



# Antimicrobial And Cytotoxic Activities Of *Sterculia Parviflora*

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## INTRODUCTION

- Antimicrobial resistance nowadays has becoming a public health emergency according to the World Health Organization (WHO, 2013).
- There are also growing concerns of breast cancer which ranks as the third most frequent cancer and single most common female malignancy worldwide (Ibrahim et al., 2012).
- The lower cases of adverse reaction among plant extraction has revive the interest in herbal medications nowadays (Amirah et al., 2011).
- Hence, there is a need for study of local medicinal plants focusing on its antimicrobial and cytotoxic activity for new remedies.
- Sterculia parviflora* (*S. parviflora*) is one of the species of family Sterculiaceae and is known in local Malay language as *Kelumpang* in Malaysia (Burkill et al., 1966).

## OBJECTIVES

- To evaluate the antimicrobial activity of *S. parviflora*'s leaves extracts against Gram-positive bacteria (*Staphylococcus aureus* and *Bacillus cereus*), Gram-negative bacteria (*Escherichia coli* and *Pseudomonas aeruginosa*) and fungi (*Candida albicans* and *Aspergillus spp.*).
- To determine the cytotoxicity of *S. parviflora*'s leaves extracts on human breast adenocarcinoma cell line (MCF 7).

## MATERIALS & METHODS

Figure 1: Sample preparation

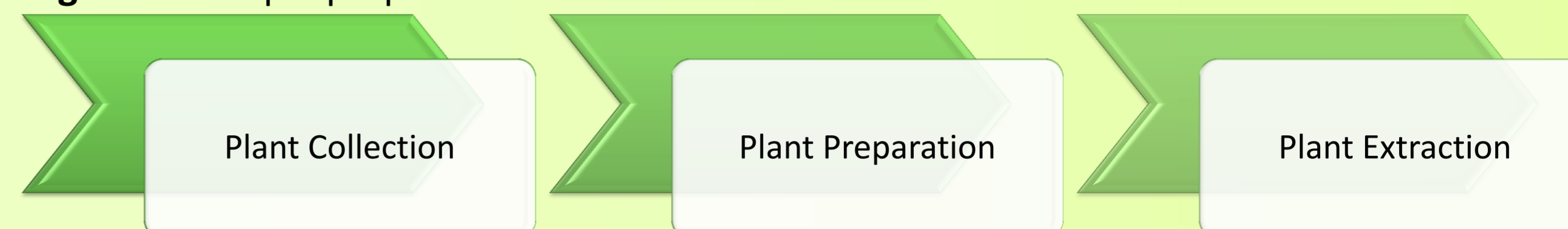


Figure 2: Antimicrobial Screening

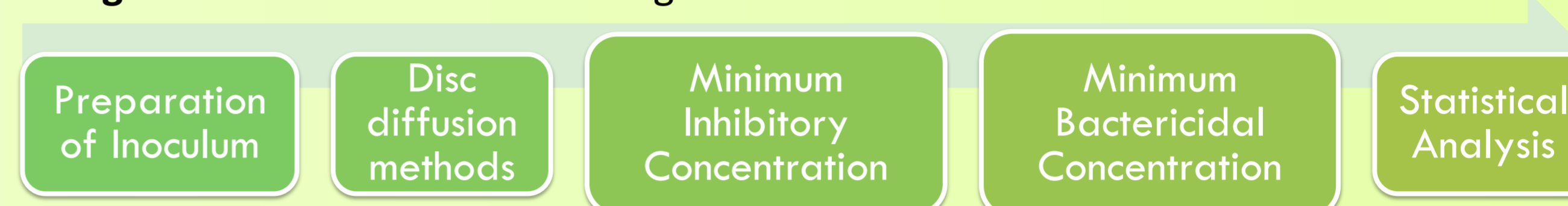


Figure 3: Cytotoxic screening

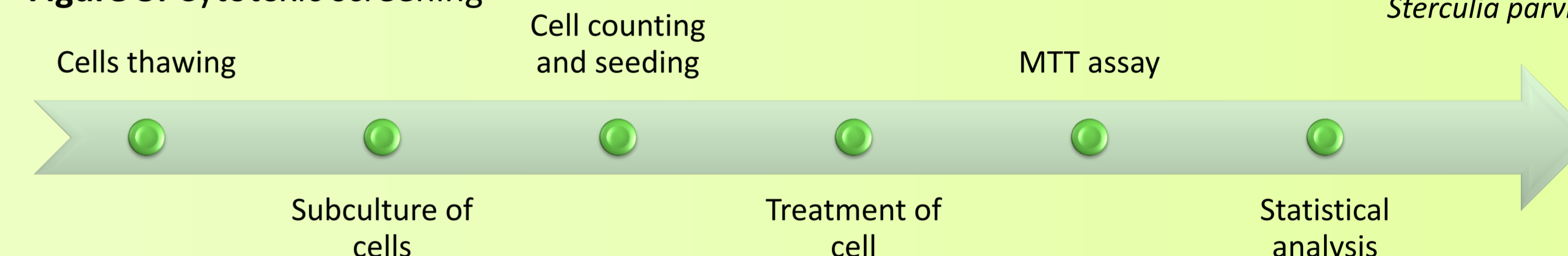


Figure 4: *Sterculia parviflora*

## Antimicrobial Activities

Microorganisms	Zone of inhibition of Plant Extracts (mm)							
	Negative control	Positive control	<i>n</i> -Hexane		Ethyl Acetate		Methanol	
			100	200	100	200	100	200
<i>S. aureus</i>	NA	30.7 ± 1.2	NA	NA	NA	NA	8.0 ± 0.0	10.3 ± 0.5
<i>B. cereus</i>	NA	29.0 ± 3.6	NA	NA	14.7 ± 5.8	26.3 ± 1.5	8.0 ± 1.0	10.7 ± 1.2
<i>E. coli</i>	NA	10.0 ± 0.0	NA	NA	NA	NA	NA	NA
<i>P. aeruginosa</i>	NA	17.1 ± 3.2	NA	NA	NA	NA	NA	NA
<i>C. albicans</i>	NA	24 ± 1.0	NA	NA	NA	NA	NA	NA
<i>Aspergillus spp.</i>	NA	10.8 ± 0.2	NA	NA	NA	NA	NA	NA

\*NA = No Activity (Did not proceed with further tests)

\*Data are mean ± standard deviation of triplicate experiments.

Table 1: Zone of inhibition resulting through disc diffusion screening by using disc concentrated with specific concentration of extracts

Plant Extracts	Microorganisms	MIC (mg/mL)	MBC (mg/mL)
Methanol	<i>S. Aureus</i>	25	50
	<i>B. Cereus</i>	25	50
Ethyl acetate	<i>B. Cereus</i>	50	100

Table 2: Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) values



Figure 5: Methanol extract of *S. parviflora* showed antimicrobial efficacy against *S. aureus*

## Cytotoxic Activities

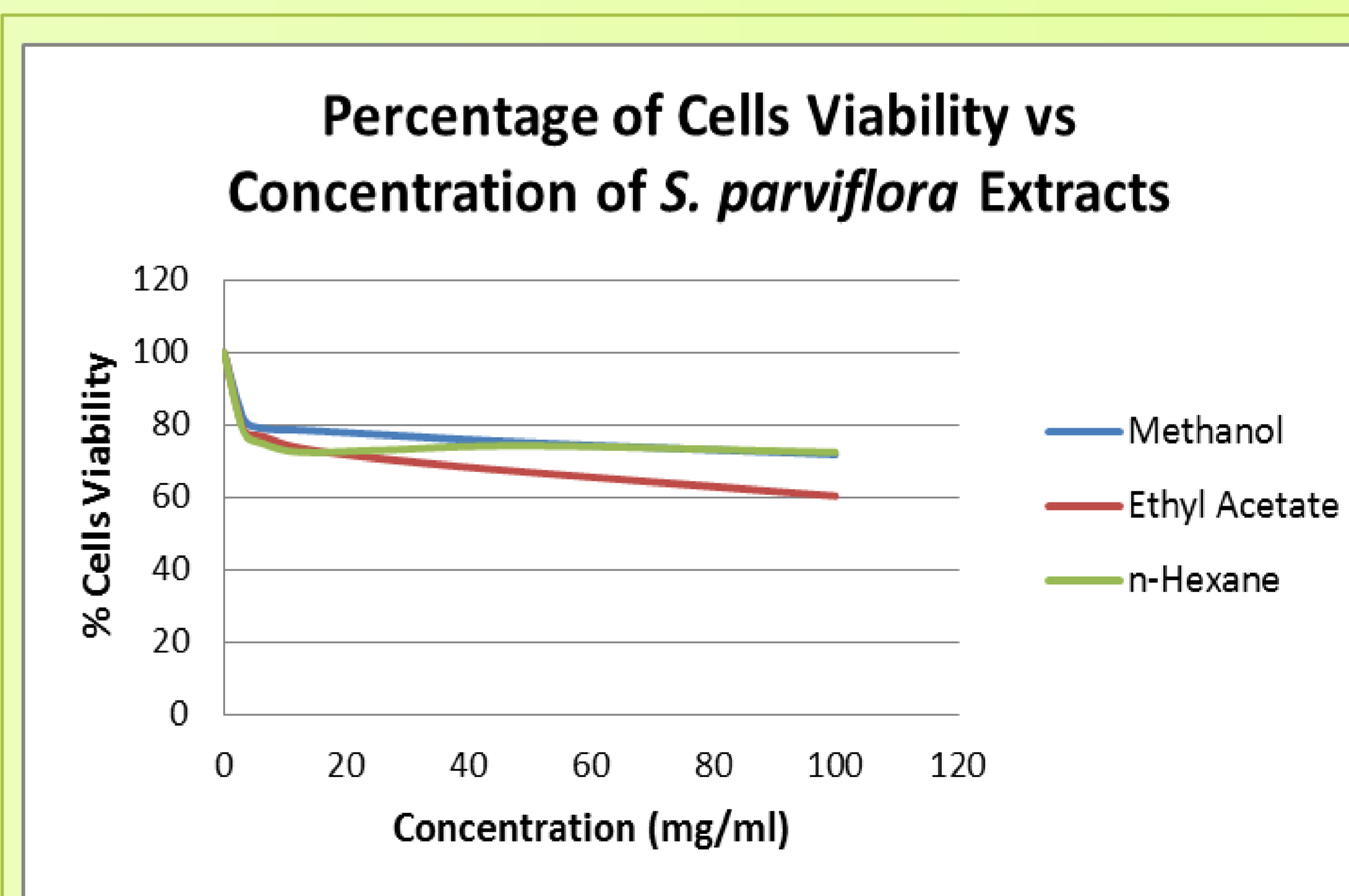


Figure 6: Cytotoxicity result of *S. parviflora*'s extracts on MCF-7 determined by MTT assay

## CONCLUSION

This study found that the methanol and ethyl acetate extracts of *S. parviflora*'s leaves exhibited moderate antimicrobial activities against *S. aureus* and *B. cereus*. The lowest MIC and MBC value determined is 25 mg/mL and 50 mg/mL respectively both in methanol extract against *S. aureus* and *B. cereus*. In cytotoxicity study, the crude extracts of *S. Parviflora* was unable to possess any cytotoxic effect against breast cancer cell line MCF-7 at concentration range of 3.13 – 100 mg/mL for 24 hours as the range of viability cells percentage calculated is from 60.7% to 82.0% which is not considerably cytotoxic enough to inhibit MCF-7 breast cancer cell growth. Thus, it can be concluded that *S. parviflora* did exhibit antimicrobial activities against gram-positive bacteria which are *S. aureus* and *B. cereus* while unable to possess cytotoxic activities against MCF-7 cell line.

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