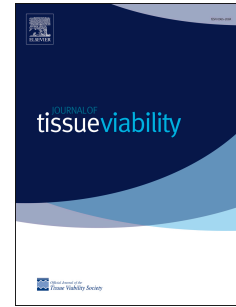


# Accepted Manuscript

Honey, bee pollen and vegetable oil unsaponifiables in wound healing

Alessandro Ragno, Emanuela Cavallaro, Daniele Marsili, Michele Apa, Laura D'Erasmus, Luis Severino Martin



PII: S0965-206X(16)30005-5

DOI: [10.1016/j.jtv.2016.03.008](https://doi.org/10.1016/j.jtv.2016.03.008)

Reference: JTV 203

To appear in: *Journal of Tissue Viability*

Received Date: 27 March 2016

Accepted Date: 31 March 2016

Please cite this article as: Ragno A, Cavallaro E, Marsili D, Apa M, D'Erasmus L, Martin LS, Honey, bee pollen and vegetable oil unsaponifiables in wound healing, *Journal of Tissue Viability* (2016), doi: 10.1016/j.jtv.2016.03.008.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Honey, bee pollen and vegetable oil unsaponifiables in wound healing.**

Alessandro Ragno<sup>1</sup>, Emanuela Cavallaro<sup>1</sup>, Daniele Marsili<sup>1</sup>, Michele Apa<sup>1</sup>, Laura D'Erasmus<sup>2</sup>, Luis Severino Martin<sup>1</sup>

<sup>1</sup>Department of Internal Medicine, "Regina Apostolorum" Hospital, Via San Francesco 50, 00041 Albano Laziale (Rome), Italy.

<sup>2</sup>Department of Internal Medicine and Medical Specialties, "Sapienza" University, Viale del Policlinico 155, 00161 Rome, Italy.

Corresponding author: Dr. Alessandro Ragno, e-mail address: [ragno.f@tiscali.it](mailto:ragno.f@tiscali.it)

We would like to discuss about the review article on “honey in wound healing” by Oryan A. et al (1). The review clarifies the mechanisms and therapeutic properties of honey on wound healing. The mechanisms of action of honey in wound healing are majorly due to hydrogen peroxide, high osmolarity, acidity, non peroxide factors, nitric oxide, phenols and flavonoids. It is known that not only honey, but also bee pollen is used in burn wound healing. In the composition of bee pollen, there are about 250 substances including amino acids, lipids (triglycerides, phospholipids), vitamins, macro- and micronutrients, phenols and flavonoids (2). It should be remembered that because bees have different nutritional behavior and collect the nourishments from different and various plants, the produced honeys and pollen have different composition and probably different efficacy on wound healing (1, 2). On the other hand, the effectiveness of vegetable unsaponifiable oils on wound healing was evaluated in few studies. The mechanisms of action of unsaponifiable of vegetable oils in wound healing are still unknown, but majorly due to high content of phenols, flavonoids, tocopherols, squalene derived compounds (vitamin D, sterols) (3-6). In a recently performed literature review, we found few references that attempts to introduce herbal remedies and their mechanisms of action in healing of skin wounds and also provides useful information for the development of more effective wound repair drugs (7). Also there are few data available on the use of associations of different phytochemicals in the management of chronic ulcers (8). The unsaponifiable fractions of vegetable oils are quantitatively different thereby leading to different effect on wound healing. Considering that fatty acids, phytosterols, tocopherols, phenols and flavonoids have important antioxidant, eudermic, nourishing, protective, soothing effects and also act as stimulators of cell metabolism in particular of fibroblasts, emerges the importance of testing in more studies different preparations based on honey, pollen and unsaponifiable fractions of vegetable oils to be used to promote the process of healing in chronic skin wound.

## References

- 1) Oryan A, Alemzadeh E, Moshiri A. Biological properties and therapeutic activities of honey in wound healing: a narrative review and meta-analysis. *J Tissue Viability* 2016; <http://dx.doi.org/10.1016/j.jtv.2015.12.002>. pii: S0965-206X(15)00097-2.
- 2) Komosinska-Vassev K, Olczyk P, Kaźmierczak J, Mencner L, Olczyk K. Bee pollen: chemical composition and therapeutic application. *Evid Based Complement Alternat Med* 2015; 2015:297425. <http://dx.doi.org/10.1155/2015/297425>.
- 3) Oryan A, Mohammadipour A, Moshiri A, Tabandeh MR. Avocado/soybean unsaponifiables: a novel regulator of cutaneous wound healing, modelling and remodelling. *Int Wound J* 2015; 12(6): 674-85.
- 4) Kumar GS, Krishna AG. Studies on the nutraceuticals composition of wheat derived oils wheat bran oil and wheat germ oil. *J Food Sci Technol* 2015; 52(2): 1145-51.
- 5) Orhan IE, Kartal M, Gülpınar AR, Yetkin G, Orlikova B, Diederich M, Tasdemir D. Inhibitory effect of St. John's Wort oil macerates on TNF $\alpha$ -induced NF- $\kappa$ B activation and their fatty acid composition. *J Ethnopharmacol* 2014; 155(2): 1086-92.

- 6) Panahi Y, Izadi M, Sayyadi N, Rezaee R, Jonaidi-Jafari N, Beiraghdar F, Zamani A, Sahebkar A. Comparative trial of Aloe vera/olive oil combination cream versus phenytoin cream in the treatment of chronic wounds. *J Wound Care* 2015; 24(10): 459-60.
- 7) Ragno A, Cavallaro E, Marsili D, Silvestri A, Apa M, Martin LS. What about the combined action of poly-herbal on wound healing? *Wound Repair Regen* 2016; 24(1): 195.
- 8) Budovsky A, Yarmolinsky L, Ben-Shabat S. Effect of poly-herbal preparations on wound healing. *Wound Repair Regen* 2016; 24(1): 196-7.