

Application of Hydroalcoholic extracts of *Salvia officinalis* and *Salvia elegans* in cosmetic formulations

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INTRODUCTION

The incessant search for aesthetic improvement has caused a large flow of cosmetics in the pharmaceutical industry, mainly from natural products to meet the demands of the world population, being important to take into account the quality and safety of these products (Silva et al., 2015).

The two species under study are *Salvia officinalis* and *Salvia elegans*, which belong to the Lamiaceae family. The first species is of great importance to the pharmaceutical, cosmetic and food industries. (Cuvelier et al., 1996; Martins et al., 1998 in Povh & Ono, 2008), the second is known in cooking as conservant or flavoring (Pereira et al., 2014).

To ensure quality and safety of cosmetics, stability tests are performed, which are also responsible for establishing shelf life and storage conditions (Oriqui, Mori & Wongtschowski, 2013).

The objective of this study was to develop and evaluate the stability of carbopol and methylcellulose-based gels with the incorporation of hydroalcoholic extracts as active ingredient and insertion of the essential oil of both species as preservatives.

MATERIAL AND METHODS

Carbopol and methylcellulose gels were prepared according to Good Manufacturing Practice and the hydroalcoholic extracts of *Salvia elegans* and *Salvia officinalis* were incorporated at concentrations of 1.25%; 2.5% and 5%.

In order to obtain the essential oil of both species, the plants were collected at IPB's and subjected to steam dragging in a Clevenger apparatus, and the yield at the end of the extraction process was determined.

The tests used to assess stability were centrifugation, mechanical vibration, pH, freeze (-20 ° C) / thaw (40 ° C), light and dark cycles, temperature cycles at 25 ° C, accelerated stability and organoleptic tests. color, odor and appearance.

Microbiological and eye irritability (HET-CAM) analyzes were performed.

RESULTS

The EO yield of both species was 0.45% (Figure 1).



Figure 1) Extraction of *Salvia elegans* EO in Clevenger apparatus.

The stability of carbopol and methylcellulose gels of both species at 1.25% concentrations were evaluated; 2.5% and 5%.

For the centrifugation test there were no phase separations or any other visible alteration (Figures 2 and 3).

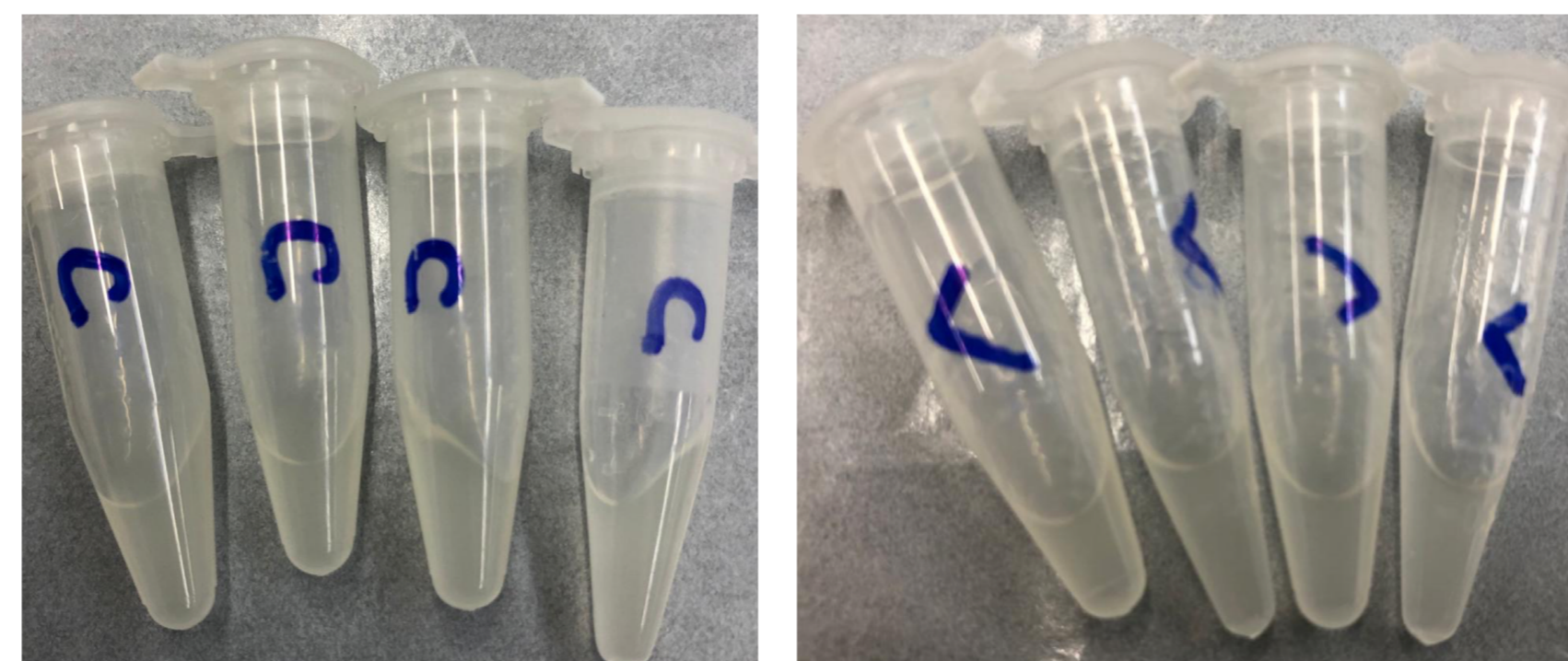


Figure 2) Centrifugation test with carbopol gel and 1.25% *Salvia officinalis*. Figure 3) Methylcellulose gel centrifugation test and 1.25% *Salvia officinalis*.

The mechanical vibration test using the vortex apparatus did not show any alterations either.

The pH of all formulations after stability tests remained within the ideal skin limits (Figure 4).

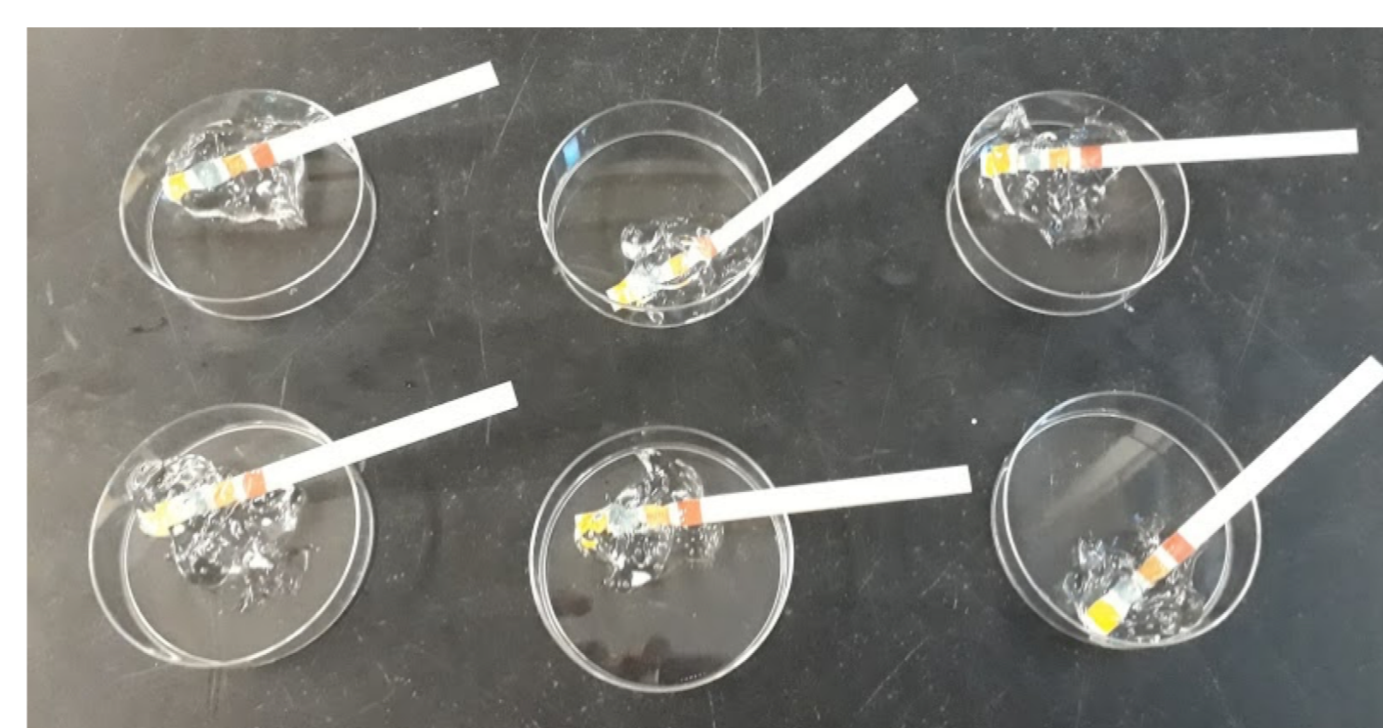


Figure 4) pH test with 1.25% carbopol gel and *Salvia officinalis* after light / dark cycle.

In the light and dark cycles only after 15 days there was a loss of color (Figures 5 and 6).

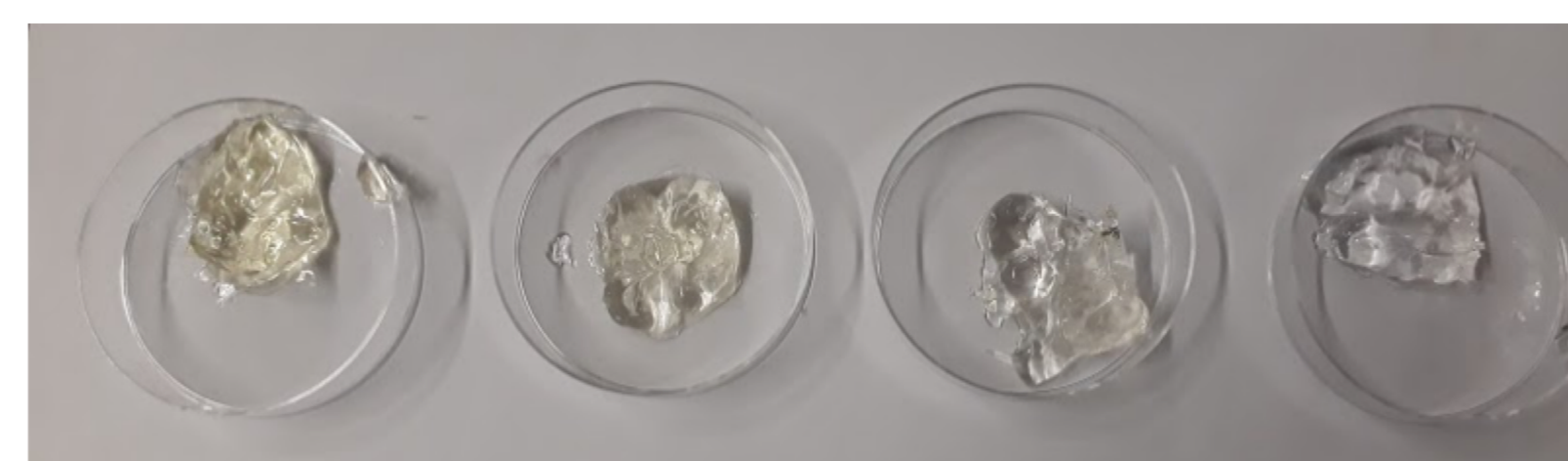


Figure 5) Carbopol gel with *Salvia elegans* extract at 5% concentrations; 2.5%; 1.25% and without active ingredient before exposure to light and dark test.



Figure 6) Carbopol gel with *Salvia elegans* extract at 5% concentrations; 2.5%; 1.25% and without active ingredient after exposure to light and dark test.

After freezing and thawing tests, in the carbopol gels with *Salvia officinalis* extract there was a loss of color and in the gels with *Salvia elegans* there was a change in appearance and pH. For the methylcellulose gels, there was a change in pH only for samples with *S. elegans* extract.

Microbiological tests were altered, inhibiting yeast growth (Figure 7).

The HET-CAM test showed no irritability or hyperemia in the egg-allantoid membrane of the eggs (Figure 8).

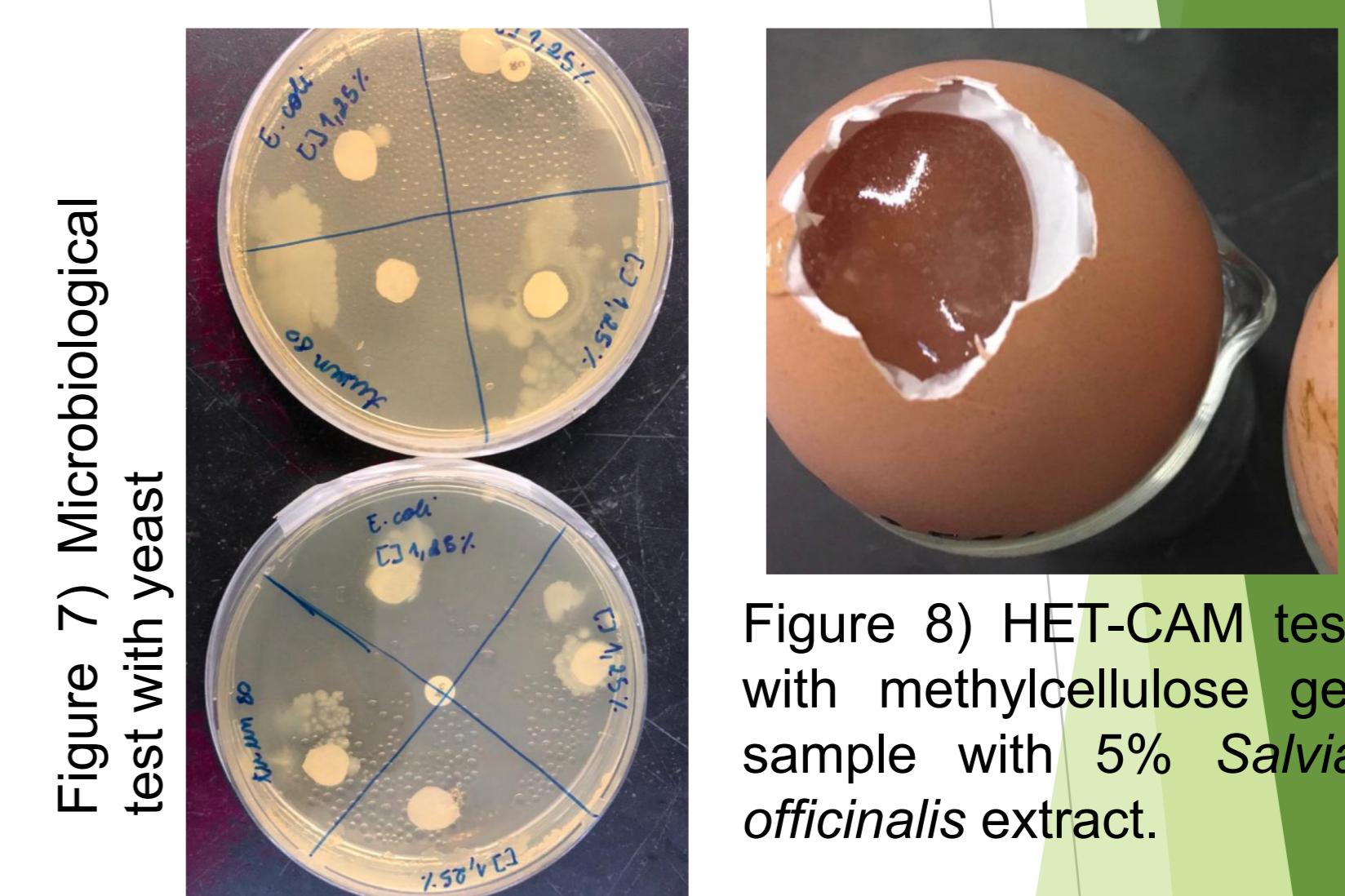


Figure 7) Microbiological test with yeast

Figure 8) HET-CAM test with methylcellulose gel sample with 5% *Salvia officinalis* extract.

CONCLUSION

It is concluded that, according to the tests performed, both carbopol and methylcellulose gels have stability, using both *Salvia* extracts, no harmful effects when used in cosmetics and can therefore be used as an anti-aging formulation.

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