Oil Content of Three Olive Cultivars (*Olea europaea* L.) in Beira Baixa (Portugal)

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Keywords: Galega cv., Bical cv., Cordovil cv., ripening index.

Abstract

The three main cultivars of *Olea europaea* L. at Beira Baixa are Galega vulgar, Bical and Cordovil de Castelo Branco. Humidity and oil content, by NMR, for the monovariety olive pastes were studied for two years, 1998/99 and 1999/2000.The results showed that Galega vulgar had significantly lower oil content when compared with Bical and Cordovil de Castelo Branco; but Bical and Cordovil de Castelo Branco did not differ significantly from each other concerning this parameter.The humidity values observed for the three cultivars are significantly different: Cordovil presents similar values during the three harvests while Galega vulgar and Bical showed their maximum values at the second harvest.

INTRODUCTION

Olive is the most extensive arboreus crop in Beira Interior, an inland region in the centre of Portugal. It occupies about 60.000 ha. In 1995 97.3% of this area was cultivated for oil production (DRABI, 1998). The most common cultivar is Galega vulgar, but Bical and Cordovil de Castelo Branco are characteristic of this region.

This research project studies some characteristics of the fruits and olive oils for the three cultivars in order to provide more detailed agronomical and technologic knowledge aimed at achieving a better quality.

MATERIAL AND METHODS

Olive samples

Olive fruits (***Olea europaea*** L.) cv. Galega vulgar, Bical and Cordovil de Castelo Branco were harvested in eight different olive groves in 1998/99 and 1999/2000.Three harvests were made in October/November (by two weekly intervals) in order to evaluate the yield of the three cultivars and the evolution of the fruits.

Analytical methods

Samples were subjected to dryness at 105ºC ± 2ºC, until constant weight, in order to evaluate their moisture content. Oil content was measured by nuclear magnetic resonance (NMR) in Oxford 4000 equipment, following the methodologies described in previous papers (Pinheiro-Alves and Gusmão, 1994; Pinheiro-Alves et al*.,* 1998). The ripening index of fruits was calculated by the method of Estación de Olivicultura y Elaiotecnia de Jaen (Hermoso et al., 1997).

Statistical analysis

Statistical analysis was performed by STATVIEW 4.01 software. Differences were considered statistically significant when probability was greater than 95% ($P<0.05$).

RESULTS AND DISCUSSION

The results showed that Galega vulgar had significantly lower ($P\leq 0.0001$) oil content when compared with Bical and Cordovil de Castelo Branco in both years (1998/99 and 1999/2000); but Bical and Cordovil de Castelo Branco did not differ significantly from each other concerning this parameter (Tables 1 and 2).

Although Galega vulgar and Bical de Castelo Branco showed in the second year a higher ripening index, the same oil content (% d. w.) was achieved in the third harvest date (Fig. 1 and 2). The oil content (% d. w.) is always greater in the late cultivars (Fig. 2 and 3); this is in accordance with previous studies by Pannelli et al. (1990) for other cultivars.

The humidity values observed for the three cultivars are significantly different when both years are considered. Also for this parameter Cordovil presents similar values during the three harvests while Galega vulgar and Bical showed their maximum values at the second harvest (Fig. 4).

Galega vulgar, besides the low oil content of its fruits, showed good quality parameters for its monovariety olive oils, namely a high content of monounsaturated fatty acids.

ACKNOWLEDGEMENTS

This work has been supported by Project PAMAF-IED- 6025: "O Olival de Azeitona Galega, Bical e Cordovil na Parte Sul do Distrito de Castelo Branco - Selecção de Morfotipos, Caracterização Isoenzimática e Qualidade dos Azeites Elementares".

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Tables

Table 1. Scheffé test for comparisons of oil content in olive pastes dry weight (%), at 5% significance level, for varieties in 1998/99.

Comparison	Mean difference	Critical difference	P value
Bical, Cordovil	0.018	1.836	0.9997
Bical, Galega	7.869	1.782	< 0.0001
Cordovil, Galega	7.851	1.708	< 0.0001

Table 2. Scheffé test for comparisons of oil content in olive pastes dry weight (%), at 5% significance level, for varieties in 1999/00.

Comparison	Mean difference	Critical difference	P value
Bical, Cordovil	0.177	1.447	0.9551
Bical, Galega	8.272	1.431	< 0.0001
Cordovil, Galega	8.094	1.414	< 0.0001

Figures

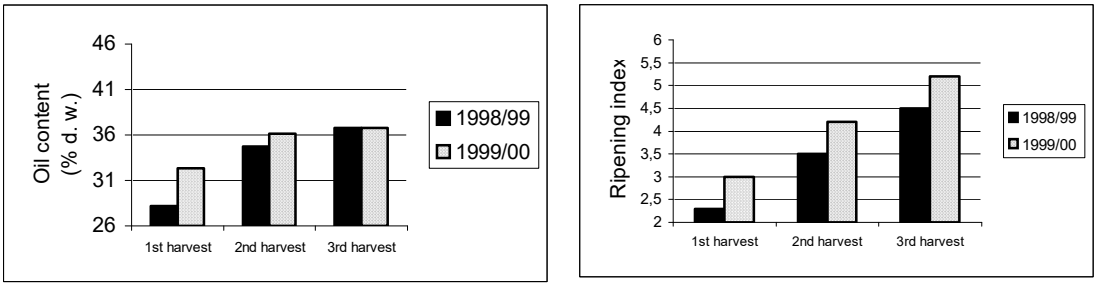

Fig 1. Galega vulgar cv. for three harvests in 1998/1999 and 1999/00: oil content of olive pastes and ripening index.

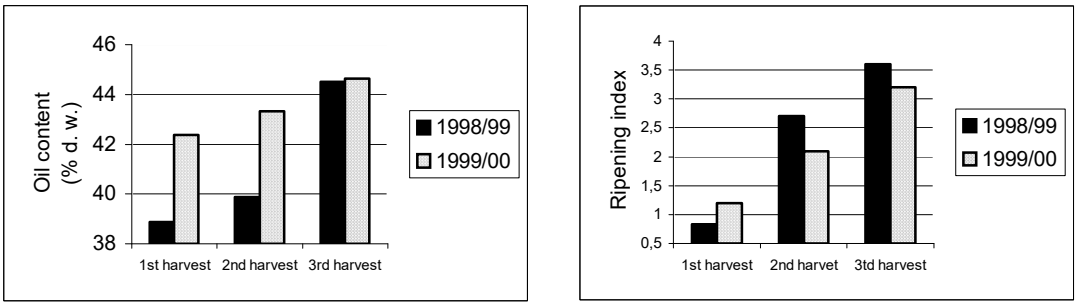

Fig 2. Bical cv. for three harvests in 1998/1999 and 1999/00: oil content of olive pastes and ripening index.

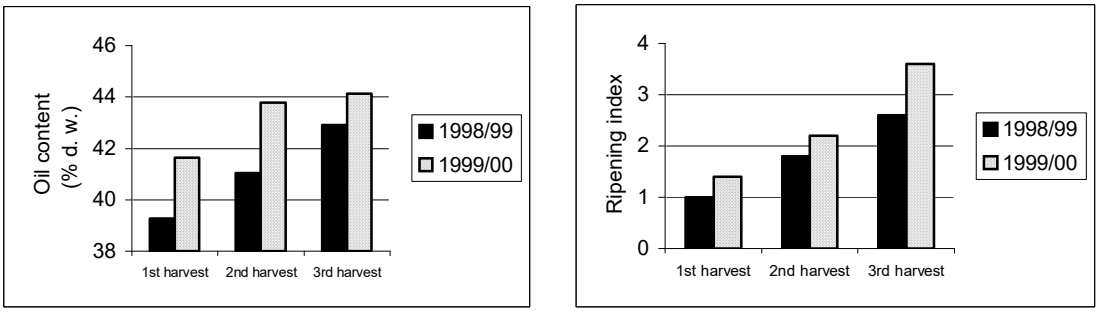

Fig. 3. Cordovil cv. for three harvests in 1998/1999 and 1999/00: oil content of olive pastes and ripening index.

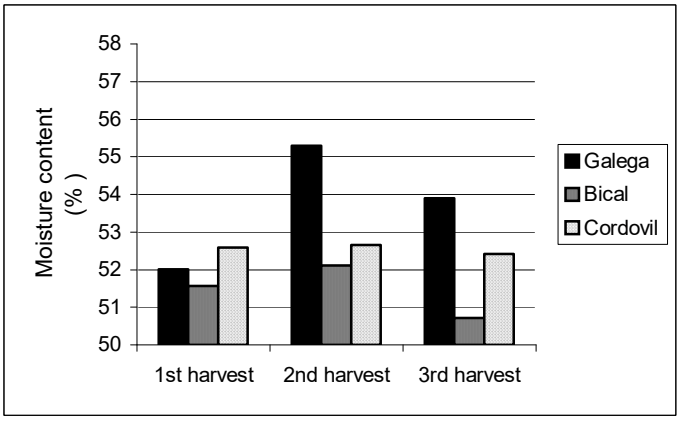

Fig. 4. Moisture content of olive fruits of Galega, Bical' and Cordovil cvs. for three harvests in both years.