

Bioactive hydrogel enriched with natural origin components as benefits for therapeutic applications

Mariana Chelu*, Monica Popa, Gabriela Marinescu, Jose M. Calderon Moreno
Institute of Physical Chemistry "Ilie Murgulescu" Romanian Academy, Bucharest, Romania

*E-mail: mchelu@icf.ro

INTRODUCTION & AIM

Natural products have long captured the interest of scientists due to their potential benefits and relatively low risks of side effects. Royal Jelly is a natural product with exceptional biological characteristics, a broad apitherapeutic spectrum and great demand in the pharmaceutical and food industries due to its nutritional properties. It has been shown to inhibit a wide range of bacterial strains, making it a promising candidate for combating microbial infections. Aloe vera is known for its skin benefits, acting as a moisturizer and healer for conditions like burns and acne, while Royal Jelly offers anti-inflammatory, antioxidant and anti-aging effects due to its rich nutrient profile, although studies are ongoing to fully establish its therapeutic potential. Together, Aloe vera and Royal Jelly promise to improve the body's defenses against cellular stress, though more research is needed.

The current research objective is related to the synthesis, analysis and characterization of the physicochemical and pharmaceutical properties of the mixture of Royal Jelly with Aloe vera, to form a biocomposite hydrogel of natural origin, for use in therapeutic and anti-aging applications.

METHOD

A composite hydrogel formulation prepared based on Aloe vera and Royal Jelly was evaluated in terms of specific organoleptic characteristics (such as appearance, consistency, color, homogeneity, presence of any agglomerations or phase separations, pH and swelling), as well as morphological and spectroscopic properties.



Aloe Vera gel

Royal Jelly



Figure 1: Schematic representation of sample preparation

Table 1 Sample quality properties

Appearances	Color	Homogeneity	Phase Separation	pH	Swelling
Homogeneous	Translucent, pale beige, neutral	Very good, good consistency	Stable, No phase separation	5,23 ± 0.12	189 ± 2.92

RESULTS & DISCUSSION

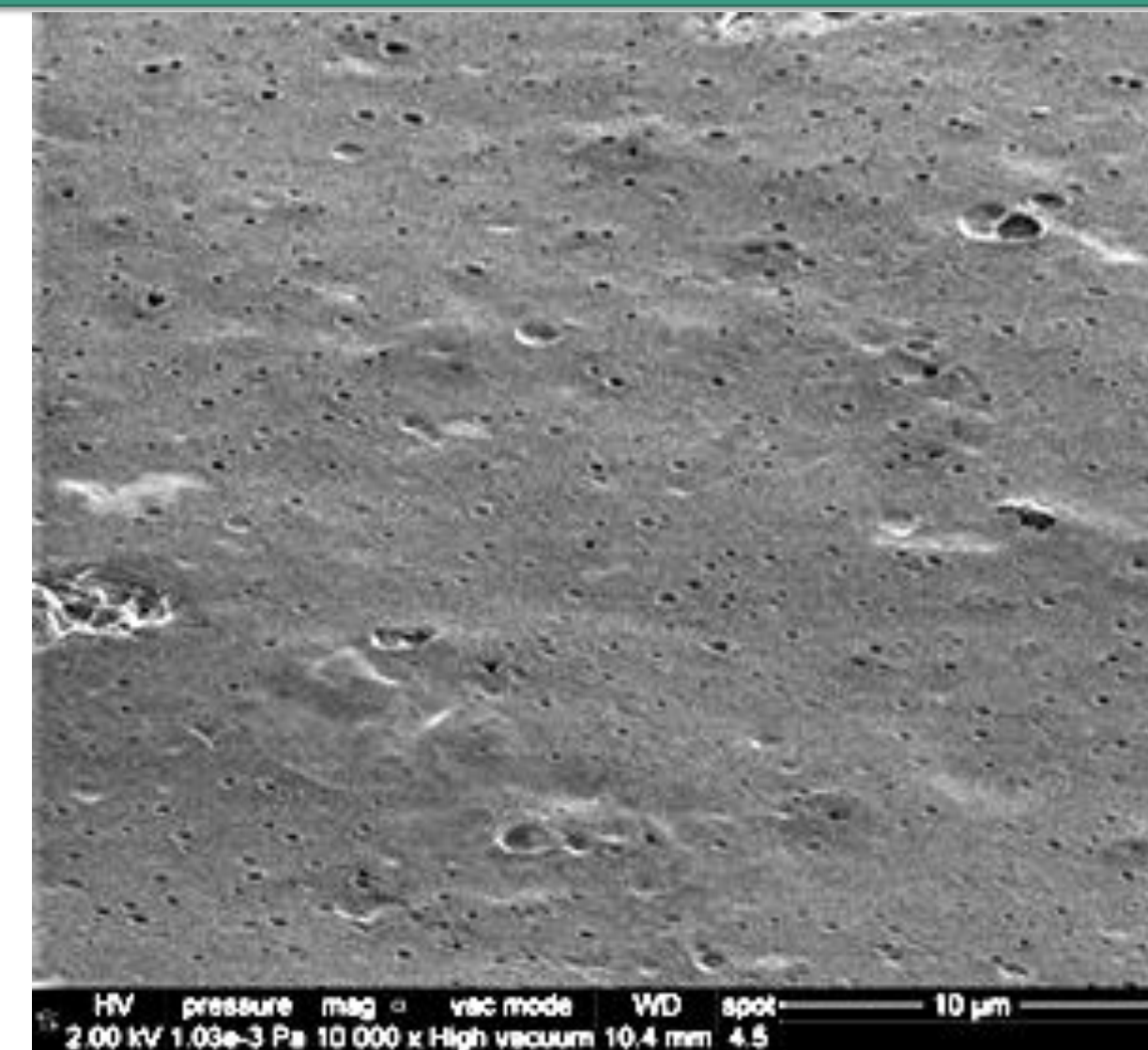


Figure 2. The SEM image of the AR hydrogel's surface.

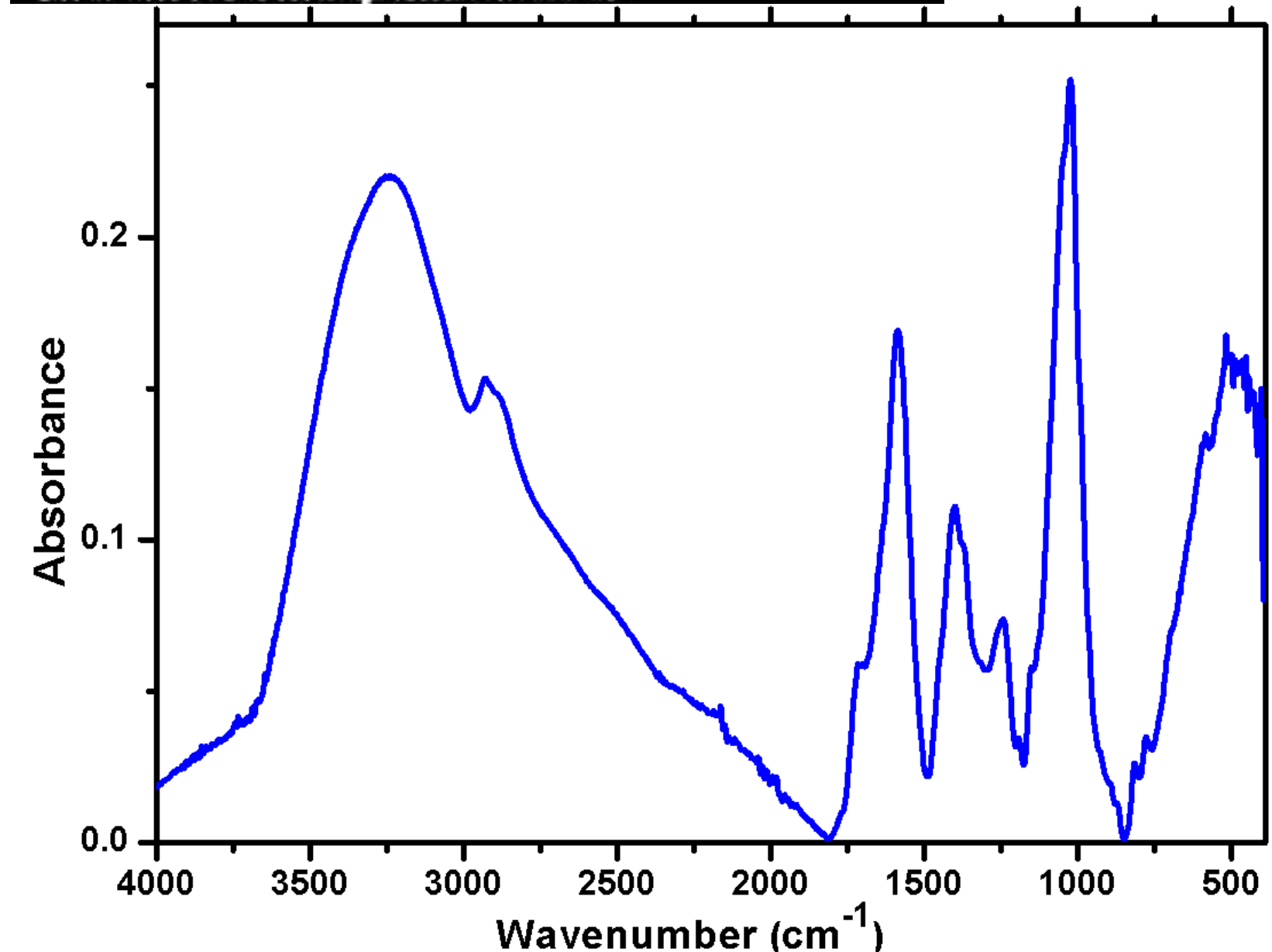


Figure 3. FT-IR spectra of AR hydrogel

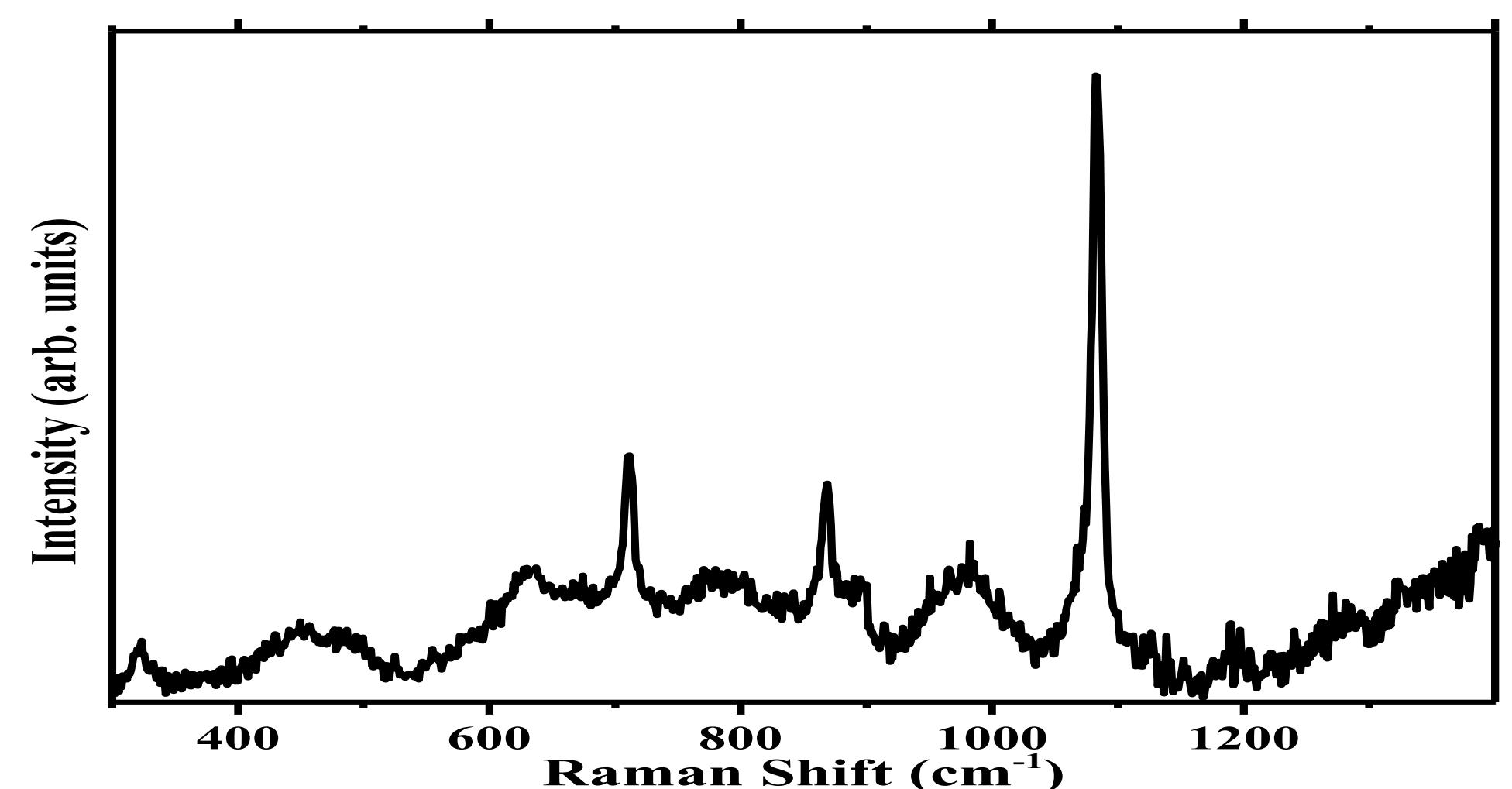


Figure 4. Raman spectra of AR hydrogel

CONCLUSION

The results highlight the considerable potential of these natural hydrogels for the management of chronic wound treatments and microbial infections and draw attention to the advantageous incorporation of Royal Jelly-derived bioactive compounds, providing dual benefits such as anti-aging, anti-inflammatory and antibacterial properties, while promoting rapid wound healing.

REFERENCES

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