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Antimicrobial and antioxidant properties of selected plant extracts as natural preservatives in ointment formulation

Erna C Arollado

University of the Philippines Manila, Philippines

Preservatives are substances added to food and pharmaceutical products to extend their shelf-life. Synthetic compounds have been widely used for such applications. However, reports demonstrated adverse effects of synthetic preservative consumption. Thus, there is a need to develop safe and cheap preservatives to avoid undesirable effects. This study aims to investigate the preservative efficacy of five plants namely *Psidium guajava*, *Premna odorata*, *Mimosa pudica*, *Allium sativum* and *Zingiber officinale*, as an alternative for synthetic preservatives. Ethanolic extracts of these plants were subjected to phytochemical screening which verified the presence of sapogenins and glycosides in all plant extracts. AAS analysis confirmed that the extracts are safe, as shown by the lead and cadmium contents within the acceptable dietary intake (<0.3 mg/kg and 0.010 mg/kg, respectively). Among the five plants, *P. guajava* and *P. odorata* exhibited the highest antioxidant activity in diphenyl picryl hydrazyl assay at concentrations between 1.00–5.00 mg/mL and below 0.50 mg/mL, respectively. Physicochemical stability of the extracts as pre-formulated ointment was observed up to 45 days at different storage conditions, with results comparable to common synthetic preservatives, methyl and propyl paraben. The preservative challenge test performed against fungi and bacteria revealed that *P. guajava* has the highest preservative capability among the pre-formulated ointments. It is concluded that *P. guajava* exhibited the highest antioxidant and antibacterial properties, suggesting its potential use as preservative in ointment formulation.

ernaarollado@yahoo.com

Chestnut honey enhances topical wound healing

Ferhat Ozturk

Canik Basari University, Turkey

Honey has been used throughout the history both as a food and a therapeutic product due to its nutritional value and biological activity (bioactivity) potential. The honeys with high bioactivity are provided to the use of complementary medicine practitioners in developed countries such as USA, UK, Japan, Australia, New Zealand and major EU countries. Wound care in the modern medicine is achieved by using adsorbents, impregnated dressings, foams, hydrogels and hydrocolloids. However, the major problem in wound treatment is the growth of antibiotic-resistant bacteria in the wound area. Meanwhile, honey stands out as the most commonly used agent for wound treatment within the field of traditional and complementary medicine. Both osmotic and high acidity properties of honey, as well as the organic compounds within the nectar sources of honey exert an accelerator effect in the sterilization and healing of the wound. The aim of this study is to examine the healing potential of high bioactivity chestnut honey on the topical burn wounds compared to the control groups in rat model. In this study, rats were induced with burn wounds and divided into 4 groups for treatment, which are saline dressing, honey dressing, Ag sulfadiazine and honey dressing+sherbet. Microscopic analysis of the wound healing was performed through monitoring the skin epithelialization, granulation, neo-vascularization, inflammation, and fibroblast maturation using the immuno-histochemical methods. The group treated with honey dressing+sherbet showed the most rapid and effective healing of the burn wound. Based on the findings of this study, the chestnut honey with high bioactivity can be used in clinical trials on burn wounds as a complementary approach to the conventional treatment methods in the future studies.

ferhatozturk@basari.edu.tr

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