
Study of the synergy between carnauba wax and fat from palm oil to structure soybean oil

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Consumers are demanding healthier alternatives to ultra-processed food products. Structured vegetal oils with natural additives are promising substitutes to animal, and partially and fully hydrogenated fatty acids, added as an ingredient or absorbed while frying the food products. Aiming to understand the carnauba wax potential as a booster to structure solutions of fat fractionated from palm oil (FPO) in soybean oil (SBO), ternary solutions of vegetal waxes, FPO and SBO were prepared and evaluated carrying out standard methods for organogel analysis. A pyramidal graphic was built with 21 different solutions. Critical concentration, oscillatory rheology, oil binding capacity, polarized light microscopy and x-ray diffraction were the methods applied to analyze the solutions. The critical concentration of carnauba wax in SBO was 4 % (w/w), and of FPO in SBO was 50 % (w/w). Concentrations of carnauba wax as low as 1 % (w/w) were able to promote the structuration of solutions containing FPO (37.5 % w/w) in SBO. Apparent solid state of the solutions was confirmed carrying out oscillatory rheology. The synergy between carnauba wax and the FPO to bind SBO was positive since the addition of carnauba wax, even at low concentrations, improved the oil binding capacity. A similar cluster crystal morphology was observed in solutions of carnauba wax in SBO, FPO in SBO and ternary solutions. The crystal morphology determined by polarized light microscopy and confirmed by x-ray diffraction demonstrated that the size of the crystals reduces with the increase of crystallizable compounds concentration. Ternary solutions of carnauba wax, FPO and soybean oil showed interesting technological properties to substitute saturated and trans-fatty acids. Acknowledgement to FAPESP for the scholarships n° 2021/08305-1 and n° 2020/02734-5 and financial support n° 2020/05254-4