



**A.P.C. MAHALAXMI COLLEGE FOR WOMEN**

**THOOTHUKUDI - 2**



## **CRITERION 3**

**SSR CYCLE IV**

## **RESEARCH, INNOVATIONS AND EXTENSION**

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### **3.3. Research Publication and Awards**

**3.3.1.1: Number of research papers in the Journals notified on UGC CARE list year wise during the last five years**



# A.P.C. MAHALAXMI COLLEGE FOR WOMEN

Thoothukudi- 628 002, Tamil Nadu.

## To whomsoever it may concern

I hereby declare that the following details and documents are true to the best of my knowledge. They have been checked and verified.

### **3.3.1. Number of research papers in the journals notified on UGC CARE list**

| S. No | Academic Year | Number     |
|-------|---------------|------------|
| 1     | 2022-2023     | 47         |
| 2     | 2021-2022     | 45         |
| 3     | 2020-2021     | 45         |
| 4     | 2019-2020     | 49         |
| 5     | 2018-2019     | 75         |
|       | <b>Total</b>  | <b>261</b> |



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## $k$ – Split and $k$ – Non Split Domination of some Zero-Divisor Graphs and its $\vartheta$ –Obrazom

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**Abstract:** The concept of split domination number was introduced by Kulli and Janakiram. Fink and Jacobson introduced the notion of  $k$  –domination in graphs. In this paper, we acquaint with the concept of  $k$  –split and  $k$  –non split domination for some zero-divisor graphs and  $\vartheta$  –Obrazom for zero-divisor graphs.

**AMS Subject Classification:** 05C25, 05C69, 05C76

**Keywords:**  $k$  – split domination,  $k$  – nonsplit domination, zero-divisor graph,  $\vartheta$  –Obrazom

### 1. Introduction

C. Berge introduced the concept of domination number in 1958. E. S. Cockayne and S. T. Hedetniemi were first introduced the notation of domination number as  $\gamma(G)$ , which subsequently became the accepted notation. I. Beck introduced the concept of zero-divisor graph in 1988. A zero-divisor graph is an undirected graph representing the zero-divisors of a commutative ring  $R$  and it is denoted as  $\Gamma(R)$ . Fink and Jacobson introduced the notion of  $k$  –domination in graphs[9]. The concept of split domination number was introduced by Kulli and Janakiram[8]. After that, S. Maheswari and S. Meenakshi have extended split domination number for some special graphs[5]. In this paper, we acquaint with the concept of  $k$  – split and  $k$  – nonsplit domination for some zero-divisor graphs &  $\vartheta$  –Obrazom for zero-divisor graphs and discussed some theorems.

### 2. Preliminaries

**Definition: 2.1**[4] A *dominating set* for a graph  $G = (V, E)$  is a subset  $D$  of  $V$  such that every vertex not in  $D$  is adjacent to at least one member of  $D$ . The domination number  $\gamma(G)$  is the number of vertices in a smallest dominating set for  $G$ .

**Definition: 2.2**[4] Given a ring  $R$ , let  $\mathbb{Z}^*(R)$  denote the set of *zero-divisors* of  $R$ . Let  $\Gamma(R)$  denote the zero-divisor graph whose vertex set is  $\mathbb{Z}^*(R)$ , such that distinct vertices  $r$  and  $s$  are adjacent provided that  $rs = 0$ .

**Definition: 2.3**[9] A *k-dominating set* is a set of vertices  $D$  such that each vertex in  $V \setminus D$  is dominated by at least  $k$  vertices in  $D$  for a fixed positive integer  $k$ . The minimum cardinality of a  $k$ -dominating set is called  $k$ -domination number  $\gamma_k(G)$ .



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## Product-Set Labeling of Some Zero-Divisor Graphs and its Line Graph

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**ABSTRACT:** Let  $G = (V, E)$  be a graph with  $p$  vertices and  $q$  edges. A graph has product-set labeling if there exist an injective function  $f: V(G) \rightarrow P(N)$  such that the induced edge labeling function  $f^*: V(G) \rightarrow P(N)$  is defined as  $f^*(uv) = f(u) * f(v) \forall u, v \in E(G)$ .  $f(u) * f(v) = \{ab: a \in f(u), b \in f(v)\}$ . In this paper we investigate how product-set labeling works for the zero-divisor graph and line graph of zero-divisor graphs.

**KEYWORDS:** Zero-divisor graphs, Line graphs, Product-set labeling.


**AMS Subject Classification:** 05C78, 05C76, 05C25

### 1. INTRODUCTION

There are two variations of the zero-divisor graph. One is in the Beck definition in the year 1988, in which the vertices represent all elements of the ring [3]. In the year 1999, Anderson and Livingston slightly varied the graph, in which the vertices represent only the zero-divisor of the given ring [2]. Graph labeling was introduced by Alexander Rosa in the year 1967[4]. Rosa identified three types of labeling which was later renamed by Solomon Golomb. In the field of Engineering and technology labelled graphs has its own application. A set labeling was introduced by [1], in this structural properties and characteristics of set-valued graph has been developed. The significant deviation of set labeling is integer additive set labeling of graphs [5,8]. In this type of set-labels vertices of graph are non-empty finite sets of non-negative integers and the set label of each edge is the sumset of the set-labels of its end vertices. Thereafter many types of additive set-labelings have been studied. This integer additive set labeling of graphs motivated a new type of set labeling is product set labeling which has been introduced in paper[9]. Line graph was comes from paper by Harary and Norman (1960)[6]. Although both Whitney (1932) [10] and Krausz(1943)[7] used this construction before. Hassler Whitney (1932) proved with one exceptional case the structure of a connected graph  $G$  which can be recovered completely from its line graph. Many other properties of line graph followed by translating the properties of the underlying graph from vertices into edges. There are many derived names for line graphs.

### 2. PRELIMINARIES

**Definition 2.1** Let  $R$  be a commutative ring with identity 1 and let  $Z(R)$  be its set of zero-divisors. We associate a  $\Gamma(R)$  to  $R$  with vertices  $Z^* = Z(R) - \{0\}$ , the set nonzero zero-divisor of  $R$ , and for distinct  $x, y \in Z(R)^*$ , the vertices  $x$  and  $y$  are adjacent if and only if  $xy = 0$ . We denote their zero-divisor graph

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### Soft Graphs on Paths and Cycles

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#### Abstract:

Let  $G^* = (V, E)$  be a simple graph and  $A$  be any nonempty set of parameters. Let subset  $R$  of  $A \times V$  be an arbitrary relation from  $A$  to  $V$ . A mapping  $F: A \rightarrow \mathcal{P}(V)$  can be defined as  $F(x) = \{y \in V / xRy\}$  and a mapping  $K: A \rightarrow \mathcal{P}(E)$  can be defined as  $K(x) = \{uv \in E / \{u, v\} \subseteq F(x)\}$ . The pair  $(F, A)$  and the pair  $(K, A)$  are soft sets over  $V$  and  $E$  respectively. Obviously  $(F(a), K(a))$  is a subgraph of  $G^*$  for all  $a \in A$ . The 4-tuple  $G = (G^*, F, K, A)$  is called a soft graph of  $G$ . In this paper we enumerate different soft graphs related to paths and cycles.

**Keywords:** Soft graph, Soft set, Relations, Parameters

#### 1. Introduction

Soft set theory [1] was introduced by Molodtsov in 1999 as a general mathematical tool for dealing with uncertainties. In soft set theory, the problem of setting the membership function does not arise, which make the theory easily applied to many different fields. The operations of soft sets are defined by Maji et al. [2]. At present, work on soft set theory is progressing rapidly. The soft graph has also been studied in more detail in some papers.

#### 2. Preliminaries

##### 2.1 Definition:

Let  $U$  be a universal set and  $E$  be the set of parameters related to the objects in  $U$ . Let  $\mathcal{P}(U)$  denote the power set of  $U$ . Let  $A$  be any non-empty subset of  $E$ . A pair  $(F, A)$  is called soft set over  $U$ , where  $F$  is a set-valued function given by  $F: A \rightarrow \mathcal{P}(U)$ . In other words, a soft set over  $U$  is a parameterized family of subsets of the universe  $U$ .

##### 2.2 Definition:

Let  $G^* = (V, E)$  be a simple graph and  $A$  be any nonempty set of parameters. Let subset  $R$  of  $A \times V$  be an arbitrary relation from  $A$  to  $V$ . A mapping  $F: A \rightarrow \mathcal{P}(V)$  can be defined as  $F(x) = \{y \in V / xRy\}$  and a mapping  $K: A \rightarrow \mathcal{P}(E)$  can be defined as  $K(x) = \{uv \in E / \{u, v\} \subseteq F(x)\}$ .

A 4-tuple  $G = (G^*, F, K, A)$  is called a soft graph of  $G$  if it satisfies the following properties:

- (i)  $G^* = (V, E)$  is a simple graph
- (ii)  $A$  is a nonempty set of parameters
- (iii)  $(F, A)$  is a soft set over  $V$
- (iv)  $(K, A)$  is a soft set over  $E$
- (v)  $(F(a), K(a))$  is a subgraph of  $G^*$  for all  $a \in A$

The subgraph  $(F(a), K(a))$  is denoted by  $H(a)$

A soft graph can also be represented by  $G = \langle F, K, A \rangle = \{H(x) / x \in A\}$

The set of all soft graphs of  $G^*$  is denoted by  $SG(G^*)$

#### 3. Main Results

##### 3.1 Theorem:

Let  $P_n = (v_1, v_2, v_3, \dots, v_n)$ . Let  $A$  be any parameter set. Define  $\rho: A \rightarrow V$  by  $x \rho y \Leftrightarrow d(x, y) = k$ . Then in the soft graph  $(P_n, F, K, A)$ , each  $H_i$  is totally disconnected

**Proof:**

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## Neighborhood Prime Labeling in Some Product and Power Digraphs

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**Abstract:** Let  $(p, q)$  be a digraph. A function  $f: V \rightarrow \{1, 2, \dots, n\}$  is said to be a neighborhood prime labeling of  $D$  if it is both in and out degree neighborhood prime labeling. In this paper, we introduce the concept of neighborhood prime labeling in digraphs and also investigate the existence of neighborhood prime labeling in some digraphs.

**Keywords:** Neighborhood prime labeling, Cartesian Product, Power Digraphs  
**AMS Subject Classification:** 05C78.

### 1. Introduction:

A graph labeling is an assignment of integers to the vertices or edges or both subject to certain conditions. The concept of graph labeling was introduced by Rosa in 1967 [5]. A useful survey on graph labeling by J.A. Gallian (2014) can be found in [1]. Patel S K and Shrimali N P [4] have introduced the neighborhood prime labeling of graphs. A directed graph or digraph  $D$  consists of a finite set  $V$  of vertices and a collection of ordered pairs of distinct vertices. Any such pair  $(u, v)$  is called an arc or directed line and will usually be denoted by  $\overrightarrow{uv}$ . The arc  $\overrightarrow{uv}$  goes from  $u$  to  $v$  and incident with  $u$  and  $v$ . A digraph  $D$  with  $p$  vertices and  $q$  arcs is denoted by  $D(p, q)$ . The in-degree  $d^-(v)$  of a vertex  $v$  in a digraph  $D$  is the number of arcs having  $v$  as its terminal vertex. The out-degree  $d^+(v)$  of  $v$  is the number of arcs having  $v$  as its initial vertex [2]. In this paper, we introduce the concept of neighborhood prime labeling in digraphs and investigate some digraphs for neighborhood prime labeling.

The following definitions and remark are from [3] and [4].

**1.1 Definition:** Let  $G = (V, E)$  be a graph with  $n$  vertices. A bijective function  $f: V(G) \rightarrow \{1, 2, \dots, n\}$  is said to be a neighborhood-prime labeling, if for every vertex  $v \in V(G)$  with  $\deg(v) > 1$ ,  $\gcd\{f(u) : u \in N(v)\} = 1$ . A graph which admits neighborhood prime labeling is called a neighborhood-prime graph.

**1.2 Remark:** If in a graph  $G$ , every vertex is of degree at most 1, then such a graph is neighborhood-prime vacuously.

**1.3 Definition:** Let  $D = (V, A)$  be a digraph. For a vertex  $v$  in  $D$ , we use the following notation: define  $N^+(v) = \{u \in V - v : vu \in A\}$  and  $N^-(v) = \{w \in V - v : wv \in A\}$ . The sets  $N^+(v)$ ,  $N^-(v)$  and  $N(v) = N^+(v) \cup N^-(v)$  are called the out-neighborhood, in-neighborhood and neighborhood of  $v$ . We call the vertices in  $N^+(v)$ ,  $N^-(v)$  and  $N(v)$  the out-neighbors, in-neighbors and neighbors of  $v$ .

**1.4 Definition:** The Cartesian product of a family of digraphs  $D_1, D_2, \dots, D_n$  denoted by  $D_1 \times D_2 \times \dots \times D_n$  or  $\prod_{i=1}^n D_i$  where  $n \geq 2$  is the digraph  $D$  having  $V(D) = V(D_1) \times V(D_2) \times \dots \times V(D_n) =$



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## CYCLE RELATED GRAPHS - NEAR MEAN CORDIAL

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Research Article

## CYCLE RELATED GRAPHS - NEAR MEAN CORDIAL

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## ABSTRACT

Let  $G = (V, E)$  be a simple graph. A **Near Mean Cordial Labeling** of  $G$  is a function in  $f : V(G) \rightarrow \{1, 2, 3, \dots, p-1, p+1\}$  such that the induced map  $f^*$  defined by

$$f^*(uv) = \begin{cases} 1 & \text{if } (f(u) + f(v)) \equiv 0 \pmod{2} \\ 0 & \text{else} \end{cases}$$

and it satisfies the condition  $|e_f(0) - e_f(1)| \leq 1$ , where  $e_f(0)$  and  $e_f(1)$  represent the number of edges labeled with 0 and 1 respectively. A graph is called a **Near Mean Cordial Graph** if it admits a near mean cordial labeling.

In this paper, It is to be proved that , Tortoise graph  $T_n$  and Snail graph  $S_n$  are **Near Mean Cordial** graphs.

**AMS Mathematics subject classification 2010:**05C78.

**Keywords and Phrases:** Cordial labeling, Near Mean Cordial Labeling and Near Mean Cordial Graph.

## I. INTRODUCTION

By a graph, it means a finite undirected graph without loops or multiple edges. For graph theoretic terminology ,we referred Harary [4].For labeling of graphs, we referred Gallian[1]. A vertex labeling of a graph  $G$  is an assignment of labels to the vertices of  $G$  that induces for each edge  $uv$  a label depending on the vertex labels of  $u$  and  $v$ .

A graph  $G$  is said to labeled if the  $n$  vertices are distinguished from one another by symbols such as  $v_1, v_2, \dots, v_n$ . In a labeling of a particular type, the vertices are assigned distinct values from a given set, which induces distinguish edge values satisfying certain conditions. The concept of graceful labeling was introduced by Rosa[3] in 1967 and subsequently by Golomb[2]. In this paper, It is to be proved that Tortoise graph  $T_n$  and Snail graph  $S_n$  are **Near Mean Cordial** graphs.

## II. PRELIMINARIES

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## A Study on CM (2,2) Near Ring

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### ABSTRACT

In this paper we introduce a new notion called CM (2,2) near ring. Also, CM (2,2) near ring has been generalized to a new notion called Strong CM (2,2) near ring. The properties of CM (2,2) near ring and Strong CM (2,2) near ring are discussed using the concepts of commutative, homomorphism, Boolean and so on. We have studied some important properties, characterization and also proved some theorems under certain conditions. We have also characterized that any homomorphic image of a CM (2,2) near ring is a CM (2,2) near ring. It is proved that every Strong CM (2,2) near ring is a CM (2,2) near ring. We have also proved that a Strong CM (2,2) near ring with regularity is reduced.

### Keywords: -

Boolean, Near field, nil near ring,  $S_1$  near ring, Simple.

### 1.Introduction

Near rings can be thought of as generalized rings: if in a ring we ignore the commutativity of addition and one distributive law, we get a near ring. Gunter Pilz "Near Rings" is an extensive collection of the work done in the area of near rings.

Throughout this paper  $N$  stands for a right near ring  $(N, +, \cdot)$ , with at least two elements and '0' denotes the identity element of the group  $(N, +)$  and we write  $xy$  for  $x \cdot y$  for any two elements  $x, y$  of  $N$ . Obviously  $0n = 0$  for all  $n \in N$ . If, in addition,  $n0 = 0$  for all  $n \in N$  then we say that  $N$  is **zero symmetric**. For any subset  $A$  of  $N$ , we denote  $A^*$  the set of all non-zero elements of  $A$ . In particular  $N^* = N - \{0\}$ .

### 2.Preliminaries

#### Definition 2.1 [35]

A **right near ring** is a non-empty set  $N$  together with two binary operations "+" and " $\cdot$ " such that (i)  $(N, +)$  is a group (ii)  $(N, \cdot)$  is a semigroup (iii)  $(n_1 + n_2)n_3 = n_1n_3 + n_2n_3$  for all  $n_1, n_2, n_3 \in N$ .

#### Definition 2.2[4]

A non-empty subset  $I$  of  $N$  is called (i) a **left ideal** of  $N$  if  $(I, +)$  is a normal subgroup of  $(N, +)$  and  $n(n' + i) - nn' \in I$  and  $i \in I$ . (ii) a **right ideal** of  $N$  if  $(I, +)$  is a normal



## Some Results on $S_1$ -NearRings

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### Abstract: -

In this paper we have given some more results on  $S_1$  near-rings. We have proved some properties on  $S_1$  near-rings. The properties are discussed using the concept of Boolean, Zero divisors and so on. We have studied some important Characterization and also proved some theorems under certain conditions. We also furnish a characterization theorem on regular near rings. It is shown that every nonzero element of  $N$  is a right zero divisor the  $N$  is an  $S_1$  near-ring.

### Keywords: -

Boolean, commutative, regular, zero divisors, zero symmetric.

### 1. Introduction

Near rings can be thought of as generalized rings: if in a ring we ignore the commutativity of addition and one distributive law, we get a near ring. Gunter Pilz "Near Rings" is an extensive collection of the work done in the area of near rings.

Throughout this paper  $N$  stands for a right near ring  $(N, +, \cdot)$ , with at least two elements and '0' denotes the identity element of the group  $(N, +)$  and we write  $xy$  for  $x \cdot y$  for any two elements  $x, y$  of  $N$ . Obviously  $0n = 0$  for all  $n \in N$ . If, in addition,  $n0 = 0$  for all  $n \in N$  then we say that  $N$  is zero symmetric. For any subset  $A$  of  $N$ , we denote  $A^*$  the set of all nonzero elements of  $A$ . In particular  $N^* = N - \{0\}$ .

### 2. Preliminaries

**Definition 2.1 [2]**



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## On Neutrosophic Semi-Generalized Sets in Neutrosophic Topological Spaces

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### ABSTRACT

In this paper we introduce and investigate about the relationship of semi-generalized open set, closed set, interior set and closure set with other sets in neutrosophic topology. Basic characterizations and several properties concerning them are also discussed.

**Keywords:** Neutrosophic semi-generalized closed set, Neutrosophic semi-generalized open set, Neutrosophic semi-generalized interior set and Neutrosophic semi-generalized closure set.

AMS Classification Code: 03E72.

### I. INTRODUCTION

The concept of fuzzy sets was first introduced by L. Zadeh in 1965. In fuzzy set theory, the membership of an element to a fuzzy set is a single value between 0 and 1. Later the concept of fuzzy topological spaces have been introduced and developed by Chang in 1968.

The intuitionistic fuzzy set on a Universe X was introduced by K. Atanassov in 1983 as a generalization of fuzzy set, where each element had the degree of membership and the degree of non-membership. In intuitionistic fuzzy set theory, the elements have the degree membership and non-membership value between 0 and 1. Later, in 1997 Coker introduced the concept of intuitionistic fuzzy topological spaces, by using the notion of the intuitionistic fuzzy set. Florentin Smarandache introduced and developed the concept of neutrosophic set from the fuzzy sets and intuitionistic fuzzy sets in 1997. He also developed the concept of single-valued neutrosophic set oriented towards real world scientific and engineering applications. In 1998, he introduced neutrality the degree of indeterminacy, as an independent concept. He also defined the neutrosophic set on three component neutrosophic topological spaces.  $(t, f, i) = (\text{Truth, Falsehood, Indeterminacy})$ . A.A. Salama and S.A. Alblawi introduced neutrosophic topological spaces by using the neutrosophic sets. The neutrosophic crisp set concept was converted to neutrosophic topological spaces as a generalization of intuitionistic fuzzy topological spaces by Salama. R. Dhavaseelan, Saied Jafari are introduced neutrosophic generalized closed sets. K. Bageerathi introduced and studied about neutrosophic semi-closed sets in neutrosophic topological spaces.

This paper consists of seven sections. The section II consists of the basic definitions and some properties which are used in the later sections. The section III deals with the neutrosophic semi-generalized closed set and some theorems related to it. The section IV deals with the neutrosophic semi-generalized open set and its theorems. The section V deals with the concepts of neutrosophic semi-generalized interior set and their properties. The section VI deals with the concepts of neutrosophic semi-generalized closure set and their properties.

### II. PRELIMINARIES

**DEFINITION: 2.1** Let X be a non-empty fixed set. A *Neutrosophic set* [NS] A is an object having the form  $A = \{ \langle x, \mu_A(x), \sigma_A(x), \gamma_A(x) \rangle : x \in X \}$  where  $\mu_A(x)$ ,  $\sigma_A(x)$  and  $\gamma_A(x)$  which represents the degree of membership function, the degree of indeterminacy and the degree of non-membership function respectively of each element  $x \in X$  to the set A. Set of all neutrosophic set over X is denoted by  $N(X)$ .



## On Contra *ir*-Continuous Functions in Topological Spaces

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### ABSTRACT

In this paper we introduce and investigate a new generalization of contra continuous called contra *ir*-continuous. A function  $f: (X, \tau) \rightarrow (Y, \sigma)$  is said to be contra *ir*-continuous if  $f^{-1}(V)$  is *ir*-closed set [3] in  $(X, \tau)$  for every open set  $V$  of  $(Y, \sigma)$ . Basic characterizations and several properties concerning them are also discussed.

**Key Words:** Contra *ir*-continuous functions, Almost *ir*-continuous, Almost contra *ir*-continuous, Contra *ir*-irresolute.

AMS Classification Code: 54 C 08, 54 C 10, 54 C 05, 54 H 05.

### I. INTRODUCTION

Dontchev[5] introduced the notion of contra continuity in 1996. Several new generalizations to this class were added by Dontchev and Noiri [6] such as contra-continuous functions and *S*-closed spaces, contra semi continuous, contra -precontinuous functions etc. C.W. Baker [1] introduced and investigated the notion of contra continuity, Jafari and Noiri [8] studied the contra precontinuous and contra continuous functions. Ekici[7] introduced Almost contra pre continuous function.

In this paper we shall continue the investigations carried out in [3] and introduce the new class of contra continuous function namely contra *ir*-continuous function. This paper comprises of several sections. In section 2, basic preliminaries are discussed. In section 3, we define and study contra *ir*-continuous, almost *ir*-continuous, almost contra *ir*-continuous, strongly *ir*-continuous, perfectly *ir*-continuous. The main results of the paper are that several properties concerning contra *ir*-continuous functions. Furthermore, the relationships between the contra *ir*-continuous and other topological functions are also investigated. Also, we establish that some implications are not reversible, which are justified with suitable examples. While in section 4, we define and study contra *ir*-irresolute and in section 5, we define and study perfectly contra *ir*-irresolute.

### II. PRELIMINARIES

**DEFINITION 2.1:** A subset  $A$  of a topological space  $X$  is called a regular open set (briefly *r*-open) if  $A = \text{int}(cl(A))$  and a regular closed set (briefly *r*-closed) if  $A = cl(\text{int}(A))$ .

**DEFINITION 2.2:** A subset  $A$  of a topological space  $X$  is called a

- *ir*-closed[3] set if  $rcl(A) \subseteq U$  whenever  $A \subseteq U$  and  $U$  is *i*-open in  $X$ . The complement of an *ir*-closed set is *ir*-open set.
- *ir*-continuous[2] if  $f^{-1}(V)$  is a *ir*-closed set of  $(X, \tau)$  for every closed set  $V$  of  $(Y, \sigma)$ .
- *ir*-irresolute[2] if  $f^{-1}(V)$  is *ir*-closed set of  $(X, \tau)$  for every *ir*-closed set  $V$  of  $(Y, \sigma)$ .

**DEFINITION 2.3:** A function  $f: (X, \tau) \rightarrow (Y, \sigma)$  is said to be

- contra continuous if  $f^{-1}(V)$  is closed set in  $(X, \tau)$  for every open set  $V$  of  $(Y, \sigma)$ .
- contra *gpr*-continuous if  $f^{-1}(V)$  is *gpr*-closed set in  $(X, \tau)$  for every open set  $V$  of  $(Y, \sigma)$ .
- contra *rwg*-continuous if  $f^{-1}(V)$  is *rwg*-closed set in  $(X, \tau)$  for every open set  $V$  of  $(Y, \sigma)$ .
- contra *gsp*-continuous if  $f^{-1}(V)$  is *gsp*-closed set in  $(X, \tau)$  for every open set  $V$  of  $(Y, \sigma)$ .
- contra *wg*-continuous if  $f^{-1}(V)$  is *wg*-closed set in  $(X, \tau)$  for every open set  $V$  of  $(Y, \sigma)$ .
- contra *gp*-continuous if  $f^{-1}(V)$  is *gp*-closed set in  $(X, \tau)$  for every open set  $V$  of  $(Y, \sigma)$ .

## CONTRIBUTIONS TO THE STUDY OF SOFT CLOSEDNESS IN SOFT TOPOLOGICAL SPACES

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**Abstract:** The concept of soft topological space was introduced by some authors. In this present paper, we offer and study a novel type of generalized soft closed sets in soft topological space, named soft Pre-semi star Generalized-closed (in brief soft- $\mathbb{P}_* \mathbb{G}$ -closed) sets which is properly placed in between the class of soft  $pg$ -closed and soft  $gp$ -closed set. Relationships with each other and other weaker forms of generalized soft closed sets with counterexamples are discussed and its properties are investigated. Also we introduce and explore several characterizations and properties of this type of soft closed sets.

**Index Terms:** Soft closed, Soft  $\mathbb{P}_* \mathbb{G}$ -closed sets, Soft  $s^*g$ -closed sets, Soft sets, Soft Topology, sets,

### I. INTRODUCTION

The concept of soft sets was initiated by Molodtsov in 1999 as a completely new approach for modelling vagueness and uncertainty. He has shown several applications of this theory in solving many practical problems in economics, engineering, social science, medical science, etc. Later Maji et.al. presented some new definitions on soft sets such as a subset, the complement of a soft set. Research works on soft sets are progressing rapidly in recent years. Muhammad Shabir and Munazza Naz introduced the soft topological spaces which are defined over an initial universe with a fixed set of parameters. The notions of soft open sets, soft closed sets, soft closure, soft interior points, soft Neighborhood of a point and soft separation axioms are also introduced and their basic properties are investigated by them. In 2012, Kannan has introduced generalized closed sets in soft topological spaces. Kannan and Raja Lakshmi

have introduced soft  $s^*g$ -closed sets in soft topological spaces in 2015. Arokia rani and Albinaa paved a new path way by introducing soft generalized pre closed sets in soft topological spaces. In this present study, we define a new class of closed set called soft  $\mathbb{P}_* \mathbb{G}$ -closed sets in soft topological spaces and obtain its relationships with other soft closed sets. Further, we obtain the basic results and properties.

### II. IDENTIFY, RESEARCH AND COLLECT IDEA

Let  $\mathbb{U}$  be an initial universe set and  $\mathbb{S}$  be the set of all possible parameters with respect to  $\mathbb{U}$ . Parameters are often attributes, characteristics or properties of the objects in  $\mathbb{U}$ . Let  $\mathbb{P}(\mathbb{U})$  denote the power set of  $\mathbb{U}$ . Then a soft set over  $\mathbb{U}$  is defined as follows:

**2.1 Definition** A pair  $(\mathbb{D}, \mathbb{V})$  is called a soft set over  $\mathbb{U}$  where  $\mathbb{V} \subseteq \mathbb{S}$  and  $\mathbb{D} : \mathbb{V} \rightarrow \mathbb{P}(\mathbb{U})$  is a set valued mapping. In other words, a soft set over  $\mathbb{U}$  is a parametrized family of subsets of the universe  $\mathbb{U}$ . For all  $\varepsilon \in \mathbb{V}$ ,  $\mathbb{D}(\varepsilon)$  may be considered as the set of  $\varepsilon$ -approximate elements of the soft set  $(\mathbb{D}, \mathbb{V})$ . It is worth nothing that  $\mathbb{D}(\varepsilon)$  may be arbitrary. Some of them may be empty, and some may have nonempty intersection.

**2.2 Definition:** A soft set  $(\mathbb{D}, \mathbb{V})$  over  $\mathbb{U}$  is said to be null soft set denoted by  $\{\}$  if for all  $\mathbb{I} \in \mathbb{V}$ ,  $\mathbb{D}(\mathbb{I}) = \{\}$ . A soft set  $(\mathbb{D}, \mathbb{V})$  over  $\mathbb{U}$  is said to be an absolute soft set denoted by  $\hat{\mathbb{A}}$  if for all  $\mathbb{I} \in \mathbb{V}$ ,  $\mathbb{D}(\mathbb{I}) = \mathbb{U}$ .

**2.3 Definition:** Let  $\mathbb{Y}$  be a nonempty subset of  $\mathbb{U}$ , then  $\tilde{\mathbb{Y}}$  denotes the soft set  $(\mathbb{Y}, \mathbb{S})$  over  $\mathbb{U}$  for which

## A NOTE ON SOFT CONNECTED SPACE IN SOFT TOPOLOGICAL SPACES

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**Abstract:** A soft topological space based on soft set theory which is a collection of information granules is the mathematical formulation of approximate reasoning about information systems. In this paper, we define and explore the properties and characterizations of soft  $\mathcal{M}$ - connected spaces in soft topological spaces. We expect that the findings in this paper can be promoted to the further study on soft topology to carry out general framework for the practical life applications.

**Keywords:** Soft  $\mathcal{M}$ -Closed Sets, Soft  $\mathcal{M}$ -Open Sets, Soft  $\mathcal{M}$ -Closure, Soft  $\mathcal{M}$ -Connected Space.

**Mathematics Subject Classification:** 06D72, 54A40, 54D10.

**1. Introduction:** In this chapter we have introduced soft  $\mathcal{M}$ -disjoint sets, soft  $\mathcal{M}$ -separated sets, soft  $\mathcal{M}$ -connected space, soft  $\mathcal{M}$ -disconnected space and study the relation between soft  $\mathcal{M}$ -disjoint sets and soft  $\mathcal{M}$ -separated sets define soft hereditary property and study soft hereditary property on soft  $\mathcal{M}$ -connected spaces.

**2. Soft  $\mathcal{M}$ -Separateness:** In this section, we will research the notion of soft  $\mathcal{M}$ -separated sets in soft topological spaces and study its basic properties in detail.

Let  $\mathfrak{M}$  be initial universe and  $\mathcal{L}$  be a set of parameters. Let  $\mathfrak{P}(\mathfrak{M})$  denote the power set of  $\mathfrak{M}$  and  $\mathcal{E}$  be a non empty subset of  $\mathcal{L}$ . A pair  $(\alpha, \mathcal{L})$  denoted by  $\alpha_{\mathcal{L}}$  is called a soft set over  $\mathfrak{M}$ , where  $\alpha$  is a mapping given by  $\alpha : \mathcal{E} \rightarrow \mathfrak{P}(\mathfrak{M})$ .

**2.1 Denotation :** Two soft  $\mathcal{M}$ -open sets  $(\alpha, \mathcal{L}), (\beta, \mathcal{L})$  over the initial universe  $\mathfrak{M}_{\mathcal{L}}$  are soft  $\mathcal{M}$ -disjoint if  $(\alpha, \mathcal{L}) \tilde{\cap} (\beta, \mathcal{L}) \cong \tilde{\emptyset}_{\mathcal{L}}$ .

**2.2 Denotation :** A non-null soft subsets  $(\alpha, \mathcal{L}), (\beta, \mathcal{L})$  of a soft topological space  $(\mathfrak{M}, \mathcal{T}, \mathcal{L})$  are said to be soft  $\mathcal{M}$ -separated sets if  $[(\alpha, \mathcal{L}) \tilde{\cap} c\ell_{\mathcal{M}}^s((\beta, \mathcal{L}))] \cong \tilde{\emptyset}_{\mathcal{L}}$  and  $[(\beta, \mathcal{L}) \tilde{\cap} c\ell_{\mathcal{M}}^s((\alpha, \mathcal{L}))] \cong \tilde{\emptyset}_{\mathcal{L}}$ .

**Axiom 2.1:**

1. Each soft  $\mathcal{M}$ -separated sets are always disjoint.
2. Each two disjoint soft sets in which both of them either soft  $\mathcal{M}$ -open sets (or) soft  $\mathcal{M}$ -closed sets are soft  $\mathcal{M}$ -separated.

**Proof:** Directly from the definition.

**Axiom 2.2:** Let  $(\alpha, \mathcal{L})$  and  $(\beta, \mathcal{L})$  be non-null soft sets of a soft topological space  $(\mathfrak{M}, \mathcal{T}, \mathcal{L})$ . Then the following statements hold:

## Some Properties of Soft Generalized Open and Closed Sets in Soft Topological Spaces

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**ABSTRACT:** In this present paper, we introduce and study some soft topological properties of soft  $\mathcal{M}$ -border, soft  $\mathcal{M}$ -exterior and soft  $\mathcal{M}$ -boundary of a soft set using the concept of soft  $\mathcal{M}$ -open sets and soft  $\mathcal{M}$ -closed sets and also studied the other property of the well known notion of soft  $\mathcal{M}$ -interior,  $\mathcal{M}$ -closure.

**Key words:** Soft sets, Soft topology, Soft  $\mathcal{M}$ -open sets, soft  $\mathcal{M}$ -interior, soft  $\mathcal{M}$ -closure.  
**AMS Subject Classification(2010):** 54A10, 54C08

### I. INTRODUCTION

Insoft systems a very general frame work has been provided with the involvement of parameters. Therefore the researches work on the soft set theory and its applications in various disciplines and real life problem are now catching momentum. Many researchers contributes towards the algebraic structures of soft set theory. In this paper we continue to investigate the properties of soft  $\mathcal{M}$ -opensets and soft  $\mathcal{M}$ -closedsets in soft topological spaces. We define and discuss the characterizations of some properties of  $\mathcal{M}$ -closed and  $\mathcal{M}$ -open sets like, soft  $\mathcal{M}$ -interior, soft  $\mathcal{M}$ -Exterior, soft  $\mathcal{M}$ -Border, soft  $\mathcal{M}$ -Boundary.

### II. Results used in this study

In this section, we present the basic definitions and results of soft set theory which will be needed in the sequel.

#### Definition

Let  $U$  be the initial universe and  $P$  be a set of parameters. Let  $P(U)$  denote the power set of  $U$  and  $E$  be a non empty subset of  $P$ . A pair  $(\alpha, P)$  denoted by  $\alpha_p$  is called a soft set over  $U$ , where  $\alpha$  is a mapping given by  $\alpha : E \rightarrow P(U)$ .

1.  $int_M^S((\alpha, P))$  is the union of all soft  $\mathcal{M}$ -opensets over  $(\tilde{U}, \tilde{T}, \tilde{P})$  contained in  $(\alpha, P)$
2.  $(\alpha, P)$  is soft  $\mathcal{M}$ -openiff  $int_M^S((\alpha, P)) \cong (\alpha, P)$
3.  $cl_M^S((\alpha, P))$  is the intersection of all soft  $\mathcal{M}$ -closedsets over  $(\tilde{U}, \tilde{T}, \tilde{P})$  containing  $(\alpha, P)$

## On Tri- $\hat{g}$ Continuous Functions In Tri-Topological Spaces

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**Abstract:** In this paper, we introduce a new function called tri-  $\hat{g}$  continuous in tri-topological spaces. A map  $f : X \rightarrow Y$  is called tri- $\hat{g}$  continuous if  $f^{-1}(V)$  is tri- $\hat{g}$  closed in  $X$  for each tri- closed set  $V$  in  $Y$ . Also we define, quasi tri- $\hat{g}$ , perfectly tri- $\hat{g}$ , contra tri- $\hat{g}$  totally tri- $\hat{g}$  and strongly tri- $\hat{g}$  continuous maps are introduced and some of their properties are studied.

**Keywords:** tri-  $\hat{g}$  continuous, quasi tri- $\hat{g}$  continuous, perfectly tri- $\hat{g}$  continuous, contra tri- $\hat{g}$  continuous, totally tri- $\hat{g}$  continuous, strongly tri- $\hat{g}$  continuous maps.

**AMS subject classification (2010):** 54A40.

### 1. INTRODUCTION

In 2003, M. K. R. S. Veerakumar[3] defined  $\hat{g}$  closed sets in topological spaces and studied their properties. The study of tri- topological space was first initiated by M. Kovar[4], where a nonempty set  $X$  with three topologies is called a tri- topological space. In 2011, S. Palaniammal[8] studied the properties of open and closed sets in tri topological space. N. F. Hameed and Moh. Yahya Abid[5] gives the definition of 123 open set in tri- topological spaces. In 2016, U. D. Tapi, R. Sharma and B. deole[9] introduce semi open set and pre open set in tri- topological space. In 2016, P. Priyadarsini[7] discussed 123-semi closed sets, 123- generalized semi closed sets and some tri- continuous functions in tri- topological spaces. In 2021, K. Bala Deepa Arasi and L. Jeyasudha[2] defined Tri-  $\hat{g}$  closed sets in Tri- Topological spaces and discussed their properties. The aim of this paper is to introduce some tri-  $\hat{g}$  continuous map and tri-  $\hat{g}$  irresolute maps in tri- topological space and discuss some of their properties.

### 2. PRELIMINARIES

Throughout this chapter, all spaces  $(X, \tau_1, \tau_2, \tau_3)$ ,  $(Y, \sigma_1, \sigma_2, \sigma_3)$  and  $(Z, \mu_1, \mu_2, \mu_3)$  [or simply  $X, Y$  and  $Z$ ] stand for tri- topological spaces with no separation axioms are assumed.

**Definition 2.1**[4] Let  $X$  be a nonempty set and  $\tau_1, \tau_2$  and  $\tau_3$  are general topologies on  $X$ . Then a subset  $A$  of  $X$  is said to be tri- open set if  $A \in \tau_1 \cup \tau_2 \cup \tau_3$  and its complement is said to be tri- closed set and  $X$  with three topologies called tri- topological spaces  $(X, \tau_1, \tau_2, \tau_3)$ .

**Definition 2.2**[2] Let  $(X, \tau_1, \tau_2, \tau_3)$  be a tri- topological space then a subset  $A$  of  $X$  is said to be tri-  $\hat{g}$  closed set if  $\text{tri-cl}(A) \subseteq U$  whenever  $A \subseteq U$ ,  $U$  is tri- semi open in  $X$ . The complement of a tri-  $\hat{g}$  closed set is called the tri-  $\hat{g}$  open set.

**Definition 2.3**[7] A subset  $A$  of  $X$  is called tri- clopen if it is both tri- open and tri- closed in  $X$ .

**Definition 2.4**[7] Let  $(X, \tau)$  and  $(Y, \sigma)$  be topological space. A function  $f : X \rightarrow Y$  is said to be

- 1) continuous if the inverse image of each open(closed) set in  $Y$  is open(closed) in  $X$ .
- 2)  $g$ - continuous if  $f^{-1}(V)$  is  $g$ - closed in  $X$  for each closed set  $V$  in  $Y$ .
- 3) quasi  $g$ - continuous if  $f^{-1}(V)$  is closed in  $X$  for each  $g$ - closed set  $V$  in  $Y$ .



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## SOME CHARACTERIZATION OF SFG-CLOSED SETS IN TOPOLOGICAL SPACES

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## SOME CHARACTERIZATION OF SFG-CLOSED SETS IN TOPOLOGICAL SPACES

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## ABSTRACT

In this paper, we have introduced and studied the topological properties of SFG-closure, SFG-interior and SFG-interior points, by using the concept of Semi Feebly Generalized open sets and Semi Feebly Generalised closed set (SFG-closed sets), A subset  $A$  of a topological space  $(X, \tau)$  is called SFG-closed if  $U$  contains Feebly closure of  $A$  whenever  $U$  contains  $A$  and  $U$  is  $sg$ -open in  $(X, \tau)$ . Some interesting results that shows the relationships between these concepts are brought about.

**KEYWORDS:** SFG-closure, SFG-interior, SFG-closed sets, SFG-open, Feeblyclosure.

**2010 AMSclassification code:** 54A02, 54A05

## I. INTRODUCTION

In 1970, for the first time the concept of generalised closed set was considered by Levine[3]. After the works of Levine on semi-open sets, various mathematicians turned their attention to the generalisations of topology by considering semi open sets instead of open sets. Maheswari and Jain[4] introduced feebly closed sets. In 1987, P.Bhattacharya and B. K. Lahiri[2] introduced Semi-generalised closed sets in Topological spaces. We[1] have already introduced a class of generalised closed set SFG-closed set using feebly closed sets and semi generalised open sets.

In this paper we have used the notation of SFG-closed sets and SFG-open sets, we introduce and study the topological properties of SFG-Interior, SFG-Closure of a set, SFG-interior points of a set and show that some of their properties are analogous to those for open sets.

## II. PRELIMINARIES

Throughout this paper,  $(X, \tau)$  (simply  $X$ ) always mean topological space on which no separation axiom is assumed unless otherwise mentioned.  $(X, \tau)$  will be replaced  $X$  if there is no change of confusion. For a subset  $A$  of a topological space  $X$ ,  $cl(A)$ ,  $int(A)$ , denote the closure of  $A$ , interior of  $A$  respectively.

We recall some of the definitions and results which are used in the sequel.

**Definition 2.1**

A subset  $A$  of a topological space  $(X, \tau)$  is called

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### Ascending Pendant Domination Decomposition Polynomial

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#### Abstract

Let  $G = (V, E)$  be a simple connected graph. We introduced Ascending Pendant Domination Decomposition of Graphs in [2] and is defined as a collection  $\{G_1, G_2, G_3, \dots, G_n\}$  of subgraphs of  $G$  such that every edge of  $G$  is exactly once in  $G_i$ , each  $G_i$  is connected and  $\gamma_{pe}(G_i) = i + 1, 1 \leq i \leq n$ . In this paper, we introduce Ascending Pendant Domination Decomposition Polynomial of a graph. Also we have found that Ascending Pendant Domination Decomposition Polynomial for  $P_p, C_p, P_p \wedge K_2$  and  $C_p \wedge K_2$ .

**Keywords:** Dominating Set, Pendant Dominating Set, Decomposition and Pendant Domination Decomposition.

**AMS Subject Classification:** 05C69 and 05C70

#### 1. Introduction

Let  $G = (V, E)$  be a simple connected graph. All the graphs considered as finite and undirected. A vertex of degree zero is called an isolated vertex and a vertex of degree one is called a pendant vertex. An edge incident with a pendant vertex is called a pendant edge. Pendant Domination in some Generalised Graphs was introduced by Nayaka S.R Puttaswamy and S.Purushothama [7]. Ascending Domination Decomposition of Subdivision of Graphs was introduced by K. Lakshmi Prabha and K. Nagarajan [5]. We have also published Ascending Pendant Domination Decomposition of Special Graphs. In [4], we extended the Ascending Pendant Domination Decomposition for some special graphs. In this paper, we obtained Ascending Pendant Domination Decomposition Polynomial for  $P_p, C_p, P_p \wedge K_2$  and  $C_p \wedge K_2$ .

#### Definition 1.1.

If  $G_1, G_2, G_3, \dots, G_n$  are connected edge disjoint subgraphs of  $G$  with  $E(G) = E(G_1) \cup E(G_2) \cup E(G_3) \dots \cup E(G_n)$ , then  $(G_1, G_2, G_3, \dots, G_n)$  is said to be decomposition of  $G$ .

## On 2 - Domination Number of Some Graphs

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### ABSTRACT

Domination and 2 - domination numbers are defined only for graphs with non-isolated vertices. In a Graph  $G = (V, E)$  each vertex is said to dominate every vertex in its closed neighborhood. In a graph  $G$ , a subset  $S$  of  $V(G)$  is called a 2 - dominating set of  $G$  if every vertex in  $v \in V$ , is in  $V-S$  and has atleast two neighbors in  $S$ . The smallest cardinality of a 2 - dominating set of  $G$  is known as the 2 - domination number  $\gamma_2(G)$ . In this paper, we find 2 - dominating set of some special graphs and also find the 2 - domination number of graphs.

**Keywords:** Dominating set, 2 - Dominating Set, 2 - Domination Number

### 1. INTRODUCTION

Fink and Jacobson introduced the concept of 2 - Domination Number [3]. Domination Number and 2 - Domination Number are defined only for graphs with non-isolated vertices. Every Graph with non - isolated vertex has a 2 - dominating set. In a graph  $G = (V, E)$ , a subset  $D$  of  $V$  such that every vertex in  $V-D$  has a neighbor in  $D$ , such a set said to be a dominating set of  $G$ . The Dominating Number  $\gamma(G)$  is the minimum size of the dominating set of vertices in  $G$ . In a graph  $G = (V, E)$ , subset  $S$  of  $V$  is a 2 - dominating set if every vertex  $v \in V$ , is in  $V - S$  has atleast two neighbors in  $S$ . The minimum cardinality of a 2 - dominating set of  $G$  is known as the 2 - domination number of  $\gamma_2(G)$ .

### 2. DEFINITIONS

#### 2.1. Dominating Set


A set  $S \subseteq V$  of vertices in a graph  $G = (V, E)$  is called a dominating set if every vertex  $v \in V$  is either an element of  $S$  or is adjacent to an element of  $S$ .

#### 2.2. Domination Number

The domination number of  $G$ , denoted by  $\gamma(G)$ , is the minimum cardinality of a dominating set of  $G$ .

#### 2.3. 2 Dominating Set

A dominating set  $S \subseteq V(G)$  is said to be a 2 - dominating set if every vertex in  $V - S$  has atleast two adjacent vertices in  $S$ .

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## Gd-Distance of Wreath Product of Graphs

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**ABSTRACT:** Let  $G = (V, E)$  be a simple connected graph. The geodesic distance between two vertices  $u, v$  in  $G$  is the length in terms of the number of edges of the shortest path between the vertices. In this paper, we determine the Gd-distance of wreath product of two graphs. Using the formulae obtained here, we have found the exact value of the geodesic distance of some classes of graphs.

**Keywords:** Wreath Product, Gd-distance, Wiener index.

### 1.INTRODUCTION

By a graph  $G = (V, E)$ , we mean a finite undirected connected graph of order  $n$ . For vertices  $x$  and  $y$  in  $G$ , the distance  $d(x, y)$  is the length of a shortest  $x$ - $y$  path in  $G$ . The degree of a vertex  $x$  in a graph  $G$  is defined to be the number of edges of  $G$  incident with  $x$  and is denoted by  $\deg x$  or  $\deg_G(x)$  or simply  $d(x)$ . Let  $P_n$  and  $C_n$  denote the path and the cycle on  $n$  vertices, respectively. The number of edges of  $G$  is denoted by  $e(G)$ .

Anto Kinsley et.al [1] introduced the concept of Dd-distance in graphs by considering the degrees of various vertices presented in the path, in addition to the length of the longest path. If  $a, b$  are vertices of a connected graph  $G$ , Dd-length of a

$a$ - $b$  path is defined as  $D^{Dd}(a, b) = D(a, b) + \deg a + \deg b$ .

V.Maheswari et.al introduced the concept of Gd-distance between any two vertices in graphs and its properties in [6]. The Gd-distance of a  $a$ - $b$  path is defined as  $d^{Gd}(a, b) = d(a, b) + \deg a + \deg b$ .

This motivates us to define the Gd-distance of a graph, which is researched in [7]. The Gd-distance of a graph  $G$  denoted as  $d^{Gd}(G) = \sum_{\{a,b\} \subseteq V(G)} [d(a, b) + \deg a + \deg b]$ .

**Definition:1.1** The Wiener index  $W(G)$  is the first distance based topological index defined as  $W(G) = \sum_{\{a,b\} \subseteq V(G)} d_G(a, b) = \frac{1}{2} \sum_{a,b \in V(G)} d_G(a, b)$  with the summation going over all pairs of vertices of  $G$ .

**Definition:1.2** The wreath product of the graphs  $G_1$  and  $G_2$ , denoted by  $G_1 \circ G_2$ , is the graph with vertex set  $V(G_1) \times V(G_2)$  and  $(a, x)(b, y)$  is an edge whenever

- (i)  $ab \in E(G_1)$  or
- (ii)  $a = b$  and  $xy \in E(G_2)$ .

**Lemma:1.3** [8]

- (i) The Wiener index of a path graph  $P_n$  is,  $W(P_n) = \frac{1}{6} n(n^2 - 1)$
- (ii) The Wiener index of a cycle graph  $C_n$ , where  $n \geq 3$  is,



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## Regular Property on Product of Pythagorean Anti Fuzzy Graph

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**Abstract:** In this paper, we introduce the notion of Pythagorean Anti fuzzy graph. We then define the Cartesian product and Lexicographic product on Pythagorean Anti fuzzy graph. It is proved that Cartesian product of two Pythagorean Anti fuzzy graphs is Pythagorean Anti fuzzy graph and Lexicographic product of two Pythagorean Anti fuzzy graphs is Pythagorean Anti fuzzy graph. In general, Cartesian product and lexicographic product of two regular Pythagorean Anti fuzzy graphs need not be Pythagorean Anti fuzzy graph. Necessary and sufficient conditions for Cartesian and lexicographic product of two Pythagorean Anti fuzzy graphs to be regular are determined. Further, we define the concept of isomorphism on Pythagorean Anti fuzzy graph with suitable example.

**Keywords:** Pythagorean Anti fuzzy graph, Cartesian product, lexicographic product, regular anti fuzzy graph.

**AMS Subject Classification:** 05C72

### 1. Introduction

Fuzzy graph theory was introduced by Azriel Rosenfeld in 1975. R. Seethalakshmi and R.B. Gnanajothi introduced the definition of anti fuzzy graph. R. Muthuraj and A. Sasirekha defined some types of anti fuzzy graph. Yager [8] proposed the Pythagorean fuzzy set for handling the uncertainty information in real world situations. Naz et al. [7] originally proposed the concept of Pythagorean fuzzy graphs. Verma et al. [4] describes the Pythagorean fuzzy graph and some basic operations. We introduce the notion of Pythagorean Anti fuzzy graph and discuss the regular property on Cartesian product and lexicographic product of Pythagorean Anti fuzzy graph.

### 2. Definitions

**2.1 Definition** A Pythagorean Anti Fuzzy set on a universe  $\chi$  is an object of the form  $\mathcal{P} = \{ \langle s, \mu_{\mathcal{P}}(s), \nu_{\mathcal{P}}(s) \rangle / s \in \chi \}$  where  $\mu_{\mathcal{P}}: \chi \rightarrow [0,1]$  and  $\nu_{\mathcal{P}}: \chi \rightarrow [0,1]$  represent the membership and non membership grade of  $\mathcal{P}$  and satisfies the condition  $0 \leq \mu_{\mathcal{P}}^2(s) + \nu_{\mathcal{P}}^2(s) \leq 1$  for all  $s \in \chi$ .

**2.2 Definition** A Pythagorean Anti Fuzzy set on  $\chi \times \chi$  is said to be **Pythagorean Anti Fuzzy relation** on  $\chi$ , denoted by  $\mathcal{Q} = \{ \langle st, \mu_{\mathcal{Q}}(st), \nu_{\mathcal{Q}}(st) \rangle / st \in \chi \times \chi \}$  where  $\mu_{\mathcal{Q}}: \chi \times \chi \rightarrow [0,1]$  and  $\nu_{\mathcal{Q}}: \chi \times \chi \rightarrow [0,1]$  represent the membership and non membership grade of  $\mathcal{Q}$  and satisfies the condition  $0 \leq \mu_{\mathcal{Q}}^2(st) + \nu_{\mathcal{Q}}^2(st) \leq 1$  for all  $s, t \in \chi$ .

**2.3 Definition** A **Pythagorean Anti Fuzzy graph** on a non empty set  $\chi$  is a pair  $\mathcal{A}^{**} = (\mathcal{P}, \mathcal{Q})$  with  $\mathcal{P}$  a PAFS on  $\chi$  and  $\mathcal{Q}$  a PAFR on  $\chi$  such that

$$\mu_{\mathcal{Q}}(st) \geq \mu_{\mathcal{P}}(s) \vee \mu_{\mathcal{P}}(t) \quad \dots\dots\dots(2.1.1)$$

$$\nu_{\mathcal{Q}}(st) \leq \nu_{\mathcal{P}}(s) \wedge \nu_{\mathcal{P}}(t) \quad \dots\dots\dots(2.2.2) \text{ for all } s, t \in \chi$$

where  $\mu_{\mathcal{Q}}: \chi \times \chi \rightarrow [0,1]$  and  $\nu_{\mathcal{Q}}: \chi \times \chi \rightarrow [0,1]$  represent the membership and non membership grade of  $\mathcal{Q}$  respectively.



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## ASCENDING BI-PENDANT DOMINATION DECOMPOSITION POLYNOMIAL OF PATH AND CYCLE

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### Abstract

Let  $G = (V, E)$  be a simple connected graph. We introduced Ascending Bi-Pendant Domination Decomposition of Graphs and is defined as a collection  $\{G_1, G_2, G_3, \dots, G_n\}$  of subgraphs of  $G$  such that every edge of  $G$  is exactly once in  $G_i$ , each  $G_i$  is connected and  $\gamma_{pe}(G_i) = i + 1, 1 \leq i \leq n$ . In this paper, we introduce Ascending Bi-Pendant Domination Decomposition Polynomial of a graph. Also, we have found that Ascending Bi-Pendant Domination Decomposition Polynomial for  $P_p$  and  $C_p$ .

### 1. Introduction

Let  $G = (V, E)$  be a simple connected graph. All the graphs considered here are finite and undirected. A vertex of degree zero is called an isolated vertex and a vertex of degree one is called a pendant vertex. An edge incident with a pendant vertex is called a pendant edge. Pendant Domination in some

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Keywords: Dominating Set, Pendant Dominating Set, Bi-Pendant Dominating Set, Pendant Domination Decomposition and Bi- Pendant Domination Decomposition.

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# Prime Fuzzy Bi-Ideals in Near-Subtraction Semigroups

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**Abstract** — A study on fuzzy prime ideals in near-subtraction semigroups is already known. We have to expand the concept of prime fuzzy bi-ideals in near-subtraction semigroups and analyse some of its properties to characterize it. This will lead to learn a new type of fuzzy ideal and to develop the researcher to made their research.

**Keywords** — Fuzzy Ideals, Fuzzy prime ideals.

## I. INTRODUCTION

In 1965, fuzzy set was first introduced by L.A.Zadeh [7]. The notion of *Near-subtraction semigroup* was studied by B.M.Schein. K.H.Kim et [2] & they established the concept of *Ideals in near-subtraction semigroup & fuzzy set*. Prince Williams [3] described the concept of *Fuzzy ideals*. Similarly, the concept such as *Fuzzy bi-ideals* has been described by V.Chinnadurai et. al. A detailed study on *Fuzzy prime ideals* was carried out by Mumtha.K and Mahalakshmi.V [6]. In this paper, we explore the concept of prime fuzzy bi-ideals in near-subtraction semigroups and discuss some of its properties.

## II. PRELIMINARIES

**Definition: 2.1**

A *right near-subtraction semigroup* is a non-empty set  $X$  with “ $-$ ” & “ $\cdot$ ” satisfies:

- (i)  $(X, -)$  is a subtraction algebra
- (ii)  $(X, \cdot)$  is a semigroup
- (iii) For all  $p, q, r \in X$ ,  $(p - q) \cdot r = p \cdot r - q \cdot r$  (right distributive law)

**Definition: 2.2**

If  $p \cdot 0 = 0 \cdot p = 0$ , for all  $p \in X$ , then  $X$  is a *zero-symmetric* and is denoted by  $X_0$ . Now after,  $X$  stands for a zero-symmetric right near-subtraction semigroup  $(X, -, \cdot)$  with at least two elements.

**Definition: 2.3**

A *fuzzy subset* is the mapping  $\mu$  from the non-empty set  $X$  into the unit interval  $[0, 1]$ .

**Definition: 2.4**

A fuzzy subset  $\mu$  of  $X$  is called a *fuzzy ideal* of  $X$  if

- (i)  $\mu(x - y) = \min\{\mu(x), \mu(y)\}$ .
- (ii)  $\mu(xy) \geq \mu(y)$ ,
- (iii)  $\mu(xy) \geq \mu(x)$ , for every  $x, y \in X$ .

**Definition: 2.5**

A fuzzy ideal  $\mu$  is called a *fuzzy prime ideal* of  $X$  if  $\sigma \cdot \delta \subseteq \mu \Rightarrow \sigma \subseteq \mu$  or  $\delta \subseteq \mu$ , where  $\sigma$  &  $\delta$  are any two fuzzy ideals of  $X$ .

**Definition: 2.6**

Let  $\mu$  and  $\lambda$  be any two fuzzy subsets of  $X$ . Then  $\mu \cap \lambda$ ,  $\mu \cup \lambda$ ,  $\mu \lambda$ ,  $\lambda \mu$ ,  $\mu * \lambda$  are fuzzy subsets of  $X$  that are defined by,

$$(\mu \cap \lambda)(x) = \min\{\mu(x), \lambda(x)\}$$

$$(\mu \cup \lambda)(x) = \max\{\mu(x), \lambda(x)\}$$

$$(\mu - \lambda)(x) = \begin{cases} \sup_{x=y-z} \min\{\mu(y), \lambda(z)\} & \text{if } x = y - z \\ 0 & \text{otherwise} \end{cases}$$

$$\mu \lambda(x) = \begin{cases} \sup_{x=yz} \min\{\mu(y), \lambda(z)\} & \text{if } x = yz \\ 0 & \text{otherwise} \end{cases}$$

$$(\mu * \lambda)(x) = \begin{cases} \sup_{x=ac-a(b-c)} \min\{\mu(a), \lambda(c)\} & \text{if } x = ac \\ 0 & \text{otherwise} \end{cases}$$

**Definition: 2.7**

For any fuzzy set  $\mu$  in  $X$  and  $t \in [0, 1]$ . We define  $U(\mu; t) = \{x/x \in X, \mu(x) \geq t\}$ , which is called a *upper t-level cut* of  $\mu$ .

**Definition: 2.8**

Let  $I \subseteq X$ . Define a function  $f_I : X \rightarrow [0, 1]$  by,

$$f_I(x) = \begin{cases} 1 & \text{if } x \in I \\ 0 & \text{otherwise} \end{cases}, \text{ for every } x \in X.$$

Clearly,  $f_I$  is a fuzzy subset of  $X$  and it is called the *characteristic function* of  $I$ .

**Definition: 2.9**

A fuzzy ideal  $\mu$  of  $X$  is said to be *normal* if there exists  $a \in X$  such that  $\mu(a) = 1$

**Definition: 2.10**

A fuzzy ideal  $\mu$  of  $X$  is said to be *weakly complete* if it is normal and there exists  $z \in X$  such that  $\mu(z) < 1$ .

**Theorem: 2.11**

Let  $\mu$  be a fuzzy bi-ideal of  $X$ . Then the finitely generated set,  $X_\mu = \{x \in X/\mu(x) = \mu(0)\}$  is an bi-ideal of  $X$ .

**Theorem: 2.12**

Let  $A$  be a non-empty subset and  $\mu_A$  be a fuzzy set in  $X$  defined by,  $\mu_A(x) = \begin{cases} 1 & \text{if } x \in A \\ s & \text{otherwise} \end{cases}, \forall x \in X$  and

$s \in [0, 1]$ . Then  $\mu_A$  is a fuzzy bi-ideal of  $X$  iff  $A$  is an bi-ideal of  $X$ . Moreover,  $X_{\mu_A} = A$ .

## Minimal Bi-ideal of $\Gamma$ -near subtraction semigroups

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**Abstract:** In analogy with the concept of bi-ideal of  $\Gamma$ -near subtraction semigroups, we introduce the notion of minimal bi-ideal of  $\Gamma$ -near subtraction semigroups. In this paper, we obtain a necessary and sufficient condition for a zero-symmetric  $\Gamma$ -near subtraction semigroup to be a  $\Gamma$ -near  $-$ field. Further we have proved some properties of minimal bi-ideal of  $\Gamma$ -near subtraction semigroups and its characterization theorems.

**Keywords:**  $\Gamma$ -near field, sub-  $\Gamma$ -near subtraction semigroup, distributive, idempotent, left zero-divisor, right zero-divisor.

### 1.Introduction

$\Gamma$ -near subtraction semigroup was introduced by Dr. S. J. Alandkar[2]. For basic terminology in near subtraction semigroup, we refer to Dheena and Satheesh Kumar G [3] and for  $\Gamma$ -near subtraction semigroup, we refer to Dr.S.J.Alandkar[2]. In this paper we introduce the notion of minimal bi-ideal of  $\Gamma$ -near subtraction semigroups by extending the concepts of bi-ideal of  $\Gamma$ -near subtraction semigroups .

### 2.Preliminaries

**Definition 2.1** A  $\Gamma$ -near subtraction semigroup is a triple  $(X, -, \gamma)$ , for all  $\gamma \in \Gamma$ , where  $\Gamma$  is a non-empty set of binary operators on  $X$ , such that  $(X, -, \gamma)$  is a near-subtraction semigroup for all  $\gamma \in \Gamma$ . In practice, we called simply  $\Gamma$ -near- subtraction semigroup instead of right  $\Gamma$ -near-subtraction semigroup. Similarly we can define a  $\Gamma$ -near- subtraction semigroup(left).

**Definition 2.2** A non-empty subset  $I$  of  $X$  is called i) a left ideal of  $X$  if  $y - y' \in I$  for every  $y \in I, y' \in X$  and  $xyi - xy(x' - i) \in I$ , for all  $x, x' \in X$  and  $i \in I$ . ii) a right ideal of  $X$  if  $x - y \in I$  for every  $x \in I$  and  $y \in X$  and  $I\Gamma X \subseteq I$  iii) an ideal of  $X$  if  $I$  is both left and right ideal of  $X$ .

**Definition 2.3** A subalgebra  $A$  of  $(X, -)$  with  $A\Gamma A \subseteq A$  is called a sub  $\Gamma$ -near subtraction semigroup.

**Definition 2.4** A nonempty subset  $A$  of  $X$  is called i) a left  $\Gamma$ -subalgebra of  $X$  if  $A$  is a subalgebra of  $(X, -)$  and  $X\Gamma A \subseteq A$ . ie.)  $X\gamma A \subseteq A$  for all  $\gamma \in \Gamma$ .

**Definition 2.5** An element  $a \in X$  is called idempotent if  $a\gamma a = a$  for all  $\gamma \in \Gamma$ .

**Definition 2.6**  $X_d = \{n \in X / n\gamma(x - y) = n\gamma x - n\gamma y \text{ for all } x, y \in X \text{ and for all } \gamma \in \Gamma\}$  is the set of all distributive elements of  $X$ .  $X$  is called distributive if  $X = X_d$ .

**Definition 2.7** The element  $u \neq 0$  is a right(left) zero divisor, if there exists an elements  $v \neq 0$  in  $X, \gamma \in \Gamma$  such that  $v\gamma u = 0(u\gamma v = 0)$ .

**Definition 2.8** An element  $e \in X$  is called left(right) identity in  $X$  if  $e\gamma x = x(x\gamma e = x)$  for all  $x \in X$  and for all  $\gamma \in \Gamma$ .



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## SPECTROSCOPIC INVESTIGATION OF SOIL TREATED WITH AND WITHOUT ORGANIC MANURES

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## ABSTRACT

FTIR analytical study has been carried out to investigate the mineralogical composition of the soil. A field experiment was carried out at Servaikaranmadam of Thoothukudi district, Tamil Nadu during Kharif season in 2018 on sandy clay loam soil to access the effect of organic manures in the soil and to determine the chemical compositions of soil samples. The experiment was laid out in Randomized Block Design (RBD) with three replications. The experiment comprised of thirteen treatment combinations. The results of the present study revealed that soils have various mineral compositions namely Quartz, Kaolinite, Montmorillonite, Feldspar and Illite etc. The application of organic manures like Goat manure (G), Vermicompost (V) and Swine manure (S) in triple manure concentration at 17 t ha<sup>-1</sup> reveals the presence of Organic Carbon along with the minerals, before and after harvest. This ensures a better yield of black gram (*Vigna Mungo* L.).

**Keywords:** Mineralogical Analysis, Organic Carbon, Kaolinite, Organic manures.

## 1. INTRODUCTION

Soils are complex mixtures of minerals, water, air, organic matter and countless organisms that are the decaying remains of once living things. It is considered as the "Skin of the Earth". It is the unconsolidated mineral or organic matter on the surface of the earth which is available as a natural medium for the growth of land plants. The quality of the soil refers to the soil's ability to endure production [1]. The techniques such as Infrared spectroscopic analysis, Ultra-Violet absorption studies and X-ray diffraction studies are used for mineral analysis [2].

X-ray diffraction method is the best characterization tool for identifying crystalline minerals present in soil. Fourier Transform Infrared (FTIR) absorption spectra of soil segments hold more information concerning minerals [3]. With the aspect of mineralogical application, pathologists used this FTIR technique. It is used to differentiate the various types of clay minerals present in the soil. The most widely occurring clay minerals in soil are kaolinite which is the simplest of all the clay minerals [4]. Fertilizers add nutrients like nitrogen, phosphorus, potassium and micro-nutrients but not organic matter.

Organic amendments add nutrients as well as organic matter, offering many more opportunities for improvement of soil physical, chemical and biological properties. This can accelerate initial reclamation and lead to self-sustaining net crop production [5]. Organic amendments occur in many forms from manure to bio solids, pulp and paper mill sludge [6].

Goat manure (G) which is rich in nutrients like nitrogen, phosphorus and potassium rather than obtaining from farm yard manure is expected to add nutrients to soil and it also makes a change in the physical properties of the soil. Vermicompost (V) is the end-product of organic matter by earthworms. It contains microsite rich in available carbon and nitrogen. Since Vermicompost improves the microbial activity of soil thereby it also increases the capability of solvability of the nutrients. Swine manure (S) is a good source of nutrients, mainly for vegetable.

The main objective of this study is to analyse the mineralogical composition of soil sample with and without organic manures using FTIR spectral analysis.





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## MINERALOGICAL AND MORPHOLOGICAL CHARACTERIZATION OF ORGANICALLY AMENDED SOIL

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### ABSTRACT

The objective of this paper is to propose a soil characterization methodology based on mineralogical and morphological analyses. This paper intends to offer the consequences of Powder X-ray diffraction (PXRD) exams and scanning electron microscopy-Energy dispersive X-ray spectroscopy (SEM-EDS) analyses which predict the presence of minerals in organically treated soil. PXRD offers records on the crystal shape of the pattern and different structural parameters. The observed PXRD patterns indicate the presence of Quartz, Kaolinite and Calcite. The FTIR study also confirms the variation in minerals before and after the application of the organic amendments. FTIR offers the molecular decision of mineral and natural purposeful corporations of soil. SEM exams had been extensively utilized to assess microstructural modifications within the tested specimens and examine the effects of pore size in the sandy soil. The results of SEM indicate the improvement in soil structure with a good Water Holding Capacity (WHC). EDAX studies confirm the significant variation in micronutrients. Measurement of pH and electric conductivity (EC) parameters offers valuable records for assessing soil situation for plant growth, nutrient cycling and organic hobby. It also improves the macro-nutrients like Nitrogen (N), Phosphorus (P) and Potassium (K).

**Keywords:** EDAX, FTIR, Mineralogical Analyses, Organic Amendment, PXRD, SEM.

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### INTRODUCTION

Our country is predominantly vegetarian and pulses play an important role in Indian agriculture. Pulses are the main source of protein and amino acids. In India, the total production of pulses for the last decades was around 13 to 15 million metric tons. Black gram (*Vigna Mungo L*) is one of the major pulse crops among the grain legume grown in India. It is commonly known as "Urad" or "Urad bean". Black gram is a very nutrient-demanding crop that needs organic or inorganic fertilizers to promote crop yield.<sup>1</sup> It is more nutritious, containing one-third of the protein in it and nourished with Phosphorus, Potassium, Calcium along a notable amount of Sodium. It is also reported that it is substantially good in Vitamin A, B<sub>1</sub>, B<sub>3</sub> other than proteins.<sup>2</sup> Nutrients that are removed from the soil can be retrieved with the usage of fertilizers and it also acts as an additive for the soil to enhance the yield.<sup>3,4</sup> Organic Farming, a system that favors the use of organic materials such as manure to improve the health of the soil and to improve the yield.<sup>5</sup> Soil fertility and productivity can be enhanced with the addition of animal manures and crop residues. Organic amendments are said to improve soil structure, texture and increase biochemical activities of soil microorganisms aside from adding essential nutrients to the soil.<sup>6</sup> It also avoids the use of synthetic fertilizers and pesticides thereby reducing their deleterious effect on the environment. Organic agriculture is healthier not only for humans and animals but also for the environment. The continuous

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## CHARACTER BUILDING THROUGH LANGUAGE LEARNING AND CULTURE OF ISLAMIC BOARDING SCHOOL IN TERMS OF THE IMPLEMENTATION OF MANAGEMENT TOWARDS SUSTAINABLE DEVELOPMENT OF GREEN CAMPUS

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### Abstract

There are several reasons after giving priority to this improved language. *First*, starting from the ability to have a mutual relationship with various countries. *Secondly*, as an academic community, a variety of writing activities are needed in foreign languages. *Thirdly*, it is because of foreign students in UIN Malang, and will continue to be sought for more, so that the service in English is time to do. *Fourth*, the increase of confidence throughout the academic civitas, mainly lecturers and educational personnel to associate and play a role in academics in international scope. On the other hand, Ma'had Sunan Ampel al-Aly is a public relationship between students living in it when they live a community life with the aim of obtaining the regularity of life in it. The research is focusing on seeking a character forming model emerged at the Islamic State University of the success of MSAA, when the existing norms have succeeded in ingrained flesh in the soul of a creature of Malang through learning the language and culture ma'had (islamic boarding school). This research requires a thorough observation in a practical ambience known as a theoretical perspective, or in the educational field often named as the realistic proposition. Islamic State University of the success of MSAA, when the existing norms have succeeded in ingrained flesh in the soul of a creature. UIN Malang, through a wide range of ideas, objectives, foundations, forms of activities as well as the well planned systems, with a model of fusion of boarding and college systems, and supported by the knowledge of development model that requires all members of the academic community mastering Arabic and English to be called bilingual university. To achieve that intention, developing a Ma'had or islamic boarding school of the campus where all the first year students should stay at the Ma'had. Therefore, education in this university is a synthesis between university and Ma'had or islamic boarding schooltradition. So it is expected to be born graduates who are predicate a professional intellect clergies and or clergies who have professional intellect with the main characteristics of such graduates are not only master the disciplines of each of their choice, but also mastered the Qur'an and Hadith as a major source of Islamic teachings.

**Keywords:** formation, character, learning, language, culture Islamic Boarding School

### 1 PREFACE

One nation's existence is determined by its characters' belongingness. Only a nation that has a strong character capable of making himself a dignified and respected nation by other nations. Therefore, being a nation of character is the desire of the nations of the world. The spirit to become a nation of character is confirmed by

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## **DOMINANT FACTORS FOR ENHANCING PRODUCT QUALITY, SERVICE QUALITY, PROMOTION EFFORTS, AND DECISION MAKING TOWARD THE XBCA BANK CUSTOMER'S SATISFACTIONS**

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### **Summary**

This research is aiming towards determining and analysing the presiding elements of the promotion, trait, service quality, and decision making toward customer satisfaction at the XBCA Branch Office of XBCA Equity Tower Jakarta, Indonesia. The data used to analyze are primary and secondary data. The sampling technique used was proportional sampling and collected data of 130 appellants from vivid norms such as education, age, monthly income, and gender. Factor Analysis is the measurable strategy that has been used as a research method here. And the results are a) the four mutables brought down to two factors (named promotion, product effort, and choosing the product). b) The primary factor (named promotion and product effort) held up by two mutables (promotion, quality of the product). c) The secondary one (named as choosing the product) held up by two mutables (service quality, & decision making).

Keywords: Promotion, quality, service quality, decision making, Customer Satisfaction.

### **I. RESEARCH BACKGROUND**

In attempt of striving for economic sustainability and growth, the government established a series of policies in the monetary and banking sector. The policy is intended to increase mobilization of public funds. Competition in the banking world has become the center of attention of various groups, due to the occurring of elements to concern and put efforts helping to the welfare of society improvement.

Seeing this condition, all banking institutions, including XBCA Bank, are competing one another to market their savings products that are able to meet the society needs. XBCA Bank as one of the largest private banks in Indonesia, also markets a savings

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## An Extensive Survey on Heart Disease Prediction

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### ABSTRACT

Prediction of occurrences of heart diseases an important work in medical field. A growing number of studies use various methods and datasets for heart disease prediction. Still, a substantial part of my research work lacks categorization and systematization. Hence, there is a necessity to take stock of current knowledge in this field. In this sense, this paper carries out a review of the literature on heart disease prediction. Analysis of a total of 150 papers addressing heart disease prediction using Data Mining (DM), Machine Learning (ML) and Deep Learning (DL) methods published between 2010 and 2020 was carried out. The purpose and the contribution of this paper is to provide a clearer picture of the subfields in heart disease prediction by concentrating on two aspects. First, a recent research to categorize the main areas of specialization in heart disease prediction is reviewed and the challenge in each category has been addressed. Second, the thematic analysis is carried out to identify a specific method under each category and a suitable method is also recommended. Despite the large number of publications, this present study identifies deep learning methods with unstructured dataset by providing better results. This study helps researchers for understanding the research gap for their future study in heart disease prediction.

### Keywords

Data mining, Machine learning, Deep Learning, Heart Disease

### INTRODUCTION

Globally, Cardiovascular Diseases (CVDs) has become the primary cause of death [43]. The people who die of CVDs are comparatively higher when compared to other diseases. As the corona virus disease 2019 (Covid-19) pandemic has spread around the globe, there has been growing CVDs recognition [46]. As per the report of the European Society of Cardiology (ESC), 26 million adults globally are diagnosed with Heart Failure, whereas every year 3.6 million are diagnosed newly. 17–45% of the patients suffering from HF die within the first year and the remaining die within 5 years. When a proper technique is chosen at a correct time, the morbidity rate can be decreased.

The result produced by ML techniques will be more accurate as compared to DM since ML is an automated process. DM method uses a database or a data warehouse server with a data mining engine. Useful information were extracted using the pattern evaluation techniques. Whereas ML uses neural networks, predictive model and automated algorithms to make the decisions.

ML techniques produce more accurate result when compared to DM techniques [47]. It is because DM method can't work without the involvement of human. ML algorithms always require structured data, while DL networks rely on layers.

The intention of this survey paper is make the researcher to do research on heart diseases prediction using DM or ML or DL approach. This paper presents an extensive survey on approaches for heart disease prediction between 2010 and 2020.

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### **An analysis on diverse Deep Learning Strategies for Automated Driving**

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#### **Abstract**

Self-driving cars are one of the hottest areas of research and business for the tech tyrant. What appeared similar to a science-narrative, a few years ago, now give the impression more like something which is presently to turn out to be a part and parcel of life. So much so, that now, with the help of basic deep learning, neural network, we can build our own pipeline for autonomous driving. Deep learning is a subset of machine learning exemplar. Deep learning methods have also shown promise in applications to vehicle Automation. The main intent of this paper is to provide an review regarding the evaluation of various deep learning control techniques like convolutional neural networks (CNN) and their role in various applications. Also this paper includes the discussion regarding the technological challenges for deep learning based control of autonomous vehicles.

**Keywords:** autonomous vehicles; self-driving cars; deep learning; sensor ;Actuators: supervised Learning; Reinforcement Learning

#### **Introduction**

Increasing urbanization and hottest advances in autonomous technologies, transportation studies move ahead to more intelligent systems, called intelligent transportation systems (ITS). Artificial intelligence is to control systems with modest human interference. Combination of ITS and AI provides effective solutions for the 21st century transportation studies. The main goal of ITS is providing harmless, efficient and consistent transportation systems to participants. Some of the key research areas are optimal traffic signal control, automated vehicle control and traffic flow control. The future transportation systems are expected to include full dominion such as autonomous traffic organization and autonomous driving. However, semi-autonomous vehicles occupy the roads and the level of autonomy is likely to increase in near future. There are several reasons why authorities want autonomy in ITS such as time reduction for drivers, power saving for environment, and safety for all participants. When vehicles use up more times on traffic, fuel expenditure increases, which has environmental and economic impacts. Another reason why human intervention is tried to be minimized is the precipitate nature of human deeds. It is expected that autonomous driving will dwindle traffic accidents and increase the quality of transportation. Experience based learning can substitute human learning. Increasing population is the source of high volume of traffic, an example the annual congestion cost for a driver in the US was 97 hours and \$1,348 in 2018. [10]. Hence, controlling traffic lights with adaptive modules is a recent research focus in ITS. Designing an adaptive traffic management system through traffic signals is an effective solution for reducing the traffic congestion. The best approach for optimizing traffic lights is still an open question for researchers, but one promising approach for optimum TSC is to use learning-based AI techniques/ Deep learning is part of a wider family of machine learning methods based on artificial neural networks with learning process such as supervised, semi-supervised or unsupervised. Deep neural networks, deep belief networks, recurrent neural networks and convolutional neural networks are the types of deep learning architecture. These techniques were applied to various fields such as computer vision, machine vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation, bioinformatics, drug design, medical image analysis, material inspection and board game programs, where they have produced results comparable to and in some cases exceed human expert performance. Information processing and distributed communication nodes in biological systems were enthused by artificial neural networks. Deep learning refers to the use of numerous layers in the network. Early work demonstrate that a linear perceptron cannot be a universal classifier, and then that a network with a non polynomial activation

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## ANALYSIS OF ORAL EPITHELIAL DYSPLASIA USING MACHINE LEARNING TECHNIQUE

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**Abstract:** The Oral Epithelial Dysplasia (OED) lesion is referred as a pre-cancerous lesion. It is a stepwise growth to cancer within the oral mucosa. The primary occurrence of a pre-cancer lesion is consequently increases the growth of the cancer cells in its surrounding area. In the proposed work, the Data Wavelet Transformation is applied to discriminate the normal and oral epithelial dysplasia disease affected images. For this the microscopic images have collected from Raja Muthiah Dental College and Hospital. The two feature extraction techniques namely Histogram Oriented features and Local Binary Pattern are used to extract the features. The extracted features are given as the input to Back Propagation Neural Network. The histogram oriented features with Back Propagation neural network gives the satisfactory results of 85%.

**Keywords—**Histogram Oriented Gradient (HOG), Local Binary Pattern (LBP), Back Propagation Neural Network (BPNN), Artificial Neural Network (ANN)

### 1. Introduction

Oral cancer can start as a primary lesion in any of the mouth's tissues, or it can spread from a isolated origin, or by extension from a neighboring anatomic structure, such as the nasal cavity. Alternatively, the oral cancers may originate in any of the tissues of the mouth, and may be of varied [histological](#) types: [teratoma](#), [adenocar-cinoma](#).

Under this Oral Dysplasia is a kind of precancerous lesion and the dysplastic stages are mild Dysplasia, moderate Dysplasia and severe Dysplasia.

Grading is done using support vector machine with highest accuracy in [1][2]. Now-a-days support vector machine plays an important role in many of the research fields.

#### **Mild dysplasia (grade I)**

It shows the proliferation / hyperplasia of cells of the parabasal and basal layers that does not extend beyond

the lower third of the epithelium. Architectural changes are minimal.

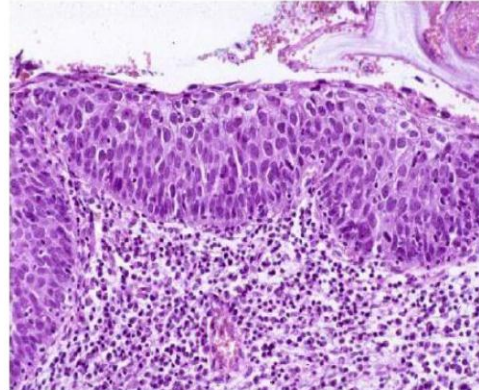


Figure 1.1. Mild Dysplasia

#### **Moderate dysplasia (grade II)**

It demonstrates a proliferation of a typical cells extending into the middle one-third of the epithelium [2][3]. Changes such as prominent cell, nuclear pleomorphism and hyperchromatism are more severe than in mild dysplasia which shows the Moderate Dysplasia in Figure 1.2.

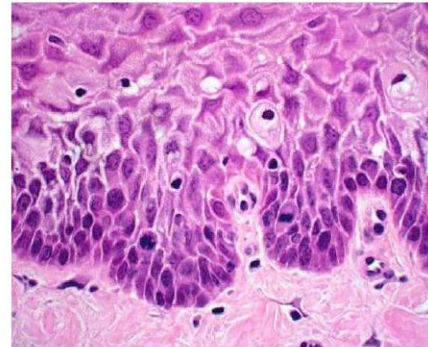


Figure 1.2. Moderate Dysplasia

#### **In severe dysplasia (grade III)**

Into the upper third of the epithelium, there is an abnormal proliferation from the basal layer. Figure 1.3. shows the Severe Dysplasia. Cytological and architectural changes can be very prominent.

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### Musical Instruments Sound Classification using GMM

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#### Abstract

Classification is the task of assigning objects to one of several predefined categories. In today's decade classifying the musical signal from large data is a major task; the proposed work classifies the music into their respective classes. In this paper, the sound of the musical instruments classified automatically from the musical signals. Mel frequency cepstral coefficient is used as a feature extractor and the machine learning model namely Gaussian Mixture Model is used for classification. This system tested in ten different classes of musical instrument sound from two different instrument families such as Woodwind and Brass instruments. In this proposed work, the result yields satisfactory accuracy in the classification of musical instruments sound.

**Keywords:** Musical Instrument Sound Classification (MISC), mel frequency cepstral coefficient (MFCC), Gaussian Mixture Model (GMM).



## Comparative Analysis of Heart Disease Prediction Techniques Using Association Rule Mining

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### *Abstract*

*The objective of this paper is to analyse various factors that influence heart disease and provide appropriate solution to prevent human life getting affected from the disease. Understanding the signs and symptoms of a heart attack by predicting it in advance using various data mining techniques helps the healthcare industry to take appropriate course of action to diagnose the disease. This field also plays an important role in designing appropriate drugs & various therapies to ensure survival. Advanced data mining techniques in computer technology, helps health care industry in a major way for early prediction, disease diagnosis and prescribe appropriate medication using health data. Ensuring this fact, it is decided to identify the best performing algorithm which can be utilized for early prediction of heart disease.*

**Keywords**— Data Mining, Heart Disease, AIS, APRIORI and SETM

### 1. INTRODUCTION

Data mining is an emerging field successful technique and commonly used in most of the healthcare industry which deals with vast quantity of complex patient data, hospital services, diagnosis of illness, electronic patient record, medical devices, etc. Larger volume of data is a critical source for information extraction to be processed and analyzed.

The heart is one of the most important organs of all creatures that play an important role in blood flow to other organs through blood vessels. The heart has four holes the top, electron, lungs and core, which run straight from the heart into in to blood stream as well. This may be affected by a number of factors contributing to issues with leakage or inadequate shutdown. [22] Heart disease describes a number of conditions that affect the heart function and are the leading cause of death worldwide. Together heart disease and stroke are the most widespread health problem the country faces today.

Cardiac disease is widespread in both men and women. The likelihood of life and mortality after a heart attack, approximately one in four women die in the first year relatively to one in five people. Some states and lifestyle choices increase people's chances of heart disease, including overweight and poor nutritional status, physical impairment and intemperate liquor utilize [19].

The major risk factors for heart disease include high blood pressure, high LDL cholesterol and smoking. Reducing blood pressure and cholesterol instead of smoking will reduce the chance of developing heart disease [22]. The World Health Organization (WHO) estimates that 14 million of India's 30million heart disease sufferers live in urban areas and 16 million live in rural areas.

Data mining techniques are used in many different applications. Within the healthcare sector, Data mining plays an important role in predicting the disease. It's important for patients to identify some of the diagnostic traits. But the number of tests should be condensed, using the mining techniques. This reduction test plays a crucial role in timing and precision.



## Image Encryption Using RK-RSA Algorithm in Aadhaar Card

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**Abstract:** Cryptography is used for secretly sending information. The information or given data is protected by cryptographic technique. The technique is used in Text and images. The technique is supported by a lot of algorithms. RSA is a better encryption technique for smart cards. In this paper, an image in the Aadhaar card is encrypted using the RK-RSA algorithm for better protection and confidentiality. The proposed RK-RSA algorithm is very secure for smart cards and Aadhaar cards. The better performance of the RK-RSA is evaluated based on the Avalanche Effect, Speed, Throughput, and Power Consumption. The improved performance of the RK-RSA algorithm's experimental results is reported. The mathematical justification supporting the RK-RSA algorithm is also detailed.

**Keywords:** Cryptography, Decryption, Encryption, RSA, Security

### 1. Introduction

In the cryptosystem, two distinctive kinds of keys are used. One is the public-key and the other is a private key. Private Key is stored secretly and the public-key is recognized to all. This process is referred to as an uneven system. The data encrypted utilizing the usage of public-key can solely be decrypted through the private key. In a public-key cryptosystem, the data are saved in secret, with no want to share the data, and no want to share the facts between two parties so that the facts are very tightly closed with less danger to be stolen.

One essential element of the encryption process is that it nearly constantly includes both an algorithm and a key. A key is just some other piece of facts nearly constantly a wide variety that specifies how the algorithm is applied to the plaintext to encrypt it. Even if you be aware of the method by way of which some message is encrypted, it's hard or impossible to decrypt it except this key.

### 2 Literature Survey

Cryptosystems are frequently thinking to refer solely to mathematical procedures and computer programs; however, they additionally encompass the rules of human behavior such as selecting challenging bet passwords, logging unused systems, and now not discussing touchy strategies with outsiders.

Using cryptographic techniques, protection execs can:

- Keep the contents of information confidential
- Authenticate the identification of a message's sender and receiver
- Ensure the integrity of the data, showing that it hasn't been altered
- Demonstrate that the supposed sender sent this message, a precept recognized as non-repudiation

There are two sorts of cryptography strategies symmetric-key cryptography and Asymmetric-key cryptography. Symmetric key cryptography is a conventional system. To perform operations equal keys are used. The symmetric encryption adjustments plaintext into cipher-text using a secret key and an encryption algorithm. To acquire plaintext form, cipher-text, and the decryption algorithm, the equal keys should be applied to the cipher-text.

In uneven key cryptography, two keys are utilized to scramble and decode a message with the aim that it arrives safely at the receiver. Hence it is also regarded as Public Key Cryptography. In this technique, the key utilized for encryption of a message is not pretty identical as to the key used to decode the message, and each uses two keys, public key and non-public key for encryption and decryption respectively. When a sender desires to talk

## Improvement of RSA Algorithm Using Euclidean Technique

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**Abstract:** Information Security has become an essential concern in the modern world. Encryption is an effective way to prevent an unofficial person from viewing the digital information with the secret key. RSA encryption is often used for digital signatures which can prove the authenticity and reliability of a message. As RSA encryption is less competent and resource-heavy, it is not used to encrypt the entire message. If a message is encrypted with a symmetric-key RSA encryption it will be more efficient. Under this process, only the RSA private key will be able to decrypt the symmetric key. The Euclidean algorithm is attainably one of the most extensively known algorithms. The Euclidean algorithm is used for finding the greatest common divisor of two numbers. The algorithm can also be defined for more general rings than just the integers. This work is very useful to improve the data security in Smart card and Aadhaar card. In this paper, the RSA algorithm is modified using the Euclidean technique to improve its performance. The proposed algorithm shows its better performance in terms of speed, throughput, power consumption, and the avalanche effect. Experimental results and mathematical justification supporting the proposed method are reported.

**Index Terms:** Decryption, Encryption, Euclidean, RSA, Security

### 1. Introduction

RSA (Rivest-Shamir-Adleman) is an algorithm used by contemporary computers to encrypt and decrypt messages. It is an asymmetric cryptographic algorithm.

Asymmetric means that there are two different keys: Public Key and Private Key.

The RSA algorithm is the base of a cryptosystem a set of cryptographic algorithms that are used for explicit safety services or resolve which allows public-key encryption and is broadly used to safeguard the data, mainly when in actuality it is directed over an insecure network such as the internet.

RSA was first publicly described in 1977 by Ton Rivest, Adi Shamir, and Leonard Adleman of the Massachusetts Institute of Technology.

Public key cryptography, also well-known as asymmetric cryptography, uses two dissimilar but mathematically related keys one public and one private. The public key is known to everyone, whereas the private key must be kept secret.

In RSA cryptography [1], both the public and private keys can encrypt a message; the opposite key from the one used to encrypt a message is used to decrypt it. This quality is one reason why RSA has become the most extensively used asymmetric algorithm. It provides a method to declare the confidentiality, integrity, authenticity, and non-repudiation of electronic communications and data storage.

### 2.Related Work

Cryptography [2] is the method of altering data from a human-readable form to an altered form, and then back to its original readable form.

Several symmetric algorithms [3] have been used in the past. These include Blowfish, DES, 3DES (Triple DES), AES.

Blowfish is yet another algorithm planned to replace DES. This symmetric cipher splits messages into blocks of 64 bits and encrypts them independently [4].

**Amelioration of Fluoride Induced Hematological Toxicity in Albino Rat By  
*Lactobacillus Rhamnosus***

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ABSTRACT

A study was conducted on albino rats (*Rattus norvegicus*) to study the toxic effects of fluoride on Hematological factors and its amelioration by probiotic bacteria. The rats were treated with 10.1mg F/kg body weight (1/5<sup>th</sup> LD<sub>50</sub> of fluoride) and 20.2mg F/kg body weight (1/2.5<sup>th</sup> LD<sub>50</sub> of fluoride) for 60 days. They were further treated with *Lactobacillus rhamnosus* for 30 days to study its amelioration effect. Fluoride water treatment to rats significantly ( $P < 0.05$ ) reduced glucose, protein, cholesterol, RBC and Hemoglobin. The WBC count was significantly increased. The above altered parameters were restored partially after probiotic treatment. The study revealed that probiotic bacteria *L.rhamnosus* can be used as a therapeutic regimen to ameliorate fluoride induced toxicity.

**Key words:** Fluoride toxicity, Hematological parameters, *Lactobacillus rhamnosus*, Amelioration.

INTRODUCTION

Fluoride is ubiquitously present in soil, water, plants and air. In the animal body fluoride makes its presence through water and food. But some of the recent studies indicate that, most of the fluoride comes from pharmaceutical drugs (20%) and through agrochemicals (30- 40%) (Jagtap *et al.*, 2012). The variability and presence of fluoride depends upon the location. It was found that fluoride is present in the soil within the range of 10-1000 parts per million (ppm). However, in water it ranges from 0.5 to 2000 ppm. According to World Health Organization (WHO 2006), fluoride exposure to animals above the 1.5 ppm, set at chronic fluoride toxicity. The deleterious effects of excess fluoride on human health are:

**Effect of *Calotropis Gigantea* on Banana Pseudostem Weevil *Odoiporus Longicollis***

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**Abstract**

Banana Pseudostem weevil *Odoiporus longicollis* (Olivier) (Coleoptera: curculionidae) is an important pest of banana (*Musa Spp.*) causing heavy yield reductions throughout the world. Farmers mainly depend upon the synthetic insecticides to manage this pest, it was more expensive and caused many problems to human beings, domestic animals and also our environment, Botanical pesticides have pesticidal, antifeedant and repellent activities. The present investigation was carried out to observe the settling response of *O. longicollis* against crude kairomone; decayed banana pseudostem and its extract; different extracts of *Calotropis gigantea* (Water, Acetone, Latex). Insecticidal activities of *C. gigantea* extracts on *O. longicollis* adults against of *C. gigantea* also carried out. Results of the present study revealed that water extract of *C. gigantea* showed better repellent activity against *O. longicollis*. Treatment caused dose dependent corrected percent mortality. Among the three toxicity bioassay Oral toxicity showed high insecticidal activity than contact and dermal toxicity bioassays. Latex of *C. gigantea* also possesses repellent activity.

**Key words:** *Calotropis gigantea*, *Odoiporus longicollis*, Pseudostem weevil

**INTRODUCTION**

In present scenario, scientists focus on the development of novel ecofriendly, non-hazardous and cost effective biopesticides (Isman, 2006). Biopesticides play an important role in crop protection. The most commonly used biopesticides are living organisms in pest management (IPM) program. Biopesticides are being used in the control of crop pest. Synthetic/conventional insecticides are used control the various insect pest. Agriculture has been facing the destructive activities of numerous pest like fungi weeds and insects from time immemorial leading decrease in yields (Salma mazid *et al.*, 2011). Need to develop biopesticides which are effective, biodegradable not leave any harmful effect on environment.

**Seasonal Variation of Water Quality Parameters in Riverine Wetland of Srivaikuntam, Thoothukudi District**

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**Abstract**

Wetlands serve as important natural resources and play a major eco-hydrological role in environmental management. A systematic study has been carried out to assess the water quality parameter of Tamaraparani riverine wetland of srivaikuntam in Thoothukudi District. The samples were collected for two consecutive years 2017 and 2018 (south-west monsoon season, north-east monsoon season and post-monsoon season). Water quality data collected from 5 sampling sites in riverine wetlands during 3 seasons and analysed 16 parameters (air temperature, water temperature, pH, alkalinity, DO, hardness, conductivity, total dissolved solids, nitrogen, phosphorus, major ions (Ca<sup>2+</sup>, Mg<sup>2+</sup>, Na<sup>+</sup>, Cl<sup>-</sup>, K, HCO<sub>3</sub><sup>-</sup>) has been done during the investigation period. Each parameter was compared with the standard desirable limit of that parameter in river water as prescribed by different agencies. Protecting wetlands from anthropogenic threats is one of the major concerns in developing countries. This can be achieved by creating awareness among people by employing appropriate communication strategies about the importance of wetlands. It was also observed that the water in the year 2017 was of a better quality than in the year 2018. Suitable suggestions were made to improve the quality of river water.

**Keywords:** Physico-chemical parameters; River Tamaraparani, Seasonal variations, Conservation

**Introduction**

Wetlands, having the capacity to store water, means they are able to support livelihoods, such as fishing, pastoralism, and agriculture, as well as providing craft materials, clean drinking water, and medicinal plants (Dixon and Wood 2007). Domestic and industrial wastewater constitutes a constant polluting source, here as surface run off is a seasonal phenomenon mainly controlled by climate within the basin (Singh *et al.*, 2004). Natural surface water bodies like rivers and streams are subjected to pollution comprising of organic and inorganic constituent (Srivastava, 2011). Renewable fresh water is an indispensable resource for life. This is why it deserves special attention because it is very impaired and seriously threatened by human activities (Atnafu 2011). In fact, population growth accompanied by rapid urbanization causes many disturbances for natural environments industrialization, the non-rational use of fertilizers and pesticides, and the lack of public awareness of the protection of the environment, lead to an imbalance of the ecosystem and generate pollutants that can affect the physicochemical and biological quality of aquatic receptors (Yuan, 2016), but also alter the uses of water (capture Water, bathing, etc.) (Zhang, 2015). As with any natural habitat, wetlands are important in supporting species diversity and have a complex of wetland values (Choudhury, 2000). Pollution of a river first affects its chemical quality and then systematically destroys the community disrupting the delicate food web. River pollution has several dimensions and effective monitoring and control of river pollution requires the



## Probiotic Effect on Zinc Sulphate Induced Haematological Toxicity in the Fish *Mystus montanus*

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### ABSTRACT

Zinc is introduced into aquatic systems through an industrial process, such as smelting and the use of fertilizers in agriculture. At higher concentrations, Zn disrupts physiological and biochemical mechanisms causing both ionoregulatory disturbance and oxidative damage in fish. The present study was designed to evaluate the haematological parameters of the fish *Mystus montanus* intoxicated with  $ZnSO_4$  and to analyse the protective effect of probiotic bacteria *Lactobacillus rhamnosus* on the fish for 60 days. Two sub-lethal concentrations of zinc (4.56 mg  $ZnSO_4/L$  ( $1/10^{\text{th}}$  of  $LC_{50}$ ) and 2.28 mg  $ZnSO_4/L$  ( $1/5^{\text{th}}$  of  $LC_{50}$ ) were prepared after determining the  $LC_{50}$  value (45.6 mg/L) and used for the toxicity study. All the haematological parameters were significantly decreased ( $p < 0.05$ ) from the control in the T3 ( $1/5^{\text{th}}$   $LC_{50}$  dose of  $ZnSO_4$  and Basal diet) group of fish. However, the fish fed diet supplemented with probiotic bacteria in T4 ( $1/5^{\text{th}}$   $LC_{50}$  dose of  $ZnSO_4$  and Probiotic diet) group showed a significant increase ( $p < 0.05$ ) from the antidote control group T3. This study suggests that dietary supplementation of probiotic bacteria can cope up with zinc pollutants in the aquatic medium.

**Keywords:** Zinc sulphate, *Mystus montanus*, *Lactobacillus rhamnosus*, Haematology.

### INTRODUCTION

Surface water is a recipient of wastes resulting from the industrial and agricultural field which enter the nearby water bodies via runoff after heavy precipitation [1]. Increased discharge of heavy metals into natural aquatic ecosystems can expose aquatic organisms to unnaturally high levels of these metals [2]. Among aquatic organisms, fish cannot escape from the detrimental effects of these pollutants and are therefore generally considered to be the most relevant organisms for pollution monitoring in aquatic ecosystems [3].

Patil and Hande [4] conducted a study on the toxic effect of Zn chloride on brain acetylcholinesterase of a marine teleost, *Arius nenga* and he was observed that Zn exerted the inhibitory effect on cytoplasmic and membrane-bound fractions of AchE. Acute zinc poisoning in fish is generally attributed to blockade of gas exchange across the gills, causing hypoxia at the tissue level.

Probiotics are commonly defined as mono or mixed cultures of live microbes that when applied to animals or humans, generate a beneficial effect on the health of the host. These beneficial effects include disease treatment and prevention as well as the improvement of digestion and absorption in the host [5]. The total erythrocyte count [6], total leucocyte count fed with *Saccharomyces cerevisiae* [7], haemoglobin, mean corpuscular volume, haemoglobin concentration and mean corpuscular haemoglobin concentrations, total protein, albumin, globulin, albumin-globulin ratio, alkaline phosphatase activity, alanine and aspartate aminotransferase activities, creatinine, sodium, cortisol, insulin and glucose were reported to increase in *Labeo rohita* provided with *Bacillus subtilis* as probiotics [8].

The specific objectives of this research were to determine the  $LC_{50}$  value of  $ZnSO_4$  in *Mystus montanus* at different concentrations, to find out the effect of two sublethal concentrations on the hematological parameters of the fish and to observe the effect of Probiotic bacteria *Lactobacillus rhamnosus* on the zinc intoxicated fish.

### MATERIALS AND METHODS

#### Experimental animal (*Mystus montanus*)

The present study was carried out in the Department of Zoology, A.P.C. Mahalaxmi College for Women, Thoothukudi. Healthy fishes of *Mystus montanus* with  $8.9 \pm 0.507$  cm in length and weighing  $3.74 \pm 0.292$  g were captured in Perunkulam pond, near Eral in Thoothukudi

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## Dr.T. Determination Of Lc50 Values Of Three Detergents And Its Effect On Biochemical Compounds Of Eisenia Fetida

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### ABSTRACT

The adult earthworms of *Eisenia fetida* are exposed to two sublethal concentrations such as 1/10<sup>th</sup> LC50 and 1/20<sup>th</sup> LC50 doses of three detergents. Biochemical components were studied in the total body tissues. The ANOVA results showed earthworms treated with detergents significantly differed in their biochemical components ( $p < 0.05$ ) than control group. Total Sugars, Total Cholesterol, Total Protein levels are significantly ( $p < 0.05$ ) reduced in the earthworms group treated with Arasan and Rin detergents, whereas increased Urea, transaminase (GOT and GPT) and phosphatase (ALP and ACP) levels found in treated group organs. The results demonstrated that exposure of earthworms to detergents through soil disturbed the basic biochemical compounds in tissues and their damages are indicated by increased enzyme levels.

**Keywords:** Detergents, Earthworm, Biochemical compounds, Enzyme studies, suggestions.

### INTRODUCTION

Earthworms are major component of soil fauna in a wide variety of soils and climates and are involved directly and indirectly in biodegradation, stabilization through humus formation and various soil processes (MunnoliPrakashMallappa *et.al.* 2010). Earthworms represent the greater fraction of biomass of invertebrates in the soil as soil macro fauna and play a vital role in structuring and enhancing plant nutrients and hence they can be successfully used as bioindicators for the evaluation of toxic risks of xenobiotics in terrestrial ecosystems (Reinecke and Reinecke 2004). This is important for protecting the health of natural environments, and of increasing interest in the context of protecting human health (Beeby, 2001).

Earthworm population is influenced by various factors (soil, temperature, moisture and pH) and the availability of organic matter, which may come from plant residues and animal or human waste applied to the land (Baker *et.al.* 1992). The abundance of earthworms in soils represents the health of soil ecosystems and the level of environmental safety (Edwards *et.al.* 1995). Soil texture can influence earthworm population because of its effects on other soil properties, such as soil moisture relationships, nutrient status and cation exchange capacity, all of which can have important influences on earthworm population.

A detergent is a surfactant or a mixture of surfactants with cleaning properties in dilute solutions. Detergents figure in an extensive array of industrial and home cleaning applications, including laundry and freshwater detergents. They are also used in pesticide formulations and for dispersing oil spills at sea. Linear alkylbenzene sulphonate (LAS), a major detergent and corrosion inhibitor ingredient is poorly broken down in rivers and soils and may be toxic to soil organisms (Lightowers, 2004).

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### Studies on Hematological Differences of Cat Fish *Mystus Montanus* in Three Different Ponds Near Eral, Thoothukudi District, Tamilnadu

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#### ABSTRACT

The present study was designed to evaluate the haematological parameters of catfish (*Mystus montanus*) in three different ponds near Eral, Thoothukudi District, Tamilnadu. Thirty adult fish of *Mystus montanus*, ten from Perumkulam pond, ten from Petmanagaram pond and ten from Arumugamangalam pond were used for the present study. The application of haematological procedures is very important in assessing fish health as it monitors stress and pollutants in the pond. The mean weight and length of fish from pond were 10±2 g and 12±3 cm. There were no significant differences of haematological parameters between the fish in the ponds of Perumkulam and Petmanagaram. However, significant differences were observed ( $P < 0.050$ ) in the Full blood count, Haematological indices and Differential Leukocytes counts of fish in the Arumugamangalam pond.

#### Keywords:

Three ponds, *Mystus montanus*, Haematology, Pollution index.

#### Introduction

The deterioration of water quality of freshwater resource is becoming faster which leads to a global problem (Mahananda *et al.*, 2005). Discharge of toxic chemicals over extraction of aquifer and contamination water body with unwanted substances excessive algal growth are some of the major causative agents of water quality degradation. Several researchers (Singh and Mathur 2005., Gupta and Shukla 2006) observed that freshwater is gradually becoming a scarce commodity due to exorbitant pollution, over exploitation, etc. Dwivedi and Pandey (2002) reported that industrial waste water, sewage and municipal wastes are being continuously added to water reservoirs which affect the physicochemical quality of water and also making them unfit for even use of livestock and other organisms. Uncontrolled discharge of domestic waste water into the ponds has resulted in eutrophication of ponds (Pandey and Pandey 2003). The added unwanted substances may be arbitrarily classified as biological, chemical, physical and radiological impurities in addition to industrial wastes, commercial solvents, metal, acid, salts, sediments, pesticides, herbicides, plant nutrients, radioactive materials, decaying animal bodies, vegetable matters and living microorganisms (Gay and Proop 1993). All these impurities result in degradation of water quality, like bad taste, colour, odour, turbidity, hardness, corrosiveness, staining and frothing. Ponds which are relatively small in size are important part of our urban ecosystem, and they perform several environmental, social and economic functions, viz. as a source of drinking water, recharging groundwater and acting as sponges to control flooding, supporting biodiversity and providing livelihoods (Saha *et al.*, 2017).

Substantial knowledge of the haematological parameters of fish, is an important tool that can be used as an effective and sensitive index to monitor physiological and pathological changes in fishes. Normal ranges for various blood parameters in fish have been established by different investigators in fish physiology and pathology (Xiaoyun, 2009). Studies on blood indices has proven to be a valuable criteria for assessing the health status of both cultured and wild fish, as these indices provide reliable information on metabolic disorders, deficiencies and chronic stress



**The Role of Mutant Strains *Pseudomonas Aeruginosa* and *Bacillus Licheniformis* in The Degradation of Cellulosic Substrates**

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**Abstract**

The mutant strains of *Pseudomonas aeruginosa* and *Bacillus licheniformis* were used in the analysis of cellulolytic activity on the cellulosic substrates namely saw dust and cellulose powder by providing 28days incubation. At the end of the incubation the results revealed that the 14<sup>th</sup> day incubation gave the maximum output. The mutant *P. aeruginosa* showed better utilization of cellulosic substrates than the mutant strain of *B.licheniformis*. The enzyme production also more in the mutant *P.aeruginosa* than *B.licheniformis*. Among the two substrates used, the utility of the cellulose powder was more than the sawdust by both the mutant strains.

Key words: Mutant strain, cellulosic substrates, cellulose powder, sawdust

**CULTIVATION OF *SPIRULINA* USING BIOGAS SPENT SLURRIES AS SUBSTRATES****\*Dr. V. JEYANTHI KUMARI**

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**ABSTRACT**

*Spirulina* grows in water, can be harvested and processed easily and has significantly high macro- and micronutrient contents. In many countries, it is used as human food as an important source of protein and is collected from natural water, dried and eaten. It has gained considerable popularity in the human health food industry and in many countries of Asia it is used as protein supplement and as human health food. *Spirulina* has been used as a complementary dietary ingredient of feed for poultry and increasingly as a protein and vitamin supplement to aquafeeds. In India the awakening of *Spirulina* with such enormous qualities has not yet reached all people. The present investigation is carried out to evaluate the very easy cultivation of *Spirulina* by using different substrates like biodegraded poultry droppings and spent cowdung slurry obtained from biogas plant. Also it is evaluated for its chlorophyll and protein content. *Spirulina* was successfully cultivated by using different biogas plant substrates and maximum chlorophyll and protein content was founded in the media contained biodegraded poultry droppings slurry as substrates followed by spent cowdung slurry. The results indicated the potentiality of the two substrates to provide nutrients to culture medium that reduces its valuable cost and make it a cheaper and economic medium to cultivate

**Keywords:** *Spirulina*, biodegraded slurry, protein content, chlorophyll

**INTRODUCTION**

The protein is an essential component of diet. The greatest single problem in the world today is Global food protein shortage. The protein need for the world cannot be replaced by the tillage industry or agricultural field alone. Hence, there is an urgent need to find other protein sources. The best potential is microbial protein or single cell protein (SCP), a new source of protein independent of agriculture. The dried cells of microorganisms

**ISOLATION AND CHARACTERIZATION OF MICROFLORA FROM  
SEWAGE TREATMENT PLANT (STP).**

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**ABSTRACT**

Total Heterotrophic Microbial Population (THMP) and Total Heterotrophic Fungal Population (THFP) were analyzed following serial dilution and pour plating method in the sewage water sample obtained from nearby Sewage Treatment Plant (STP). The bacterial isolation has been done by quadrant streak technique on selective media. The results from the analysis revealed that by using selective media 11 bacterial cultures were isolated from STP and their characteristic features were confirmed by biochemical experiments. In addition to that monthly samples were collected for THBP and THFP analysis up to four sampling cycles. Throughout the sampling period, the THBP was found to be in the order of  $10^7$ CFU/ml. Among the four cycling periods, the lowest count was observed in the first sampling cycle ( $98 \times 10^7 \pm 4.013$ CFU/ml) and highest at the third sampling cycle ( $151 \times 10^7 \pm 3.654$ CFU/ml). In the case of THFP, the population density was consistently low in the order of  $10^3$ CFU/ml. Here the highest fungal population occurred in the first sampling cycle ( $21 \times 10^3 \pm 3.018$ CFU/ml) and the lowest in the fourth sampling cycle. In both cases, THBP and THFP, the variations were marginally signifying the relatively consistent nature of their occurrence.

**Key words:** STP, THBP, THFP,CFU.

**Analysis of Microbial Diversity in the Effluent of A Sugar Industry,  
Thiruvengadam-Tamilnadu.**

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**Abstract**

The sugar industry plays an important role in the economic growth of a country but the effluent releases from the industry cause water pollution which eventually causes health hazards. The variety of microbes present in the effluent capable to degrade the organic matter in them. Hence, the present study was undertaken to know the bacterial, fungal, and yeast population in the effluent of the sugar industry of Thiruvengadam, Tamilnadu, and were analysed for microbial composition and population density. The results revealed that totally 15 microbial species were isolated from the effluent. Four types of fungi have predominantly occurred and its load comprises  $35 \times 10^3$  CFU/ml, eight bacterial species with a density of  $49 \times 10^6$  CFU /ml, and two yeast species with the density of  $17 \times 10^3$  CFU/ml.

**Keywords:** Sugar industry, Effluent, Bacterial load, fungal load, Yeast load.

**Introduction**

The most important crop from which sugar could be produced in commercial quantity is sugarcane. India is one of the largest sugar producing country. Today sugarcane is grown in over 110 countries. In 2008 an estimated 1,743 million



## Effect of Preferred Dietary Probiotics on the Growth Execution of *Carassis Auratus*

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### Article Info

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### Abstract

In this study, the impact of the commercial supplement nutrient on the durability and boosting execution of gold fish *Carassius auratus* was observed. For that, the uniform size fry (average weight  $2.29 \pm 0.06$  g) were distributed in five experimental groups into triplicates of 10 fish each in a series of cylindrical fiberglass tank. The feeding trial was conducted for 35 days. Four types of probiotic supplements namely Spirulina (T1), Lactobacillus (T2), Yeast (T3), and Mixed supplement of above said nutrients (T4) along with control (T5) feed with none of the supplement were chosen. Periodically the weight, Ratio of Food Conversion (RFC) together with Rate of Survival Growth (RSG) of the experimental fishes was reasoned. Results manifested that, the various probiotic supplements gave high survival ability of *C. auratus* which includes, increase in mass with Rate of survival growth (RSG) in given experiments. Among the 4 supplement nutrients provided, the maximum and optimum growth performance were observed in fish fed with mixed supplement nutrient (T4) where the maximum weight of the fish is  $5.05 \pm 0.21$  g followed by T1 ( $4.51 \pm 0.09$ g), T3 ( $4.06 \pm 0.03$ g) and T2 ( $3.89 \pm 0.08$ g). The best feed conversion ratio were T1 (0.45), T2 (0.63), T3 (0.57), T4 (0.36) and control (0.89) respectively. The low growth seen in control treatment. Shortly, additive nutrient probiotics can act like a good enhancing material for increasing the survival durability of *C. auratus*.

### Article History

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**Keywords:** probiotics, Specific Growth Rate, Feed Consumption Rate.

### I. INTRODUCTION

The types and appealing shape of the body with the good looking colour of the skin construct *C. auratus*, is the popular ornamental fishes (Zhou *et al.*, 2001). The desirable marketed value is due its skin pigmentation nature (Yanaret *et al.*, 2008). Prosperous cultivating method includes the system of preparing nutrients and price impact on diets that gave needed important nutrients for the enhancement of the fish. The ratio of *C. auratus* farming has increased in recent years, indicating that the profitability of the local aquaculture and import and export industries in fisheries. (Andras, 2012).

Now a day better growth of the ornamental fishes depends on the growth-enhancing accompaniment substances comprising hormones and antibiotics (El-

Haroun *et al.*, 2006). They frequently practiced at the beginning of 1940s (Ahilanet *et al.*, 2004) like conventional method to the diseases management of fisheries. In some countries, this method is banned because resistance bacteria both in fishes and host aroused from the mishandle and excess usage of antibiotics (Watson *et al.*, 2008). The use of antibiotics to control diseases has generated many problems like the bio accumulation in the tissue of fishes and thus entered in food chain (Tukmechiet *et al.*, 2007). Aquaculture is the fastest growing food production sector in the world in existing situations (Abd El-rhmanet *et al.*, 2009).

Probiotics is recognized as a natural therapy for health protection because of its limitations towards antibiotics, the vaccine preparations also in the

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## Hazardous microplastic characteristics and its role as a vector of heavy metal in groundwater and surface water of coastal south India

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### ARTICLE INFO

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### ABSTRACT

Study of hazardous microplastics in the natural water resources is minimal compared to the sea salt, seafood and even packaged water. We presented results of the first baseline research of microplastics in groundwater and surface water from the coastal south India (Tamil Nadu state) and evaluated the heavy metal adsorption capacities of different polymers. The microplastics (up to 19.9 particles/L) were of relatively larger size in surface water (0.34–4.30 mm) compared to the groundwater (0.12–2.50 mm). Polyamide (nylon), polyester, polypropylene, polyethylene, polyvinyl chloride and cellulose were the common polymers and all of them showed different capacities of heavy metal adsorption. In two different experimental sites, the polypropylene showed higher capacity of adsorption compared to other polymers in the following orders: (i) cadmium > manganese > lead > arsenic and (ii) manganese > zinc > arsenic > lead > copper. The polyamide, however, exhibited better adsorption only for manganese. Similar to other recent findings, our results associate microplastics as a major vector to transport heavy metals in the water system. Formulation of strategies to reduce the environmental risks of particulate plastics as a potent vector for transportation of the toxic trace elements and subsequent, impact on human health through the OSPRC framework (Origins, Sources, Pathways, Receptors and Consequence) in the study area would require future research.

### 1. Introduction

Even though several countries have recently restricted the plastic usage, it's application in the day-to-day life is unavoidable (Derraik, 2002; Wagner et al., 2014; Eerkes-Medrano and Thompson, 2018; Kool et al., 2018; Li et al., 2018; Panno et al., 2019; Koelmans et al., 2019; Bellasi et al., 2020; Egessa et al., 2020; Fu et al., 2020). The extensive use of plastic in the recent past has contributed large quantities of non-degradable and hazardous solid waste in the marine ecosystems and the rate of accumulation has increased at an alarming rate over the last couple of decades (Dris et al., 2018 and Walker, 2018). Smaller fragments of these plastics or fibers with <5 mm size represent the microplastics (MPs) and they have been reported both in the marine as well as freshwater environments (do Sul and Costa, 2014; Eerkes-Medrano et al., 2015; Jambeck et al., 2015; Mani et al., 2015; Lares et al., 2018; Li

et al., 2020; González-Pleiter et al., 2020). Bays, estuaries, beaches, rivers and harbors, in vicinity of the urban developments, are the regions of microplastic accumulation. Recently, Rummel et al. (2016) and van Cauwenberghe and Janssen (2014) reported the presence of MPs in the digestive tracts of several species. In freshwater bodies of the Arctic (Svalbard Archipelago), González-Pleiter et al. (2020) reported the presence of MPs and other anthropogenic litters. The presence of MPs is also reported in seafood (Tanaka and Takada, 2016), salt (Selvam et al., 2020), tap water (Kosuth et al., 2017), as well as in honey (Liebezeit and Liebezeit, 2015). Ganesan et al. (2019) and Schymanski et al. (2018) observed MPs in the bottled drinking water and related their sources to the packaging materials (polyethylene terephthalate). These microplastics serve as a vector for transporting organic pollutants (POPs) toxic additives into the ecosystems and cause hazardous effect on marine organisms such as benthic invertebrates, birds, fish, mammals and

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## Biodigested Slurry as Biological Carrier for Rhizobium Phaseolus

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### ABSTRACT

A comparative study was carried out by providing two different climatic conditions for 4 types of biodigested organic slurries obtained from biogas plant and were used as carriers for *Rhizobimphaseolus* isolated from *Phaseolus vulgaris*. The 2 different climatic conditions were the room temperature ( $37\pm 2^{\circ}\text{C}$ ) and the refrigerated temperature ( $6\pm 2^{\circ}\text{C}$ ) to determine which biodigested organic slurries function as good carrier to enhance or hold the high viable load of rhizobial culture. Propagation ability of organisms in the carriers were analysed for every 10days interval. The 4 different biodigested organic slurries were, OWCS (Ordinary Water treated biodigested Cow dung Slurry), SWCS (Sewage Water treated biodigested Cow dung Slurry), SWPS (Sewage Water treated biodigested Poultry droppings Slurry) and Mixed form of the above mentioned organic manures (OWCS+ SWCS+SWPS). The experimental results showed that, in the provided both climatic conditions, the better survival and growth of *R. phaseolus* were observed in refrigerated temperature than the room temperature. Among the four biodigested organic slurries, the mixed carrier slurry showed the maximum concentration of rhizobial load followed by SWPS and SWCS slurries in both different climatic conditions provided. OWCS was less supportive for rhizobial growth even though it had ensured their survival.

### Keywords:

Biofertilizer, *Rhizobium phaseolus*, biodigested slurries, sewage water

### Introduction

Fertilizers supply essential plant nutrients, mainly nitrogen (N), phosphorus(P) and potassium(K). They are removed in large quantities from the soil by each successive harvesting<sup>1</sup> (Madhiyazhagan *et al.*, 2001). Among the fertilizer elements, nitrogen and phosphorus play key role in plant growth and development. But their application is not fulfilled a satisfied dosage due to their alarming cost and inadequate availability<sup>2</sup> (Baqual and Das, 2006). In intensive cropping system, supplementing soil nutrients by the use of chemical fertilizer is considered inevitable for obtaining optimum yield of crops. But it has been observed that continuous use of chemical fertilizers may affect the soil health and may lead to negative impact on soil productivity<sup>3</sup> (Indu Paul and Savithri, 2003). High inputs of chemical fertilizers for high yield in agriculture during the last 150 years has not only pollute and cause less productive but also posed severe health hazards<sup>4</sup> (Alokadhobya and Deepak, 2003).

Due to excessive use of chemical fertilizers and plant protection chemicals, the rhizosphere micro flora has been affected greatly and because of it, in the place of the beneficial associative bacteria, the harmful type's pre occupy the rhizosphere<sup>5</sup> (Nagina Parmer and Dadarwal, 1997). The use of biofertilizers has been reported to be beneficial for the cultivation<sup>6</sup> (Naja Chandra, 2001). There is ample scope for increasing production through the use of organic fertilizers<sup>7</sup> (Madhiyazhagan *et al.*, 2001). India is the third largest producer and consumer of fertilizer in the world (after China and USA) accounting for 12% of world population of N and P nutrients and 12.6% of world consumption of NPK nutrients<sup>8</sup> Rao, 1986). In recent years, biofertilizers have emerged as promising component of integrated nutrient supply system in Indian agriculture. Nitrogen fixing bacteria not only provides the nitrogen but produce a variety of growth promoting substances like acetic acid, gibberellins, B vitamins and anti fungal substances<sup>9</sup>; Sindu and Dadarwal, 2000).

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## Rhizosphere Effect of Microorganisms on Green Gram Cultivated Soil - A Field Study

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### ABSTRACT

The quantitative comparative analysis of the rhizosphere effect between rhizosphere soil and non-rhizosphere soil of the green gram cultivated soil was done based on R : S ratio (Root-Soil ratio). The results revealed that high rhizosphere effect was seen in the rhizosphere soil of green gram also the quantification studies explored that the rhizosphere effect among the microbes was more in bacteria than in fungi and actinomycetes during the plate count method on various media used. The result of the isolation and enumeration of rhizosphere bacterial culture by selective and decimal dilution method revealed that among the bacterial culture, the quantity of *Rhizobium* sp. ( $140 \times 10^6 \pm 2.056$  CFU/ml) was more followed by Phosphate Solubilizing Bacteria (PSB) ( $89 \times 10^6 \pm 3.080$  CFU/ml) and Cellulolytic bacteria ( $54 \times 10^6 \pm 3.012$  CFU/ml). The lowest count was observed in the TCBS agar medium).

### Keywords

Rhizosphere effect, green gram soil, R:S ratio, Bacteria, fungi

### INTRODUCTION

Microbial communities play a pivotal role in the functioning of plants by influencing their physiology and development and are beneficial to plant growth (Rodrigo Mendes, et al.2013). Plants are colonized by an astounding number of microorganisms that can reach cell densities much greater than the number of plant cells (Johnson and Graham, 2013). Microbial population interacts with plants through a series of complex mechanism and the interactions can be beneficial, neutral or detrimental depending upon the nature of microbiome in the plant also the microbial activity is high due to the secretion of bioactive compounds from roots (Gaurav Yadav, et al.2017).

The root microbiota provides indirect pathogen protection, and to serve additional host functions through the acquisition of nutrients from soil for plant growth. Thus, the plant microbiota emerge mutualism through diverse biochemical mechanisms by plant growth-promoting and plant health-promoting bacteria (Davide Bulgarelli, et al.2013). The study of microbiomes helps in the identification of new groups involved in plant diseases from the rhizospheremicrobiome and the number of studies have revealed that many plant-associated microorganisms have profound effects on seed germination, seedling vigor, plant growth and development, nutrition, diseases, and productivity (Inceoglu, et al.2013).

The microbial community at the seedling stage was distinct from the other developmental time and the phylum such as Acidobacteria, Actinobacteria, Bacteroidetes, Cyanobacteria and specific genera are associated with plant development and root exudation (Jacqueline Chaparro, et al.2014). Recently, it was reported that the composition of root exudates can change a plant developmental gradient (Chaparro et al., 2013). Cumulative secretion levels of sugars and sugar alcohols were higher in early time points and decreased through plant growth (Badri et al., 2013). As the plant ages it releases specific substrates and potentially antimicrobial compounds in an effort to select for particular microbial inhabitants of the rhizosphere ( Selvakumar et al., 2012).



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### Analysis of Pigment Production from Soil *Pseudomonas Putida*

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#### ABSTRACT

The environment conservation and human safety has created awareness for natural pigment sources. Microbial pigments shows better biodegradability and have numerous applications from food to cosmetics when compared to synthetic pigments. The current study aimed to screen and identify pigment producing microbial isolates especially pseudomonas using pseudomonas isolation agar from garden soil. Various time incubation were provided to optimize its maximum pigment production. During the incubation of *P.putida* in nutrient broth, for the first four days, there was a slight colour change in the media. The colour change was notable from the sixth day onwards. On the eighth day, it was dark green and continued on until the end of the incubation time. The validity of this experiment was demonstrated by colorimetric observation also. The pigment concentration was low ( $0.089\pm 0.08$ ) during the second day of colorimetric reading. At the time of the sixth and eighth day of colorimetric observation, the concentration of pigments was gradually increased. The concentration of pigment production was high during the tenth day of optical density observation ( $0.527\pm 0.16$ ). The colorimetric reading in the subsequent days was more or less the same. The density of the pigments remained intact.

#### Keywords

*Pseudomonas putida*, biodegradation, pigments, optical density

#### INTRODUCTION

Nature produces many colorants from various resources including plants and microorganisms, which are possible alternatives to synthetic dyes and pigments currently employed (Parekh *et al.*, 2000). In today's living environment, the impact of natural pigment is rapidly spreading and raising awareness among people. The effects and side effects of chemical colouring agents cannot be listed and they are the important cause of diseases that affect the human species (Kamla *et al.*, 2012).

The recent awareness of human safety and environmental conservation has made fresh enthusiasm for natural sources of colors. Natural colorants or dyes derived from flora and fauna are believed to be safe because of the non-toxic, non-carcinogenic, non polluted and biodegradable nature (Joshi *et al.*, 2003). Among natural pigments, pigments from microbial sources are potentially good alternatives to synthetic pigments (Dufossel, 2006).

Pigments responsible for bright colours are synthesized almost exclusively by bacteria belonging to genera *Pseudomonas*, *Streptomyces*, *Nocardia*, *Sorangium*, *Brevibacterium*, *Burkholderia* and *Bacillus*. Among them *Pseudomonas* is most eligible pigment producing agent (Yuodimet *et al.*, 2002). Realizing the importance of natural pigments and its positive impact on society, the work plan was designed to synthesize natural pigments from *Pseudomonas* sp.

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## Analysis the antibacterial activity *Pseudomonas aeruginosa* pigment on *Escherichia coli*

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### ABSTRACT

Biodegradability, non-toxic nature and therapeutic nature of the natural pigments, colorants and dyes make an alternate and attractive source for human use. The current study aimed to screen and identify pigment producing *Pseudomonas aeruginosa* from garden soil using pseudomonas isolation agar and its species level was identified under the guidance of Bergey's manual. Different incubation times were provided to optimize its maximum pigment production. There was a slight colour change in the media observed, for the first three days during the incubation of *P.aeruginosa* in nutrient broth. The colour change was notable from the fifth day onwards. On the seventh day, it was dark green and continued on until the end of the incubation time. The validity of this experiment was demonstrated by colorimetric method. The pigment concentration was low ( $0.076\pm 0.18$ ) during the third day of colorimetric reading. The concentration of pigments was gradually increased at the time of the fifth and seventh day of colorimetric observation. The concentration of pigment production in optical density was increased at 9<sup>th</sup> day observation ( $1.873\pm 0.16$ ). The colorimetric reading in the following days was more or less the same. The density of the pigments remained intact.

**Keywords:** *Pseudomonas aeruginosa*, biodegradation, pigments, optical density

### INTRODUCTION

Biodegradability, non-toxicity and non carcinogenicity of the natural dyes and colorants derived from natural flora and fauna make an alternate source for human use (Joshi *et al.*, 2003). Plants and microorganisms are the natural colorant resources of nature and are great alternatives to synthetic dyes and pigments currently employed (Parekh *et al.*, 2000). In today's living conditions, the impact of natural pigment is rapidly spreading and raising awareness among people. The side effects of chemical colouring agents cannot be listed and they are the important cause of diseases that affect the human species (Kamla *et al.*, 2012).

Among natural pigments, pigments from microbial sources are potentially good alternatives to synthetic pigments (Dufossel, 2006). Pigments responsible for bright colours are synthesized almost exclusively by bacteria belonging to genera *Pseudomonas*, *Streptomyces*, *Nocardia*, *Sorangium*, *Brevibacterium*, *Burkholderia* and *Bacillus*. Among them *Pseudomonas* is most eligible pigment producing agent (Yuodim *et al.*, 2002). Pigments possess some inhibitory effects towards many bacterial strains and microorganisms commonly present in medical and industrial process. It is nontoxic, safe and inorganic antibacterial agent.

Behind the discovery of many diseases, it has become important to bring our rare species of plants and antimicrobial agents for those dreadful diseases (Hawkey 2008; Jemal *et al.*, 2011). The phytochemical analysis of many plants emphasized that the secondary metabolites are bioactive compounds with medicinal properties like antibacterial, antifungal, antioxidant, antidiabetic and anticancer (Gurib-Fakim 2006; Phillipson 2007).

Pharmaceutical industries turned researchers to find potential components in these pigments that have important therapeutic applications (Muhammed numan *et al.*, 2018). The toxic effect of many drugs compel pharmacist to search new sources of drugs that are safer in use and antibiotic of broad spectrum potential. The current increase in the drug resistance in the pathogen might be due to the increased use of present antibiotics. Products of the microbes in particular isolated from novel ecosystem can be a potential alternative source for new drugs (Mellouli *et al.*, 2003). Considering the pharmacological potential of bacterial pigments, and realizing the importance of natural pigments and its positive impact on society, the

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## Effect Of Spirulina platensis Probiotic Feed On Growth Performance Of Poecilia Reticulate

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### Abstract:

Poeciliareticulata (Guppy) is an aquarium fish, added to stale water bodies to control mosquito populations. The dietary supplementation impact on Spirulina platensis probiotic strain on the growth performance was evaluated. Experimental groups 3 and one control group were maintained. The study was designed to evaluate the dried Spirulina platensis 0.5%, 1% ,and 1.5% in diets for guppy fish. Guppies (E1, E2, and E3) were taken care of with the eating regimen supplement with Spirulina platensis probiotic, the development rate was critically contrasted with the control. The development rate was most noteworthy in E2 when contrasted with other test groups. The greatest development rate was seen in the E2 bunch enhanced with 1.0% Spirulina.

**Key Words:** Probiotics, Poecilia reticulata, Spirulina platensis.

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### Introduction:

Fishes in general, fascinate humans. The fishes which are colourful and with captivating movements are greater attention. The human urge to have fishes of this category, Whole habit of gracefully gliding through water closer to them as a soothing source of mental relaxation, gave birth to the practice of

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## Phytochemical analysis and DPPH radical scavenging activity of marine red seaweed *Gracilaria corticata*

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### Abstract

In recent times, researchers paid more attention on marine macro algae or seaweeds owing its biological activities with their multiple applications to the humans. In the marine environment red seaweeds are renowned for their biological activities due to the presence of various bioactive substances including phenolic residues. The present investigation deals with the qualitative and quantitative phytochemical analysis of red seaweed *Gracilaria corticata*. DPPH radical scavenging activity using different solvent extracts also performed. Preliminary phytochemical screening confirmed the existence of proteins, carbohydrates, lipids, aromatic acids, alkaloids, phenols, flavonoids, tannins, terpenoids, steroids, saponins, coumarins, quinones, anthroquinones and catechins. *G. corticata* contains 16.7% protein, 1.0 % lipid, 7.9% carbohydrate, 3.14 mg GAE/g DW phenol and 1.05 mg GAE/g DW flavonoid. Maximum DPPH radical scavenging ability was recorded by ethanol extract (74.5%) followed by methanol (73.82%), water (73.62%), chloroform (36.9%) and petroleum ether (18.2%). No scavenging activity recorded by benzene extract.

**Keywords:** *Gracilaria corticata*, seaweed, phytochemicals, DPPH radical

### Introduction

More than 70 % of the world covered by ocean which provide shelter for wide variety of marine planktons, plants and animals. These unique marine environmental organisms offer a rich foundation for natural products and several miracles of this location still remains unknown. Recent investigation suggested that variety of phytochemicals like polyphenolic compounds, peptides, polysaccharides, antioxidants, essential vitamins polyunsaturated fatty acids and minerals are derived from these marine organisms (Fernando et al., 2017). Abundant number of organisms and different kind of species are present in the vast marine environment. Seaweeds otherwise called as macroalgae with lot of biological properties are an important eco – friendly therapeutically important species from marine resources (Umavandhana and Jayanth, 2018).

This macrophytic marine algae growing in salt water and largely available in surface sea waters. It provides a extensive variety of healing properties. In Japan and China seaweeds are used by man for eras and used as part of staple food. Many countries are well-known for the use of marine algae as food, animal feed and fertilizer. It contains more than 60 trace elements and it is higher than the land plants. Stimulatory and antibiotic substances and other components like carbohydrates, protein, amino acids, iodine, bromine and vitamins are occur in seaweeds (Kannan, 2014).

There is increasing attention in substances that possess antioxidant properties, which are used in nutrition and pharmaceuticals. (Ekrem and Ilhami, 2008). As enormous amount of antioxidant compounds is present in seaweeds it plays a vital part against many illnesses and anti – ageing processes by preventing the cells from oxidative injury. Bioactive substances like polyphenols and phlorotannins present in seaweeds are act as prominent antioxidant compounds. Progression of numerous chronic diseases were retarded by these substances and also shelter the human body from free radicals. Due to this reason food industries and pharmaceuticals targeting antioxidants from seaweeds for the development of health promoting constituents (Dhinakaran et al. 2015). With this background information this work was aimed to assess phytochemical content and DPPH scavenging capacity of marine red seaweed *G.corticata*.

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## Effect of *Ulva Lactuca* Seaweed Liquid Fertilizer on Drought Stressed *Vigna unguiculata*

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### ABSTRACT

Impact of *Ulva lactuca* seaweed liquid fertilizer (SLF) on drought stressed *Vigna unguiculata* was studied. *Ulva* SLF obtained by Autoclave method and Alcohol-Aqueous method were assessed for their role in water stress alleviation in *Vigna unguiculata* by analysing the morphological characters; shoot length, root length, number of lateral roots, fresh weight and dry weight and biochemical parameters; photosynthetic pigments, sugar, amino acid, protein, lipid, proline, nitrogen, Nitrate reductase,  $\alpha$ -amylase, Abscissic Acid and cytokinin. 1% *Ulva* SLF obtained by the alcohol-aqueous method, triggered enhanced shoot and root length, number of lateral roots and fresh weight in water stressed SLF treated cowpea seedlings. The amount of photosynthetic pigments in *Ulva* SLF (from both the methods of extraction) treated drought stressed cowpea seedlings exceeded over that of unstressed and water stressed untreated cowpea seedlings. *Ulva* SLF induced increment of biochemicals like sugar, amino acid, protein in cowpea and nitrate reductase activity was at the peak. The response of the test crop seedlings varied with the treatments under water stressed conditions. Highest value of amino acid (39 mg) and protein (0.49 mg) content was recorded in *Ulva* SLF treated stressed seedlings. The amount of sugar (1.12 mg) and amino acids (30.9 mg) was found to be more in stressed SLF treated seedlings. The amount of sugar (1.12 mg) and amino acids (30.9 mg) was found to be more in stressed SLF treated seedlings.

### Keywords

*Ulva lactuca*, SLF, Cowpea, Pigments, Biochemicals

### INTRODUCTION

Application of fertilizers plays an important role in the yield of crops. But the continuous use of inorganic fertilizers has made the soil infertile for cultivation, besides eutrophication of surface water and contamination with nitrogen of sub surface water. In order to overcome this problem, the use of naturally available organic fertilizers is recommended nowadays. There are many type of organic manures, blood, bones, farmyard manure, fish, garden refuse, horn shavings, leaves, malt dust, night soil, woolen rags and seaweeds. Of these, the most abundant and easily available source is seaweeds. Seaweeds can be used in many ways to increase soil fertility (Sylvia *et al.*, 2005). An adequate amount of potassium, nitrogen, growth promoting hormones, micronutrients, humic acids etc present in seaweeds make it an excellent fertilizer. Unlike chemical fertilizer, fertilizers derived from seaweeds (*Fucus*, *Laminaria*, *Ascophyllum*, *Sargassum* etc) are biodegradable, non-toxic, non-polluting and non-hazardous to human, animals and birds (Dhargalkar and Pereira, 2005). Seaweed extract can be good sources of nutrients for crop production. It works as an intrinsic factor affecting the production of plants. Thus, this treatment has grown in popularity and led to development and production of a large number of crops (Tawfeeqa *et al.*, 2016). The application of seaweed fertilizer can induce soil enzyme activity and microbial activity, thus promoting the improvement of soil quality (Wang *et al.*, 2018).

ANVESAK

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UGC Care Group 1 Journal

**IMPACT OF DIGITAL PAYMENTS IN MUDUKULATHUR, RAMANATHAPURAM DISTRICT****A. BENAIZIR LAILA KALEETH**, Ph.D Research Scholar (Part Time) of Commerce,  
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Thoothukudi**ABSTRACT**

Digitalization in India has become inevitable in recent times because most of the sectors are entirely digitalized. The Government of India aims to transform our country into a digitalized society, and it takes enormous steps to carry out technology into the nook and corner of the nation. It embraces the digitalized innovation and encourages all individuals, Corporate, etc to make their necessary payments online. Recently a drastic change in digitalization opens the wide way and has improved in virtual payment strategies and made all of the Payments digitally that indicates transparency in transactions done by an individual. The aim of this study is to find out the Impact of Digital Payments and also to find out the way a consumer handles payment through Digital mode especially in the Mudukulathur, Ramanathapuram District. The study focuses mainly on whether this Digital payment helps all sorts of People and its challenges of paying through Digital mode especially in Mudukulathur, Ramanathapuram District.

**Keywords:** Digitalized Society, Digital Revolution, Transformation, Transactions, UPI Application.

**INTRODUCTION**

In recent years technology advancement plays a vital role in all sectors and also creates a massive change in economic growth. Though the Indian economy depends on the rural economy in many aspects, recently this Digital revolution made a great impact, and therefore the need for Digital Payments in rural areas is extremely essential. Consumers' attitudes and technology continue to change day by day and there's a need for this indispensable evolution. Empowerment of Digital trends and also the transformation are deliberately required in the rural areas. Digital Payments are made through gadgets like mobile phones, desktops, laptops, and tablets, in some cases in the absence of these gadgets, even Payments made through internet centers and e – Seva Kendras. The Indian government and private sector companies such as Google pay, Amazon pay, Paytm, Phone pe, etc., had been persistently make individuals utilize the UPI application, Aadhar enabled payment system, Fintech apps etc. By this transfer of money is easier in rural areas and across the country, but it faces pragmatic difficulties. In the rural areas, most transactions are cash-oriented, and their livelihood is based on daily wages. Digital literacy is very low, despite on the other hand Digital trends also gradually growing in a way. Though the people are not completely ready to adopt digitalization, in certain sectors Digital Payments cannot be avoided as it is merged in all the day to day activities. Governments, financial service providers, and fintech companies need to create awareness to the rural people and make comprehend the need for digitalization through enlisted volunteers.

**DIGITAL PAYMENTS IN RURAL AREAS**

Digitalization is a big leap taken by the Indian government to make our society a cashless economy. It takes people to the next pace of the Digital world. The use of these Digital Payments in rural areas is the biggest challenge as there are many barriers to be faced when making Digital Payments. The Ministry of Rural development issued a Training module on Enabling Digital Payments in Rural India in December 2016 ensures that its objective is to promote less cash and cashless transactions. So internet infrastructure to be developed in the rural areas and take necessary steps to improve it to make it more effective. In ET statistics it was cited that only 20.26% of rural and 64.84% of the urban Indian population has direct access to the internet. (Rohit Kumar, CEO, and CMD, XPay.Life.). For the last few years to make a part of the Indian economy the rural economy was included in the digitalization the Government of India has been focusing on



## A STUDY ON CREDIT LINKED SUBSIDY SCHEME (CLSS) ON HOUSING IN THOOTHUKUDI

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### Abstract:

Home is “Where the Heart is”. Owing a home is a lifelong dream for most of the people. Home is more or less a lifetime investment and hence, home loans are an integral part of every person who dreams and want to have a living space of his own home is a watershed event in our life. It is very commonly know that the housing has very important role to be played in human life and hence it is kept it very first stage of Maslow’s theory of need hierarchy among basic needs. Housing has the history of existence in various kinds. Not only in human life but in very animals on earth since their existence.The most common purpose of home loans is to provide the funds a buyers needs to purchases a home. Home equity loans allow to a homeownerborrow against the difference between the home values and the current loan balance or equity. This paper attempts to explore the reasons and satisfaction level of customers for availing CLSS for their house. Primary Data were collected from 75 respondents in the area of Thoothukudi. Simple Random Technique was used by the researcher. Secondary data was collected from Magazines, Journals, and Books.

**Keywords :** CLSS, Housing for all, Home Loan, Interest rate, Subsidy

### INTRODUCTION

Earlier, the home loan sector in India was solely depend on nationalized on public sector bank, into the housing finance business marked the beginning of the first round interest rate cuts.The Credit Linked Subsidy Scheme (CLSS) is a benefit under the Pradhan Mantri Awas Yojana which focuses on helping the Middle Income Groups, Economically Weaker Sections, and Lower Income Groups in India by bringing down their housing loan EMIs by over Rs. 2,000 per month by offering an interest subsidy.The most common purpose of home loans is to provide the funds abuyers needs to purchases a home. Home equity loans allow to a homeownerborrows against the difference between the home values and the current loanbalance or equity.Earlier, the home loan sector in India was solely depend on nationalized onpublic sector bank, into the housing finance business marked the beginning of thefirst round interest rate cuts.

The Pradhan Mantri Awas Yojana (PMAY) has been introducedby Prime Minister, Narendra Modi on 1 st June 2015. PMAY scheme is an initiativeprovided by the Government of India which aims at providing affordable housingto the urban poor. The mission is to provide housing for all by the year 2022, bythat time Nation completes 75 years of its Independence. Under this scheme, affordable houses will be built in selectedcities and town with eco-friendly constructions methods for the benefits of theurban poor population in India. Also under the Credit Linked Subsidy Scheme,beneficiaries under PMAY are eligible for interest subsidy if they avail a loan topurchases or construct a house. The Credit Linked Subsidy aspect of the

A STUDY OF NEW CREDIT APPRAISAL TECHNIQUES TO ENHANCE PROFITABILITY OF BANKS

### A STUDY OF NEW CREDIT APPRAISAL TECHNIQUES TO ENHANCE PROFITABILITY OF BANKS

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#### ABSTRACT

The aim of any business sector is to make profits. No doubt, Banks represent the business eco system. In order to be a successful business, the entity should have adequate capital and consistent profits. Currently the banks are having a profit crunch. They need funds from government to enhance their Capital Base. For a decade or so, we have been witnessing the crumbling of long rooted banks because of bad loans or NPAs. The crisis at Laxmi Vilas Bank, the YES Bank fiasco and PMC fraud were all because of escalating bad loans. On the contrary, we also come across large value acquisitions based on the market cap. The Edutech Company Byju's acquiring tutorial chain Aakash Educational Services Ltd (AESL) in a deal estimated at \$950 million is a case in point. The process of sanctioning of loans by Banks involves a standard system of Five Cs, namely Capital, Capacity, Character, Conditions and Collateral. The collateral acts as a form of protection for the lender. Collateral comprises Tangible and Intangible collateral. To sum up, banks do not concentrate much on the valuation of business with respect to market capitalization of the company's shareholding. It is proposed in the study that banks can revisit their lending process and bring in the saleability criteria or the market value of the business, apart from 5Cs guidelines. Banks can bring in both time-tested and innovative ways to bring down NPAs. New credit appraisal methods and suggestions on dealing with credits are given in this paper to bring down NPAs. The basis of the study is secondary data.

**Keywords:** Credit Appraisal, loan, bank, risk and security

#### INTRODUCTION

Non-performing assets play a prominent role in denting the operations and viability of the banks. NPAs drain the bank's financial position and impact the nation's economy. This also affects the stock market and funds from foreign investors. In a recent interview, former RBI governor RaghuramRajan has said that non-performing assets of the banking sector are likely to witness unprecedented rise in the next six months and the sooner the problem is recognised the better it would be.

We also see many startups getting huge valuation and they monetise it by bringing on board new investors or selling it off to other companies. Can Banks monetise such valuations and thus improve their operations? Are there better ways of credit appraisal techniques before sanctioning loans? Prevention is always preferred to cure. Often, we find that the banks supported by law enforcement authorities chase the horse after it has bolted the stable.

#### OBJECTIVES

1. To analyse the present loan sanctioning process in Banks
2. To enhance banks' Profitability through New Credit Appraisal techniques which will lead to minimising NPAs
3. To suggest various other ways to review credits and by which NPAs can be controlled.

#### BANKS AND RBI GUIDELINES

Banks need funds from government to enhance their Capital Base. Capital Adequacy Ratio is used to measure the capital. This ratio gives the relationship between Risk Weighted Average Assets

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### GROWING TRENDS OF E-COMMERCE IN INDIA – BENEFITS AND CHALLENGES

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#### ABSTRACT

Our country, being a swift adaptor of technology, is a pace with the current scenario of electronic data exchanges (EDI) and showing incredible growth in the field of E-commerce. There is an emerging awareness among the business community in India about the opportunities offered by e-commerce. The COVID-19 pandemic has changed the way of buying nature of people tremendously. The recent situation of social distancing and restricted mobility of human beings have pushed the consumers to look forward e-commerce. Compact internet surfing charges, recent remarkable development in an online facility covering wider bandwidth, improved speeds, and reliability has made e-commerce accessible to a large pool of budding market consumers. People have switched from direct shopping in nearby stores, super markets, hyper markets and shopping malls to online portals for purchasing both goods and services. As most of our people prefer shopping through online rather than getting out of their houses, there is a raising curve in Indian e-commerce sector usage. This study explores the types of e-commerce models, recent market scenario of e-commerce, its opportunities and challenges and the current developments that are shaping the e-commerce industry.

**KEYWORDS:** e-commerce, trends, online shopping, internet, e-commerce models

#### INTRODUCTION

E-commerce is swiftly renovating the pace in which enterprises are networking each other as well as with Governments and customers. With the raising involvement of ICTs, the global business groups are quickly stepping towards B2B E-commerce. Owing to the transparency in the e-commerce market, consumers can compare and associate the services and goods of numerous e-commerce sites quickly and easily. From the suppliers' side, they do not want to have physical presence of shops. E-commerce has shifted the business style of India. The growth of Indian e-commerce is expected to increase to US\$200 billion by 2026 (Indian e-commerce report, 2021). Because of the growth of Internet usage and Smartphones penetration, most of the e-commerce business has been triggered tremendously.

#### TYPES OF E-COMMERCE BUSINESS MODELS

Various business models which are possible in e-commerce are

- Business to consumers (B2C): when an individual getting goods or services from online shopping websites. (Ex. Buying furniture from
- Business to Business (B2B): When one business group or organisation sell goods and services to another business group or organisation.
- Consumer to consumer (C2C): when a consumer sells goods or services to other consumer.
- Consumer to Business (C2B): when a consumer sells goods or services to another business.

## Information and attitudes of Women Doctors towards ICT and Digital Resources

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### Abstract

Using information and communication technology (ICT) means communicating, creating, distributing and managing data. There is no sector of society that does not benefit from the use of information and communication technology. Covid-19 epidemic necessitates the repurposing of ICT systems intended for other distributed purposes to retain social connections, deliver distributed services, and fulfil corporate needs. Next to the IT field, the paradigm shift takes place in the medical field. During the pandemic situation, the usage of ICT tremendously increased in all departments of the medical field. In this situation, the research analyses women doctors' attitudes towards ICT and digital resources for understanding their acceptance. The study's objective is to identify how women Doctors use ICT products and applications. To decide the familiarity of ICT products and applications among women Doctors. To find the frequency of using ICT based health knowledge by the women doctors. Research design and sites used a cross-sectional investigation strategy. Few medical women doctors in government hospitals and private hospitals in Tirunelveli city contributed. The sample size of the study was restricted to 62 in numbers. Secondary data was also used for further information. Descriptive analysis methods, partial correlation and ANOVA tests are used as analytical tools for this study.

**Keywords:** ICT, Digital Resources, Women Doctors, Online Healthcare Information, Pandemic

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## A Study on Job Satisfaction among Nurses in Thoothukudi District, Tamilnadu

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### ABSTRACT

Job satisfaction among the nurses play great role in any health care organisation to deliver a great quality of services for patients from different communities. On the other hand, the job satisfaction has direct impact on absenteeism, turnover rate and the quality of the performance. It is a normal phenomenon that every human performs well when they are satisfied in their job and that comes from rewards and benefits received from their organisation. In contrary, low job satisfaction leads to bad impact on their performance. Job satisfaction level affects not only the quality of the tasks done by the nurses but also affects the satisfaction of patients towards any health care organisation. Due to many reasons, job satisfaction among nurses turned to be inconsistent. The present study was designed and carried out to understand the reasons for their job satisfaction or dissatisfaction. The working condition and working environment being perceived by nurses in different ways and that leads to discrepancy in job satisfaction at various circumstances. Though this is an universal concern perception, nurses from both government hospitals and private hospitals of Thoothukudi District that served as the population for this study. In this study, the researcher used a snowball sampling method.

### Keywords

Nurses, job satisfaction, working condition, satisfaction level and hospital

### INTRODUCTION

Health care specialists play a significant role in improving quality health care for the people. The World Health Organisation Global strategy on human resources on health workforce 2030 sets out the policy agenda to make sure a workforce that is fit for purpose to attain targets of the sustainable Development goals (SDGs) [1]. The term job satisfaction refers to the attitude and the feelings of the people about their work and it is said to be associated with the employee's work environment and time pressure [2]. And it is defined as the level to which employees like their jobs [3]. Job satisfaction is one of the most vital factors that decides productivity and efficiency of human resources for health [4]. As main members of the health care team, job satisfaction of nurses takes an essential role in delivery of high quality health care [5]. They are the only health consultants accessible to many people in their life time and hence, addressing their satisfaction is a keyconcern [6]. The nursing career is also incompetent to attract adequate number of men and women due to salaries, shift hours and social insight of nurses [7]. Job satisfaction of nurses is a multidimensional phenomenon which was influenced by many variables [8]. Job satisfaction has often mentioned as the key reason for a high rate of absenteeism and turnover of nurses which pose a threat to a health care organization's capacity to provide quality care by encumbering their efficiency and effectiveness [9].

## A Study On Problems And Challenges Faced By Female College Students In Thoothukudi

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**Abstract:** Our India is a developing country moreover it is one of the largest democracies. Since the day of independence, our country has remarkable development in all fields. And this was all possible because of the increase in education. We can say that women's education is a major step toward success. Women's literacy rate is increasing day by day but still due to some reasons the growth is hampering. The main reason for this is a crime against women various crimes against women take place every day. Because of which women are not able to roam freely on the roads. Also gender discrimination and male superiority are still common. This is one of the main reasons for the reduced women literacy in the entire country. However, there are many steps that the government is taking to promote women's education. This paper attempts to ascertain the challenges faced by female students in higher education.

**Keywords:** women's education, Independence, literacy, growth, gender discrimination, male superiority

### 1. Introduction

In the Vedic period women had access to education in India, they had gradually lost this rights. However in the British period there was revival of interest in women's education in India. During this period various socio religious movements led by eminent persons like Raja Ram Mohan Roy, Iswar Chandra Vidyasagar emphasized on women's education in India.

Mahatma Jyotiba Phule, Periyar and Baba Saheb Ambedkar were leaders of the lower castes in India who took various initiatives to make education available to the Women of India. However Women's education got a fillip after the country got independence in 1947 and the government has taken various measures to provide education to all Indian women.

### 2. Objective Of The Study

1. To study the history of women education.
2. To analyze the problems of women education.

### Sampling Design

The total sample size came to 150 respondents.

### Source Of Data

The present study was based on the primary data collected from the respondents and Secondary data consists of different literature like books, articles, journals and websites.

### Statistical Tools

1. Percentage Method
2. Weighted Average Method

### 3. Result And Discussion

**Table 1** Demographic Profile Of The Respondents

|                | Demographic profile (150) | No of respondents | Percentage |
|----------------|---------------------------|-------------------|------------|
| Age            | 17- 20                    | 96                | 64         |
|                | 20-22                     | 42                | 28         |
|                | Above 22                  | 12                | 8          |
| Marital status | Married                   | 55                | 36         |

## Information and attitudes of Women Doctors towards ICT and Digital Resources

Rajeswari, A<sup>1</sup> Arockiasamy, K<sup>2</sup> Samundeswari, R<sup>3</sup> Sivankalai, S<sup>4\*</sup>

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### Abstract

Using information and communication technology (ICT) means communicating, creating, distributing and managing data. There is no sector of society that does not benefit from the use of information and communication technology. Covid-19 epidemic necessitates the repurposing of ICT systems intended for other distributed purposes to retain social connections, deliver distributed services, and fulfil corporate needs. Next to the IT field, the paradigm shift takes place in the medical field. During the pandemic situation, the usage of ICT tremendously increased in all departments of the medical field. In this situation, the research analyses women doctors' attitudes towards ICT and digital resources for understanding their acceptance. The study's objective is to identify how women Doctors use ICT products and applications. To decide the familiarity of ICT products and applications among women Doctors. To find the frequency of using ICT based health knowledge by the women doctors. Research design and sites used a cross-sectional investigation strategy. Few medical women doctors in government hospitals and private hospitals in Tirunelveli city contributed. The sample size of the study was restricted to 62 in numbers. Secondary data was also used for further information. Descriptive analysis methods, partial correlation and ANOVA tests are used as analytical tools for this study.

**Keywords:** ICT, Digital Resources, Women Doctors, Online Healthcare Information, Pandemic

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## Greensynthesis and Characterisation of Silver Nanoparticles Using *Phallusia nigra*

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### ABSTRACT

Biosynthetic technique is used for the production, characterization and application of silver nanoparticles (AgNPs), as reducing agent, which can be utilized in biomedical research and environmental cleaning applications. The reducing agents used to produce the nanoparticles were from the ethanolic extracts made from the simple ascidian *Phallusia nigra*. Prepared AgNP was observed by UV-Visible and IR spectroscopy. UV-Visible spectrum showed a peak as plasmon absorption in the range of 417 and 425 nm. AgNPs characterise their size and shape by Atom Force Microscopy (AFM). XRD pattern showed the characteristic Bragg peaks of (111), (200), (220) and (311) facets of the face center cubic (fcc). Antioxidants present in the ascidian reduce the Ag metal ions, for formation of silver nanoparticles and AgNPs presented in the ethanolic medium were quite stable, even up to 4 months of incubation. This work proved the capability of using biomaterial towards the synthesis of silver nanoparticle, by adopting the principles of green chemistry.

### Keywords

Green synthesis, *phallusia nigra*, AFM.

### INTRODUCTION

Marine sedentary organisms of ascidians belong to biofouling community. They are found in piers, pilings, harbour installations, materials used in aquaculture operations etc. *Phallusia nigra* is a simple ascidian belonging to the family Ascidiidae. Ascidians are consumed as food in many parts of the world and there are coastal aqua farms in Japan as well as Thailand for the culture of ascidians. *Microcosmus sulcatus*, *Styela plicata* and *Polycarpa pomaria* are taken as food in the Mediterranean.[1] *Halocynthia roretzi* in Japan, is even cultured in the North of Honsyu[2] for human consumption and *Pyura chilensis* is popular in South America[3] as a food source. Margalino and Destefano found that the flesh of *Microcosmus sulcatus* is almost as digestible as whole egg and the protein content higher.[4] Literature survey show that the animal possesses antipyretic[5], analgesic[6], anaesthetic[7] wound healing[8] and antimicrobial activities.[9-13] and Chemical investigation and antioxidant, antitumour effect to DLA, EAC cells using colonial ascidian has been done [14- 24]. The objective of this work is to investigate the silver nanoparticles in *Phallusia nigra*. In the present report, we report the synthesis and Characterization of silver nanoparticles of simple ascidian *Phallusia nigra* using for the first time. The morphology structure and stability of the synthesized silver nanoparticles were studied using scanning electron microscope (SEM and AFM studies).

### Materials and methods

#### Collection and identification

Green Gate area (8°48'N and 78°11'E) of Thoothukudi Port, Tamil Nadu, *Phallusia nigra* (Plate:1) was collected by SCUBA diving and identified using Key to identification of Indian ascidians.[26] A voucher specimen (AS 2083) was deposited in the Museum of the Department of Zoology, A.P.C. Mahalaxmi College for Women, Tuticorin 628002 Tamilnadu, India.

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## Biosynthesis and Characterisation of Magnesium Oxide Nanoparticles Using *Andrographis Panniculata*

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### ABSTRACT

*Andrographis panniculata* was effectively used for the synthesis of magnesium oxide nanoparticles as a natural ligation agent. We used an environmentally friendly biosynthetic methodology for the preparation of the magnesium oxide nanoparticles. Magnesium oxide nanoparticles were monitored by UV and IR studies. The XRD, SEM revealed the crystallinity and spherical morphology of the biosynthesized nanoparticles. EDAX studies reported the percentage of mgo in the sample. This result revealed that the crystalline spherical behaviour of magnesium oxide nanoparticles present in effective manner.

### Keywords

MgO,UV, IR, SEM

### INTRODUCTION

Green synthesis techniques make use of moderately pollutant free chemicals to synthesis Nanoparticles and embrace the use of benign solvents such as water, natural extracts[1]. Green chemistry seeks to reduce pollution at source. It is enhanced to prevent waste than to treat or clean up waste after it is formed. Though physical and chemical methods are trendier for nanoparticles synthesis, the biogenic fabrication is a better choice due to eco- friendliness[2]. MgO nanoparticles have found fabulous application in biomolecular detection, diagnostics, and microelectronics. Green synthesis of MgO nanoparticles were agreed out using Neem leaf extract for the eco- friendly development of novel technologies[3]. Recently, nanoparticles (NPs) have attracted a lot of attention because of their use in a variety of areas such as electronic, cosmetic, biomedical, energy, environmental, catalytic and material applications[4]. Though numerous chemical methods are available for metal nanoparticles synthesis, copious reactants and starting materials are used in these reactions that are toxic and potentially hazardous. Increasing environmental concerns over chemical synthesis routes have resulted in attempts to develop bio-mimetic approaches. One of them is the synthesis using *plant extracts*. *Environmentally benign nanoparticles synthesis procedures do not use any toxic chemicals* in the synthesis protocols. In these aspects synthetic methods based on naturally occurring biomaterials provide an alternative means for obtaining these nanoparticles. In the present investigation, green chemistry route for the synthesis of magnesium oxide nanoparticles using extract derived from *Andrographis panniculata*.

### MATERIALS AND METHODS

Present research is focused on the synthesis of the MgONPs. *Andrographis panniculata* were collected from Thoothukudi, Tamilnadu, India. Biosynthesis of MgONPs prepared by using Magnesium nitrate and *Andrographis panniculata* leaf extract as reducing agent.

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### ***In Vitro* Antioxidant Properties of NaringiCrenulata(Roxb.)Nicolson(Rutaceae)**

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#### **ABSTRACT**

The *invitro* antioxidant activity of petroleum ether, benzene, ethyl acetate, methanol and ethanol extracts of leaf and bark of *Naringicrenulata* have been tested using various antioxidant model systems *viz.*, DPPH, hydroxyl, superoxide, ABTS and reducing power. Methanol extract of *Naringicrenulata* is found to possess higher DPPH, hydroxyl radical scavenging activity, while ethanol extract is found to possess higher superoxide & ABTS radical cation scavenging activity. Methanol extract of leaf and bark of *Naringicrenulata* shows the highest reducing ability. The study indicates the significant free radical scavenging potential of *Naringicrenulata* leaf and bark extract which can be experimented for the treatment of various free radicals mediated ailments.

#### **Keywords:**

*Naringicrenulata*, Ethanol, DPPH, antioxidant.

#### **Introduction**

Oxygen is a highly reactive atom that is capable of becoming part of potentially damaging molecules commonly called "Free radicals". Free radicals are capable of attacking the healthy cells, causing them to lose their structure and function. Cell damage caused by free radicals appears to be a major contributor to aging and to degenerative diseases of aging such as cancer, cardiovascular disease, cataracts and immune system decline and brain dysfunction [1]. Radical formation is controlled naturally by various beneficial compounds known as "antioxidants". Free radicals are electrically charged molecules, *ie.*, they have an unpaired electron, which causes them to seek out and capture electrons from other substances in order to neutralize themselves. Although the initial attachment causes the free radical to become neutralized, another free radical forms in the process, causing a chain reaction to occur. And until subsequent free radicals are deactivated, thousands of free radical reactions can occur within records of the initial reaction. Antioxidants are capable of stabilizing or deactivating the radicals before they attack cells [2]. Vegetables and Fruits are sources of different antioxidants such as tocopherol, glutathione, ascorbic acid [3]. The present study aims to study the antioxidant activities of *Naringicrenulata* by using different models.

#### **MATERIALS & METHODS:**

##### **Plant sample extraction**

Leaf and bark of *N. crenulata* were cleaned, shade dried and pulverized to powder in a mechanical grinder. Required quantity of powder was weighed and transferred to Stoppered flask and treated with petroleum ether, benzene, ethyl acetate, methanol and ethanol separately until the powder is fully immersed. The flasks were shaken every hour for the first six hours and then it was kept aside and again shaken after 24 hours. This process was repeated for three days and then the extracts were filtered. The extracts were collected and evaporated to dryness by using vacuum distillation unit. The final extracts were thus obtained were used for *in vitro* antioxidant activity.

##### **DPPH radical scavenging activity**

The DPPH is a stable free radical and is widely used to assess the radical scavenging activity of antioxidant component. This method is based on the reduction of DPPH in methanol solution in



**CORROSION STUDIES OF CARBON STEEL USING INHIBITOR OF *CITRUS X SINENSIS* AND *PUNICA GRANATUM* PEEL EXTRACT IN PHOSPHORIC ACID MEDIUM**

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Dr. H. Kohila subathra christy<sup>4</sup>, Mrs. S. Kalaiarasi<sup>5</sup> Susai Rajendran

**Abstract:**

Among the available methods of preventing corrosion the use of inhibitors is one of the most effective methods due to the ease of application and cost effectiveness. A significant part of the cost can be minimized by using inhibitors. In industries inhibitors are used in many systems including cooling systems, refinery units, pipeline chemical operation, steam generations, oil and gas production units. The aims of this research are to discover the inhibition efficiency in different concentration of *citrus x sinensis* and *punica granatum* peel's extract. To determine the maximum peel's extract concentration as corrosion inhibitor of mild steel in phosphoric acid environment and immersing times.

**Keywords:** Corrosion, Weight loss method, Natural inhibitor.

**Introduction:**

Environmental issues and their solutions became a priority all over the world [1]. Corrosion of metals and alloys is an important and well-studied industrial problem which has found a fertile research field in green chemistry[2]. The corrosion inhibitors added in low concentration to the fluid and it was able to slow down the corrosion reactions[3]. Plant extracts are viewed as rich source of naturally synthesized chemical compounds that can be extracted by simple experiments with low cost [4]. The aims of this research are to discover the inhibition efficiency in different concentration of *Citrus x sinensis* and *Punica granatum* peel's extract. To determine the maximum peel's extract concentration as corrosion inhibitor of mild steel in phosphoric acid environment and immersing times.

**Materials and Methods****Sample Preparation:**

Rectangular samples of mild steel were mechanically press-cut into coupons, each of dimensions  $4 \times 2.5 \times 0.1$  cm was used for weight loss.

**Preparation of Plant Extracts:**

Peels of *Citrus x sinensis* and *Punica granatum* were washed under running water, shade dried, by reducing their moisture content and ground into powder. The powdered peels were extracted using 95 % ethanol. 5g each of powdered peels was soaked in 200 ml for 14 days and filtered. In order to leave these samples free of ethanol, the filtrate was subjected to evaporation. The evaporated filtrate was diluted with appropriate amount of 50 % of phosphoric acid to obtain inhibitors test solutions of 2.5, 5, 7.5 and 10 % v/v concentrations.

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## An Eco-approach synthesis of undoped and Mn doped ZnO nano-photocatalyst for prompt decoloration of methylene blue dye

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Degradation efficiency

## ABSTRACT

The present work reports the synthesis of nano pure ZnO and Mn-doped ZnO in an Eco-approach using seed extract of *Cassia angustifolia* for the removal of methylene blue. The aqueous Phyto-molecules helps in the reduction of metal precursor to nano-photocatalyst zinc oxide and the changes in absorbance was noted in UV-DRS for varying the parameters to get optimized. Different concentrated dopant material manganese sulphate (0.001 M, 0.003 M, and 0.005 M) was introduced on ZnO to enhance the optical absorption and to generate a new Fermi level. The XRD data exhibit the same wurtzite pattern for pure ZnO and Mn-doped ZnO samples. The slight shift in peak positions was noted in Mn-doped ZnO samples compared to pure ZnO without additional peaks determines the incorporation of Mn<sup>2+</sup> ions in the lattice of ZnO NPs. The peak appearance in FT-IR denotes the bond formation among functional groups and metal oxide. The structural morphology of ZnO and Mn-doped ZnO was observed in Field Emission Scanning Electron microscopy. The elemental composition of Mn in ZnO was predicted in the EDAX. The High-resolution transmission electron microscopy (HRTEM) denotes the reduced size and altered the crystallinity of ZnO when Mn was introduced as the dopant in the green route. The effective photocatalytic activity of nano ZnO, Mn-doped ZnO achieves 84 and 95% decoloration of water pollutant Methylene blue (MB) dye with H<sub>2</sub>O<sub>2</sub> and UV radiation by changing parameters like dye concentration, amount of catalyst, and pH. Results from this study suggest that the nano- Mn-doped ZnO photocatalyst can be advantageous for dye removal compared to pure ZnO. The green synthesized Mn-doped ZnO using *Cassia angustifolia* seed might considerable for treating dye contaminated water and supports in water remediation.

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## 1. Introduction

Recently, water pollution possesses a stern threat to the environment and human health [1]. The quality of water declines when toxic compounds like dyes from industrial waste get dissolve, deposit, and damages the ecosystem [2]. The water system having trace measure of dye effluents makes it incompetent for consuming and promote carcinogenic effect to humans [3]. Pollutant organic dye Methylene Blue (MB) is used as dyeing materials in the textile and printing industry tough to molder and its extreme points may root for numeral diseases by affecting digestive and respiratory systems [4]. The physical and biological water treat-

ment techniques like an electrochemical deposition, adsorption, the hazardous contaminants dye were shifted to colorless with post-treatment and huge sludges [5–8]. But in photocatalytic degradation, the dyes are renewed into harmless substances by generating hydroxyl radicals with light radiation and effective in high activity, reusable, less expensive [9].

Heterogeneous photocatalysts like ZnO act as forceful metal oxide, which can generate electrons and holes in the presence of light to perform excellent dye degradation depending on their bandgap [10,11]. ZnO semiconductor has a bandgap 3.3 eV considered for many usages and on doping Mn, ZnO properties were reformed by tuning size and bandgap [12,13]. Transition metal Manganese (Mn) was preferred as dopant due to the convenience of d electrons at t<sub>2g</sub> level can join the ZnO valance bond [14,15]. When the results of ZnO doped with Ag, Au, Pt, Pd noble metals

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**BIO FABRICATION AND CHARACTERISATION OF METAL OXIDE NANOCOMPOSITE USING PIPER BETEL LEAVES****B. Princess Evangelin\*, P.Gurulakshmi**

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\*Corresponding author: [princessbazil77@gmail.com](mailto:princessbazil77@gmail.com)**ABSTRACT**

In recent years nanotechnology is used as a wide platform for beginners on research works and it has various ranges of advantages over any other technology. Nano based materials are used in a variety of manufacturing processes, healthcare, paints, filters and lubricant additives. Green synthesis is one of the best and eco-friendly method for synthesizing nanomaterials. In this work, Copper/Titanium dioxide nanocomposite was successfully synthesised by using *Piper Betel* leaf extract. The *piper betel* leaves naturally contains the antioxidant and antimicrobial activities. The biosynthesized copper titanium dioxide nanocomposite was characterized using UV-Vis analysis, FTIR analysis, X-ray diffraction analysis (XRD), Scanning Electron Microscopy (SEM) analysis and EDAX analysis. The optical property of the nanocomposite was studied by using UV-Vis Spectroscopy. FTIR analysis shows the presence of functional groups in *piper betel* plant which is responsible for the reduction of metal/metal oxide nanocomposites. Using XRD analysis the crystallinity of the synthesized nanocomposite was determined. SEM image shows that the synthesized Cu/TiO<sub>2</sub> NCs were flake like shape. EDAX analysis shows presence of elemental composition of Cu, Ti and O.

**Keywords:** Nanocomposites, SEM, XRD, EDAX**1. INTRODUCTION**

In recent years nanotechnology gained utmost importance in industrial, pharmaceutical, environmental and health care applications due to their unique physical and chemical characteristics [1]. Titanium dioxide (TiO<sub>2</sub>) is one of the most important metal oxide semiconductors, which find applications in various fields of solar energy conversion, water purification, PEC splitting of water into Hydrogen and Oxygen, photocatalysis, ceramic material, filler, coating, pigment [2], cosmetics [3] etc. Reports of TiO<sub>2</sub> with different shapes such as nano-particles, thin films [4], nanorods, nanowires and nanotubes have spurred a great interest in studies on TiO<sub>2</sub> nanostructure synthesis and their applications. The doping of various metal ions like Ag, Ni, Co, Au, Cu, V, Ru, Fe, La, Pt, Cr, Ce, etc. in titanium dioxide have been found to be influencing the band gap, surface area, particle size, thermal property, etc.[5]. In this present work, the transition metal copper was doped with titanium dioxide to produce cu doped titanium dioxide nanocomposite.

Green synthesis has become one of the most preferred applications in various fields, including chemistry, because of its eco-friendly approach. With the application

of green synthesis to nanochemistry, another area of study had emerged that has gained increasing value: Green nano synthesis. Green nano synthesis allows for a nano material to be synthesized in a way that is friendly to both humans and to the environment [6].

The betel leaf when taken alone has several medicinal benefits. Apart from being a mild stimulant, betel leaf is used for various medicinal purposes. Betel leaves possess good diuretic properties. The betel leaves are also beneficial in treating nervous pains and debility. Betel leaf has been in use since ancient times for healing wounds. Also, recent studies have shown that the leaf contains components that have chemo-preventive and anti-cancer properties [7].

Green Synthesis of Copper-Titanium dioxide nanocomposite has considerable attention due to their electrical, catalytic properties. The Green syntheses of Titanium oxide nanoparticle using plants have already been reported. In this work, we report synthesis of Copper-Titanium dioxide nanocomposite using the extract of *Piper betel* leaves.

The Scope of the present work is to synthesize the Cu/TiO<sub>2</sub> nanocomposite using the extract of *Piper betel* leaves. The optical property, nature of metal oxide bond



தமிழ்மொழி மற்றும் இலக்கிய பன்னாட்டு ஆய்விதழ்  
அறிஞர்களால் பதிவு செய்த பெயர்க்கடிம் அளவாணித் தரணம் தி ஆய்விதழ்

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குறளடிப்படையில் மருத்துவச் சிந்தனைகள்

Medical Concepts as per Kural

ர.செல்வ லதா, உ.தனிப்பொசிரியர், தமிழ்த்துறை, ஏ.பி.சி.மகாலட்சுமி மகளிர் கல்லூரி, தூத்துக்குடி - 2.

### Abstract

*The Kurals of Thiruvalluvar has strong messages of medical concepts. The ample way of telling the procedures are surprising and truthful. Its medical methods are valuable and widely practices all over the world. So, the paper scrutinizes the medical ideas in it.*

**Keywords:** Kural, Medical Concept.

### முன்னுரை

தமிழ் இலக்கியத்தில் தனியிடம் பிடித்த நீதிநூல் திருக்குறள். இந்நூல் பற்றியும், ஆசிரியர் குறிப்பும் அறியாதவர்கள் அவனியில் இல்லை எனலாம். பொருட்பாலில் 6வது பகுதியில், அதிகாரம் 95ல் மருந்து என்ற தலைப்பில் 10குறள்கள் உள்ளன. 10ஆவது குறள் மூலம் மருத்துவச் சிந்தனைகளை வெளிப்படுத்துவது இக்கட்டுரையின் நோக்கமாகும்.

### குறள் கருத்து

இரண்டடியில் எண்ணில்லாத கருத்துக்களை உள்ளடக்கிய குறளை, திருவள்ளுவமொழி குறிப்பிடும்போது,

அணுவைத் துளைத்தேழ் கடலைப்புக்கடிக்  
குறுகத் தரித்த குறள் (திருவள்ளுவமொழி ப.2)

என்று சிறப்பிக்கிறது.

உற்றவன் தீப்பான் மருந்துஉழைச் செல்வானென்று  
அப்பால்நாற் கூற்றே மருந்து (குறள் 950)

உற்றவன் - நோயற்றவன், தீப்பான் - நோய்தரிக்கும் மருத்துவன், மருந்து - நோய்தரிக்கும் மருந்து. உழைச்செல்வான் - அருகிலிருந்து மருந்து கொடுப்பவன் என்று நான்கின் வகையே மருத்துவம் என்று குறள் பொருள் கொள்கிறது.

### நோயற்றவன்

மனிதன் பஞ்சபூதங்கள் எனப்படும், நிலம், நீர், நெருப்பு, காற்று, ஆகாயம் ஆகியவற்றின் தன்மையால் ஆனவன். பஞ்சபூதங்கள் அவ்வண்ணத்துச் சென்றால் ஒத்துவழித்தால் மட்டும் அவனால் வாழ முடியும். இல்லையெனில் இறப்புநிலை எய்துவான். மனிதனுடைய எலும்புமண்டலம், நரம்பு மண்டலம், இரத்த ஓட்ட மண்டலம், நசைமண்டலம், முச்சுமண்டலம் இவை ஏழுங்காகத் தம்பனியை செய்தால் மட்டும் மனிதன் உயிரோடு உடல்நலமாக வாழமுடியும். இந்த மண்டலங்களின் பணியில் ஏதேனும் சிறு இடையூறு ஏற்படின் உடல்நலம் பாதிக்கப்பட்டு நோயற்றவனாகிறான்.

மிகினும் குறையினும் நோய்செய்யும் நூலே  
வளிமுதலா எண்ணிய முன்று (குறள் 941)

வாதம், பித்தம், கபம் என்ற மூன்றும் மனித உடலில் இருக்க வேண்டிய அளவுக்கு அதிகமானாலும், குறைந்தாலும் நோய்கள் உண்டாகும் என்று மருத்துவக் கருத்து புலப்படுத்துகிறது. வளி என்ற ஆகாயத்திலிருந்து உயிர் வாழ்வதற்குத் தேவையான ஆற்றல் கிடைக்கின்றன. காற்று, வெப்பம், மழை இவற்றில் ஏற்படும் மாற்றங்கள் உடலைப் பாதித்து நோயை உருவாக்குகிறது.

நீராடிக் கால்கழவி வாய்ப்புசி மண்டலஞ்செய்யு

மகாலட்சுமி கல்லூரி மருத்துவக் கல்வித் துறை

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## INDIAN JOURNAL OF TAMIL



### கிறிஸ்தவ சமயக் கொள்கைகளின் தனித்தன்மை

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### The uniqueness in the Principles of Christianity

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**Abstract:** The Bible, the holy book of Christians, consists of two parts, the Old Testament and the New Testament. In the Old Testament, wrongdoers bled to get rid of it by sacrificing sheep, cattle and birds. They thought that their sins were being relieved by the bleeding. During the New Testament, Jesus came to human beings and taught people the order of life and the way to seek God by living with man. He made people realize their crimes. He bled himself to death to get rid of it. Salvation is the relief from sin by Jesus' blood. On the third day he rose alive and recorded his marvellous event in the history of the world. It is the belief of Christians in godliness that Jesus will come back to the world for the second time, judge people according to their actions and take those who live pure life according to their principles to heaven. The purpose of this study is to express these views.

**Keywords:** Bible, Christian literature, Jesus, Christians.

### முன்னுரை

கிறிஸ்தவர்களின் மறைநூலான வேதாகமம் தேவன் பேசிய வார்த்தை என்று கூறப்படுகிறது. கிறிஸ்தவர்களுக்கு முற்பட்ட காலநிகழ்வுகள் பழைய ஏற்பாடு என்றும், இயேசு கிறிஸ்துவின் பிறப்பு, வளர்ப்பு, போதனைகள், பாடுகள் மரித்து உயிர்த்தெழுந்த வரலாறு பற்றிய செய்திகள் அடங்கியது புதிய ஏற்பாடு என்றும் இரண்டு வகையாக அமைந்துள்ளது. கி.மு.100 ஆண்டுகளுக்கு முந்தையது என்பர். இதன் மையப் பொருள் கிறிஸ்துவின் மூலம் இரட்சிப்பு என்பதாகும். இதை வெளிப்படுத்துவதே இக்கட்டுரையின் நோக்கமாகும்.

### மறைநூல் விளக்கம்

“பிப்ளோஸ் என்ற கிரேக்கச் சொல்லிலிருந்து ஒலிபெயர்ப்புச் செய்யப்பட்ட சொல்லே விவிலியம் என்ற சொல் ஆகும். ஆங்கிலத்தில் இது ‘பைபிள்’ என்று குறிப்பிடப்படுகிறது. வேதாகமம் என்பது “கடவுள் மனிதனுக்குத் தம்மை எவ்வாறு வெளிப்படுத்தியிருக்கிறார் என்பதன் பதிவேடு” என்று கூறப்பட்டுள்ளது.

விவிலியம், பைபிள், வேதாகமம், திருமறை என்று பல பெயர்களில் இப்புனிதநூலை அழைத்தனர் (William Barclay, 1981).



## SUFFERINGS AND CHALLENGES OF MAYA IN ANITA DESAI'S *CRY, THE PEACOCK*: A FEMINISTIC VIEW

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### Abstract

*Anita Desai, a great analyst of the human mind, a creator of brilliant characters, and an astute interpreter of life, represents a gallery of vivid and realistic portraits. She concentrates on the predicament of modern women in the male-dominated society and her destruction at the state of marriage. According to her, most marriages prove to be unions of incompletely men who are apt to be rational and rigid with the women who are sentimental and emotional. Anita Desai's first novel Cry, the Peacock is about Maya's cries for love and understanding in her loveless marriage with Gautama. She wanted to live passionately like peacocks which tore at each other before making love.*

**Keywords:** marriage, relationship, domination, detachment, crisis

### Introduction

Anita Desai, one of the most appealing novelists on the Indo-English fiction, appeared on the Indian English Literary scene with the publication of her first novel *Cry, the Peacock* in 1963. Unlike many other Indian writers in English, Desai is not interested in merely narrating a story. She is more interested in her characters and themes and primarily her views. She is interested in the inner life of her characters. The themes of her novels are mostly related to the plight of women. These women characters react very strongly and sensitively to the forces of male dominated society. As Kohli points out, "No other writer is so much concerned with the life of young men and women in Indian cities as Anita Desai is" (62).

The novel *Cry, the Peacock* narrates the story of Maya's married life with Gautama. Maya, young, beautiful, intelligent and very sensitive as well as sensuous, fails to grow out of childhood, married to a reputed lawyer, nearly twice her age. She is incapable of leading an

independent existence. Her neurotic life is linked with her father's personal attention. She is filled with fear of death and so she cannot establish effective communication with her husband. She feels lonely and this isolation is total when she murders her husband in a fit of insane fury. The death motif is built into the structure of the story. R.S.Sharma feels, "The novel operates primarily on a symbolic level. But it has a vast Canvas of events, characters and relationships that add to the narrative appeal" (49).

Maya represents a class of women who silently suffer at the hands of men. Maya, as a wife, how far succeeded in capturing Gautama's mind, is debatable. There is a temperamental difference between Gautama and Maya, and a wide difference in age too. Her husband's indifference adds to her loneliness in the house. The nerve-racking experience of being ignored by Gautama and his family induces her to recoil to her childhood days.

There is a gap between the family status of Maya and Gautama. She comes from high class,



## IMPACT OF WORKING ENVIRONMENT ON JOB SATISFACTION OF EMPLOYEES

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### ABSTRACT

*The aim of this paper is to analyse the impact of working environment on job satisfaction of port trusts employees. A well-structured interview schedule was used to collect the primary data and proportionate random sampling method was used to select the respondents. The study found that there is a significant difference between the satisfaction of employees of V.O.C. and Chennai port trusts with regard to working environment.*

**KEYWORDS:** Working environment, Job satisfaction, Port trusts employees, Interview schedule.

### INTRODUCTION

A working environment is the environment where people work together for achieving organization objectives. It means systems, processes, structures and tools and all those things which interact with employees and affect in positive or negative ways on employee's performance. It can also be defined as the location where a task is completed. When studying place of employment, the work environment involves the physical geographical location as well as the immediate surroundings of the workplace such as a construction site or office building. It typically involves other factors relating to the place of employment such as the quality of the air, noise level and additional perks and benefits of employment. The term job satisfactions refer to the attitude and feelings people have about their work. Positive and favorable attitudes towards the job indicate job satisfaction. Negative and unfavorable attitudes towards the job indicate job dissatisfaction (Armstrong, 2006).

### STATEMENT OF THE PROBLEM

In order to increase efficiency, effectiveness, productivity and job commitment of employees, the business must satisfy the needs of its employees by providing good working conditions. Office

employees spend a lot of their time inside a building, where the physical environments influence their well-being and directly influence their work performance and productivity. In the workplace, it is often assumed that employees who are more satisfied with the physical environment are more likely to produce better work outcomes. Temperature, air quality, lighting and noise conditions in the office affect the work concentration and productivity. Numerous studies have consistently demonstrated that characteristics of the physical office environment can have a significant effect on behaviour, perceptions and productivity of employees. There were few studies done on the relationships between the physical office environment and employees' job satisfaction. Hence, this paper presents the impact of working environment on job satisfaction of port trusts employees.

### REVIEW OF LITERATURE

Ketharaj and Selvakumar (2009) in their research titled, "A Study on Job Satisfaction of Women Workers in Fireworks Industries in Tamil Nadu", analysed the perception of women workers relating to wages, working conditions, working environment, welfare facilities and so on in fireworks industry situated at Virdhunagar District in Tamil



## A Study on Consumer Satisfaction towards Sakthi Masala Products in Thoothukudi

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### ABSTRACT

There are number of suppliers in the market to supply the masala powders in desired quantity for a reasonable price. All the manufacturers of masala powder try to satisfy the needs of the consumers by supplying various types of masalas which are frequently used in preparing foodstuff items. The main objective of this study is to find out the consumer satisfaction level towards Sakthi Masala products in Thoothukudi. A well structured questionnaire was used to collect the primary data simple random sampling method was used to select the respondents and appropriate findings and suggestions are given in the paper.

**Keywords:** Consumers, Sakthi Masala, Thoothukudi, Satisfaction level.

### INTRODUCTION

"Masala" is the Hindi word for "Spice". When a combination of Masala, herbs and others condiments are ground together, it is additionally called "Masala". Masalas play a really critical part in Indian cooking. Masala trade may be an enormous trade from time immemorial. Masala from India and distant Eastern Asia were in demand from antiquated times. Indian Masalas are celebrated all over the world for their wealthy taste and unique enhance. India produces assortment of Masala all across the nation changing with the climatic conditions. India has been developing Masala for ages conjointly trading them to other nations around the world. Indian Masala include to the taste of nourishment, giving it a scrumptious enhance and making it completely yummy.

Sakthi Masala 'The Queen of spices' as the household name among the millions today, Mr. P.C. Duraisamy, was the Founder of the Company He found Sakthi Trading Company in 1975. It was doing Turmeric Trading for some time. Later, the company entered into the arena of pure spice powders like Turmeric, Chilli and Coriander. It was the concept selling on "Easy Cooking" rather than marketing food products. With self-determination and persistent attempts it was able to get into the kitchens of our country and the rest of the world. Sakthi Trading Company has transformed into Sakthi Masala Private Limited named after its brand name "SAKTHI" in 1997. Success of SAKTHI MASALA lies in the innovation of manufacturing procedures. Tradition and Technology perfectly blended' is the shibboleth of SAKTHI MASALA. Sakthi Masala is serving the society through Sakthi Devi Charitable trust, as extended arm Sakthi Masala.

### Statement of the Problem

Consumers play a vital role in every business growth. Because of the profits and sales of the business depend on consumers. So, each business must know about the consumers' needs and perception about satisfaction and try to satisfy them through correct actions. Once the consumers are satisfied with the product, they shall become the consumers of the product and act as an advertiser by telling about the products. Consumer satisfaction helps to retain the consumers and attract the new consumers. In the competition world, there are lot of masala products available in the market. So, it is difficult to survive in the market. Hence in this study, an attempt has been made to analyse the consumers satisfaction towards Sakthi Masala products in Thoothukudi.

### Objectives of the Study

1. To find out the demographic profile of the consumers of Sakthi Masala products in Thoothukudi.
2. To analyze the factors that influence the consumer to buy Sakthi Masala products in Thoothukudi.
3. To find out the consumer satisfaction level towards Sakthi Masala products in Thoothukudi.
4. To offer suggestions to improve the consumer satisfaction of Sakthi Masala products in Thoothukudi.



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### **An analysis on diverse Deep Learning Strategies for Automated Driving**

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#### **Abstract**

Self-driving cars are one of the hottest areas of research and business for the tech tyrant. What appeared similar to a science-fiction narrative, a few years ago, now give the impression more like something which is presently to turn out to be a part and parcel of life. So much so, that now, with the help of basic deep learning, neural network, we can build our own pipeline for autonomous driving. Deep learning is a subset of machine learning exemplar. Deep learning methods have also shown promise in applications to vehicle Automation. The main intent of this paper is to provide an review regarding the evaluation of various deep learning control techniques like convolutional neural networks (CNN) and their role in various applications. Also this paper includes the discussion regarding the technological challenges for deep learning based control of autonomous vehicles.

**Keywords:** autonomous vehicles; self-driving cars; deep learning; sensor ;Actuators; supervised Learning; Reinforcement Learning

#### **Introduction**

Increasing urbanization and hottest advances in autonomous technologies, transportation studies move ahead to more intelligent systems, called intelligent transportation systems (ITS). Artificial intelligence is to control systems with modest human interference. Combination of ITS and AI provides effective solutions for the 21st century transportation studies. The main goal of ITS is providing harmless, efficient and consistent transportation systems to participants. Some of the key research areas are optimal traffic signal control, automated vehicle control and traffic flow control. The future transportation systems are expected to include full dominion such as autonomous traffic organization and autonomous driving. However, semi-autonomous vehicles occupy the roads and the level of autonomy is likely to increase in near future. There are several reasons why authorities want autonomy in ITS such as time reduction for drivers, power saving for environment, and safety for all participants. When vehicles use up more times on traffic, fuel expenditure increases, which has environmental and economic impacts. Another reason why human intervention is tried to be minimized is the precipitate nature of human deeds. It is expected that autonomous driving will dwindle traffic accidents and increase the quality of transportation. Experience based learning can substitute human learning. Increasing population is the source of high volume of traffic, an example the annual congestion cost for a driver in the US was 97 hours and \$1,348 in 2018. [10]. Hence, controlling traffic lights with adaptive modules is a recent research focus in ITS. Designing an adaptive traffic management system through traffic signals is an effective solution for reducing the traffic congestion. The best approach for optimizing traffic lights is still an open question for researchers, but one promising approach for optimum TSC is to use learning-based AI techniques/ Deep learning is part of a wider family of machine learning methods based on artificial neural networks with learning process such as supervised, semi-supervised or unsupervised. Deep neural networks, deep belief networks, recurrent neural networks and convolutional neural networks are the types of deep learning architecture. These techniques were applied to various fields such as computer vision, machine vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation, bioinformatics, drug design, medical image analysis, material inspection and board game programs, where they have produced results comparable to and in some cases exceed human expert performance. Information processing and distributed communication nodes in biological systems were enthused by artificial neural networks. Deep learning refers to the use of numerous layers in the network. Early work demonstrate that a linear perceptron cannot be a universal classifier, and then that a network with a non polynomial activation

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## An Extensive Survey on Heart Disease Prediction

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### ABSTRACT

Prediction of occurrences of heart diseases an important work in medical field. A growing number of studies use various methods and datasets for heart disease prediction. Still, a substantial part of my research work lacks categorization and systematization. Hence, there is a necessity to take stock of current knowledge in this field. In this sense, this paper carries out a review of the literature on heart disease prediction. Analysis of a total of 150 papers addressing heart disease prediction using Data Mining (DM), Machine Learning (ML) and Deep Learning (DL) methods published between 2010 and 2020 was carried out. The purpose and the contribution of this paper is to provide a clearer picture of the subfields in heart disease prediction by concentrating on two aspects. First, a recent research to categorize the main areas of specialization in heart disease prediction is reviewed and the challenge in each category has been addressed. Second, the thematic analysis is carried out to identify a specific method under each category and a suitable method is also recommended. Despite the large number of publications, this present study identifies deep learning methods with unstructured dataset by providing better results. This study helps researchers for understanding the research gap for their future study in heart disease prediction.

### Keywords

Data mining, Machine learning, Deep Learning, Heart Disease

### INTRODUCTION

Globally, Cardiovascular Diseases (CVDs) has become the primary cause of death [43]. The people who die of CVDs are comparatively higher when compared to other diseases. As the corona virus disease 2019 (Covid-19) pandemic has spread around the globe, there has been growing CVDs recognition[46]. As per the report of the European Society of Cardiology (ESC), 26 million adults globally are diagnosed with Heart Failure, whereas every year 3.6 million are diagnosed newly. 17–45% of the patients suffering from HF die within the first year and the remaining die within 5 years. When a proper technique is chosen at a correct time, the morbidity rate can be decreased.

The result produced by ML techniques will be more accurate as compared to DM since ML is an automated process. DM method uses a database or a data warehouse server with a data mining engine. Useful information were extracted using the pattern evaluation techniques. Whereas ML uses neural networks, predictive model and automated algorithms to make the decisions.

ML techniques produce more accurate result when compared to DM techniques [47]. It is because DM method can't work without the involvement of human. ML algorithms always require structured data, while DL networks rely on layers.

The intention of this survey paper is make the researcher to do research on heart diseases prediction using DM or ML or DL approach. This paper presents an extensive survey on approaches for heart disease prediction between 2010 and 2020.