

## CHAPTER I

### INTRODUCTION

As the wound care technique, the basic requirement for all wound healing are clean, enough perfused wound environment free from infection, necrotic tissue and foreign material (Vowden *et al.*, 2014). The major factor that causes diseases is bacteria (Armstrong *et al.*, 1999).

In the last few years various wound dressing antibiotic carriers have been designed in order to produce the ideal wound dressing with good adherence to the wound site and good exudate absorbance, proper moisture transmission, nonetheless, easy application and removal. Such a dressing should also strongly reduce conformability problems that conventional devices, as sheets or membranes, are unable to do (Berger *et al.*, 2004). Moreover, the new choice that is spray wound dressing is popular with convenience usage. The sprayed droplets spread onto the substrate surface and, as the solvent evaporates, the polymer chains interpenetrate, going through a gel state then forming the film with further drying (Felton *et al.*, 2013).

Polyvinyl acetate is manufactured from the corresponding monomer of vinyl acetate using a free radical polymerization procedure. It is an atactic, non-crystalline polymer which is well known in the pharmaceutical industry as a binder and matrix-former for melt extrusion. Furthermore, polyvinyl acetate is also used as an intermediate for the production of polyvinyl acetate phthalate, an enteric coating, or polyvinyl alcohol, an instant release film former. Due to its high flexibility and low toxicity, polyvinyl acetate is widely used in the food industry (Kolter *et al.*, 2013).

Mangosteens or *Garcinia mangostana* are mostly found in Southeast Asia. This plant is known for its anti-inflammatory properties, antifungal and antibacterial and promoting properties. Mangosteens contain a variety of xanthenes that are most important to inhibit families of fungi and lichens. Xanthenes obtained from mangosteen have remarkable biological activity (Pedraza-Chaverri *et al.*, 2008).

The objective of this work is to develop a new kind of active polyvinyl acetate for use as wound spray dressing incorporating mangosteen extract.

Optical, mechanical and barrier properties of this film was also investigated. Furthermore, the effects of mangos teen extract loaded in polyvinyl acetate solution are studied. The antibacterial activities of the exchanged samples were determined against gram positive such as *S. aureus* (*Staphylococcus aureus*), Methicillin-resistant *Staphylococcus aureus* (MRSA), *Staphylococcus epidermidis* and gram negative bacteria for instant *E. coli* (*Escherichia coli*), *Enterococcus faecalis*, *Acinetobacter baumannii* (MDR), *Pseudomonas aeruginosa* and Vancomycin-resistant *Enterococcus* (VRE) to estimate its role in the suppression of the development and proliferation the microorganisms.