Influence of olive anthracnose and olive fruit fly on bioactive compounds of Cobrançosa olive oils

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Phenolic compounds are the most important bioactive compounds in olives and since 2012 a health claim can be declared for the olive oil if it contains more than 5 mg of hydroxytyrosol (Hyt) and its derivatives per 20 g of oil[1]. In turn, β-carotene is a precursor of vitamin A that essentially functions in many biological processes including vision. However, the presence of bioactive compounds in olive oils depends on cultivar, agro-ecological conditions, harvest time, post-harvest, extraction technology and storage. Pests and fungal diseases of olive fruits, mainly olive fly (*Bactrocera oleae*) and anthracnose (*Colletotrichum* spp.), are among the main constraints that affect both olive production and oil quality. The most relevant fungal disease of the olive tree in Portugal is anthracnose, also known as "Gafa", resulting in a depreciating effect on the quality of olive oil, reflected mainly in increasing free acidity and in the presence of negative sensory attributes[2]. 'Cobrançosa' cultivar is considered moderately susceptible[3] to the disease and Cobrançosa oils are known for their high contents in phenolic compounds, that gives high intensity of bitter and pungent notes, that´s why this oil is usually used in the blends of "premium extra virgin olive oils".

The present study is focused on the effect of olive anthracnose and olive fruit fly on the concentration of bioactive compounds, namely in phenol composition, Hyt and its derivatives (health claim) and β-carotene in olive oils extracted from olives of the cultivar 'Cobrançosa', harvested in October and November in two consecutive years, in Castelo Branco. The olives were extracted in an Abencor laboratory system after harvest, without any storage time. The phenolic profile was evaluated by HPLC-UV and the total Hyt derivatives by HPLC-DAD; total carotenoids were evaluated by VIS spectroscopy.

The results show that the total concentration of Hyt and tyrosol (Tyr) is higher than 5 mg/20g, the minimum value that allows the use of this health claim, for all Cobrançosa olive oils, throughout ripening, in both campaigns and regardless of the incidence of pests and diseases. Although, also dependent on ripening stage, the lower content of β-carotene (1.58 mg/kg) was achieved for fruits with higher severity of fly attack (40%) and anthracnose (12%). From the sensory point of view, a decrease in all positive attributes was observed in Cobrançosa oils, corresponding to a decrease in oleacein and oleocanthal, when biotic stress increased. However, no sensory defects were observed. Both oleacein and oleocanthal are phenolic compounds highly related with the positive attributes of bitterness and pungency in virgin olive oils. Thus, the presence of pests and fungal diseases may compromise the use of Cobrançosa oils in award-winning olive oil blends, mainly due to the decrease in the intensity of these attributes.

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References:

1. Commission Regulation (EU) No 432/2012 of 16 May 2012 establishing a list of permitted health claims made on foods, other than those referring to the reduction of disease risk and to children's development and health**.**

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