

**ISOLATION, IDENTIFICATION AND  
ANTIBACTERIAL ACTIVITY OF SOME XANTHONES  
PRESENT IN FRUIT HULLS OF  
*GARCINIA MANGOSTANA* LINN.**

**PhD (DISSERTATION)**

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**NOVEMBER, 2005**

## ABSTRACT

The fruit hulls of mangosteen, *Garcinia mangostana* Linn. (Guttiferae), have been in use in Myanmar folk medicine for the treatment of skin infections, wounds, diarrhea and dysentery. The main aim of this work was to get scientific scrutiny of mangosteen which is used in traditional medicine

Phytochemical investigations on mangosteen fruit hulls indicated the presence of carbohydrates, glycosides, organic acids, phenolic compounds, reducing sugars, flavonoids and tannins in it. Four xanthenes, namely, gartanin (**1**) (m.p 146-152°C; yield 0.48%), and compound mangostin (**2**) (m.p 179-181°C, 0.97% yield),  $\beta$ -mangostin (**3**) (m.p 175°C, 0.063% yield) and nor-mangostin (**4**) (m.p 196-198°C, 0.91% yield) were isolated and spectroscopically identified from the fruit hulls of mangosteen collected from Kyeik-kaw township of Mon State in June, 2003.

Antibacterial activities of crude extracts (petroleum ether and ethanol extract) by agar disc diffusion method against 33 bacteria strains including *Escherichia coli*, *Shigella* spp., *Salmonella* spp., *Staphylococcus aureus*, *Bacillus subtilis*, *Klaesiella aeruginosa*, *Proteus morgani*, *Plesiomonas shigelloides*, *Pseudomonas pyocyanea* and *Vibrio* spp. were evaluated. Ethanol extract inhibited the growth of *B. subtilis* and *S. aureus* as evidenced by zone inhibition diameter measurements (d=14mm for both strains) when compared to standard antibiotic. In addition, **1** and **2** exhibited inhibitory effect against resistant strains of *Staphylococcus aureus* with the minimum inhibitory concentration (MIC) value of >0.1 mg/ml and 0.05 mg/ml, respectively, showing the superiority of **2** over **1**. No inhibitory effect was observed against remaining strains indicating narrow antibacterial spectrum of mangosteen crude extract and its constituents.

*S. aureus* and its pathogenic capacity were mentioned by the effect of food poisoning, boils, abscesses and wound sepsis. This study proved mangosteen fruit hulls which are widely used in remedies of traditional medicine are of valuable antibacterial agents especially for *S. aureus* infection. It may be used in the treatment of amoebic dysentery; however, it should not be used for bacillary dysentery which is caused by members of the genus *Shigella*.

**Keywords** : mangosteen, *Garcinia mangostana* Linn, *S. aureus* infection, amoebic dysentery, gartanin, mangostin,  $\beta$ -mangostin, nor-mangostin.