



## Preliminary Phytochemical Screening and Anti Bacterial Activity of Leaves of *Moringa oleifera*. Lamk

S. Tharshika<sup>1</sup>, M. P. Vidhya<sup>2\*</sup>, R. Shivatharsiny<sup>1</sup>, A. C. Thavaranjit<sup>3</sup>  
and T. Thayalini<sup>2</sup>

<sup>1</sup>Department of Chemistry, Faculty of Science, University of Jaffna, Sri Lanka.

<sup>2</sup>Unit of Siddha Medicine, University of Jaffna, Sri Lanka.

<sup>3</sup>Department of Botany, Faculty of Science, University of Jaffna, Sri Lanka.

### Authors' contributions

This work was carried out in collaboration between all authors. Authors ST and RS carried out the phytochemical screening. Authors MPV and TT designed the study, wrote the protocol, and wrote the first draft of the manuscript, managed the literature searches. Author ACT carried out anti microbial activity and author TT managed the analyses of the study. All authors read and approved the final manuscript.

### Article Information

DOI: 10.9734/AJMAH/2017/34816

#### Editor(s):

(1) Maria Manuel Azevedo, Department of Microbiology, Faculty of Medicine, University of Porto, Porto, Portugal.

#### Reviewers:

(1) Eman N. Ali, Universiti Malaysia Pahang, Malaysia.

(2) Hanaa Elgamily, National Research Centre, Egypt.

(3) Oliver Pfaff, Pontificia Universidad Católica Madre y Maestra, Dominican Republic.

Complete Peer review History: <http://www.sciencedomain.org/review-history/20158>

Short Research Article

Received 13<sup>th</sup> June 2017

Accepted 17<sup>th</sup> July 2017

Published 22<sup>nd</sup> July 2017

### ABSTRACT

*Moringa oleifera* is a tree belongs to the family Moringaceae. It is called as Drumstick tree in English. In traditional medicine, the leaves and flowers are used in different ways to cure different ailments. Leaf juice is used for the eye infection. Mixed with honey, it is applied as anjanam to the eyelids in eye disease. Antibacterial activity of extracts of seeds, roots and leaves has been reported previously against *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Aspergillus niger* and *Candida albicans*. The aim of this study is to screen the Phytochemicals and antibacterial activity of the decoction and ethanolic extract of obtained from the leaves of *M.oleifera* against *Staphylococcus aureus* (ATCC 25923), *Pseudomonas aeruginosa* (ATCC 27853),

\*Corresponding author: E-mail: vidhyac0413@gmail.com;

*Escherichia coli* (ATCC 25922) and *Enterococcus faecalis* (ATCC 29212). Fresh leaves were collected from Jaffna, Sri Lanka washed and dried under sunshade for one week. The decoction was prepared using water as solvent, and the ethanol extract was prepared using soxhlet apparatus. These extracts were used to screen the phytochemical and test its antibacterial activity. Both were qualitatively tested for the presence of chemical constituents, such as alkaloids, saponins, tannins, steroids, flavonoids, glycosides and triterpenoids. Antibacterial activity was determined by using the standard well diffusion method. The Nutrient Agar (NA) plate was inoculated with 1 mL (about  $1 \times 10^6$  CFU/mL) of each liquid bacterial culture was dispersed on the surface of NA plate and allowed to dry at 37°C for 15 min. The wells with 9 mm in diameter and 4 mm in depth were bored into the NA using a sterile cork borer and the well was completely filled with the test extract. Ethanol alone was used as control. Plates were incubated at 37°C for 24 hrs. Inhibition of growth was observed and the diameters of the zones of inhibition (ZOI) were measured. Replicates were made for the entire procedure. Ethanolic extract of leaf showed antibacterial activity against all tested gram positive and gram negative organisms. ZOI was ranged from  $12 \pm 0$  mm to  $19 \pm 0$  mm. Decoction showed antibacterial activity against *S. aureus* and *E. faecalis* the ZOI was  $11 \pm 0.18$  mm. Growth inhibition was highly significant against *P. aeruginosa* and less significant against *E. coli*. in ethanol leaf extract. Degree of antibacterial activity of ethanol leaf extract was higher than decoction among the bacteria tested. Saponin, tannin and cardiac glycoside were present in both extract but terpenoid found only in ethanol leaf extract. It was also found that the extraction of bioactive compounds depend on the type of solvent used and the method of extraction. Ethanolic extract of *M.oleifera* leaf extract exhibited potent antibacterial activity against all tested organisms. It may be due to the presence of terpenoid. It could be used in the treatment of infections caused by these organisms.

**Keywords:** *Phytochemical screening; anti-bacterial activity; leaves of Moringa oleifera; solvent extraction.*

## 1. INTRODUCTION

*Moringa oleifera* is a tree belongs to the family Moringaceae. It is called as Murungai in Tamil, as Drumstick tree in English and as Murunga in Sinhala. In traditional medicine, the leaves and flowers are used in different ways to cure different ailment. In particular, the leaves are used as a poultice to reduce glandular swellings. The juice of the leaves has purgative and anthelmintic properties [1] Several uses of *Moringa* leaves, such as antibacterial, antioxidant, anticancer applications, have been reported. In addition, these leaves can be used as protein supplement due to its high protein content [2]. The young leaves are used as food. Leaves ground into paste with a few pods of garlic, a bit turmeric, salt and pepper are given internally in scurvy. Leaf juice is used in the eye infection. Mixed with honey, it is applied as anjanam to the eyelids in eye disease [1]. The chloroform and ethanol extracts of seeds and leaf of *Moringa oleifera* were investigated previously for antimicrobial activity against some selected food – borne microorganisms, such as *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Enterobacter aerogenes* [3]. Antibacterial activity of extracts of seeds, roots and leaves

has been reported previously against *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Aspergillus niger* and *Candida albicans* [4]. However, structure-activity relation is missing in the existing literature. The present investigation mainly aims to screen the Phytochemicals and antibacterial activity of the decoction and ethanolic extract of leaves of *M.oleifera* against *Staphylococcus aureus* (ATCC 25923), *Pseudomonas aeruginosa* (ATCC 27853), *Escherichia coli* (ATCC 25922) and *Enterococcus faecalis* (ATCC 29212).

## 2. MATERIALS AND METHODS

### 2.1 Collection of Materials

Fresh leaves of *M.oleifera* were collected from Jaffna, Sri Lanka and washed well and dried under sunshade for one week [5]. Then the dried leaves were stored in sterile bottle further analysis.

#### 2.1.1 Preparation of aqueous and ethanolic extract

50 g of dried leaves were placed in a sterile container. 600 mL of distilled water was added