Total Contents of Phenols and Flavonoids and Antioxidant Activity of Honeys of Africanized and Native Bees from Alagoas

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The profile of compounds with antioxidant activity (AA) in honey depends on its floral/ entomological origin, and seasonal/storage conditions. We evaluated the AA and the total content of phenolic (TCP) and flavonoid (TCF) compounds of honeys from different bees (5 samples of *Apis mellifera* honeys, 10 of *Mellipona scutellaris*, and one of each: *M. quadrifasciata*, *M. subnitida* and *Plebeia droryana*), from the backlands, coast and semi-arid regions of Alagoas (Brazil). The TCP, TCF and AA were determined [using respectively methods of Folin-Ciocalteu, $AlCl_3$, and radical 2.2-diphenyl 1-picryl-hidrazil (DPPH = 6.5 X 10^{-5} g.mL^{-1})] by analysis in triplicate and results expressed in eq. mg gallic acid (GA = 0-4 µg.mL^{-1}) or quercetin (Q = 0-5 µg.mL^{-1}). Thin-layer chromatography (silica gel 60, $F_{254\ nm}$) was evaluated using standard antioxidants (GA, Q, catechin and rutin), $CHCl_3$:CH_3OH:C_3H_7OH:H_20 (6:6:2:4 v:v:v:v) as solvent system, methanolic solutions of DPPH (0.2%) or $FeCl_3$ (2%), Folin-Ciocalteu reagent and ammonia vapors for revealing after observation under visible and UV (366 and 254 nm) light. The TCP ranged from 81.9-106.4 eq. mgGA.$100g^{-1}$ in *Apis* honeys, from 44.7-56.7 eq. mgGA.$100g^{-1}$ in *M. scutellaris* honeys, and it was respectively 33, 36.2 and 99 eq. mgGA.$100g^{-1}$ for *M. subnitida*, *M. quadrifasciata* and *P.droryana* honeys. The TCF ranged from 14.8-36.4 eq. mgQ.$100g^{-1}$ in *Apis* honeys, from 7.9-29.5 eq.mgQ.$100g^{-1}$ in those of *M. scutellaris,* and it was respectively 7.6, 10.4 and 40.4 eq. mgQ.$100g^{-1}$ in *M. quadrifasciata*, *M. subnitida* and *P. droryana* honeys. A good correlation (R = 0.79) between TPC and TFC was seen, and the AA of *Apis* honeys was superior than others. TLC-bands showed similar retention factors to the patterns of antioxidants revealed by DPPH and $FeCl_3$. Thus, according to their entomological origin, the honeys varied in their composition and bioactivity.

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