

Pigment Content and Colour of Monovarietal Virgin Olive Oils from Four Olive Varieties grown in Madrid (Spain)

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Introduction. Chlorophyll and carotenoid pigments greatly influences the colour of Virgin Olive Oils (VOOs), which is the first sensory attribute evaluated by consumers. Moreover, the interest for food pigments is increasing due to their health benefits.

Objective. The aim of this work was the determination of the chlorophyll and carotenoid pigments content together with the evaluation of oil colour in monovarietal VOOs produced from four olive cultivars (Cornicabra, Picual, Castellana and Manzanilla Cacereña) grown in Madrid (central Spain).

Material and Methods. Olives of different varieties were harvested in two consecutive crops (2010/11 and 2011/12) and picked at bi-weekly intervals from November 15 to December 31. Olive oils were extracted using Abencor system. Chlorophyll and carotenoid pigments and CIEL*a*b* colour parameters were determined in the oils.

Results and discussion. Results show a significantly higher total pigment content in Picual oils, with a mean value of 21.1 mg/kg. Castellana, Cornicabra and Manzanilla Cacereña oils exhibit mean values of 18.5, 15.5 and 10.0 mg/kg respectively.

Chlorophylls content ranges from 3.9 mg/kg in M. Cacereña oils to 10.4 mg/kg in Picual oils. Carotenoids concentration ranges between 6.1 mg/kg in M. Cacereña oils and 10.7 mg/kg in Picual oils. No significant differences were found among the pigments contents for the monovarietal oils as olive fruit ripened.

The highest carotenoid/chlorophyll ratio is found in M. Cacereña oils (1.97) opposite to Cornicabra oils (0.99). These ratios remain stable for the oils obtained from the different fruit ripening stages.

With regard to CIEL*a*b* colour parameters (L^* , a^* , b^*), results show slight differences among varieties. According to the negative a/b ratio, all the VOO lie within the greenish-yellow colour zone. The oil colour does not change along the harvest season.

The best correlation between colour coordinates and pigments content was found between carotenoid content and b^* ($r = 0.85$, $p < 0.05$).

The pigments content together with other analytical parameters might be used as markers of typicity for VOOs. Otherwise, a/b ratio wouldn't be useful for this purpose.