

COLD PRESSED OILS: MORE UNDERSTANDING OF THE CHEMISTRY BEHIND NEEDED

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Cold-pressed oils have become very popular commodity since they are believed to contain compounds associated with health benefits that are transferred in high quantities from a raw material from which they are prepared. Minimal losses of bioactive compounds are expected thanks to mild processing condition used for their production. Currently, a wide range of oily seeds is used for cold-pressing; some of them were not traditionally used for plant oils preparation. With regards to a relatively high cost of cold-pressed oils, various fraudulent practices might be encountered. In our study, in which altogether 12 kinds of freshly-pressed oils (prepared from various seeds of flax, pumpkin, hemp, poppy, argania, milk thistle and black cumin) and those after oxidation were involved (to accelerate oxidation process, oils were held 10 days in closed jars at 60°C). In experimental work, we focused not only on the oils authentication, but also on assessment their stability and identification of oxidation markers. In addition to conventional tests commonly performed when evaluating oils oxidation, polar fraction of oils (isolated by aqueous methanol) in which most of bioactive compounds is present, was in depth investigated using UHPLC/ SFC- HRMS/MS techniques for non-targeted screening. Employing advanced chemometric methods for data processing, clustering of cold-pressed oils, regardless their degree of oxidation, was observed, moreover, a number of characteristic markers enabling their classification was identified. Interestingly, transformation of these compounds, as the result of oxidation process, was observed, this was, for instance, the case of cyclolinopeptides characteristic for linseed oil. In the follow-up study, the assessment of bioactivity of these oils based on employing an array of biochemical and cell test will be performed.

Keywords: cold-pressed oils, authentication, stability, oxidation markers