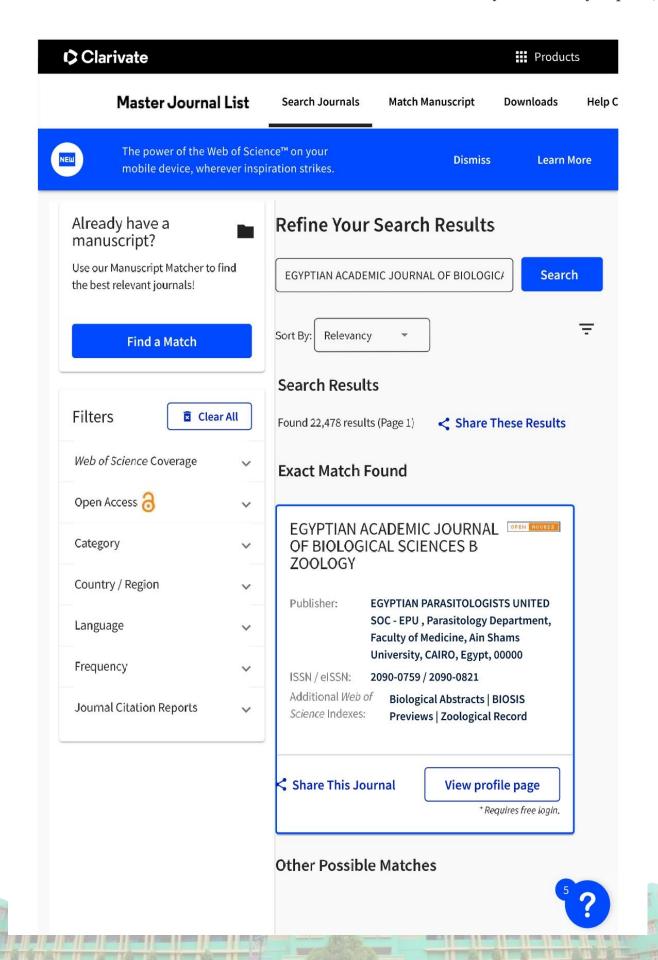
Phyla nodiflora is a creeping perennial herb, which is widely used in folk medicine. The present study evaluates the phytochemical constituents and in vitro antioxidant and antibacterial potential of the aqueous leaf extract of Phyla nodiflora. The phytochemical analyses were carried out using standard methods. The antioxidant activity of aqueous leaf extract was investigated by using DPPH and total antioxidant activity. The antibacterial assay was determined using the agar well diffusion method against the Gram-positive and Gram-negative bacterial strains such as Staphylococcus aureus, Bacillus subtilis, Klebsiella pneumoniae and Pseudomonas aeruginosa using streptomycin as a positive control. The aqueous leaf extract of Phyla nodiflora was screened against Human Hepatocarcinoma (HepG2) cell lines to determine its anticancer activity. Phytochemical screening of aqueous leaf extract revealed the presence of steroids, flavonoids, carbohydrates, tannins, saponins and alkaloids. Aqueous leaf extract showed DPPH radical scavenging and total antioxidant activity with an IC<sub>50</sub> value of 45.91 μg/ml and 52.33 μg/ml. The highest zone of inhibition was found in K. pneumoniae (22.5mm), while P. aeruginosa (9.1mm) exhibited the lowest zone of inhibition, indicating that the leaf extract has significant antibacterial properties. The aqueous leaf extract of P. nodiflora exhibited significant antiproliferative activity against the HepG2 cancer cell line with an IC<sub>50</sub> value of 47.5 μg/ml. The increased apoptotic potential of HepG2 cells in a concentration-dependent manner was determined using the Acridine Orange/Ethidium Bromide assay. It has been concluded that the aqueous leaf extract of *Phyla nodiflora* possesses the potential for antioxidant, antimicrobial and anticancer activities.

#### INTRODUCTION

Medicinal plants are the 'backbone' of traditional remedies. Traditional medicine related to the healing of both human and animal diseases with plant-derived preparations is considered precious information for the discovery of new antimicrobial and antifungal drugs (Seniya *et al.*, 2011). The importance of medicinal plants as a source of active drugs emerged from the chemical profile that produces a clear physiological action on the

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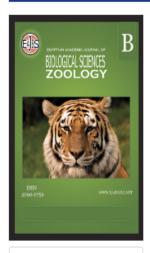
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Toxicity and Teratogenicity Effects of Aqueous Leaf Extract of *Phyla nodiflora* in Zebrafish (*Danio rerio*) Embryos

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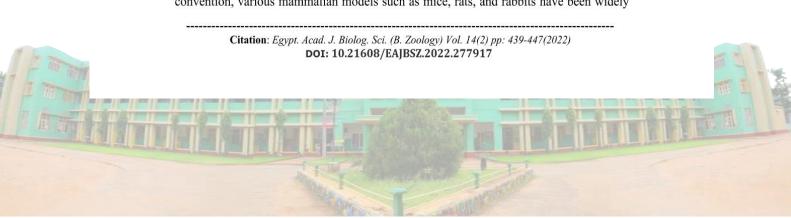
#### ABSTRACT

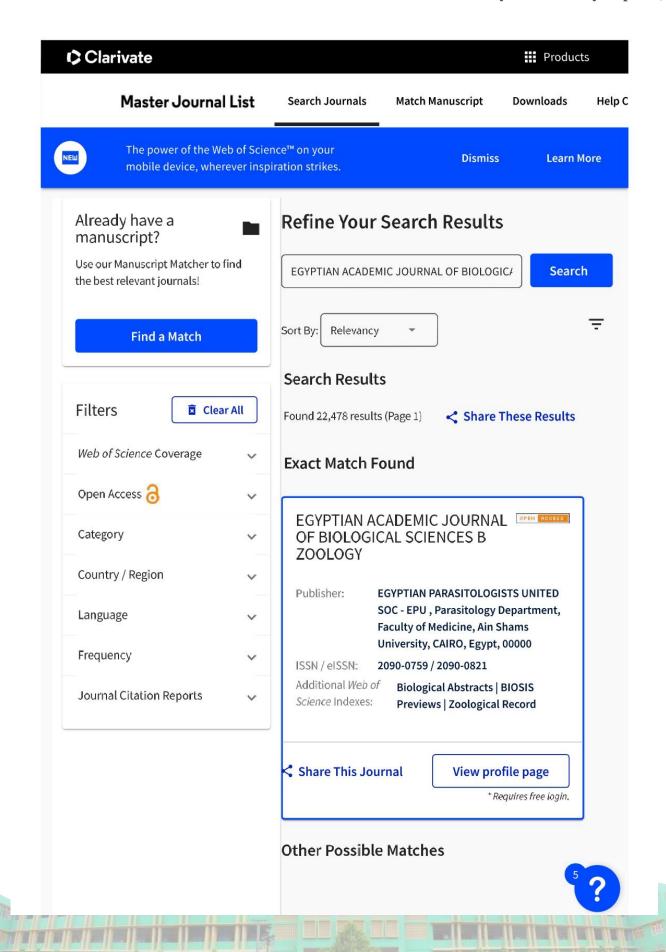
In India, Phyla nodiflora plant has often been used as traditional medicine for several years. In the current research, Zebrafish (Danio rerio) were used as animal model to examine the toxic and teratogenic effects of the plant on embryonic development. Zebrafish embryos were treated with concentrations of 6.25, 12.5, 25, 50, 100 and 200 µg/ml of the aqueous leaf extract of P. nodiflora. The Organization for Economic Co-operation and Development (OECD) guidelines of safety level was met by the extract, which was found to have a median lethal concentration (LC50) value of 147.02 μg/ml. However, the teratogenicity assessment found that embryos exposed to extracts of concentrations 50 µg/ml and above exhibited a variety of developmental abnormalities. The magnitude of the defects was observed to be concentration-dependent. In addition, delayed hatching was seen at concentrations of 100 and 200 µg/ml owing to stunted growth and early death. The surviving embryos at the test concentration of 100 µg/ml indicated a substantial decrease in heart rate. As a result, the treated embryos had bent tail tips, scoliosis, edema in the yolk sac and curved tail. The current investigation has produced preliminary findings on the possible toxicity and teratogenicity of P. nodiflora leaf extract on zebrafish embryos.

#### INTRODUCTION

Plants have been exploited as a useful source of chemical compounds with a wide variety of pharmacological effects, many of which have been developed into medications that are employed in therapeutics (Ghasemzadeh *et al.*, 2015). The promising potential of plants, particularly those with a history of ethno medicinal applications in alleviating a range of illnesses and ailments, has also led to the establishment of a broad array of herbal remedies and supplements around the world. However, despite the beneficial effects on human health, herbs and products derived from them have also been associated with cases of adverse side effects resulting from their ingestion.

Thus, the toxicological assessment of herbal products is an essential step within the framework of herbal product development to protect and ensure consumer safety. By convention, various mammalian models such as mice, rats, and rabbits have been widely







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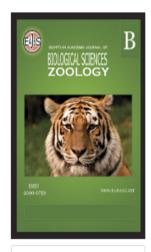
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# In vitro Antibacterial and Cytotoxic Activity of The Leaf Extract of Anisomeles malabarica against HepG2 Cancer Cell Lines

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#### ABSTRACT

Plant-based therapies have made an impact on human health. In the present study, aqueous A. malabarica leaf extract was subjected to determine the qualitative phytochemical screening, antibacterial activity against Staphylococcus aureus, Bacillus subtilis, Pseudomonas aeruginosa and Klebsiella pneumoniae, cytotoxic activity, and Acridine Orange/Ethidium Bromide dual staining assay for apoptotic effect against the HepG2 cell lines. The aqueous extract contained secondary metabolites such as quinones, carbohydrates, flavonoids, phenols, terpenoids, and amino acids, which were revealed in preliminary phytochemical screening. Among the bacterial species tested, P. aeruginosa (23.1mm) had the highest zone of inhibition, whereas K. pneumoniae (13.2mm) had the lowest, indicating that the leaf extract had significant antibacterial activity. After 24 hours of observation, the highest concentration of aqueous leaf extract suppressed 65.52% of cancer cell proliferation. The aqueous extract that had a concentration-dependent apoptotic impact against HepG2 cells was ascertained using the Acridine Orange/Ethidium Bromide assay. However, more research is needed before it can be used as a therapeutic tool. The findings of this study will be useful in the development of new antibacterial and anticancer therapeutic medicines derived from A. malabarica in the future.

#### INTRODUCTION

Plants are widely employed as therapeutic agents nowadays due to their accessibility, adaptability, affordability, therapeutic efficacy, and lack of adverse effects (Joseph *et al.*, 2010). The presence of phytochemicals in plant extracts plays an important role in therapeutics. Because of the occurrence of numerous bioactive secondary metabolites such as alkaloids, terpenoids, glycosides, steroids, flavonoids, and phenolic chemicals, modern pharmaceuticals rely on plant-based medication (Ouerghemmi *et al.*, 2017). Plant extracts contain a wide range of biochemical actions, including anti-allergic, anti-inflammatory, antioxidant, anti-microbial, anti-fungal, antiviral, and anti-cancer properties (Pisoschi and Pop; Friedman, 2007).

Medicinal plants are used by about 80% of the world's population in developing countries to heal a variety of diseases (Rai and Lalramnghinglova, 2010). Bacterial infections are regarded as a major public health concern since germs have been genetically





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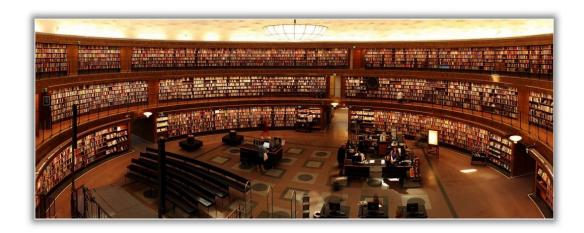


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# Purification and Characterization of a Sialic Acid Specific Lectin Isolated from the Marine Crab *Grapsus* albolineatus (GaLec)

# Rathika, RK<sup>1</sup>, \*Mary Mettilda Bai, S<sup>2</sup>, Vinoliya Josephine Mary, J<sup>3</sup>, Citarasu, T<sup>4</sup>, Sebastiammal, S<sup>5</sup> and Vargila, F<sup>6</sup>.

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#### Abstract

Lectins one of the defensive protein molecules have become the focus of intense interest for biologists and in particular for the research and applications in medicine. In this study, a lectin GaLec was purified from the marine crab Grapsus albolineatus by affinity chromatography using Fetuin-Sepharose 4B column. GaLec showed specific affinity for rat erythrocytes as evident from the hemagglutination assay. Physico chemical analysis of the GaLec demonstrated high hemagglutination activity ranging from pH 7.5 to 9 and temperature 0 to 40°C. The GaLec was dependent on calcium, magnesium and manganese. It was reversibly sensitive to EDTA and trisodium citrate. Hemagglutination activity was inhibited by the sugar N-acetyl D-glucosamine and N-acetyl D-galactosamine and the glycoproteins fetuin and lactoferrin. Reduction in HA with disialylated fetuin confirms the sialic acid specificity of the lectin. The reduction of HAI following de-O-acetylation confirms the specificity of the lectin for O-acetyl sialic acid.

Keywords: Grapsus albolineatus, Fetuin, Sepharose, EDTA, Hemagglutination, Sialic acid





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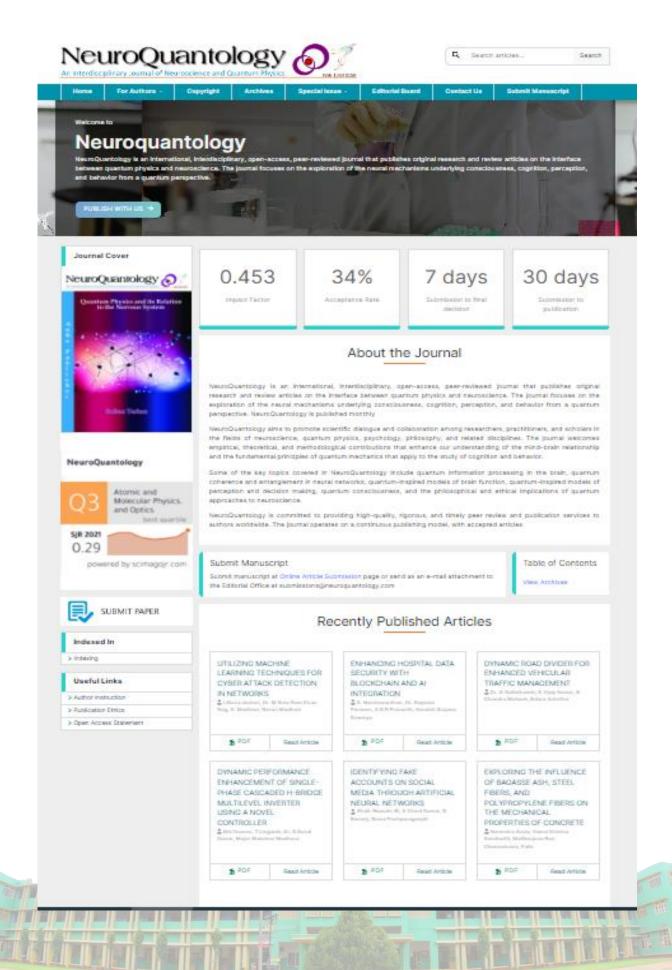
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NeuroQuantology| September 2022 | Volume 20 | Issue 11 | Page 8928-8931 | doi: 10.48047/ng.2022.20.11.NQ66891 Dr. S. Mary Judit et al/HISTORICAL MONUMENTS IN KANYAKUMARI DISTRICT A STUDY



# HISTORICAL MONUMENTS IN KANYAKUMARI DISTRICT A STUDY

Dr. S. Mary Judit

Assistant Professor in History Holy Cross College (Autonomous), Nagercoil. (Affiliated to Manonmaniam Sundaranar University, Tirunelveli – 627 012)

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The aim of this study is to highlight the historical importance of monuments in Kanyakumari district. The object of this study is to describing historical values of Hindu temples Muslim tombs and Christian churches. In English the word monumental is often used in reference to something of exordinary size and power as in monumental sculpture, but also mean simply anything made to commemorate the dead as a funery monument or other example of funerary art. The word comes from the Latin monere which means to remind or to warn. The term is often used to describe any structure that is a significant and legally protected historic work. Monuments are quiet testimonials of its past glory of any countries of politics socio, cultural and historical validity. By the way of its importance of heritage it attracts more number of domestic and international tourist. Usually monuments like temples forts and dwelling places provide information about the people of the past. Though the natives of Kanyakumari region were originally Hindus in due course transition and transformations crept in when Christianity, Islam and other religious penetrated into it. They have left with us numerous remnants and monuments of various nature in the form of buildings and architecture.

Kanyakumari District is the Lands end of India situated on the Southernmost tip of the Indian Peninsula.1 The total area of the elSSN1303-5150

district was ruled by the Ays. Early Pandyas, Later Cholas, Venadrulers<sup>2</sup> (1225 - 1950), Kanyakumari District is Primarily land of temples. There are four hundred and ninety prodigious temples.3 The notable centers of Siva worship are many in the district.4 Thanumalayaswami temple is situated at Suchindram Village about twelve kilometers north of Kanyakumari and seven kilometers south of Nagercoil. The present structure of the temple is the work of a number of persons spread over a number of centuries and is one of the best specimens and a store house of the Dravidian style of art and architecture.5 One hundred and twenty three inscriptions of this place narrate a lot about this chadurvedimangalam its evolution development. The king of almost all dynasties of the south had viewed with each other to commemorate their association with the 125 meters long and 72 meters wide main temple by constructing halls and arranging for the conduct of special Pujas in their name.<sup>6</sup> The temple is a store house of varied types of sculptures. The well Polished sculptures of Garudalvar, ThirumalaiNayak, the musical pillars, the two Travancore kings, Navagraha images. On the base of the Gopura are all very fine pieces of art.

Thirumalai Mahadevar temple is situated at a distance of about six miles south of Kulithurai in Vilavancode Taluk.7 It is located on the top of a petty rock elevation



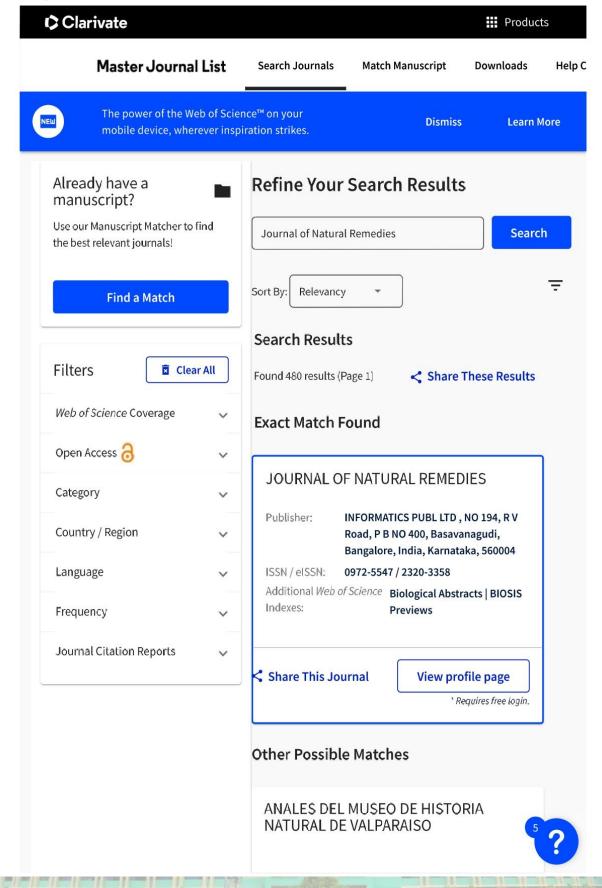
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#### TRACKING THE CHRONOLOGY OF EPIDEMICS AND PANDEMICS

Arul Vallarasi. S Guest Lecturer, SOEL, The Tamilnadu Dr. Ambedkar Law University, Chennai. and Dr. Regi, S

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#### ABSTRACT

As human spread across the world, infectious and contagious diseases are inevitable. Even from the prehistoric era there were some evidences for the occurrence of epidemics and pandemics. In the modern era, the fastest developments in transport and science and technologies transformed the world into a global village. Therefore, there are constant outbreaks of epidemics and pandemics in the modern era. Covid-19 is one such pandemic. In this situation the researchers have taken a step to narrate the occurrence of important or deadly pandemics of the world on a chronological basis. Though there were references of the occurrence of pandemics in the pre-historic era, stress has been given to the pandemics from 1 A.D. onwards.

**Key words**: Epidemics, pandemics, virus, bacteria, out-break, pathogen, China, flu, plague, and Yersinia pestis.

#### I. INTRODUCTION

An outbreak of a disease at a larger scale in a particular region is called as epidemic. If it spreads to a larger area it is known as pandemic. If a disease is a communicable disease then only it will become an epidemic or pandemic. In the human history there were records of occurrences of pandemics. The spread of pandemic has happened in many phases. Most of the times epidemics or pandemics occurred because of the transmission of the pathogen, disease causing virus or bacteria, from animals to human. When the pathogen spreads from human to human it becomes an outbreak. When it spreads to many people and confined in a same community or a particular locality it becomes an epidemic. When it spreads to larger area or a larger community, it would be called as pandemic. In the written history of the human past there were many references of the occurrence of epidemics and pandemics. In this article we are going to learn about the chronological occurrences of the epidemics and pandemics as it was referred in the chronicles of the world.

#### 1. Prehistoric Epidemic of China: Circa 3000 B.C.

The first ever known epidemic was the prehistoric epidemic of 3000 B.C. It was considered that it affected China. It was said so that there were lots of bones found in an archeological site at Hamin Mangha in northeastern China. Another archeological site named Miaozigou is also excavated with mass burial. This proved that there might be an epidemic which devastated the entire north eastern part of China.

#### 2. Ancient Plagues and other epidemics

The most threatening word in the history of epidemics and pandemics was plague. In Greek plague means strike or blow. The disastrous disease of plague was caused by a bacteria called as Yersinia pestis. There are three forms of plagues they are pneumonic, septicemic and bubonic. Apart from plague smallpox was also considered as a life threatening epidemic during the ancient times. With the invention of the vaccination for smallpox this greater health menace was eradicated.

#### 2.1. Plague of Athens: 430 B.C.



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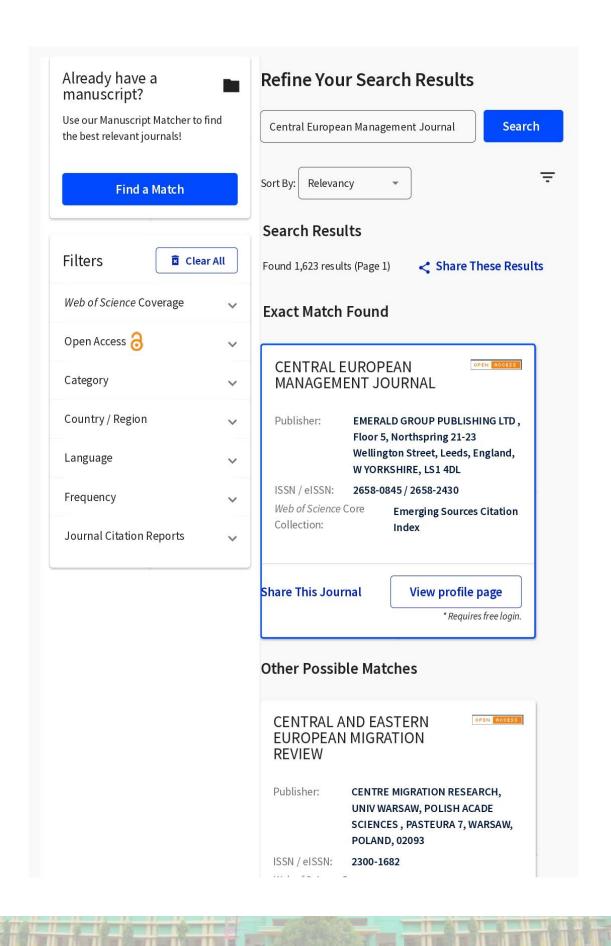
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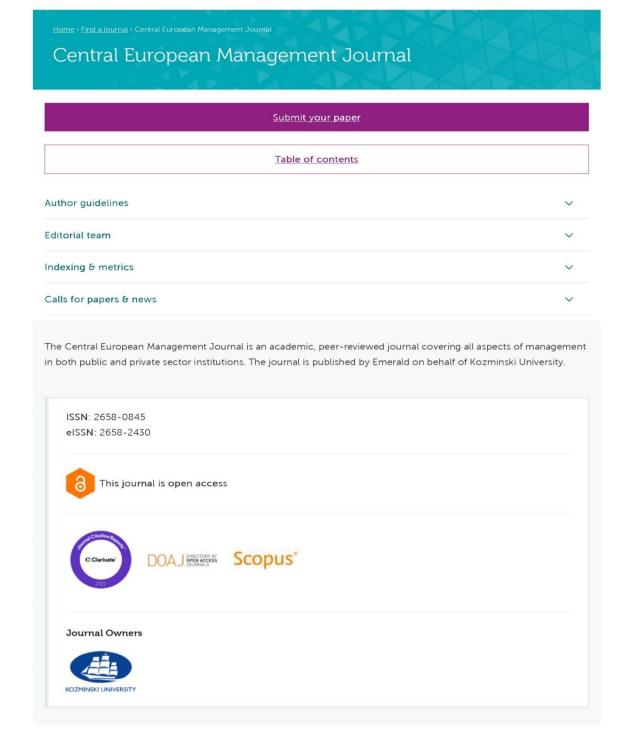
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# A STUDY ON PSYCHOLOGY AND MEMORIES OF THE PEOPLE IN NAGERCOIL TOWN

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#### Neil Beeto Jerrin

Research Scholar, Department of English, School of Social Sciences and Languages, Vellore Institute of Technology, Chennai, Tamilnadu, India.

#### INTRODUCTION

Past life regression is a method that uses hypnosis to recover what practitioners believe are memories of past lives or incarnations. The practice is widely considered discredited and unscientific by medical practitioners, and experts generally regard claims of recovered memories of past lives as fantasies or delusions or a type of confabulation. Past-life regression is typically undertaken either in pursuit of a spiritual experience, or in a psychotherapeutic setting. Most advocates loosely adhere to beliefs about reincarnation, [2] though religious traditions that incorporate reincarnation generally do not include the idea of repressed memories of past lives.

#### Memory

Memory is the way in which we record the past and later refer to it so that it may affect the present. It is hard to think of humans without this capacity. The more we can evaluate, nderstand, train, and strengthen our relationship with the mind, the more successfully we navigate our lives andovercome challenges.

#### PSYCHOLOGICAL BACKGROUND

Psychology is the science of mind, sometimes as the science of behaviour, i.e., how and why organisms do what they do. For example, why do birds sing and why do we remember how to ride a bicycle twenty years after the last try. All ofthese are behaviours, and psychology is the science that studies them all. The technique used during past-life regression involves the subject answering a series of questions while hypnotized to reveal identity and events of alleged past lives, a method similar to that used in recovered memory therapy and one that, similarly, often misrepresents memory as a faithful recording of previous events rather than a constructed set of recollections. The use of hypnosis and suggestive questions can tend to leave the subject particularly likely to hold distorted or false memories. The source of the memories is more likely cryptomnesia and confabulations that combine experiences, knowledge, imagination and suggestion or guidance from the hypnotist than recall of a previous existence. Once created, those memories are indistinguishable from memories based on events that occurred during the subject's life. Investigations of memories reported during past-life regression have revealed that they contain historical inaccuracies which originate from common beliefs about history, modern popular culture, or books that discuss historical events. Experiments with subjects undergoing past-life regression indicate that a belief in reincarnation and suggestions by the hypnotist are the two most important factors regarding the contents of memories reported.

#### STATEMENT OF THE PROBLEM

Nagercoil is the place for good education and better climate. People in Nagercoil are some what safety and happy, They have the psychological problems and several memories in the

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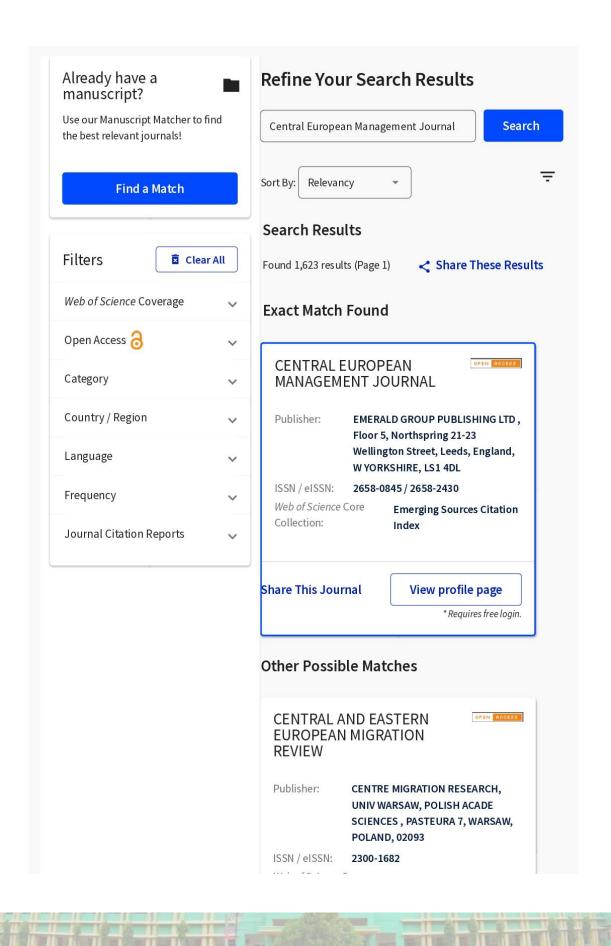
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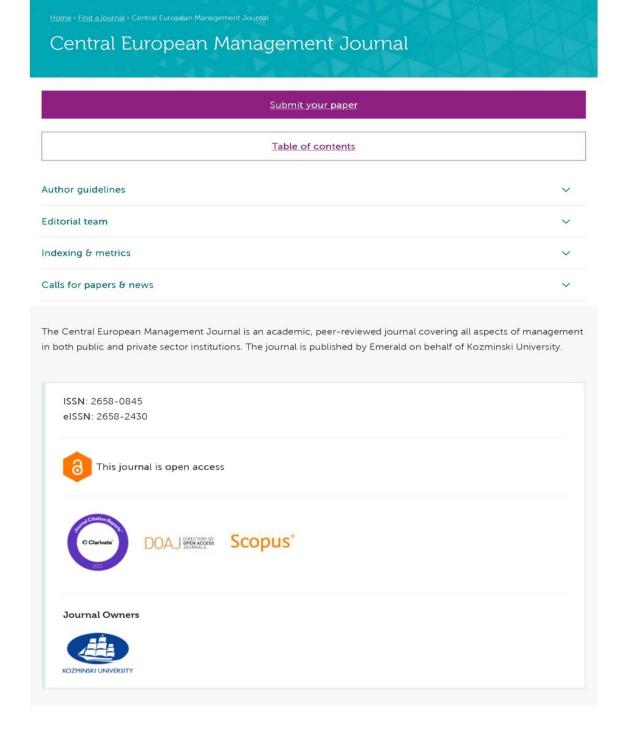
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Social Sciences  Sociology and Political Science	#622/1415	56th

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## Aims and scope

Central European Management Journal (CEMJ) publishes peer-reviewed research that focuses on all aspects of management, covering all from the nature of management itself to the impact management has within organisations. Articles may be interdisciplinary, as authors may base their studies of management within fields such as economics, law, psychology, literature, and sociology. CEMJ aims to, through its published research, facilitate a better propage propage

Central European Management Journal Vol. 30 Iss. 3 (2022)

ISSN:2336-2693 | E-ISSN:2336-4890

# A STUDY ON STUDENTS ATTITUDE TOWARS VIRTUAL LEARNING EXPERIENCE IN NAGERCOIL

#### A. Babila Kingsly

Assistant Professor of Economics, Holy Cross College (Autonomous), Nagercoil - 4

#### ABSTRACT

A Virtual Learning Environment (VLE) in educational technology is a web - based platform for the digital aspects of courses of study, usually within educational institutions. They present resources, activities, and interactions within a course structure and provide for the different stages of assessment. VLEs also usually report on participation; and have some level of integration with other institutional systems. For teachers and instructors who edit them, VLEs may have a fact role as authoring and design environments. VLEs have been adopted by almost all higher education institutions in the English – Speaking World.

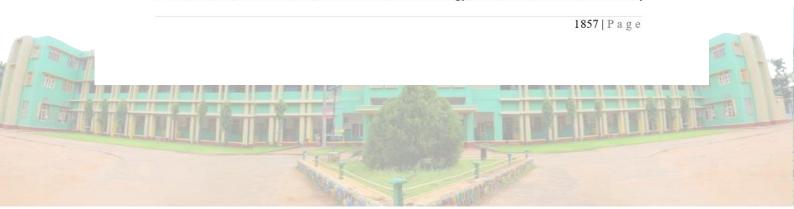
# Key Words: VLEs Introduction

Virtual learning has become a widespread method for providing education at the graduate and undergraduate level. Although it is an extension of distance learning, the medium requires new modes of presentation and interaction. Wide spread of Internet has encouraged universities and organizations to develop Learning Management Systems (LMS) based on Internet technologies to support teaching and learning process. Such LMSs provides various registrations of courses, distribution of learning material, tracking learner's progress, conducting tests, interaction between teacher and learner and other educational needs. Such LMSs based on Internet technologies, which are a type of E-learning systems, can be used to provide hybrid learning experience that is a combination of face-to-face traditional classroom learning with Internet oriented learning. In an E-learning environment, learners can learn at their own convenience of schedule and willingness. Ease of access to the learning material, time independence, repetitive learning and mobility are critical factors which drives the utilization of E-learning systems.

The purpose of education is to mould a person to be perfect. Education provides the pathway to reach their destiny. Education helps in inculcating social responsibilities as well. And so the epidemic of COVID 19 has its footprints on education. The outbreak of this dangerous virus across the globe has forced educational institutions to shut down to control the spread of this virus. This happening made the teaching professionals thinkof alternative methods ofteaching during this lockdown. And thusit pavesthe way towards web-based learning or e-learning or online learning. In today's scenario learning has stepped into the digital world. In which teaching professionals and students are virtually connected. E-learning is quite simple to understand and implement. The use of a desktop, laptop, or smart phones and the internet forms a major component of this learning methodology. E-learning provides rapid growth and proved to be the best in all sectors, especially in education during this lockdown.

#### Statement of the Problem

Today is a very exciting time for technology and education. Online programs offer technology bases instructional environments that expand learning opportunities and can provide top quality education through a variety of formats and modalities. In order for an online program to be successful, the curriculum, the facilitator, the technology, and the students must be carefully





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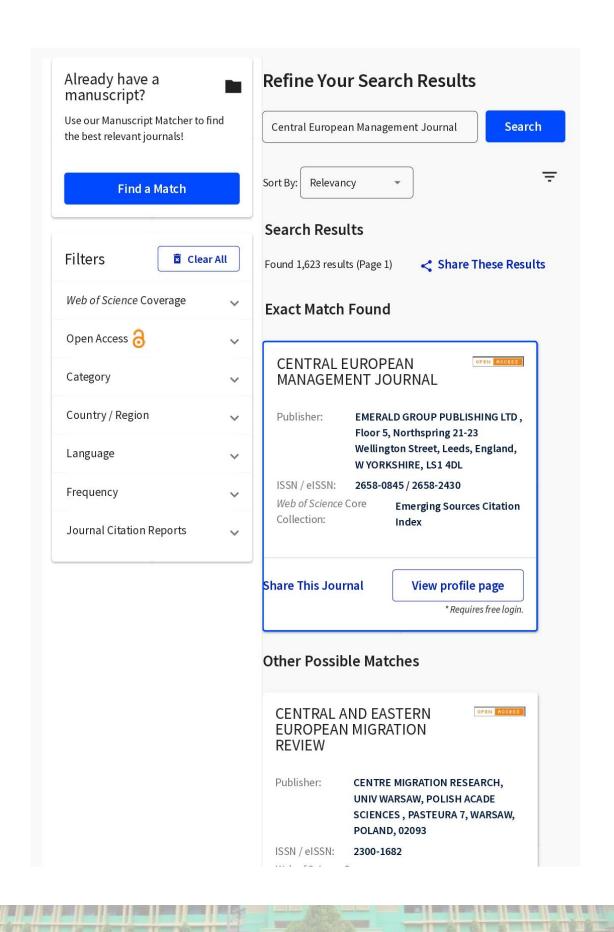


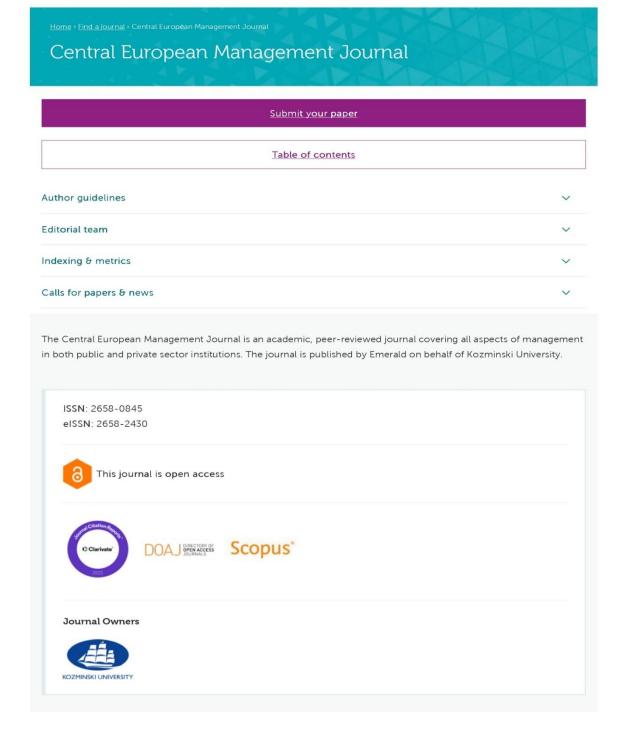
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#### CHALLENGES OF ONLINE LEARNING IN EDUCATION

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#### ABSTRACT

Online learning offers several benefits for students who want flexibility while attending college. Also, the COVID-19 has changed the education discourse drastically because now the students can find their courses and books online where they can study as per their own schedule. However, students face multiple problems in online classes and look for online learning challenges and solutions. We know very well that online learning platforms have attracted lots of attention. But many of them face some challenges of online learning much as hindrances in their comprehensive learning experience and real-time doubt solution. In this article, we have provided some of the challenges faced by the students and professors, the effect of online classes on students, and the suggestions on how to overcome online learning challenges.

Keywords; Internet ,online learning platforms, comprehensive learning, hindrances

#### Introduction

These days, technology has impacted every industry, including education. The most recent method of getting an education through the internet is online education. Utilizing your smartphones, laptops, or tablets for learning is a fun and productive method. Both teachers and students can benefit greatly from it, but there are also many drawbacks. Learning from anywhere is flexible with online education. Non-time-boundness is another advantageous property. We don't have to sit from morning until lunch like in a typical school. Depending on our preference, we can study online day or night. There is no upper age limit for learning online, in addition to the flexibility of time and location. we can pick the subjects and skills we want to learn by using online education. There are numerous institutions that provide their degrees and courses online.

#### Statement of the problem

People who reside in areas with poor internet connectivity, however, struggle with online learning. The core of online education is the internet. The human health may suffer if they spend more time in front of devices. Only those with the ability to discipline them should consider it. Online education is a flexible method of providing instruction that includes all online learning. This paper highlighted the challenges of online learning problems and its solutions.

#### **Objectives**

The objectives of the study are,

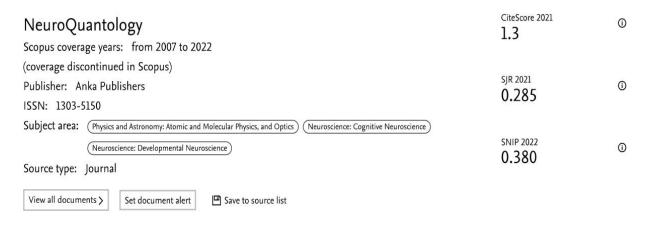
1. To know the problems faced by the students and teachers in online learning.

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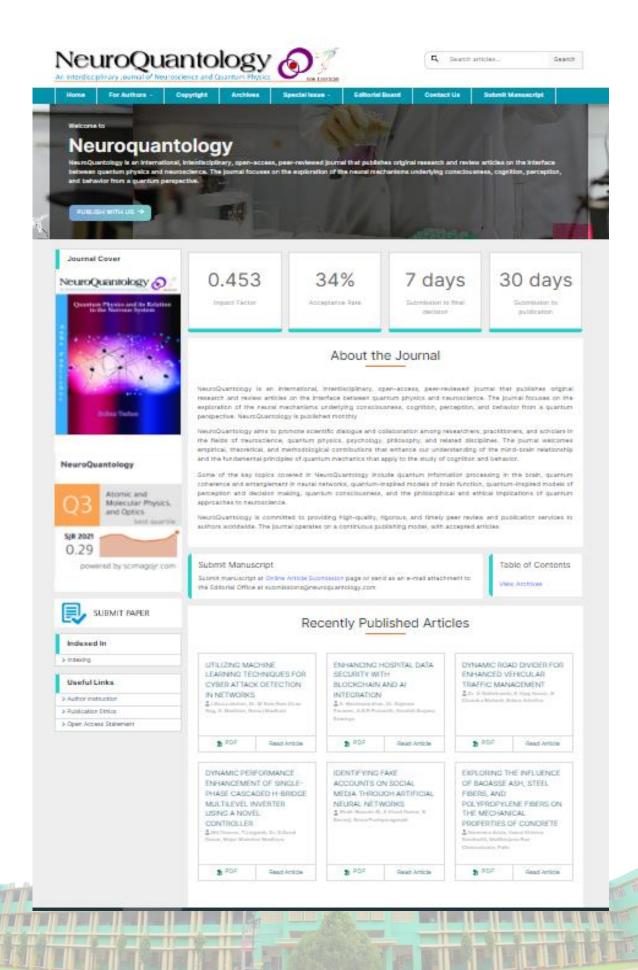


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NeuroQuantology | December 2022 | Volume 20 | Issue 22 | Page 1639-1644 | doi: 10.48047/nq.2022.20.22.NQ10152 V.REGIMA et al/ MOTIVATIONAL AND SUCCESS FACTORS: THROUGH THE LENS OF WOMEN ENTREPRENEURSHIP



# MOTIVATIONAL AND SUCCESS FACTORS: THROUGH THE LENS OF WOMEN ENTREPRENEURSHIP

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli - 627 012)

#### Abstract:

World over 1/3<sup>rd</sup> of the entrepreneurial ventures are run by women entrepreneurs. Special incentives and drives have been created in India to bolster the growth of women entrepreneurs. More than 50 per cent of Indians struggle to meet their most basic necessities and live in poverty. They can find a solution and escape poverty by launching an entrepreneurial venture, whether it be a small business, cottage industry, or handicraft. The sample size was 100. The primary data were analyzed in percentages and ANOVA. With growing awareness about the business and the spread of education, women have started shifting from 3Ps to 3Es, viz., engineering, electronics and energy. These are opportunities motivating educated women and even not highly qualified women to launch their own enterprises. Thus, this paper focuses on the motivational and success factors: through the lens of women entrepreneurs in Kanniyakumari District.

Keywords: Women entrepreneurs, Motivation factors, Independence, Economic Necessity

DOI Number: 10.48047/nq.2022.20.22.NQ10152 NeuroQuantology 2022; 20(22):1639-1644

### Introduction:

Women entrepreneurs may be defined as a woman or a group of women who initiate, organise and run a business concern. Women entrepreneurs are those who think of a business enterprise, initiate it, organise and combine factors of production, operate the enterprise, undertake risks, and handle the economic uncertainty involved in running it.

eISSN1303-5150

World over 1/3<sup>rd</sup>of the entrepreneurial ventures is run by women entrepreneurs. Due to economic progress, better access to education, urbanization, the spread of liberal and democratic culture and recognition by society, there has been a spurt in woman's entrepreneurship in India. Special incentives and drives have been created in India to bolster the growth of women entrepreneurs. Schemes like Start up India and Stand-ups also



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ISSN: 1303-5150	0.263	
Subject area: (Physics and Astronomy: Atomic and Molecular Physics, and Optics) (Neuroscience: Cognitive Neuroscience)  (Neuroscience: Developmental Neuroscience)	SNIP 2022 <b>0.380</b>	0
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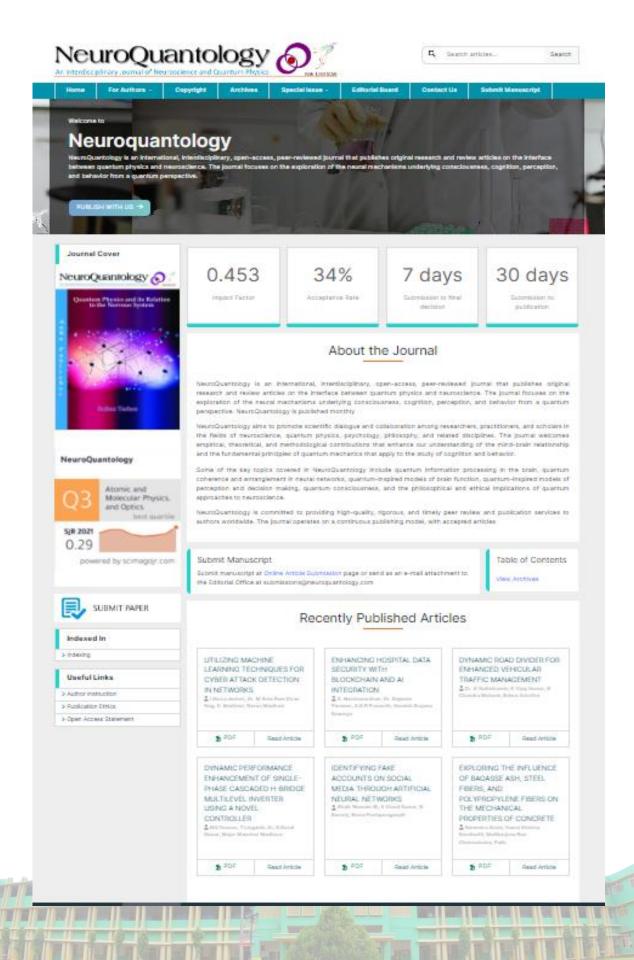
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NeuroQuantology| December 2022 | Volume 20 | Issue 22 | Page 1526-1532 | doi: 10.48047/nq.2022.20.22.NQ10137 S.K.Antshel Reshiba et al/ CUSTOMER SATISFACTION TOWARDS FISH AND FISH-BASED PRODUCTS IN KANYAKUMARI DISTRICTWITH SPECIAL REFERENCE TO AGASTHEESWARM TALUK



# **CUSTOMER SATISFACTION TOWARDS FISH** AND FISH-BASED PRODUCTS IN KANYAKUMARI DISTRICTWITH SPECIAL REFERENCE TO AGASTHEESWARM TALUK

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<sup>2</sup>Research Guide and Assistant Professor Department of Commerce Holy Cross College (Autonomous) Nagercoil (Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

### Abstract

To fulfill the nutritional demands of India's growing population, fish will be a key food item in the overall scheme of national food security. To fulfill the nutritional demands of India's growing population, fish will be a key food item in the overall scheme of national food security. Customers nowadays seek healthy and organic foods. As far as customer satisfaction with processed fish, there are certain challenges for the seafood industry. The study focused on customer satisfaction towards valueadded fish products. The study is based on subjective and objective knowledge of the future prospects of value-added fish products, social and demographic characteristics. The findings of the study were based on data collected from 100 respondents who responded to a questionnaire. The result of the findings exposed that innovative product development, eco labeling products with concern to consumer requirements are the main aspect to enhance the customer acceptation on the products.

Keywords: Consumer preference, customer satisfaction, value-added fish, fish and fish-based products, sea food products.

DOI Number: 10.48047/nq.2022.20.22.NQ10137 NeuroQuantology 2022; 20(22):1526-1532

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ISSN: 1303-5150	0.285	
Subject area: (Physics and Astronomy: Atomic and Molecular Physics, and Optics) (Neuroscience: Cognitive Neuroscience)		
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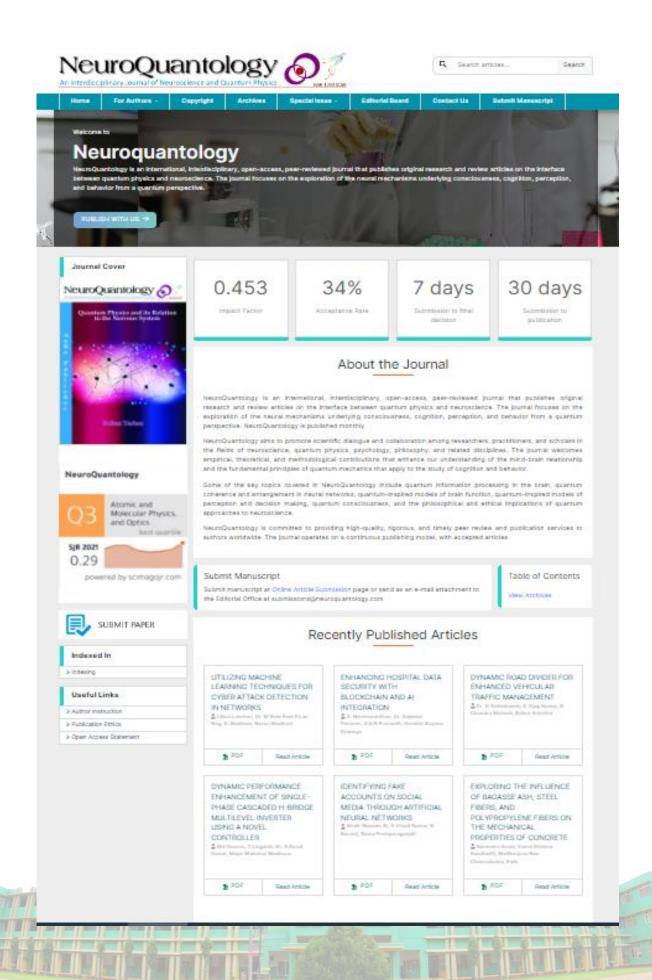


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REMANDAMENTAL BY A STUDY ON E-MAILET AMARGNESS AND ITS USAGE IN KARNITAKOMARI DESTRICT



# A STUDY ON E-WALLET AWARENESS AND ITS USAGE IN KANNIYAKUMARI DISTRICT

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### ABSTRACT

E-wallet is an internet based payment system which allows the users to make online transactions quickly and it keeps financial as well as personal identity related information securely. Such electronic payment (E-wallet) systems enable a customer to pay online for the goods and services. E-wallets are primarily used for mobile recharges and bill payments. During the last decade, customers areusing E-wallet for payment trending in Indian payment pattern.COVID-19 pandemic effect, E-wallet has tremendous growth in India. With the Government initiative such as Digital India and increased use of smartphone and internet are means to exponential growth in use of E-wallet. The present study is an attempt to clarify the concept of E-wallet and to analyse the awareness and usage of E-wallet in Nagercoil, Kanniyakumari district. The study is descriptive and analytical in nature which makes use of primary and secondary data. For the purpose of study, well-structured questionnaire is prepared to collect the data from the respondents. A sample of 120 respondents from Nagercoil is selected by using convenient sampling technique. The study pointed out the necessity of proper awareness towards E-wallet among all category of people and to solve the concerns and issues of the present customers. This study leads to perform better in future.

Keywords: E-wallet, Awareness, Usage of E-wallet, Online transaction.

DOINumber:10.48047/NQ.2022.20.14.NQ77239

#### NeuroQuantology2022;20(14):2640-2646

#### L. Introduction

#ISSN1303-5150

E-wallet refers to an electronic wallet, an application that facilitates online transactions and cashless in-store payments. Ewallet applications run through smartphones and computers. The latest technological innovations have brought in new conveniences to everyday life. E-wallet is one such innovation, allowing customers to make purchases without the use of cash. These wallets can be used for simple transactions both online and in stores. E-wallets offer the ease to make swift payments online or at physical stores. E-wallets can be used to purchase train or flight tickets, pay



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