

PAPER REF: 6851

INCORPORATION OF BIOMATERIALS (PROPOLIS AND CAMPHOR) IN TOPICAL ANTISEPTIC FORMULATIONS FROM DISTILLED FATTY ACIDS OF SOYBEAN OIL AND PALM OIL

Didouche Yasmina-fadhéla^{1(*)}, Djeziri Mourad^{2,3}

¹Research Unit: Materials, Processes and Environment (UR / MPE), University of Boumerdes, 35000 Algéria.

²Research Laboratory in Food Technology, Faculty of Engineering Sciences, University M'hamed Bougara of Boumerdes 35000, Algeria.

³Center for scientific and technical research in Physico-chemical analysis (CRAPC) Bou Ismail, Tipaza.

(*)*Email: fadyesdid@yahoo.fr*

ABSTRACT

This work focuses on the upgrading of biomaterials, including propolis and camphor, for incorporation into a formulation of Distilled Fatty Acids (DFA), soybean oil, palm oil. Subjected to oleochemical analysis and spectral methods, these oils have given convincing results in accordance with international standards. The good quality of these oils encouraged us to the Topical Antiseptic Formulations (TAF), respectively based on propolis and camphor, responding favorably to tests of homogeneity and pH. Their antimicrobial activity reacted positively on the tested microbial strains, found to be highly active on Gram⁺ and not very active in Gram⁻. Note that the TAF based on camphor has a better activity than based on propolis.

Keywords: antiseptic cream, propolis, camphor, distilled fatty acids.

INTRODUCTION

Besides to their use as food, Fatty Substances (FS) find particular interest in the technical field, natural substances such as bioactive molecules derived from plants are currently a particular interest for their multiple biological activities (Antibacterial and antioxidant), so appreciated by pharmacy and cosmetics (MaanBahadur R.2010). Currently, vegetables FS are available for cosmetic formulations. Their surfactant properties, biodegradability and unsaponifiables are preferred for TAF (Siaka K., 2000). Until now these materials have been very little exploited, which justifies the interest of the present work.

RESULTS AND CONCLUSIONS

The Lipid Content origin (LC) is from the refinery at the distillation stage of CEVITAL Fatty Acids (FA) sis in Bejaia (Algeria). This LC was subjected to ISO oleochemical standard analysis carried in the Research Laboratory of the Sciences Faculty (RLSF) M'Hamed Bougera Boumerdes University (UMBB) (Algeria). They relate mainly to the determination of following indices: acid (0.2), refraction at 20 ° C. (1.451), peroxide (4), saponification (194), and iodine (34), Density at 20 ° C (0.920) for palm oil and soybean oil DFA, these indices are: acid (0.45), refraction at 20 ° C (1.468), Peroxide (5.2), saponification (191), and iodine (132), the density at 20 ° C. (0.920). These results note a clear fluidity. This specificity makes it an excellent lubricant (Boha diener, 2001), considerably extending its use.

- The chromatogram notes a striking absence of light fatty acid ($C < 12$) and odd carbon fatty chains. These latter's are preferential elements of the bacteria from which they derive their food substrate (Sudan 1965), which confers microbial virginity on our LC. On the other hand, polyunsaturated, mono-unsaturated and saturated palm fatty acids oil are found in varying proportions. And a number of carbons ranging from 6 (caproic acid $C_6: 0$) to 22 (behenic acid $C_{22}: 0$). Noted cis oleate ($C_{18}: 1 n7$) and cis oleate ($C_{18}: 1 n9$) were detected. Also, literature tells us that in plants, C_{18} FA are the most common forms and precise their emulsifying and biodegradable properties. This distinctive part offers them an appreciable spectrum in industrial applications, where they are used either as an excipient or as a source of active substance, favoring their interest for industrial purposes, where surfactants are in great demand (Joey, CV Geode, 2003).

- The spectrogram (FT-IR), suggest for the most significant absorption bands:

Absorption bands at 3007.94 cm^{-1} and 3008.98 cm^{-1} are attributed to vibrations $-\text{CH}_2$ characteristic of fatty acids. An absorption band in the vicinity of 1376.95 cm^{-1} and 1377.46 cm^{-1} corresponds to the vibration C-H (CH_3), attributed to the aliphatic chains of fatty acids on glycerol.

-A band in the vicinity of 720 cm^{-1} corresponds to the vibration $(\text{CH}_2)_n$ with $n \geq 4$ characteristic of an aliphatic chain of the fat. The expected results of LC, encouraged us to formulate two TAF: one based on propolis and the other based on camphor. (Didouche Y. F., 2012). The synthesis of TAF requires an LC and fatty alcohols, auxiliary products for the emulsion stabilization and for antiseptis: propolis and camphor. Both TFA were subjected to macroscopic tests, homogeneity with a pH check, (Sanogo R 2006). The results were convincing. For antimicrobial activity of our TAF, we used the method of diffusion in agar medium (the aromatogram) using sterile disks.

ACKNOWLEDGMENTS

I, the undersigned Dr DIDOUCHE yasmina -fadhéla and Dr DJEZIRI Mourad thanked the Ministry of Science, Technology and Higher Education, FCT, Portugal, for grants PTDC / SAU-BEB / 71459/2006 and SFRH / BD / 418.

REFERENCES

- [1]-MaanBahadur R., Munzbergova Z., Binu T., - Ethnobotanical study of medicinal plants from the Humla district of western. Nepal - Journal of Ethnopharmacology. 2010. Vol.130, pp: 485-504.
- [2]-Siaka K., -Products cosmetics from vegetable oils. Techn Information F8f. 2000 pp: 1-7.
- [3]-Mr. Boha diener, Revue tabula. 2000. N ° 4 / October.
- [4]-Soudanf, Anguezm, Benzi A., Cold storage of fish, crustaceans and molluscs, Ed bailler J.B and Fils, Paris.,1965 pp: 514-520.
- [5]-P. Joey, C.V. Geode., Development of co-products from the crushing of oilseed rape on the farm (TRICOF). 2003 research project.
- [6]-Didouche Y. F., -Valorization of industrial waste economic ecological impact. Thesis of Doctorate..UMMBB Algeria. 2012pp: 24, 25, 69,70.
- [7]-Sanogo R. Formulation of a dermal ointment based on extracts of *Mitracarpus Scaber* (ZUCC), Pharm. Med. Trad. Afr. Vol / XIV. 2006 pp: 159-177.