RHEOLOGICAL CHARACTERIZATION OF PECTIN EXTRACTED FROM TEJOCOTE (*Crataegus mexicana*).

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Introduction. Pectins are polysaccharides that are present in many vegetables. This compounds play a very important role in plants' physiology due to they absorb large amounts of water, forming gels [1]. This property makes pectin very useful in alimentary and pharmaceutical industries [1] where is used to afford consistency to some products [2]. When pectins are in solution, they have characteristic properties, which can be determined by doing rheological tests.
The aim of the present work is to describe the rheological behavior of pectins in solution.

Methods. Rheological properties of pectin extracted from tejocote (*Crataegus mexicana*), were determined by using stationary shear and small-amplitude oscillatory shear (SAOS) tests [3]. That probes were developed in a controlled stress rheometer AR2000 TA INSTRUMENTS. Pectin solutions were used at 1, 2 and 3%. Results were adjusted to Ostwald de Waele model [3] by using the software SigmaPlot v.11.0.

Results. Samples were subjected to a shear stress, with shear rates in the range of 1000-0.01 s^{-1} using a plate and cone geometry. Rheograms that were obtained by plotting data from the stationary shear analysis are shown in the figure below.

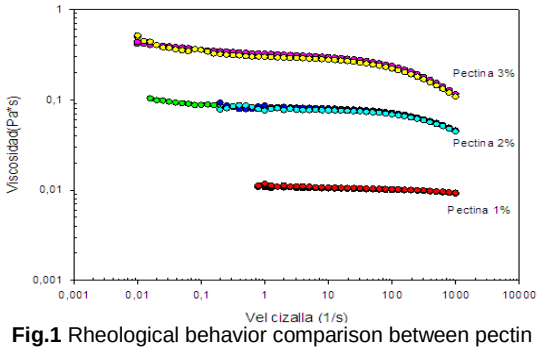

Fig.1 Rheological behavior comparison between pectin solutions at 1, 2 and 3%.

Also, adjust of the data to Ostwald de Waele model let obtain consistence (K) and flux (n) indexes that determine what type of fluid we are working: newtonian or non-newtonian. Table 1 shows the values of the indexes for each concentration.

Table 1. Values of consistence (K) and flux (n) indexes for each pectin concentration.

Pectin solution	K	n	R2
1% (test 1)	0.0125	0.9533	0.9999
(test 2)	0.0128	0.9532	1.0000
2% (test 1)	0.1868	0.7979	0.9989
(test 2)	0.1798	0.8029	0.9989
3% (test 1)	0.9565	0.6979	0.9973
(test 2)	0.8884	0.6999	0.9974

Finally, loss (G'') and storage (G') moduli were determined with SAOS test, this parameters indicate what characteristic dominates in a viscoelastic fluid. Figure 2, shows only the results for pectin solution at 3%.

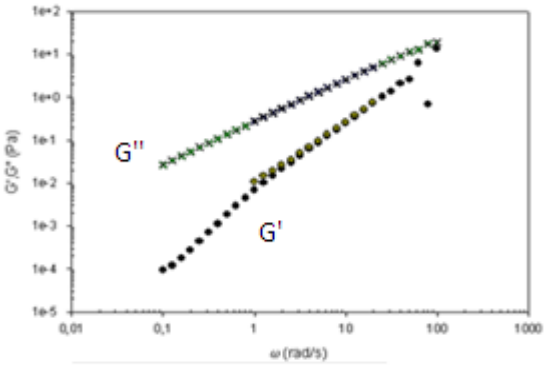

Fig.2 Loss (G'') and storage (G') moduli for pectin solution at 3%.

Conclusions. Pectin from tejocote is a newtonian fluid at low concentrations (1% n≈1) and describes a pseudoplastic behavior at higher concentrations (2 and 3% n<1). Loss modulus dominates in pectin from tejocote and that means pectin forms a weak gel.

References.

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