

Chapter 45

Annonarose Balm: Phytochemical Screening and Antibacterial Properties of *Annona muricata* Leaves Extract

Ropisah Me^{1,2*}, Nur Haziqah Yahaya¹, Fatin Nurzarifah Razali¹, Nurul Salwani Wahid¹, Nurul Ain Nadirah Jamaludin¹, Arnawaty Ayob¹

¹*Faculty of Applied Sciences, MARA University of Technology Negeri Sembilan Branch, Kuala Pilah Campus, Malaysia.*

²*Atta-ur-Rahman Institute for Natural Product Discovery, MARA University of Technology Selangor Branch, Puncak Alam Campus, Malaysia.*

* ropisah@ns.uitm.edu.my

Abstract

Annonarose balm is one of the fantastic natural balm products that can be used as alternative medicine in treating skin problem. Annonarose balm is made by mixing the leaves of *Annona muricata* with rose petal and beeswax as the main ingredients. The present of *A. muricata* leaves in this product can be commercialized as one of the alternative medicine to cure some skin problems and other diseases. Therefore, this study is aimed to screen phytochemical compounds present in the leaves extracts of *A. muricata* and to check its ability for antibacterial activity. The leaves extracts were proceed to phytochemical screening tests to confirm the presence of alkaloid, flavonoid, phenol, saponin, tannin, triterpenoid and steroid. As a result, methanol crude extracts show the present of alkaloid, flavonoid, phenol, saponin, tannin, triterpenoid and steroid. Ethyl acetate crude extracts show the present of alkaloid, phenol, tannin and steroid. Meanwhile, hexane crude extracts show the positive results of alkaloid, tannin, triterpenoid and steroid. Further the antibacterial properties of all the extracts were tested against four microorganisms such as *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli* and *Salmonella typhi* by using disk diffusion method. Methanol extracts shows the highest diameter of inhibition zone (16.0 mm) against *B.subtilis*, while hexane crude extracts shows the lowest diameter of inhibition zone (7.0 mm) against *E.coli*. This study was revealed that, the present of *Annona muricata* leaves in Annonarose balm give significant potential as antibacterial agent.

Introduction

Hundreds or thousands of diseases occurs and each of the disease has its own particular symptoms and effects on humans (Montalvo *et al.*, 2016). Every disease has the causes, although the causes of some of the disease remain undiscovered (Gavamukulya *et al.*, 2015). But still, each of the disease may have their own treatments, either in traditional ways or modern treatments (WHO, 2005). *A. muricata* can be commercialized as one of the alternative medicine to cure some skin problems and other diseases (Aibmr and Sciences, 2016, Montalvo *et al.*, 2016). *A. muricata* leaves extract had been proven in treating various bacterial infectious diseases such as pneumonia, diarrhea, urinary tract infection and some skin disease (Solomon *et al.*, 2014). Due to the huge potential of *A.muricata* in treating some diseases, this study is aimed to investigate the phytochemical compounds present in *Annona muricata* leaves extract and its capability as an antibacterial agent. The

scientific investigation of the extract can give significant contribution in pharmaceutical and medicinal industry.

Methods

Annona muricata leaves were collected from Kuala Pilah area, Negeri Sembilan. The extraction process was carried out in the laboratory of UiTM Negeri Sembilan Branch, Kuala Pilah Campus. Phytochemicals screening on the extracts were done through several tests in order to confirm the present of major compounds. Further, the antibacterial effect of the extract was studied on several bacteria strains such as *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*, and *Salmonella typhi* by using Kirby Bauer Disk Diffusion Technique (Abubacker and Deepalakshmi, 2012).

Results and Discussions

This research was confirmed the presence of compounds such as alkaloid, flavonoid, phenol, saponin, tannin, triterpenoid and steroid in the *A.muricata* leaves extract. Most of the screening tests in leaves extracts show the positive result at methanol extract. As reported by Adegbegi et al. (2014), the methanol crude extracts of *A.muricata* obtained the positive results for alkaloid, flavonoid, tannin, saponin and triterpenoid. However, for the ethyl acetate crude extract, only alkaloid, phenol, tannin and steroid shows a significant presence of compounds. Hexane crude extract show the presence of tannin, triterpenoid and steroid.

The antibacterial activity of hexane extract, ethyl acetate extract and methanol extract were determined by the inhibition zone around the disk against the gram-positive bacteria; *S. aureus* and *B. subtilis* and gram-negative bacteria; *S. typhi* and *E. coli*. These three crude extracts showed the inhibition zone against all tested microorganisms (Table 1). The maximum inhibition zone observed at hexane extract was *E. coli* with the diameter of 12.0 mm. Ethyl acetate extract show the highest inhibition zone on *E. coli* with the diameter of 13.0 mm, meanwhile, methanol extract show the maximum inhibition zone with the diameter of 16.0 mm against *B. subtilis*.

Table 1
The diameter of inhibition zone of *A.muricata* leaves extracts against bacteria

Types of Bacteria	Hexane extract (mm)	Ethyl acetate extract (mm)	Methanol extract (mm)	Amoxicilin (mm)	Methanol (mm)
<i>S. aureus</i>	8.0±0.1	9.0±0.2	14.0±0.2	21.0±0.1	6.0
<i>B. subtilis</i>	7.0±0.2	8.0±0.1	16.0±0.2	19.0±0.2	6.0
<i>E. coli</i>	12.0±0.2	13.0±0.3	15.0±0.3	22.0±0.1	6.0
<i>S. typhi</i>	10.0±0.3	7.0±0.1	11.0±0.1	20.0±0.2	6.0

Note: Diameter of disk (6.0 mm)

This study had showed significant finding as previous study where methanol extract of *A. muricata* leaves has successfully showed the maximum activity of inhibition zone tested in *B. subtilis* as compared to the ethyl acetate crude extract and hexane crude extract (Philip et al., 2014). Based on the previous researches, *A.muricata* have great medicinal properties towards the pathogenic organisms, in which this plant shows good antibacterial activity (Vijayameena et al., 2013).

Conclusion

The study of *A.muricata* leaves extract had showed that methanol extracts give positive phytochemical screening results for the entire compounds. The methanol extracts also shows the best inhibition zone for all tested bacteria, and it show a significant potential as antibacterial agent against *B. subtilis*. Therefore, the present of *Annona muricata* leaves in this balm give significant contribution in treating skin problem especially as antibacterial agent.

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