

## **Organic and Organic-Destoned Virgin Olive Oils: Their Potential Protective Role against Oxidative Stress and Dismetabolic Syndrome**

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Some compositional figures from our database, obtained by HRGC, HPLC, GC-MS, HPSEG and other analytical methods, relating to either nonorganic-unstoned (NOU), nonorganic-destoned (NOD), organic-unstoned (OU), organic-destoned (OD) or organic-destoned-enzyme-treated (ODET) virgin olive oils (*Coratina*, *Provenzale*, *Leccino*, and *Nocellara del Belice* varieties) are referred to in this work. Destoner did not subjected olive paste to the *mechanical-thermal stress* and moreover removed the kernel oxidoreductase enzymes (peroxidases and polyphenoloxidases noticeably), responsible for oil oxidation and other degradation processes. Thus, it led to obtain natural oils markedly enriched in nutraceutical, functional, terpenic or nonterpenic phytochemicals, which strongly affected their bionutritional and health properties. In particular, compared to reference oils, they were richer in  $\alpha$ -T,  $\gamma$ -T, tocotrienols ( $\alpha$ -T<sub>3</sub> and  $\gamma$ -T<sub>3</sub>), biophenols (natural and oxidised oleuropein and ligstroside derivatives, lignans, flavonoids, phenol acids and phenol alcohols) and *oleocanthal* (*p*-HPEA-EDA). This is a natural aspirin-like compound exerting anti-inflammatory effects against COX 1 and COX 2. Destoned oils also were richer in pleasant green volatile compounds (aldehydes C<sub>6</sub> noticeably) biogenerated from 13-hydroperoxides of LA or  $\alpha$ -LnA (having a *cis-cis*-1,4 pentadiene system) through the "lipoxygenase cascade". They had higher stability, longer shelf-life and balanced colour (as proved by CIE, CIELAB and CIELUV chromatic parameters and contents of chlorophylls, pheophytins, carotenes, and xanthophylls). ODET and OD oils were excellent new produces with meaningfully enhanced concentrations of nutraceutical and functional factors and higher bioactivity level. They can thus represent a reliable effective aid against oxidative stress, early ageing, dismetabolic syndrome, several cancer types, and other current human pathologies. This will lead to enhance both wellbeing and longevity.

**Keywords:** *nonconventional virgin olive oil types; analytical pattern; richness in nutraceuticals; potential effects on human health and against cell ageing; chemometrics.*