PHYSICOCHEMICAL RHEOLOGICAL AND THERMAL PROPERTIES OF COLOMBIAN HONEYS

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Colombia’s geographical position is influenced by climate factors at the intertropical convergence zone, which allow harvest honey in different regions and times, their quality properties dependent on the region and floral disposition in a defined time. Physicochemical, thermal and rheological characteristics of thirty-three Colombian honeys obtained from Caribbean (8), Coffee land (16), Andean regions (5), Andean valley and eastern plains (7), have been evaluated. pH, solids fraction (Xs), moisture (Xw), water activity (a_w), color (Pfund), electrical (EC), thermal conductivity (K), glass transition temperatures (T_g, -100 to 100°C, 10°C min^{-1}), viscosity (25°C, 0.01 and 300s^{-1}), elasticity (G'), loss (G'') and complex viscosity properties (in rheometer with a plate-plate geometry 40 mm, 700 μm gap, 0.1 and 10Hz), 3% strain in the linear viscoelastic region, were measured. Samples were found to differ from each other in color; honey with amber (86-114) and light amber (51-89) tones are dominant. pH for the Coast, Inter-Andean honeys are lowest (3.70 ± 0.13) relative to the Andes and Eastern (3.84 ± 0.15) samples, non statistical differences were observed in (Xs) and (a_w) values (Andean samples 0.810 ± 0.02 and 0.590 ± 0.110; Coast, Andean valley honeys 0.780 ± 0.05 and 0.657 ± 0.100). Typical range for electrical and thermal honeys conductivity were found (0.801 to 1.20) mScm^{-1} and (0.380 to 0.400) Wm^{-1}K^{-1}. Glass transition (T_g) occurs between (-38.3 and -49.7)°C. Honeys exhibited Newtonian behavior, with viscosity between 6.34-10.65Pa.s oscillatory rheology data revealed that viscous component predominates over elastic modulus (G'' > G') and dependent on applied frequency but no the complex viscosity.