

## ABSTRACT

Marine ecology and environment is an immense yet untapped source for new bioactive compounds with unique biochemical features. Some of the compounds derived from marine organism exhibited a wide variety of biological activities that can be exploit for pharmaceutical and therapeutical purpose. The objective of this study is to screen the aqueous (water), n-butanol, acetone, ethyl acetate and hexane extracts from Malaysian green mussels (*Perna viridis*) for antimicrobial, antioxidant capacity, spermicidal and wound healing activity.

The mussel extracts were prepared by using microwave-assisted extraction (MAE) and animal tissue homogenization (ATH) method and compared to assess the efficacy of the extraction method. The extracts were subjected to biochemical analysis followed by antimicrobial, antioxidant, spermicidal and wound healing property.

Antimicrobial and antifungal study was carried out by using disk and well diffusion methods. Spermicidal activity was assessed on semen samples from Fertile Brangus-Simmental Cross-bred bulls. Parameters such as sperm morphology and viability, plasma membrane integrity and acrosome integrity were studied to assess the spermicidal activity whereas nonoxynol-9 was used as standard. Excision wound model method were used to assess the wound healing activity in rats and 10 % povidone iodine was used as the control. The dimensions of wound area were measured to correlate the wound healing activity. The antioxidant property was assessed by using DPPH and H<sub>2</sub>O<sub>2</sub> scavenging method.

The results of antimicrobial screening suggested that the n-butanolic extract prepared by ATH method exhibited higher inhibition zone of  $20.00 \pm 0.44$  mm and  $13.20 \pm 0.36$  mm against *Neisseria gonorrhoeae* and *Streptococcus agalactiae* strain respectively. The results

suggest that the n-butanol extract of *Perna viridis* exhibited significant reduction in parameters (sperm viability, plasma membrane integrity, total count and acrosome integrity) that correlates with spermicidal activity. The mean numbers of viable sperm were found to be significantly different ( $p < 0.001$ ) compared with normal control. The n-butanol extract also showed higher wound healing activity (reduction of wound areas of about 85.70%) as compared to the standard (povidone-iodine 10% ointment) and normal control at the end of day 21 of the animal studies. It was also observed that the n-butanol extract showed the best antioxidant activity (DPPH:  $70.55 \pm 1.53$  %;  $H_2O_2$ :  $64.92 \pm 1.41$ %).

Results suggested that animal tissue homogenization (ATH) is the more suitable choice of extraction method when compared to microwave-assisted extraction (MAE) due to the presence of biochemical metabolites and its capability to exhibit more positive results as compared to the latter method on the test conducted in this study.

**KEYWORDS:** n-butanol extract, aqueous extract, Microwave-assisted extraction, Animal tissue homogenization, Qualitative analysis, *Neisseria gonorrhoeae*, Antimicrobial, Spermicidal activity, Wound healing activity.