



TEACHING THE ESSENTIALS OF SCIENCE INVESTIGATORY PROJECT USING THE IMRAD FORMAT (Part 1)

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## **NET LINGUA** Fun with Acronyms



# Age? Sex? Location?



## Laughing Out Loud



### Talk To You Later



# As Far As I Know

### IMRAD

Introduction Method Result and Discussion

What did you find?

How did you do it?

Why did you do this study?

What does it all mean?

### RESULT

### METHOD

### INTRODUCTION

### DISCUSSION

#### Why IMRAD?



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#### **Antibacterial Activity of Some Plant Extracts**

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#### Abstract

Ten aqueous and one ethanolic extracts from medicinal plants used in Turkey were evaluated for antimicrobial activity. Plant extracts were prepared using distilled water and 50 % ethanol. It was found that three plant extracts from the 9 plants studied had antibacterial activity. These activities were produced by the aqueous extracts of *Pistacia, Tilia argentea* and *Anthemis pungens*. All of these plant extracts had antibacterial activity against *E.coli*. Also, *Tilia argentea* and *Pistacia spp* inhibited the growth of *Bacillus subtilis*. In addition to these bacteria, *Klebsiella pneumoniae, Staphylococcus aureus* and environmental *Aeromonas spp*. strains were inhibited by *Tilia argentea*.

Keywords: Plant extracts, antibiotics, antibioterial activity, agar well- diffusion. \*Corresponding author: Zuhal Zeybek (E- mail: zzeybek@yahoo.com) Abbreviations: AE, aqueous extract; DMSO, dimethyl sulfoxide; EE, ethanolic extract; EMEM, Eagle's minimum essential medium; PBS, phosphate buffer saline; MTT, 3-4,5dimethylthiazol-2-(yl-2,5-diphenyl tetrazolium bromide; h, hour.



traditional medicines are still part of the habitual treatment of various maladies. It has been reported that 115 articles were published

been shown in Table 1. *Tilia argentea* and Anthemis pungens were classified reference youchers and deposited at the Herbarium of the

#### For publications

reported the antibacterial effect of lichen extracts against *Legionella pneumophila* strains (Zeybek et al. 2006). The present study describes the evaluation of the antibacterial potency of some plant species from Turkey.

#### **Material and Methods**

Collection and identification of plant samples

Plant specimens were collected from Istanbul University Botanical Garden and

Two separate samples of the plant material (10 g of each) were air-dried and powdered and were extracted with distilled water (80 mL) and 50% ethanol (75 mL) at room temperature using a waring blender. Plant residues were removed by centrifugation (15000 rpm, 30 min, 4°C) and the supernatant was filtered and evaporated to dryness under reduced pressure and/or lyophilized. In this way, two different crude extracts were obtained: aqueous extract (AE), 50% ethanolic extract (EE). AE was dissolved in the medium Phosphate buffer

#### **TRADITIONAL FORMAT**

CHAPTER 1

INTRODUCTION

#### Background of the Study

Diabetes mellitus is one of the 21st century's most challenging health problems. It is defined as a complex heterogeneous disease brought about by the interaction of genetic and environmental factors. It is a disorder in which the body does not produce or properly use insulin. Insulin is a hormone that is needed to convert sugar, starches and other food into energy needed for daily life. This is the reason why diabetics need an insulin injection if the disease is already severe.

Diabetes mellitus is also associated with long-term complications, including retinopathy, nephropathy, neuropathy and angiopathy and several others (Kristova et al., 2008). As stated by Fernando-Lopez (2008), seventy five (75) percent of persons with diabetes die because of cardiovascular disease. Diabetes more than doubles the risk of heart attack and stroke. It is the

leading cause of non-traumatic amputation done in the hospitals.

### LET'S VOLT IN! What goes into each section of the IMRAD?

1. Which of the following is **NOT** included in the Introduction?

- A. Background of the study
- B. Review of Related Literature
- C. Significant of the Study
- D None of the Above

#### What goes into each section of the IMRAD?

2. Among the four components of the background of the study, which is considered as the most important?

- A Research gap
- B.Current state of the field
- C.Conventional practices in addressing the issue
- D.Contribution of the present study addressing the research gap

3. What is the effect of the different amount of chicken manure on the growth of Mung beans?, is an example of \_\_\_\_\_.

A. General Objective
B. Specific Objective
C. Null Hypothesis
D. Alternative Hypothesis

4. In an experiment in which blood pressure medication is tested, one group is given the blood pressure medication while the other group is given a placebo (dummy) pill. Which one is the control group?

A.The group which receives the medication B.The group which receives the placebo pill. C.Neither of the group is the control group. D.Both groups are considered as control groups.

#### What goes into each section of the IMRAD?

5. Which of the following is TRUE in writing the methodology of the research plan?

- A. The procedure shall be written in past tense.
- B. Standard procedures need to be described in detail.
- C. The materials and equipment do not need to be specified.
- D Passive voice is preferred in describing the procedure of the study.

# SCORE REVEAL!

# **BACKGROUND CHECK!** Writing the Introduction

#### **Improvised Plastic Waste Recycling Machine**

One of the major sources of garbage is the non-biodegradable or petroleum-based plastics. Plastics have been blamed for clogging up drainage systems, causing soil and food chain contamination when polyethylene, the main component of plastic, breaks down and releases toxic substances that leach into the soil and for killing marine and land animals that mistakenly ingest plastics or become entangled in plastic bags (Rassas, 2007). In Manila alone, it generates 8,000 tons of plastic wastes every year (Salvito, 2011). Although the sanitary engineers collect them along with other refuse, they do not decompose or it would take hundreds of years for them to decompose. Others find way to lessen the proliferation of plastic and other garbage through incineration. However, burning of non-biodegradable plastics can cause serious health problems, air pollution and even destroys the ozone layer. This scenario motivated the researcher to recycle the non-biodegradable petroleum-based plastics into useful products such as wall decors by inventing an Improvised Plastic Waste **Recycling Machine.** 

The main objective of this study is to design, construct and evaluate the Improvised Plastic Waste Recycling Machine. In specific, this study aims to determine the efficiency of the machine in terms of the number of decoratives produced for every kilogram of plastic wastes; the number of decorative produced for every hour of operation & its percent yield in the production of decorative materials.

This study could be beneficial to the community as it provides a source of livelihood to the residents by recycling the wastes into useful and marketable products. This study could help reduce the proliferations of plastic wastes in the environment.

- What is the current problem?
- What are some initiatives undertaken to solve/address the problem?
- What is/are the weakness/es of the solutions done before?
- What is unique about the solution that I am going to provide through this study?
- What is the aim of your study?
- What is the significance of my study?

1. What is the current problem?
- Existence
- Seriousness
- Widespread
- Support with Pertinent Data
2. What has been done so far to solve the problem?
3. What is/are the weakness/es of the solutions done before?
- research gap
4. What is unique about the solution that I am going to provide through this study?

Helpful

Tips

- introduce and describe your study
- 5. What is the aim of your study?
  - state the objectives of your study
- 6. What is the significance of my study?
  - state the benefits of your study

# **GENERAL OR SPECIFIC?** Writing the Research Objective

### **General or Specific?**

1. To determine the effect of chicken manure on the growth of Mung beans. Genera

2. To determine the zone of inhibition of *Staphylococcus aureus* treated with different concentrations of Tanglad leaves extract.





#### Tips in Writing the Research Objective

#### Effect of Chicken Manure on the Growth of Mung Beans

- For general objective: rephrase the title
- The main objective of the study is (infinitive verb) and copy the title

The main objective of the study is to determine the effect of chicken manure on the growth of mung beans.

- For specific objective: identify the IV and DV
- incorporate the variables in the statement

IV - amount of chicken manure;DV - height and number of leaves of mung beans

Specifically, this study aims to determine the effect of the different amount of chicken manure on the height and number of leaves of mung beans.

The main objective of the study is to determine the effect of chicken manure on the growth of mung beans. Specifically, this study aims to determine the effect of the different amount of chicken manure on the height and number of leaves of mung beans.





Answers the questions:

• What are you going to use?

#### **MATERIALS AND EQUIPMENT**

• How are you going to conduct it?

PROCEDURE

#### Components of Methodology





### •The methodology is not enumerated in "recipe" type but rather in paragraph form

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**Materials and Equipment** 

Α

¼ kg Madre de cacao leaves 1 mortar and pestle1 graduated cylinder1 Beam balance2 plastic sprays30 termites1 Tripod1 wire gauzeTimer1 Alcohol lamp3 plates/dishes1 beakerkatsa

Materials and Equipment

This study required the use of the following materials and equipment: /4 kg Madre de cacao leaves, 1 mortar and prode, 1 graduated cylinder, 1 Beam balance 2 roustic sprays, 30 termites, 1 Tripod, 1 wire proce, Timer, 1 Alcohol lamp, 3 plates/dishes, 1 braker and cheese cloth.

 Passive voice is used rather than active voice when describing the procedure.

Active voice

Passive

B

The researcher randomly selected 100 munggo beans from each group and placed them on a filter paper.

One hundred mungo (100) bean seeds were randomly selected by the researcher from each group and were placed on a filter paper.

 Standard procedures need not be described in great detail. However, modifications, improvements or novel methods done are presented in detail so that your experiment can easily be duplicated if necessary

Example:

The Rag Doll method was adopted from the study of Douglas (2015).

The Rag Doll method was adapted from the study of Douglas (2015) with some modifications.



- In research plan, the methodology is written in future tense
- In research report, it is written in past tense

Example:

The leaves will be collected..... (research plan) The leaves were collected..... (research report)

- The group that is used as a standard and does not receive the experimental treatment
- Positive Control (+ result is expected)
- Negative Control (no result is expected
- Untreated Control



 The group that is being tested and receives the experiment al treatment

#### Tips in Writing the Procedure

Research Design					Variables			
						Independent	Dependent	Controlled
		Sampling				Variable	Variable	Variable
		Treatment	Treatment	Treatment	Positive	different	height and	amount of
Set-up		A	В	С	Control	amount of	number of	soil
Experimental Group	Control Group	5	15	9	17	chicken	leaves of	type of soil
(10g chicken manure)	PC (20g commercial fertilizer)	10	1	20	4	manure	pechay	amount of
(20g chicken manure)		14	11	7	13			water
(30g chicken manure)		3	19	16	8			amount of
		18	6	2	12			sunlight
			v	-				variety of

pechay

#### Materials and Equipment

 Includes the materials and equipment used with exact technical specifications and quantities, and their source.

The leaves of lemongrass were collected from May's Organic Garden while the coconut meat was obtained from the local public market. The commercial fungicide (Domark Pro) was bought from DC Cruz Trading while the four bars of gulaman were purchased at the local grocery store. Other materials and equipment such as 21 Petri dishes, three graduated cylinders, 21 test tubes, 1kg agar, 1L dextrose, 1L ethyl alcohol (70% analytical grade) and 1 analytical balance were provided by the Sugar Regulatory Administration Soils Laboratory. A sack of sugarcane (56226-86550 variety) infected by smut disease was collected from SRA La Granja Sugarcane Plantation, La Carlota City.

# GO WITH THE FLOW!

### Making the Flowchart of the Procedure

### Instruction: Arrange the steps in determining the effect of Madre de Cacao leaf decoction on the mortality of termites.



Tips in Writing the Procedure

#### **Procedure**

#### Include the following:

- All processes done during actual experimentation
   Plants or animals involved, with exact descriptions (genus, species, strain, etc.)
- Management of sample plants/or animals; include ethical considerations especially in dealing with animals
- Manner of data collection
- Proper disposal after experimentation

### **Statistical Analysis Tool**

 Includes statistical and mathematical procedures used to analyze and summarize the data.

Objective	Statistical Tool
Descriptive objective	Mean and Standard Deviation
Comparative objective	t-test; One-way ANOVA
Relational	Pearson moment of correlation

#### Objective

**Statistical Tool** 

1. What is the effect of different amount of Mean and Standard Deviation chicken manure as bio-fertilizer on the height and number of leaves of mung beans?

2. Is there a significant difference among the One-way ANOVA different amount of chicken manure as bio-fertilizer on the height and number of leaves of mung beans?

3. Is there a significant relationship between Pearson moment of correlation the height and number of leaves of mung beans?

## "You don't have to be great to start, but you have to start to be great."

# End of Presentation

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