THE LOWERING EFFECT OF POWDERED *Musa acuminata* (BANANA) PEELS ON THE CONCENTRATION OF LEAD CONTAMINATED WATER

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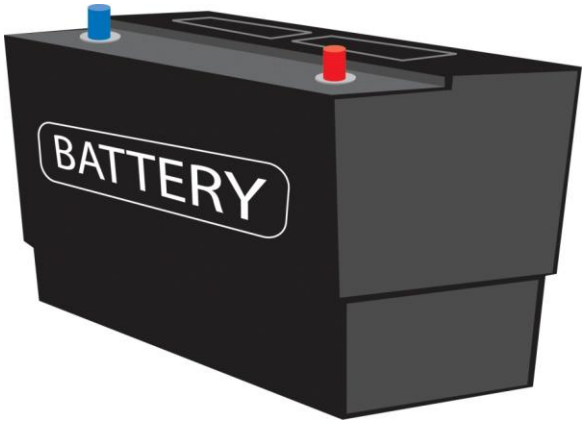
PRIMUM HOMO ESTO
1973
PHILIPPINES

PROJECT DESCRIPTION

WHO: 884 million people worldwide> No access to Safe drinking water

UNICEF (2012):

Philippines: approximately 17M have no access to safe drinking water; over 15% from rural communities



WHO:

- **In Metro Manila, Lead (Pb) pollution is associated to lead acid battery recycling or repair activities.**

(Riddell et. al - WHO)

PROJECT DESCRIPTION

In Cebu:

- **Mining started in 1953.**
- **A study done by Mendoza et al. suggest that significant amounts of Lead are found in air particles, soil, human milk and water in Metro Cebu.**

(Blacksmith Institute)

- **CDC and WHO > maximum allowable limit for total lead in drinking water is 0.01 mg/dl and that a blood level of 0.1 mg/L or above- lead poisoning.**

PROJECT DESCRIPTION

BANANA

- **Banana Peels have been used for absorption and filtration of Heavy metal contaminated water in countries like Brazil, Taiwan and Thailand (Castro et. al, Thirumavalavan and Kaewsarn, respectively)**

The following will benefit:

1. **People residing in the urban poor and neglected areas**
2. **General Public**
3. **People who work in health sectors**
4. **Researchers and future researches**

OBJECTIVES

General Objective:

- To determine the lowering effect of powdered *Musa acuminata* (banana) peels on the concentration of lead contaminated water.

Specific Objectives:

Specifically, this study determined the following:

1. The mean baseline lead concentration among the samples in the negative control group and experimental group **before treatment**.

OBJECTIVES

Specific Objectives:

2. The mean lead concentration among the samples in the negative control and experimental group after treatment.
   - After 1 hour
   - After 2 hours
3. The mean change in the lead concentrations in the negative control and experimental group after treatment.
4. The significant difference in the mean lead concentration between the experimental and the negative control group.

METHODOLOGY

Research Design

One factorial controlled trial design

Research Locale

1. Cebu Doctors' University College of Medicine Research Laboratory, North Reclamation Area, Mandaue City, Cebu
2. F.A.S.T. (the First Analytical Services and Technical Cooperative), M.C. Briones Highway (Highway Seno) Mandaue City, Cebu.

Research Samples

- Distilled Water

Research Instruments

- Perkin Elmer AAnalyst 400 AAS
- Data sheets

METHODOLOGY

A. Preliminary Preparation

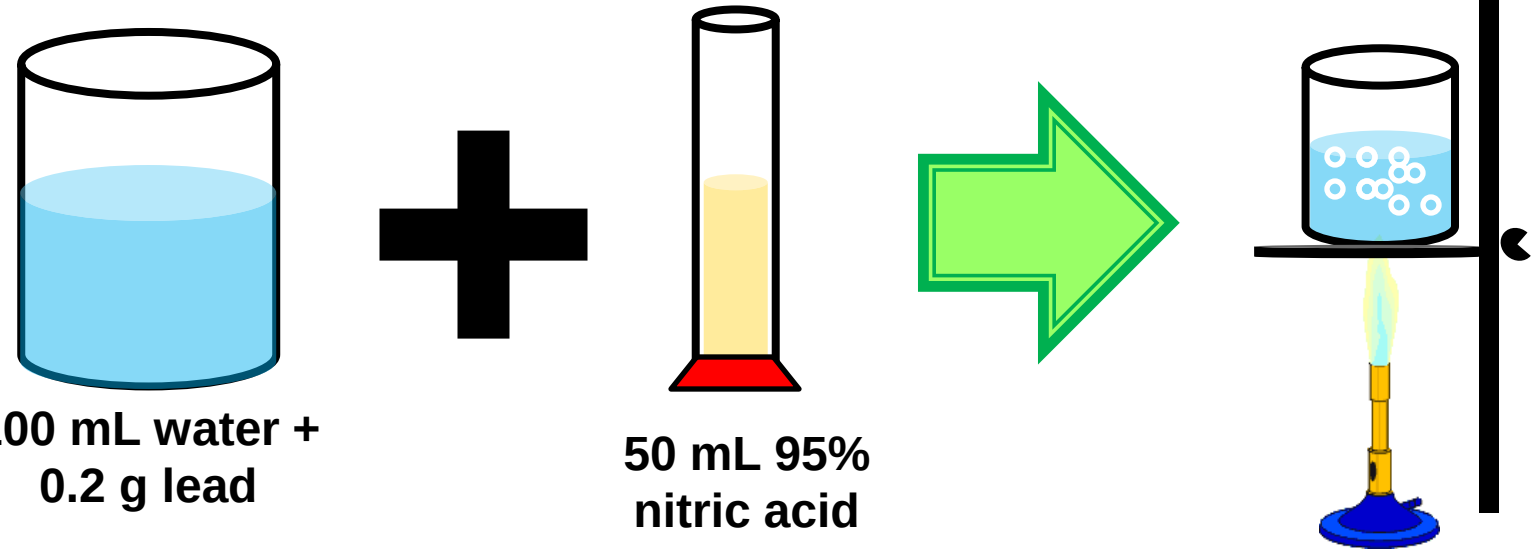
Transmittal Letters to:

- dean
- level coordinator
- DENR
- Maritrans recycler

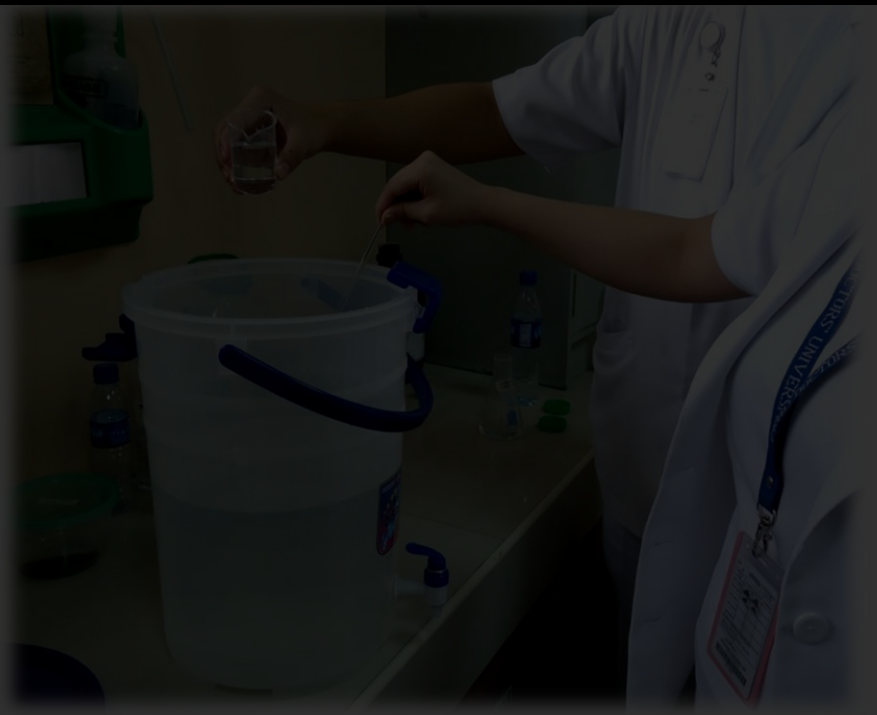
B. Preparation of Musa acuminata (Banana) Powder

Bananas → Department of Agriculture → washed and peeled → sliced to ~ 1X1 inch → sun dried (2 days) → ground using a coffee grinder

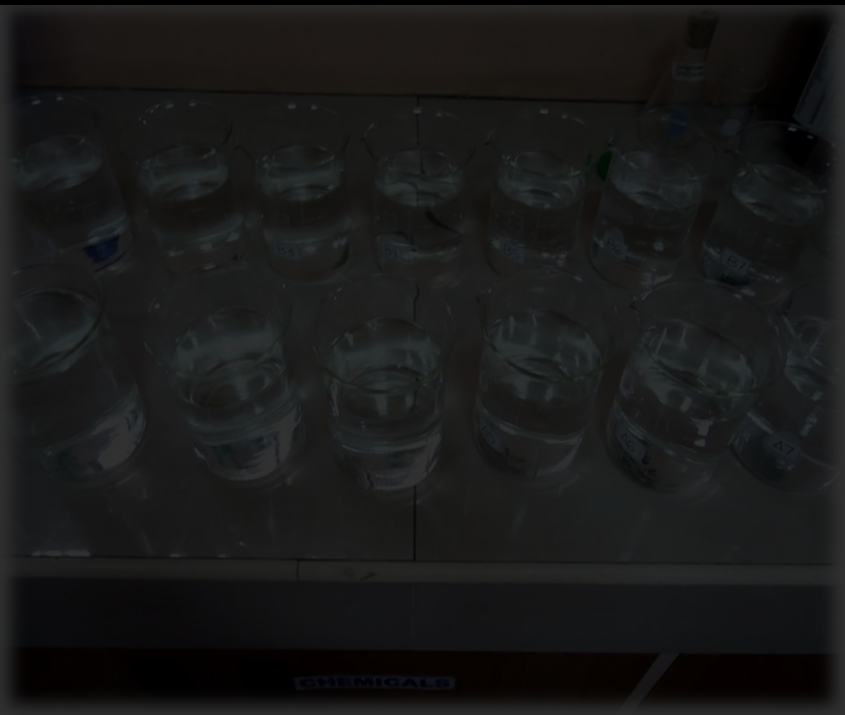
METHODOLOGY: Preparation of Lead Concentrate



METHODOLOGY: Preparation of Water container



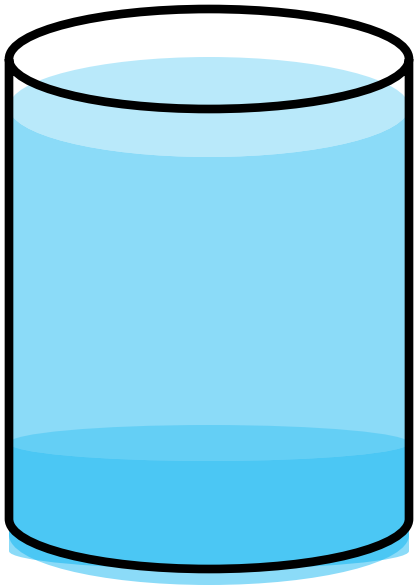
9L Distilled water

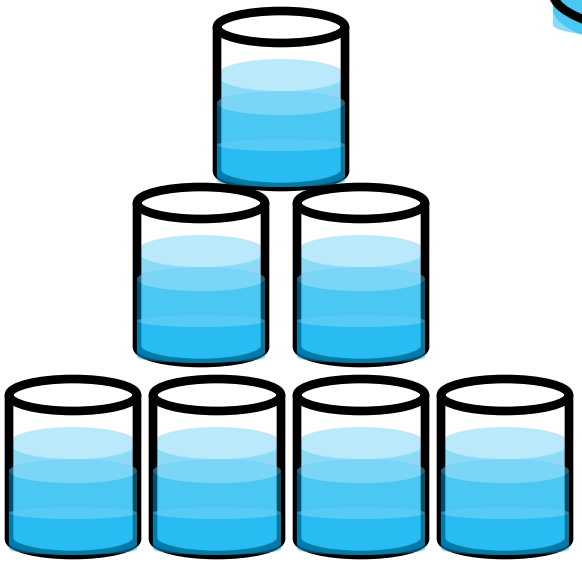


14 Beakers (600ml)

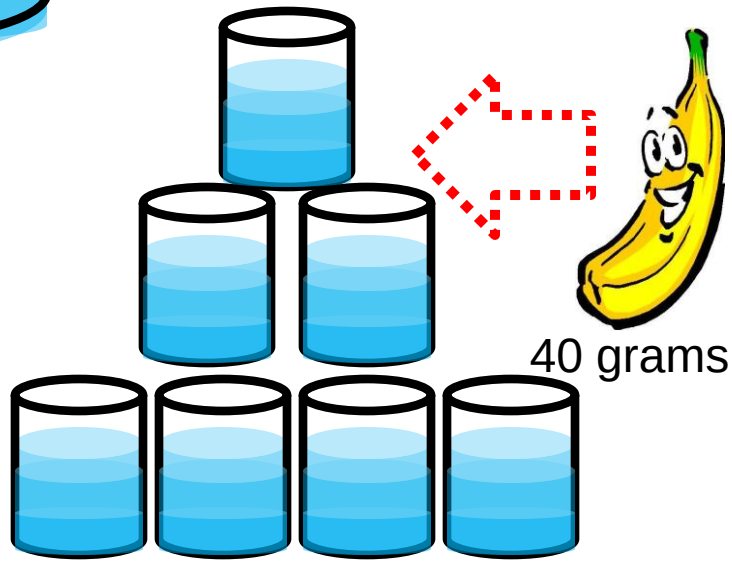
ACTUAL DATA GATHERING

9L water + 90 mL lead concentrate (100:1)





NEGATIVE CONTROL

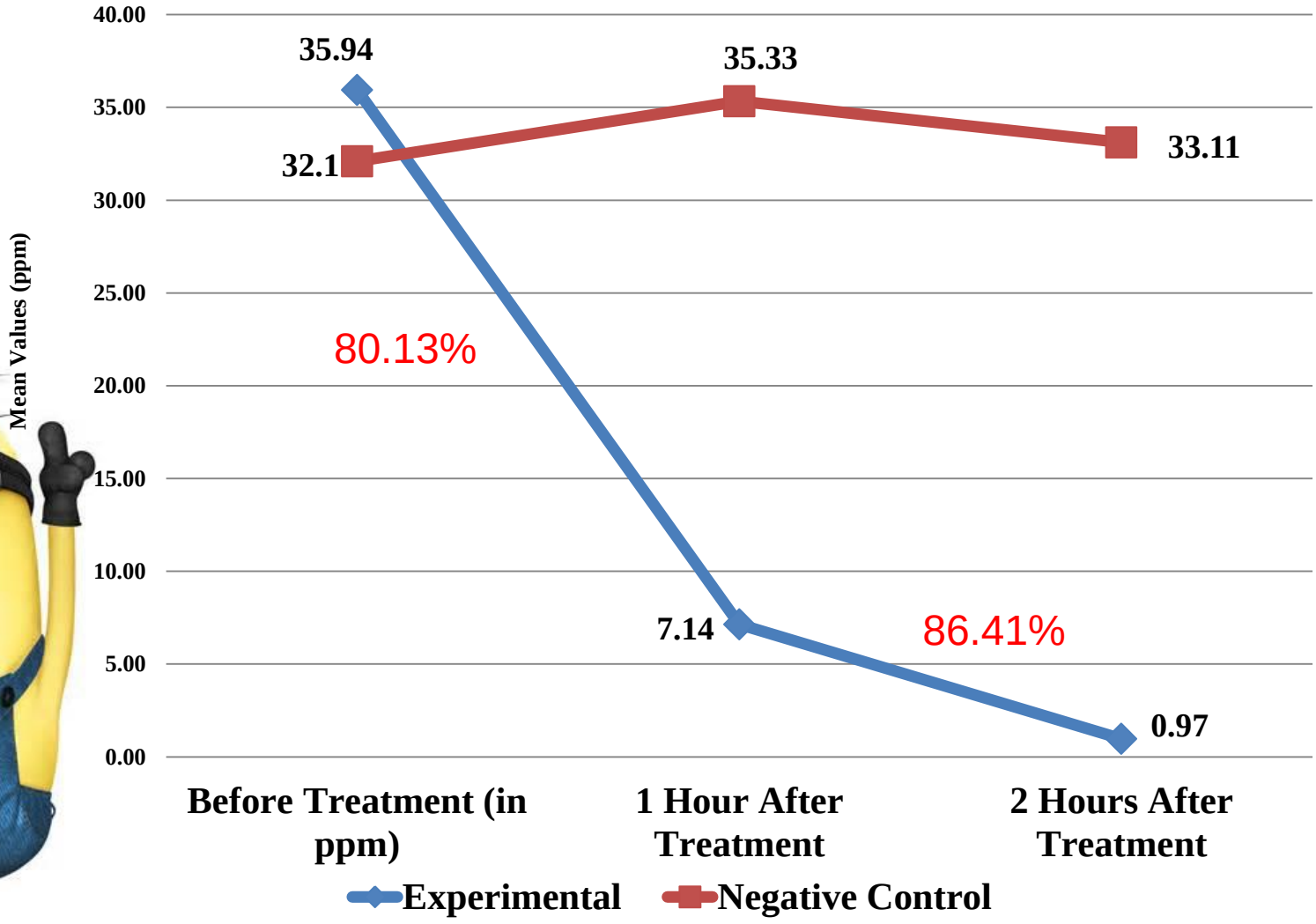


40 grams

EXPERIMENTAL

RESULTS

Figure 1. Mean Lead Concentrations of the Negative Control Group and Experimental Group Before and After Treatment



RESULTS

Table 1. Mean Change in the Lead Concentration in the Negative Control and Experimental Group After Treatment

	Paired t-test	p-value	Decision on Ho
Experimental Group (Baseline – 1 Hour)	21.51	0.000	Reject Ho (significant change)
(Baseline – 2 Hours)	52.23	0.000	Reject Ho (significant change)
Negative Control Group (Baseline – 1 Hour)	1.858	0.112	Accept Ho (change not significant)
(Baseline – 2 Hours)	0.848	0.429	Accept Ho (change not significant)

RESULTS

Table 2. Computed t-value and p-value Between the Experimental Group and Negative Control Group

Comparisons	Mean difference	Independent t-test	p-value	Decision on Ho
At baseline experiment vs. negative	3.843	3.597	0.004	Reject Ho – there is a significant lowering effect
At 1 hour after intervention experiment vs. negative	28.19	-15.311	0.000	Reject Ho - there is a significant lowering effect
At 2 hours after intervention experiment vs. negative	32.14	-14.882	0.000	Reject Ho – there is a significant lowering effect

CONCLUSION

Therefore, powdered dried banana (*Musa acuminata*) peel has a significant lowering Effect on lead contaminated water.

RECOMMENDATIONS

1. **Government agencies could help disseminate information and mass produce the product to become accessible to the community especially in high risk areas.**

3. **Promote its use as a more affordable and practical alternative in safer disposal of lead containing water wastes from factories and the like.**

4. **Recommendations for improvement of future researches.**

END.

THANK YOU!

ATOMIC ABSORPTION SPECTROPHOTOMETER