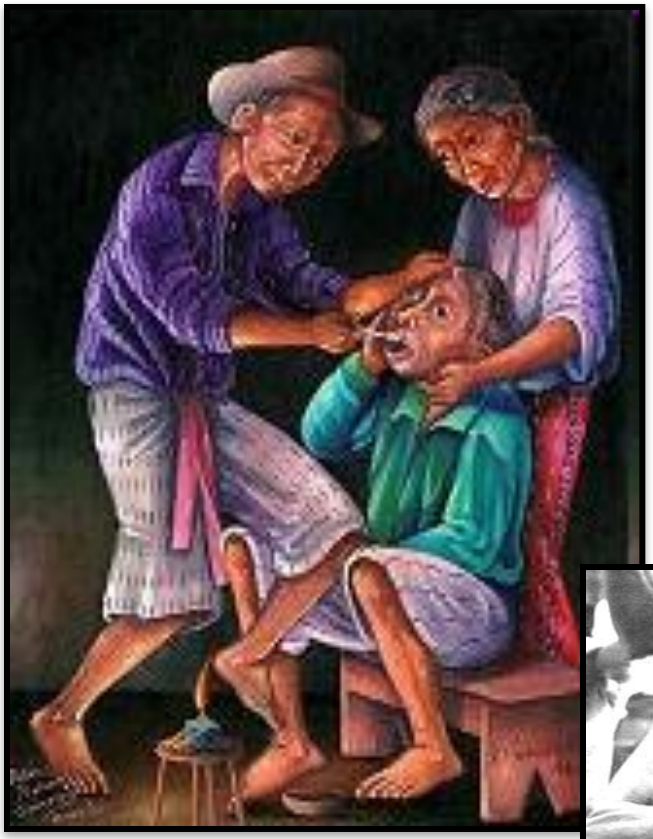


THE PHYTOCHEMICAL AND ANTIMICROBIAL SCREENINGS OF THE FIVE SELECTED MEDICINAL PLANTS USED AS FOLKLORIC MEDICINES BY SOME MINDANAOAN LUMADS

Chrismy Shane M. Daquiado, Irene-Vie G. Itable, Judee Nogodula, MSc

Rogelio L. Rivera Jr.

OBJECTIVES

1.) What are the **active constituents** present in each of the 5 selected medicinal plants?

2.) What is the **level of antimicrobial activity** of the 5 selected medicinal plants?

3.) What is the **Minimum Inhibitory Concentration** of the 5 selected medicinal plant leaf extracts?

4.) Is there a **significant difference among the mean zones of inhibition** of the five selected medicinal plant leaf extract against four organisms?

SIGNIFICANCE

- **Mindanaoan Lumads**
  - their healing process will be documented and can still be transferred from generation to generation for future use.

SIGNIFICANCE

- **Community**
  - awareness of the importance of these medicinal plants and can be used as their ***alternative medicine*** for their different illnesses and diseases.
  - People can now ***save both money and time*** especially those who can not afford to buy expensive drugs in the market.

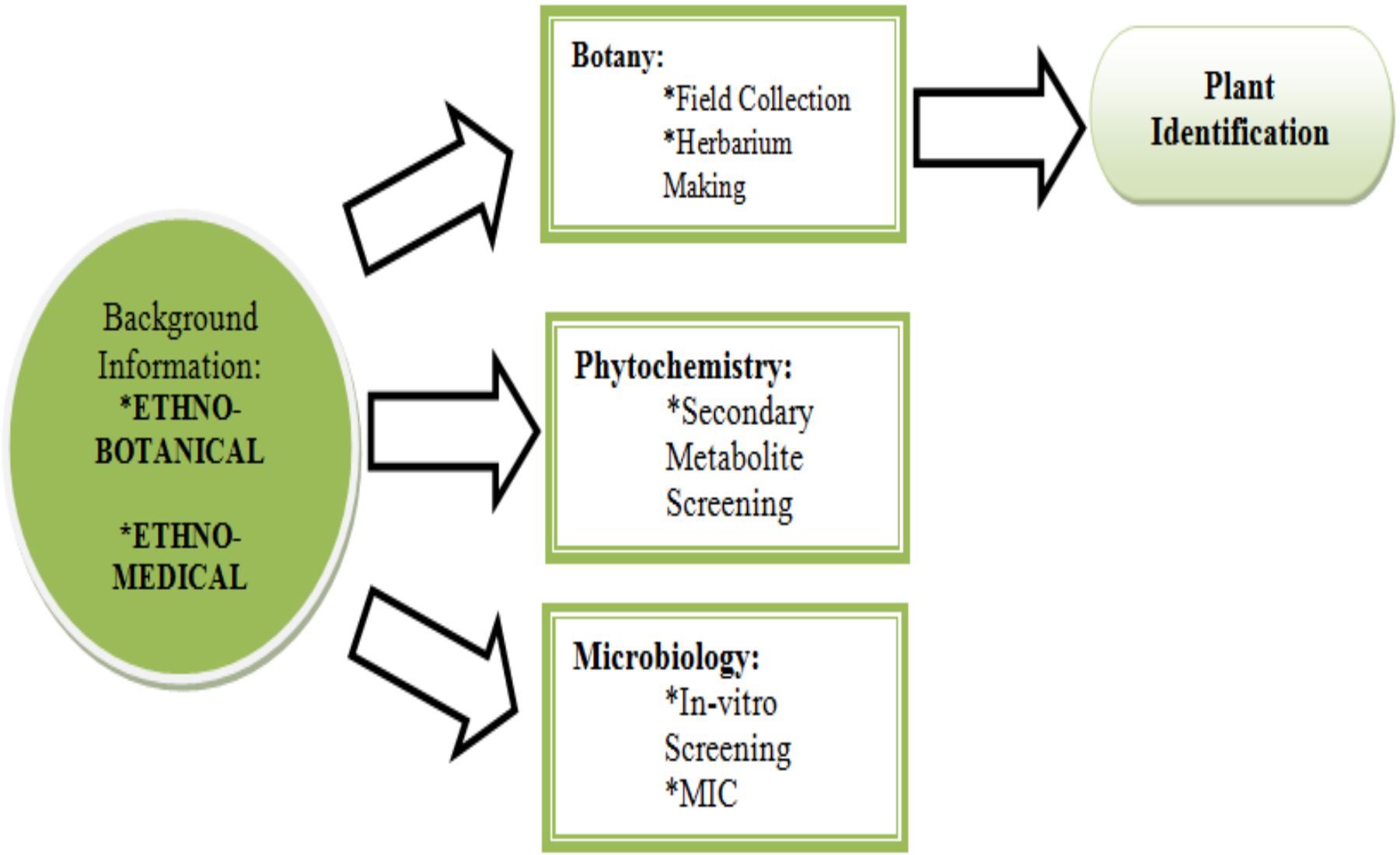
SIGNIFICANCE

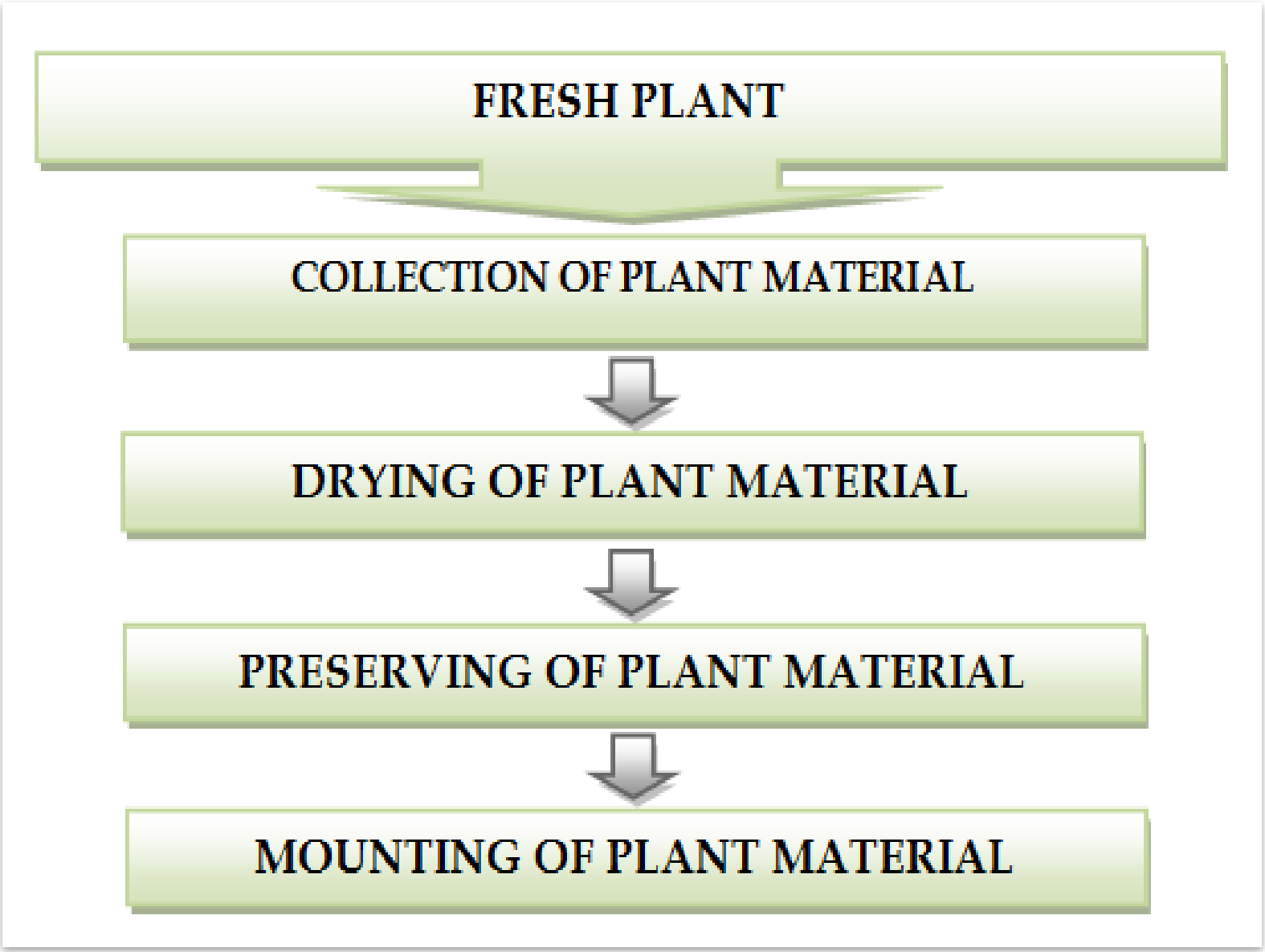
- **Different Organizations/Agencies (DOST, DOH, DA)**
  - ***Additional database*** or survey about the different medicinal plants that have antimicrobial properties which are not yet known to the society.

SIGNIFICANCE

- **Students**
  - a ***challenged for them to discover*** more medicinal plants that have curative properties for the betterment of the health care system and to ***broaden their knowledge.***

METHODOLOGY


Background Information:
*ETHNO-BOTANICAL
*ETHNO-MEDICAL
Botany:
*Field Collection
*Herbarium Making
Plant Identification
Phytochemistry:
*Secondary Metabolite Screening
Microbiology:
*In-vitro Screening
*MIC



Collection and Herbarium Making for Authentication

NATIONAL MUSEUM
BOTANY DIVISION
Manila

CERTIFICATION

This is to certify that the specimen/s herein listed and presented by the person/s herein noted was verified by this office.

NAME : **ROGELIO RIVERA** JR.
CHRISMY SHANE DAQUIADO
IRENE-VIE ITABLE
SCHOOL/OFFICE/INSTITUTION : University of Immaculate Conception
ADDRESS : Fr. Selga St., Davao City
PURPOSE : Undergraduate thesis

Specimen Number	Family	Scientific Name

(See attached sheet)

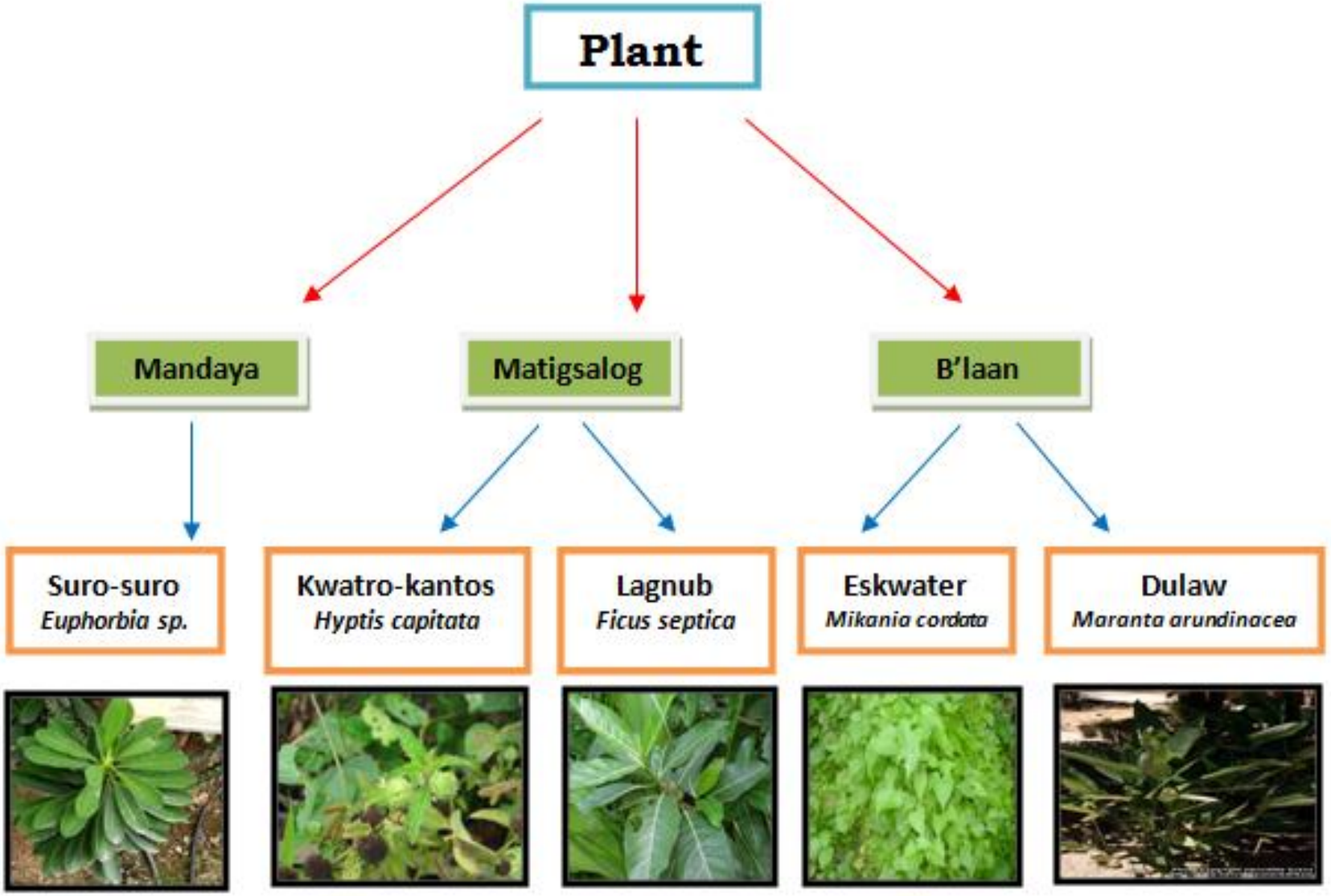
☐ Determined by:
■ Verified by:

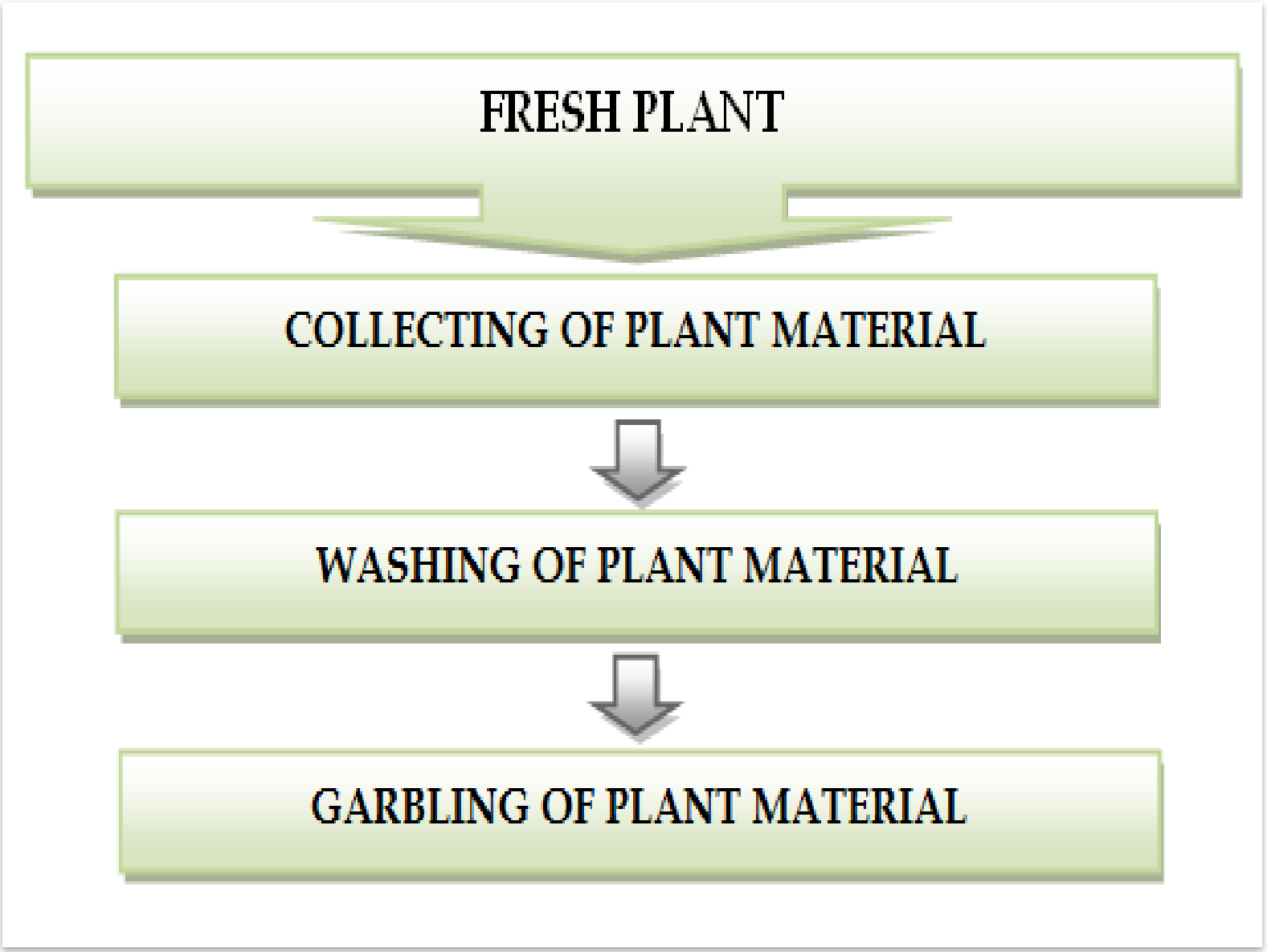
DANILO N. TANDANG
Museum Researcher I

PHILIPPINE NATIONAL HERBARIUM

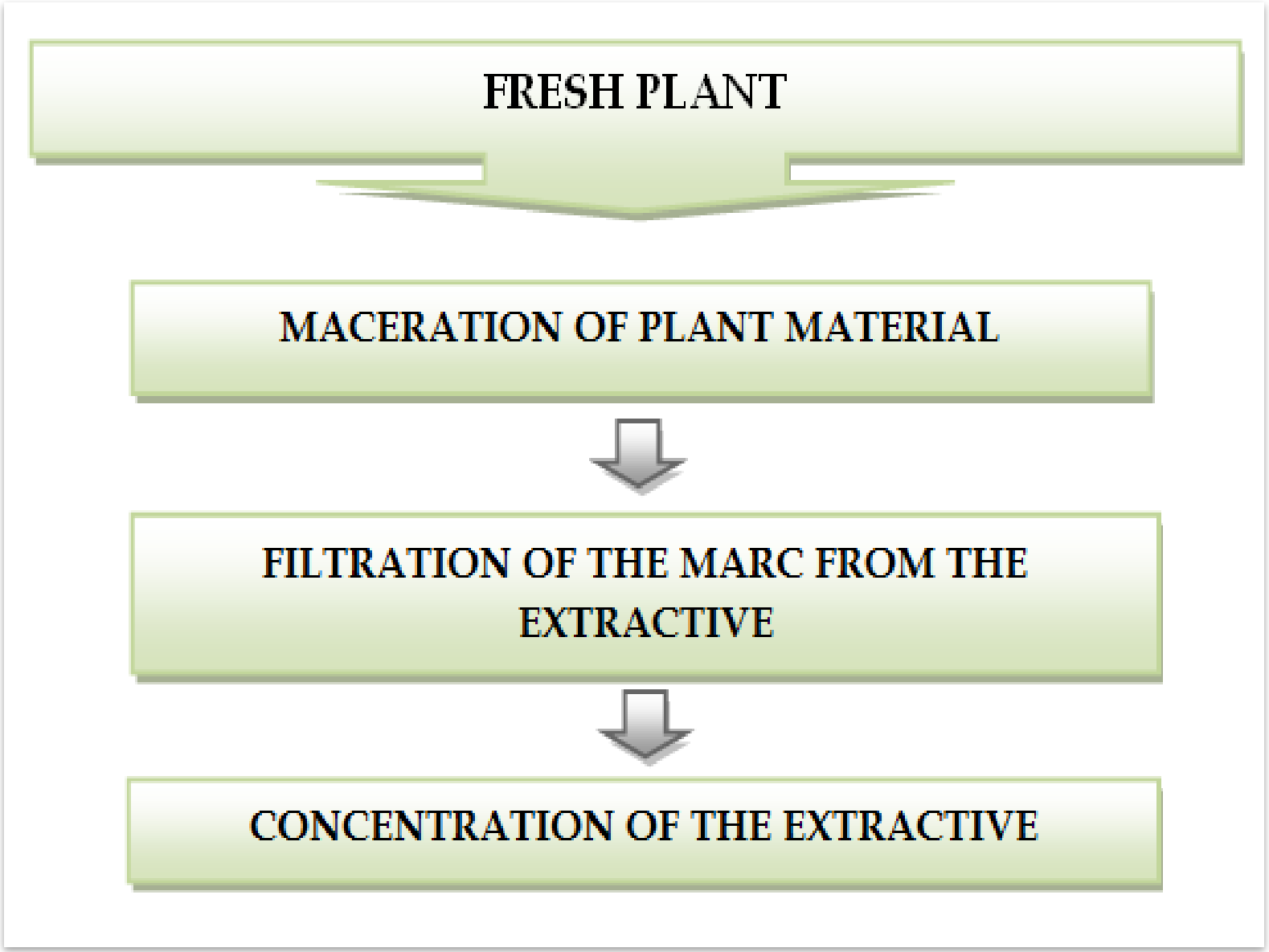
Date: December 1, 2009
Control number: 972

Plant Samples:



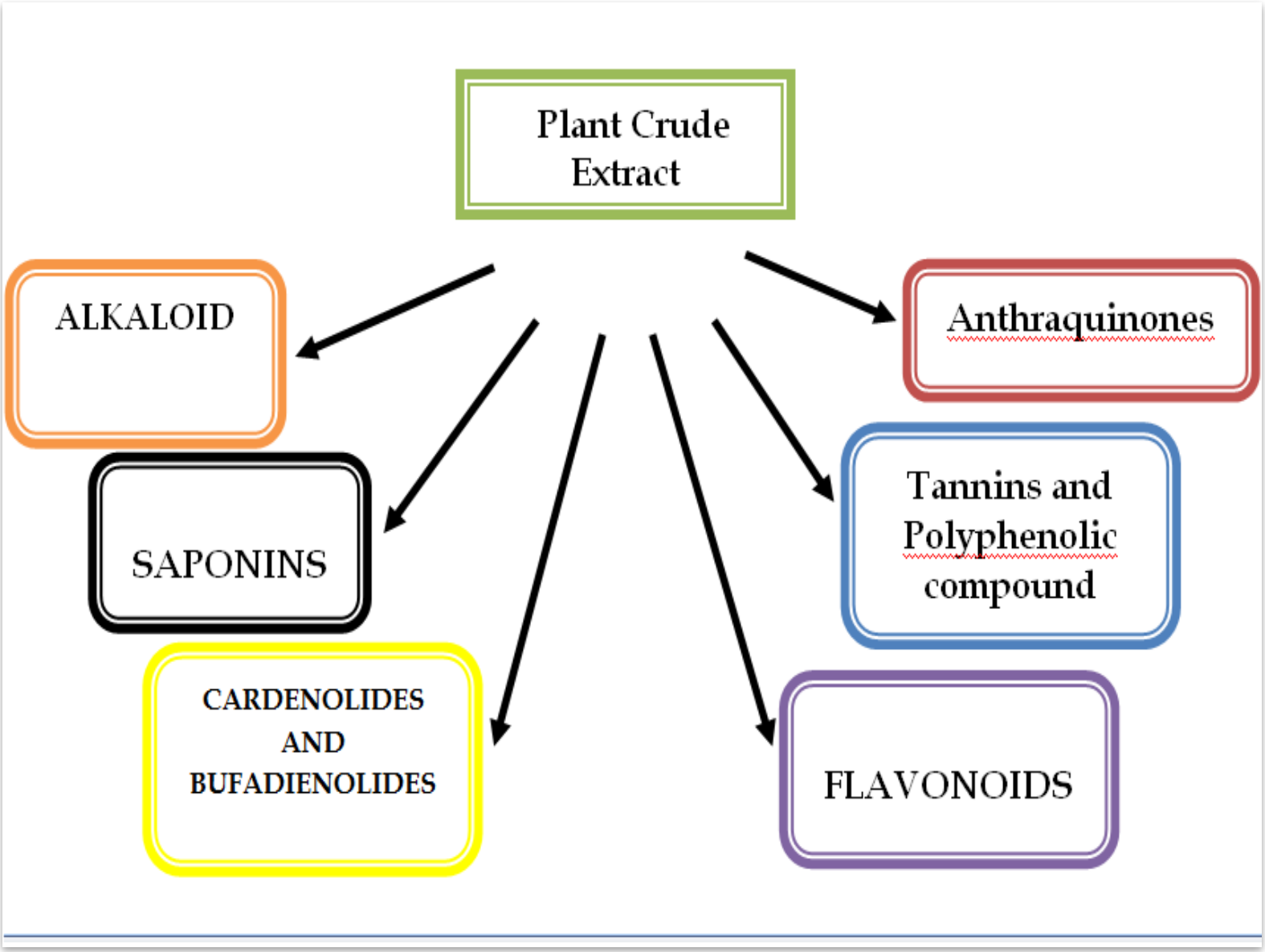


Collection of Plant Material for Extraction

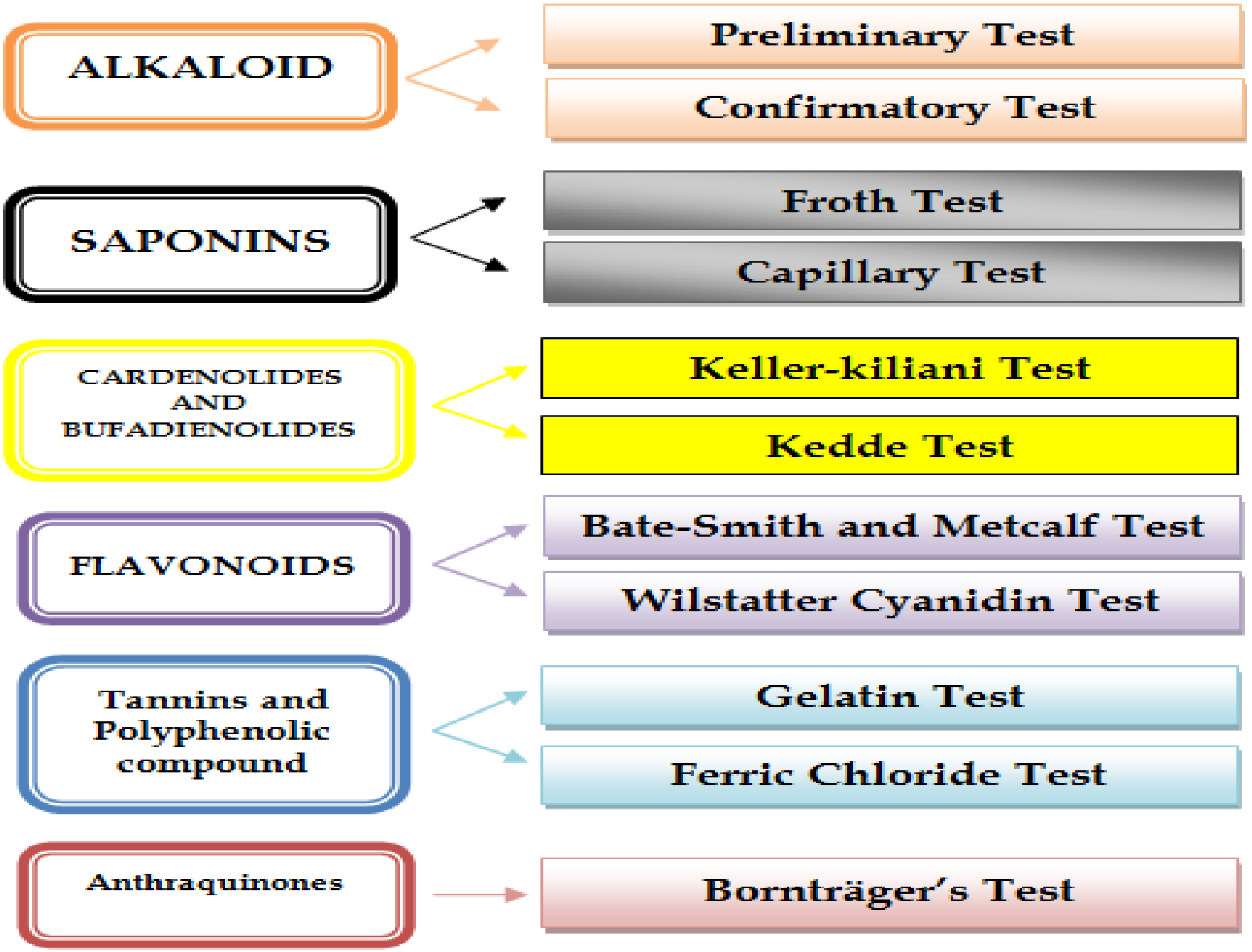


Preparation of the Plant Extracts

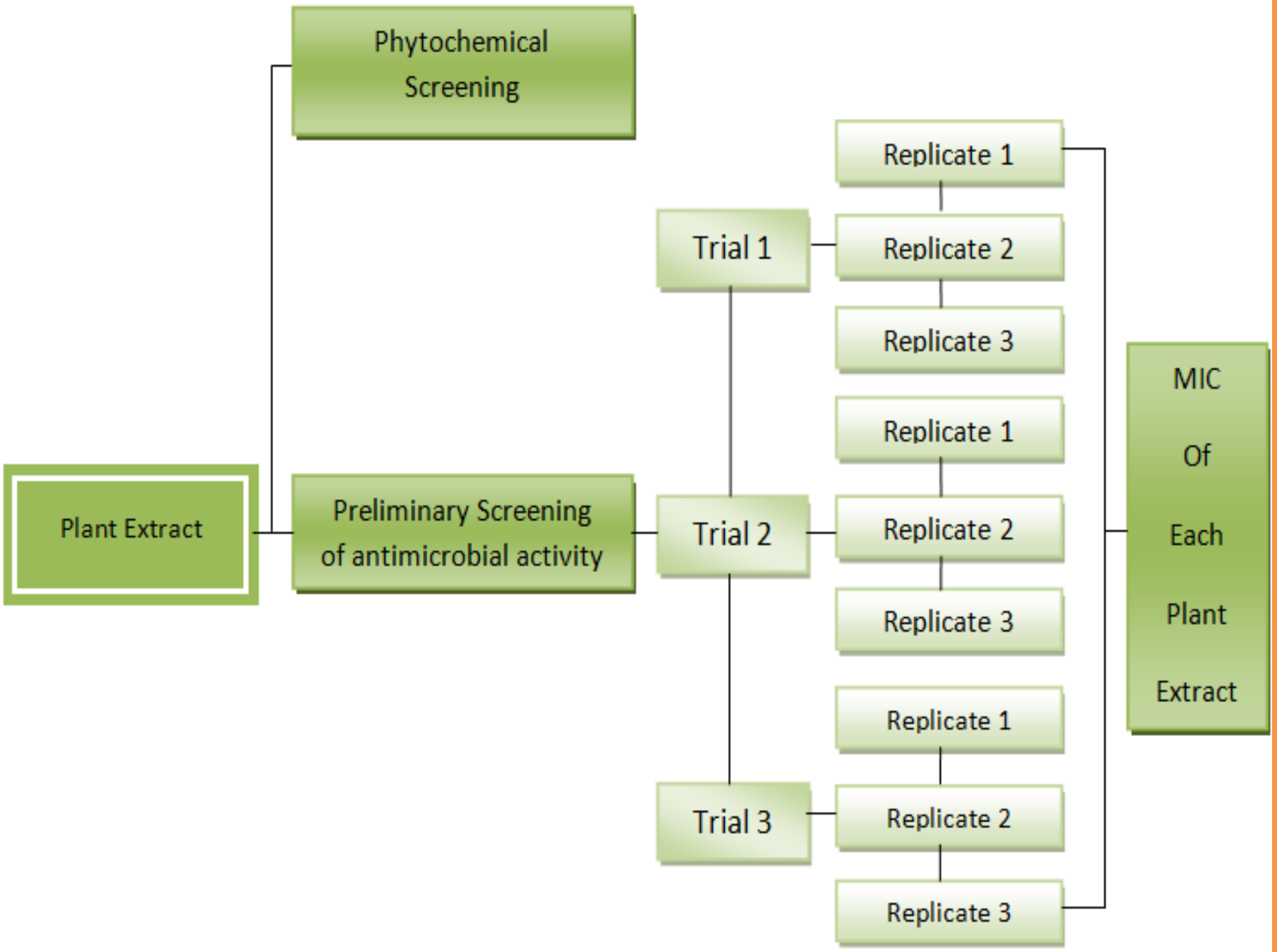
Phytochemical Screening



Phytochemical Screening


ALKALOID
Preliminary Test
Confirmatory Test
SAPONINS
Froth Test
Capillary Test
CARDENOLIDES AND BUFADIENOLIDES
Keller-kiliani Test
Kedde Test
FLAVONOIDS
Bate-Smith and Metcalf Test
Wilstatter Cyanidin Test
Tannins and Polyphenolic compound
Gelatin Test
Ferric Chloride Test
Anthraquinones
Bornträger's Test

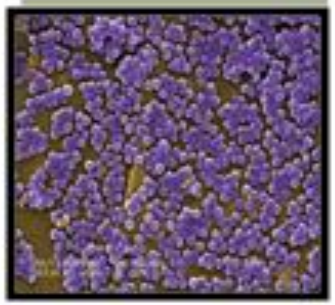
Antimicrobial Screening


Phytochemical Screening
Plant Extract
Preliminary Screening of antimicrobial activity
Trial 1
Trial 2
Trial 3
Replicate 1
Replicate 2
Replicate 3
Replicate 1
Replicate 2
Replicate 3
Replicate 1
Replicate 2
Replicate 3
MIC Of Each Plant Extract

Microorganism

Bacteria

Gram +



PNCM, NIMB, UPLB

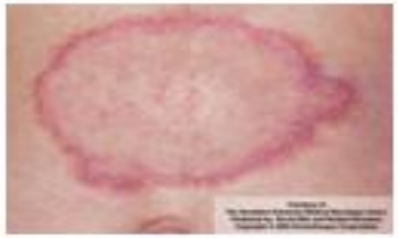
Gram -

DOST XI, Davao

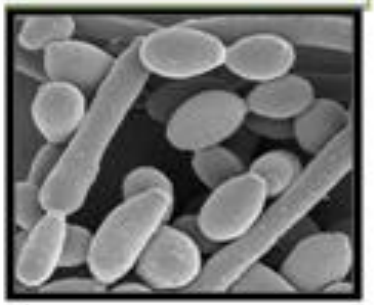
Fungi

Multicellular

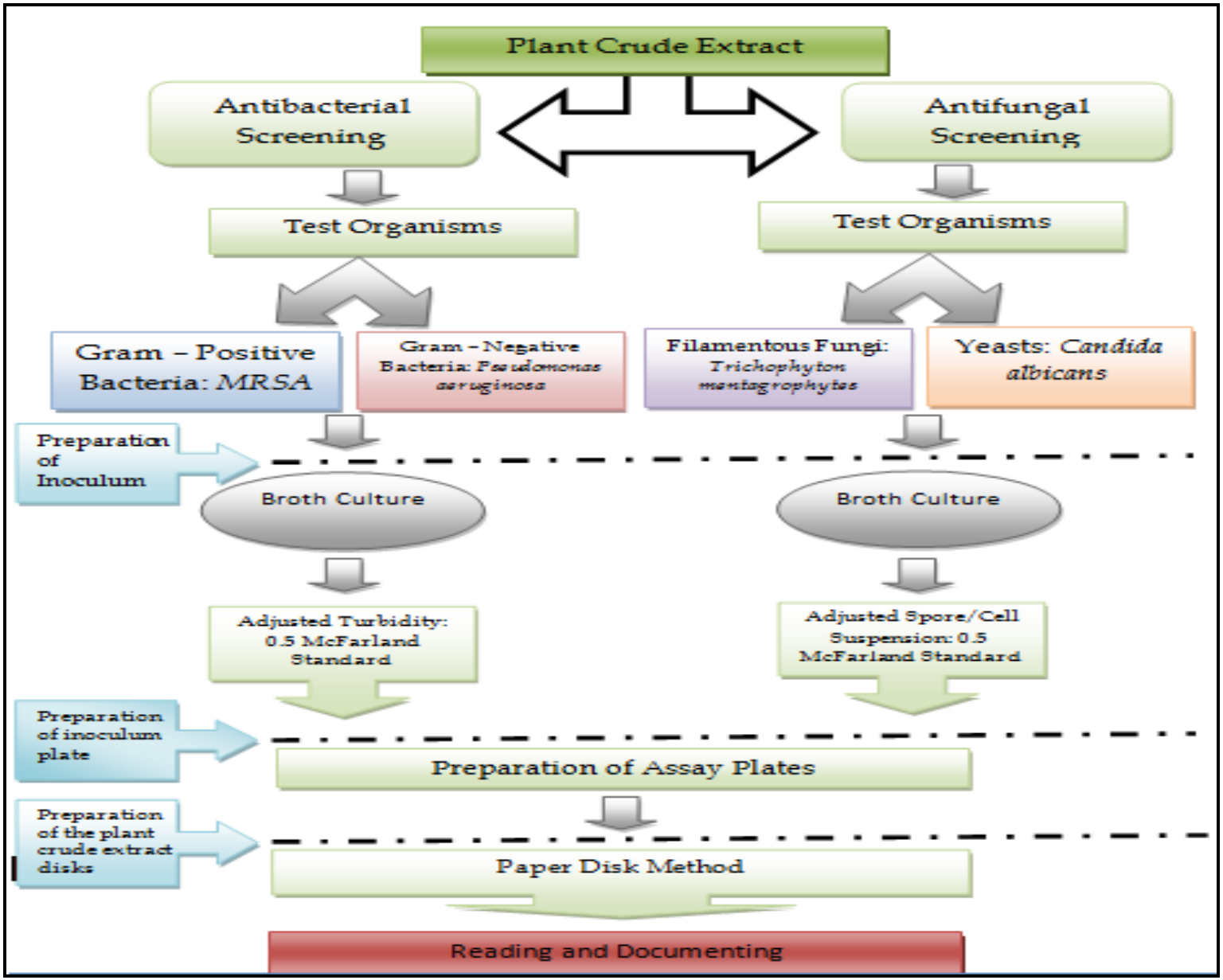
DOST XI, Davao



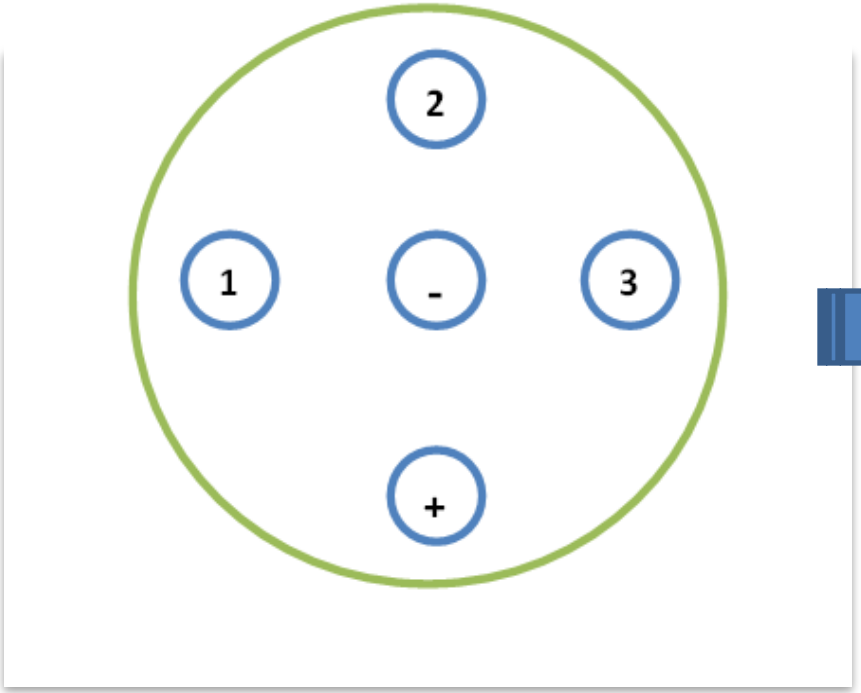
Unicellular

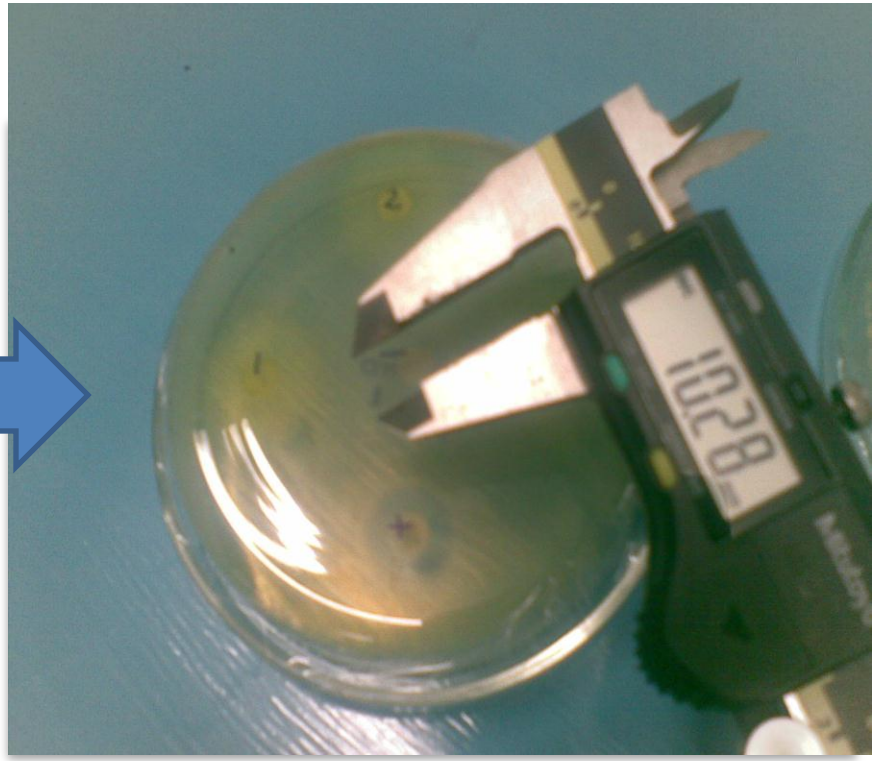


PNCM, NIMB, UPLB



Susceptibility Test of the Plant Crude Extract



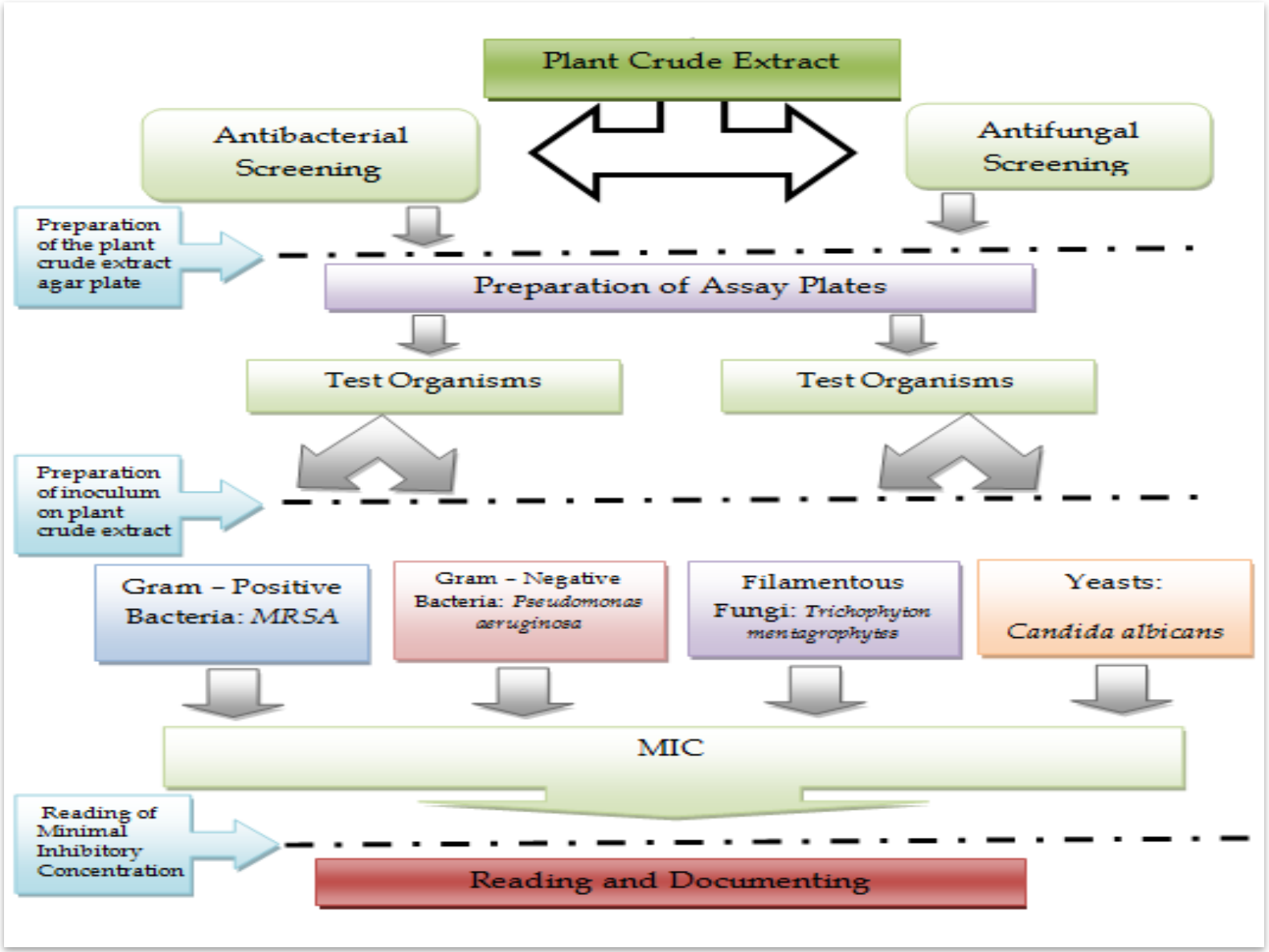


POSITIONING OF THE PLANT EXTRACT DISK

READING AND DOCUMENTING

The exhibited zones of inhibition were then interpreted as follows:

< 10 mm	Inactive
10 – 13 mm	Partially active
14 – 19 mm	Active
> 19 mm	Very active



Minimum Inhibitory Concentration (MIC)

Phytochemical Screening Result

Table 1. Summary of the Phytochemical Screening of the Five Medicinal Plants

	Active Constituents					
	Alkaloid	**Saponin**	**Steroids**	**Flavonoid**	**Tannins**	**Anthraquinone**
Euphorbia sp. **(Suro-suro)**	ND	ND	+	ND	+	ND
Hyptis capitata **(Kwaro-kantos)**	ND	+	+	ND	+	ND
Ficus septic **(Lagnub)**	+	+	+	+	ND	ND
Mikania cordata **(Eskwater)**	+	+	ND	ND	+	ND
Maranta arundinacea **(Dulaw)**	ND	+	+	ND	+	ND

ND: Not detected

(+): Presence of secondary metabolite

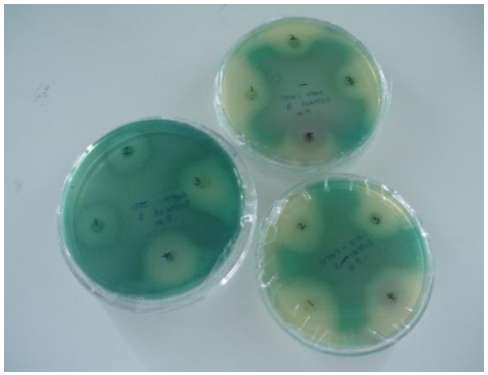
Preliminary Screening Result

Table 2. Summary on the Antimicrobial Susceptibility Test

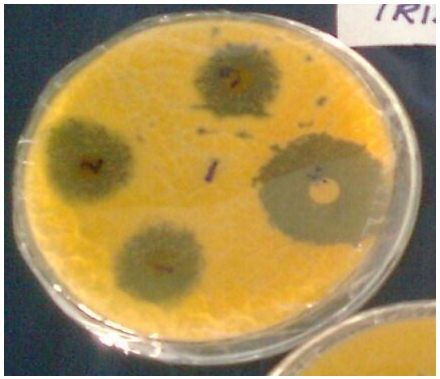
Plant Extracts	TEST ORGANISMS			
	MRSA	*P. aeruginosa*	*T. mentagrophytes*	*C. albicans*
Euphorbia sp (suro-suro)	6.00±0.00	**30.61±5.90 Very active**	6.00±0.00	6.00±0.00
Hyptis capitata (Kwatro-kantos)	**19.30 ±1.50 Very active**	7.15±1.20 inactive	6.00±0.00	6.00±0.00
Ficus septic (Lagnub)	7.24±1.50	6.00±0.00	**30.26±4.00 very active**	**10.92±2.19 partially active**
Mikania cordata (Eskwater)	**11.71±0.74 Partially active**	7.70±1.74	**19.02±5.87 Very active**	6.26±0.77
Maranta arundinacea (dulaw)	7.00±1.22	7.32±2.08	6.00±0.00	6.00±0.00

Hyptis capitata (kwatro kantos) against MRSA

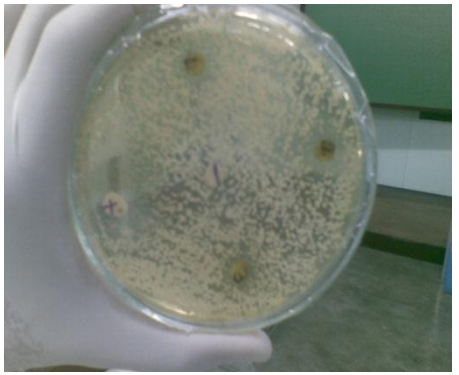
Eskwater against MRSA



*Euphorbia sp. (*suro-suro) against P. aeruginosa



Ficus septica against *Trichophyton mentagrophytes*



Ficus septica against *Candida albicans*

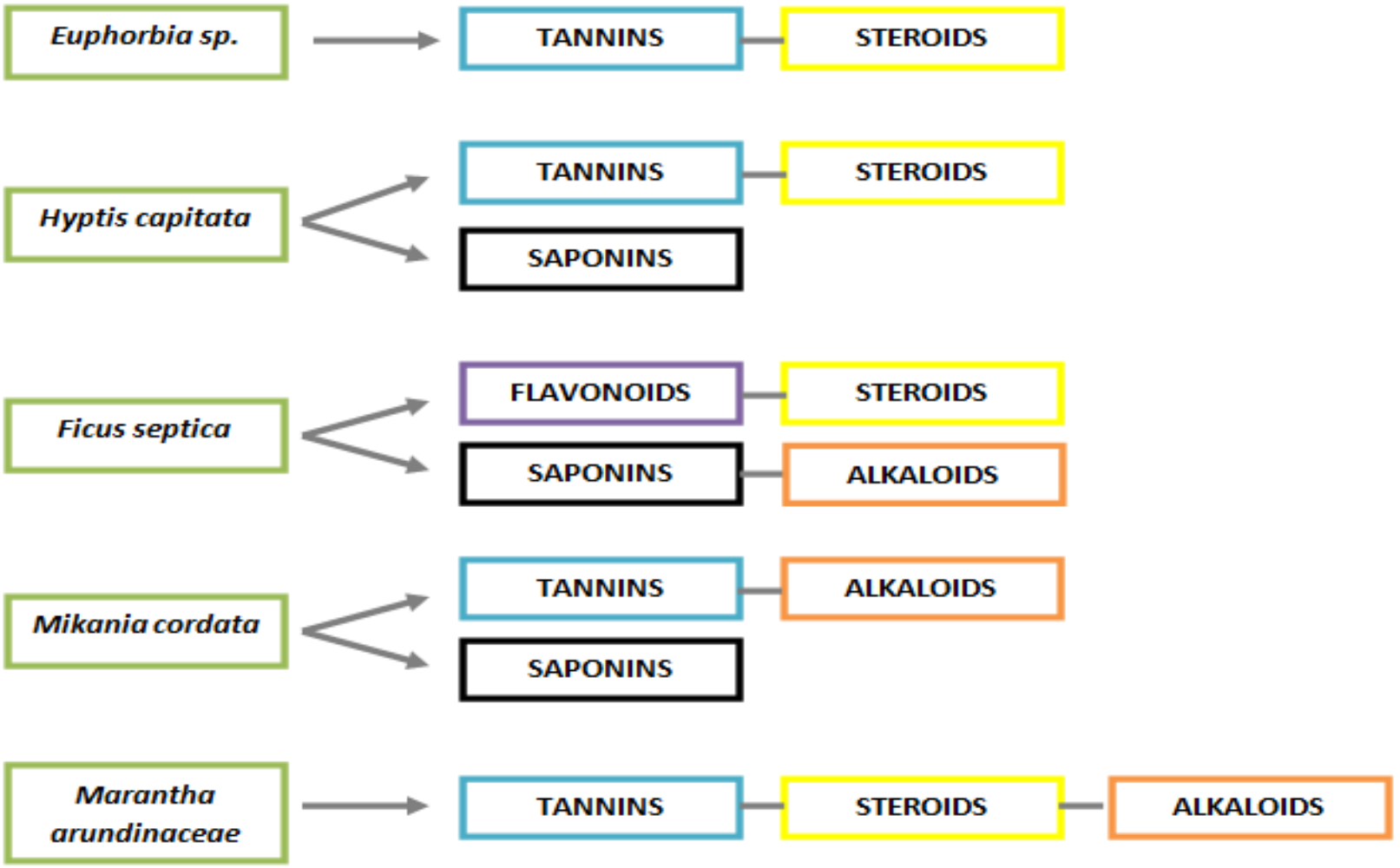
Minimum Inhibitory Concentration

Table 3. Minimum Inhibitory Concentration the five medicinal plants

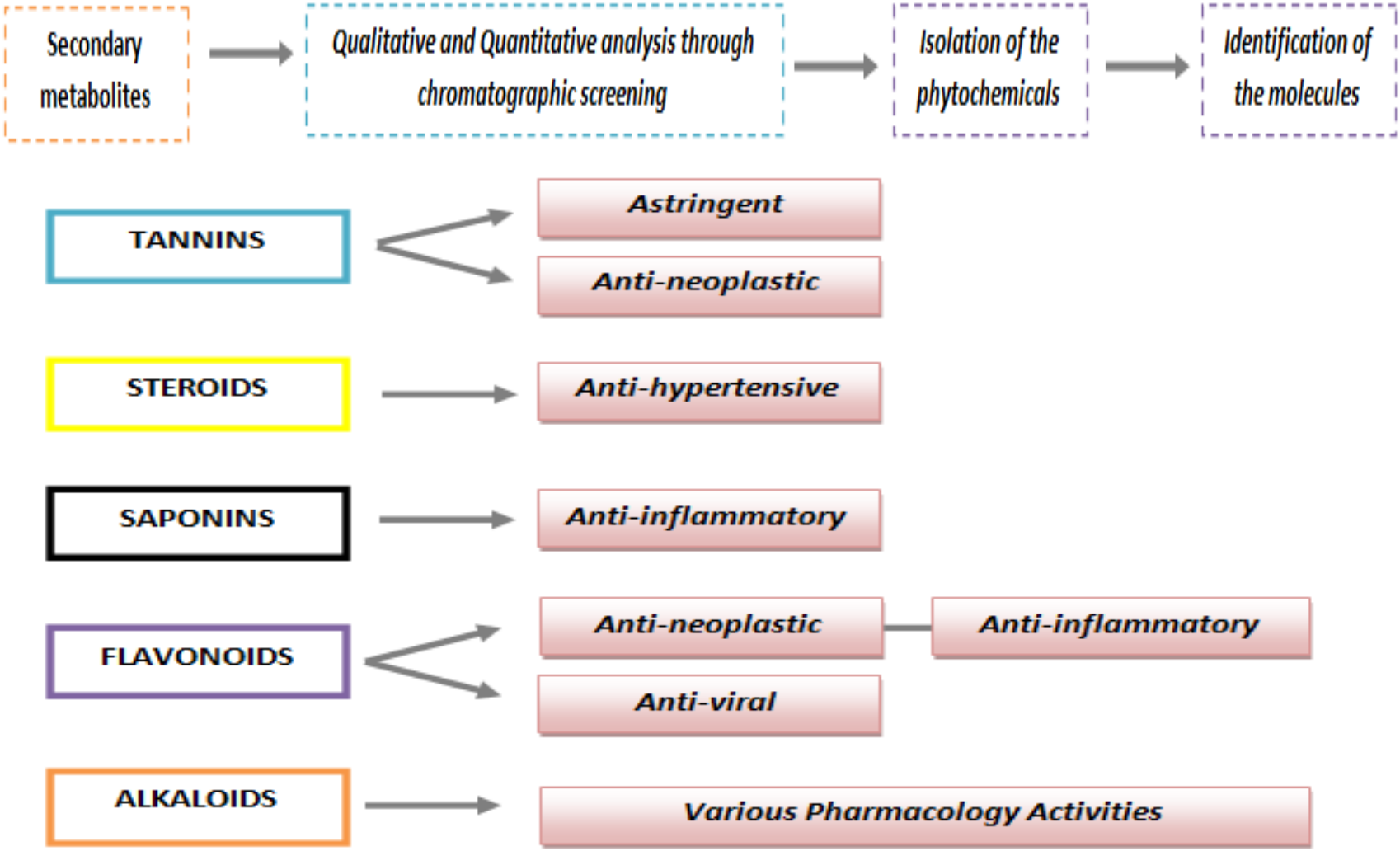
Plant extracts	Microorganisms	MIC value (mg/ml)
Euphorbia sp (suro-suro)	*Pseudomonas aeruginosa*	100 mg/ml
Hyptis capitata (Kwatro-kantos)	*Methicillin-resistant Staphylococcus aureus*	100 mg/ml
Ficus septica (Lagnub)	*Trichophyton mentagrophytes* *Candida albicans*	50 mg/ml 200 mg/ml
Mikania cordata (Eskwater)	*Methicillin-resistant Staphylococcus aureus* *Trichophyton mentagrophytes*	100 mg/ml 50 mg/ml
Maranta arundinacea (dulaw)		

CONCLUSIONS and RECOMENDATIONS

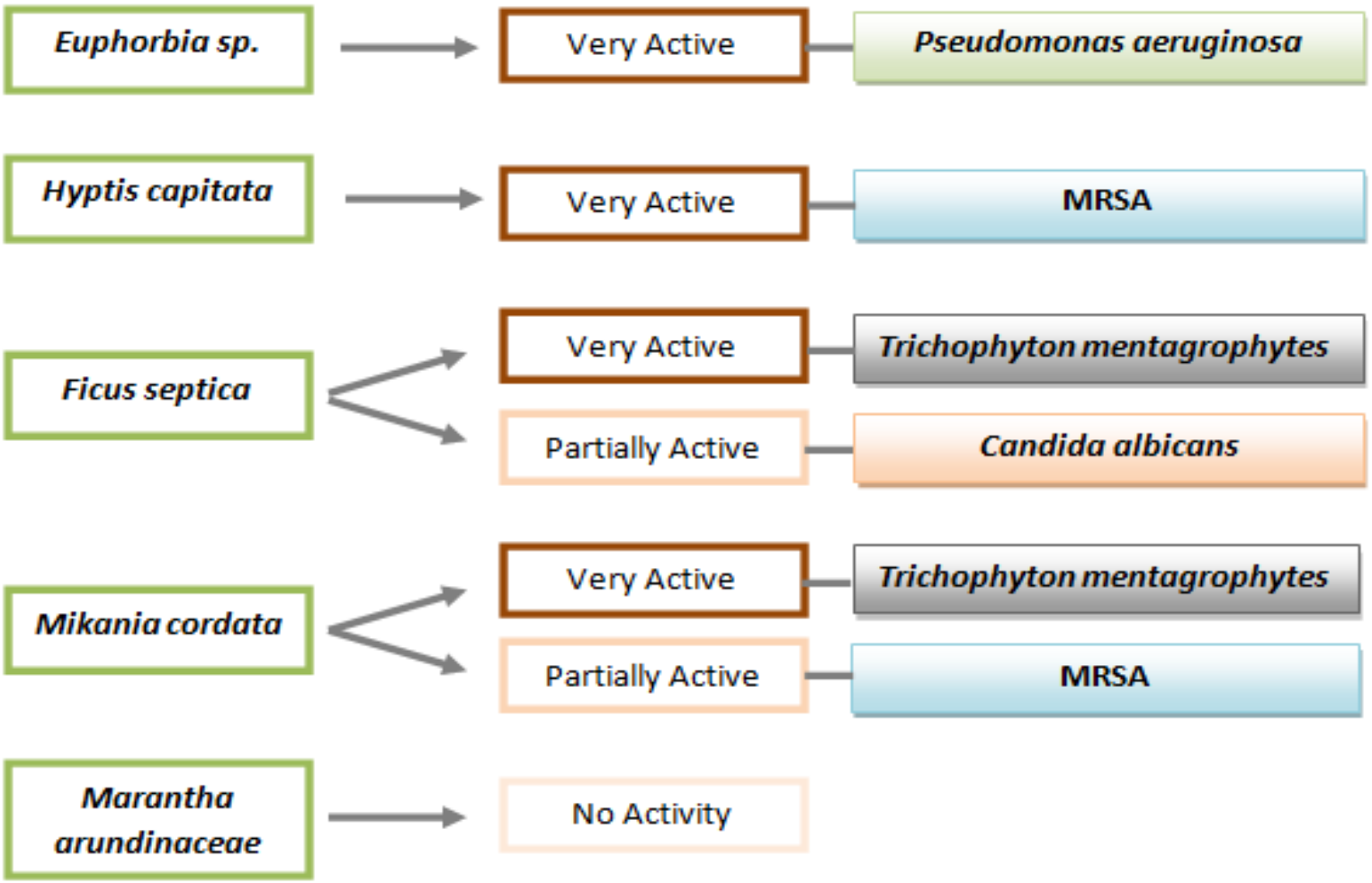
1. The active constituents of the plant leaf extracts:



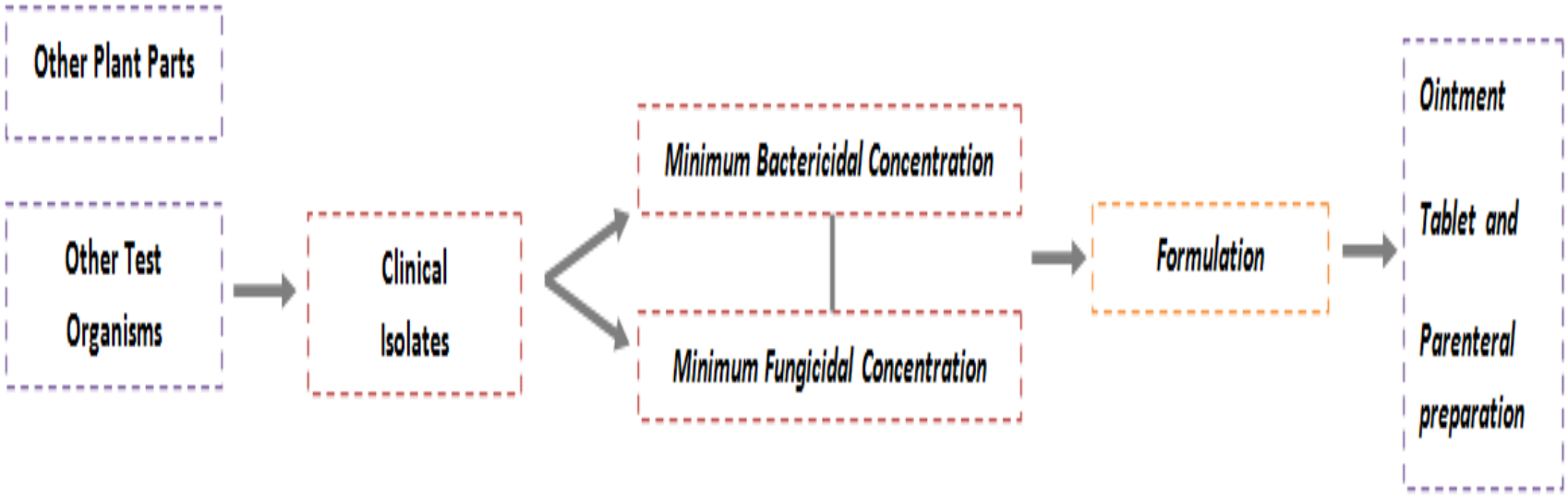
Recommendations



2. Susceptibility Test



Recomendation



3. Minimum Inhibitory Concentration of *Euphorbia sp.* against *Pseudomonas aeruginosa* is 100 mg/mL; *Hyptis capitata* against *Methicillin-resistant Staphylococcus aureus* is 100 mg/mL and *Ficus septico* against *Trichophyton mentagrophytes* is 50 mg/mL while 200 mg/mL against *Candida albicans*.

4.There is a significant difference of the zones of inhibition of the 5 selected medicinal plant extracts against *Methicillin-resistant Staphylococcus aureus, Trichophyton mentagrophytes*, and *Candida albicans.* Particularly, the Suro-suro exhibited wider zones of inhibition compared with tetracycline, kwatro kantos, lagnub,eskwater and dulaw in the growth of *Pseudomonas aeruginosa*, kwatro kantos exhibited wider zones of inhibition compared to vancomycin, suro-suro, lagnub, and dulaw in the growth of *Methicillin-resistant Staphylococcus aureus*, Lagnub exhibited wider zones of inhibition compared to suro-suro, kwatro kantos, eskwater and dulaw in the growth of *Trichophyton mentagrophytes* and *Candida albicans.* Eskwater exhibited smaller zones of inhibition compared to vancomycin in the growth of *Methicillin-resistant Staphylococcus aureus* and to ketoconazole in the growth of *Trichophyton mentagrophytes.*

Thank you!

To God be the glory!