EVALUATION OF EDDIBLE FILMS OF CHIA *(Salvia hispánica)* TO PROLONG THE SEHELF LIFE IN FRUITS

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Introduction. An edible film according Guilbert (1986) is a thin continuous layer made of materials that could be ingested by the consumer and provides a barrier to moisture, oxygen and solutes. The material may completely cover the food or can be placed between components of the product. Edible films have the ability to incorporate antimicrobial agents to provide food microbiological stability, these compounds have the ability to extend the shelf life of a product and reduce the risk of growth of pathogens in the food surface (Rooney, 2002; Lin, 2007; Ozdemir, 2008).
The objective of this work was to develop and characterize edible films made from mucilage of *Salvia hispanica* for its application in food industry.

Methods. *Salvia hispanica* seed was hydrated with distilled water at a ratio of 0.5:5 (w v) for 90 minutes at a temperature of 37°C with constant agitation; subsequently was ground in a blender and centrifuged at 1200 rpm for 30 minutes at a temperature of 25°C. Finally seeds were filtered. Edible films were prepared using 0.2% of $CaCl_2$, 1% of plasticizer and mucilage of chia in 6 concentrations (21, 23, 25, 30, 35 and 40%). The edible films were characterized by water activity, gas permeability and mechanical, thermal (DSC), and rheological properties.

Results. In the table 1 is observed that as the concentration of chia increases the applied stress is higher, this can occur because there is more interaction between the links of its components, which implies a greater force to achieve elongation. In the mucilage chia composition there are essential oils that influence in the mechanical behavior of the films allowing a greater flexibility. The DSC method shown that the films can´t be affected in a range of 0-100°C, it means that the polysaccharides of chia made a synergy between them and is able to blend water in the film (Ixtania, 2010). Rheological data shown that the films are pseudoplastic fluids, it means that the viscosity is high at low shear rates, and decreases with increasing γ; this behavior is related to a phenomenon of orientation of the solid particles or macromolecules in the direction of flow, the more intense is the velocity gradient applied.

Table 1. Mechanical properties of *Salvia hispanica* edible films

A (%)	B (N/mm^2) γ	C (%)	D (N/mm^2)	E	F (mm)
21	0.3328_a	35.974	2.2641	0.3267	0.056
23	0.5563b	23.014	9.0855	0.4173	0.058
25	0.7064c	14.976	10.6045	0.3477	0.062
30	0.9988d	16.236	12.1492	0.3410	0.065
35	0.8140d	19.455	14.6796	0.3590	0.071
40	1.1612d	17.736	13.8284	0.4733	0.076

a) chia mucilage, b) Young module, c) deformation, d) maximum effort, e) water activity, f) thickness

Chia films allow less gas exchange, this could be explained because the high hydrophobicity of the film, associated, in part, to the presence of nonionic low molecular weight polar solutes (Villaseñor, 2008).

Conclusions. Edible films of chia (*Salvia hispanica)* represent a new alternative for its application in postharvest fruits.

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