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Honey is a natural product valued for its nutritional composition and health benefits, although environmental pollution and adulteration may compromise its quality and safety. This study investigated the physicochemical properties and elemental composition of 33 honey samples of different botanical and geographical origins, including adulterated products. Physicochemical parameters were determined, while macroelements and trace elements were quantified using inductively coupled plasma mass spectrometry (ICP-MS).



Honey Sample	K	Mg	P	Fe	Cu	Pb	Zn
8	1696.0	38.2	69.9	7.4	32.3	10.1	20.6
9	412.0	26.4	54.0	38.7	159.1	92.5	97.1
14	2942.0	122.0	160.4	6.3	0.9	0.1	1.1
25	1866.0	29.8	72.1	1.3	1.3	4.5	1.8
33	4094.0	88.4	268.4	3.8	4.4	0.1	1.0

Considerable variability in physicochemical properties and elemental composition was observed among the analyzed honey samples. Sample 33 showed the highest K and P concentrations among the selected samples, while Sample 9 exhibited markedly elevated Fe, Cu, Pb and Zn levels. Several samples also deviated from regulatory limits for electrical conductivity, water content, and heavy metals. Overall, physicochemical characterization combined with ICP-MS elemental profiling proved valuable for assessing honey quality and safety.