Texture analysis of Thermoresponsive Systems containing Propolis Microparticles for *Herpes simplex*

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PURPOSE The aim of the present study was to evaluate the mechanical properties of mucoadhesive, thermoresponsive polymeric systems containing propolis microparticles that were designed for use as a drug delivery platform within the topical administration. **METHODS** Binary polymeric formulations were prepared containing 15% (w/w) of P407 and 0.25% (w/w) of C934P. The mass of C934P was dispersed in distilled water using a mechanical stirrer, following which the mass of P407 was added to this gel and stirred to ensure complete mixing. The resultant gels were neutralized by the addition of triethanolamine. Propolis extract (EPRP) was prepared with a propolis/ethanol ratio of 30/70 (w/w) by turbo extraction. EPRP was added to the formulations at 8% (w/w), by the dripping technique, with magnetic stirring for 30 min. The mechanical properties of all formulations were determined using a TA-XT2 Texture Analyser (Stable Micro Systems, UK) in texture profile analysis mode (TPA). In TPA mode, an analytical probe (10 mm diameter) was twice forced down into each sample at a defined rate (2 mms^{-1}) and to a defined depth (15 mm), allowing a delay period (15 s) between the end of the first and the beginning of the second pass. At least six replicates analyses of each sample were performed at temperatures of 5, 25 and 37°C. From the resulting force-distance and force-time plots, the hardness, compressibility, adhesiveness, elasticity and cohesiveness were derived. **RESULTS** It was found that with increasing temperature there was an increase in hardness, compressibility, elasticity and cohesiveness of the formulation. Moreover, the addition of EPRP modified hardness, compressibility, adhesiveness, elasticity and cohesiveness of formulations. These mechanical properties were also increased as the temperature increased with EPRP in addition, all the formulations displayed adhesiveness at 37 ºC. **CONCLUSION** This result efforts the interaction between the polymers and acts as further evidence of mucoadhesion, helping to provide better retention for topical administration. **ACKNOWLEDGMENTS** The authors acknowledge the Brazilian funding agencies CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior), Araucaria Fundation, CNPq (Conselho Nacional de Pesquisa), and FINEP (Financiadora de Estudos e Projetos).