

PROTEOMIC SIGNATURE OF NON-ALCOHOLIC BEVERAGES VIA COMBINATORIAL PEPTIDE LIGAND LIBRARIES

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Just when buying high fashion one wants to make sure to purchase a genuine item by looking carefully at the trade mark imprinted in, so today a customer can look at the “proteomic signature” revealed by combinatorial peptide ligand libraries (CPLLs), able to identify the correct origin of such beverages. CPLLs is a performant technology for the detection of low- and very-low-abundance proteome, applied until now to plenty of biological samples and recently to alcoholic beverages (beer; *J Proteome Res.*,2010, 9(10),5262, white and red wines; *J Proteomics*, 73, 2010, 1732 and 2370). Here we have adopted this technique for exploring the “hidden” proteome of non-alcoholic beverages first of all to certify the genuineness of such products and secondly to screen for the presence of any potential allergen in these beverages. Our attention has focused on several different non-alcoholic beverages, stated to be produced with natural extract and we here report the capture via CPLLs of the full content of such drinks, as purchased in supermarkets. Our method is based on sample pre-treatment with 1% polyvinylpyrrolidone (PVPP), in order to precipitate polyphenols strongly interfering with the CPLLs capturing process, and on capture at three different pH values (pH 4.0, 7.0 and 9.3) enabling essentially complete harvest of all proteins present in these beverages. The proteome thus captured has given sharp SDS-PAGE patterns, stained by silver nitrate compatible with mass spectrometry. MS analysis, performed by LTQ Orbitrap equipment, has identified proteins belonging to natural components. The presence of these proteins has confirmed the genuineness of such beverages and suggested the possibility of certifying whether soft drinks, present on the market, are indeed made with vegetable extracts or only with artificial chemical flavouring.