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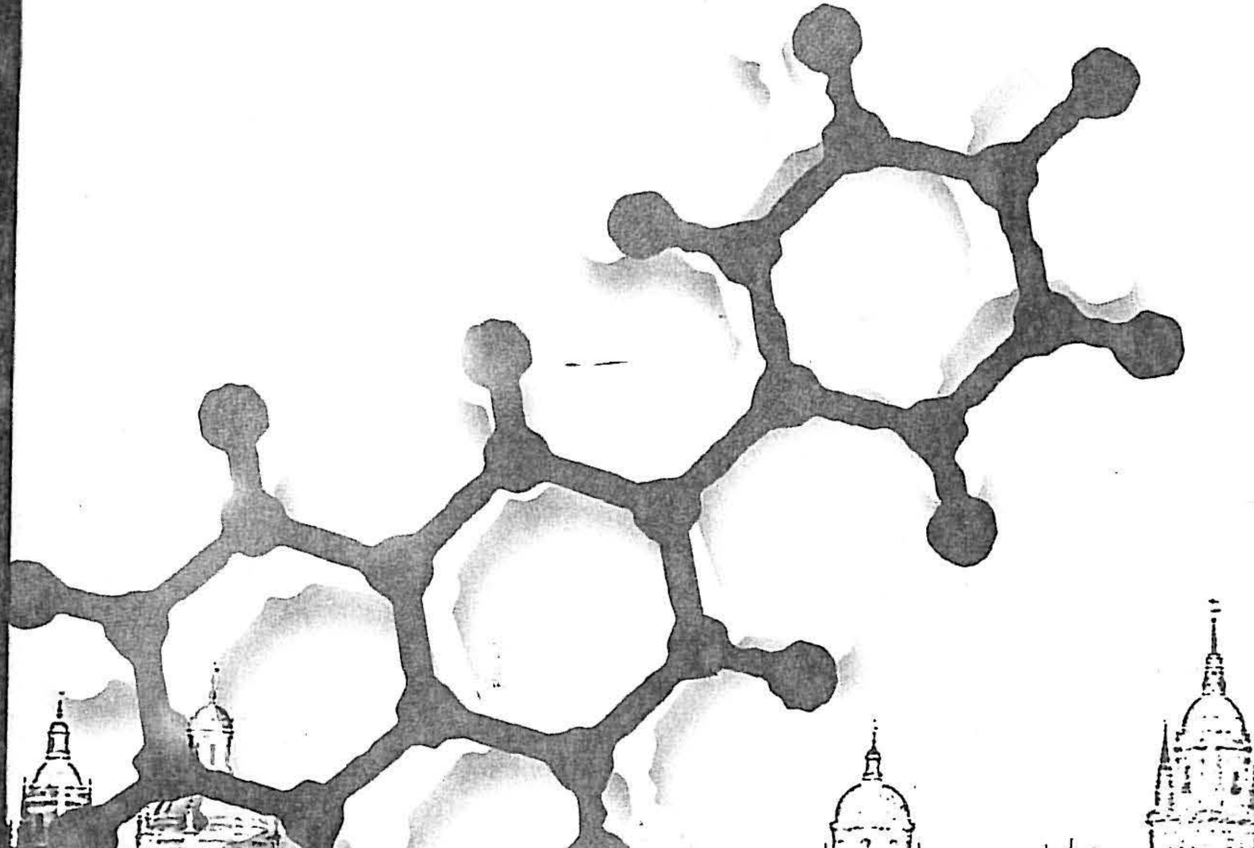

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Phenolic composition of *Cydonia oblonga* Miller leaf

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Abstract. Phenolic profile of 36 *Cydonia oblonga* Miller leaf samples, from 3 different geographical origins of Portugal, harvested in 3 collection months, was determined by HPLC/DAD. Quince leaf presented a common profile composed by 9 constituents: 3-*O*-, 4-*O*- and 5-*O*-caffeoylquinic acids, 3,5-*O*-dicaffeoylquinic acid, quercetin-3-*O*-galactoside, quercetin-3-*O*-rutinoside, kaempferol-3-*O*-glycoside, kaempferol-3-*O*-glucoside and kaempferol-3-*O*-rutinoside. *C. oblonga* leaf total content varied from 4.9 to 16.5 g/kg of dry matter, indicating that this leaf can be used as a good and cheap source of bioactive constituents. 5-*O*-caffeoylquinic acid was the major phenolic compound (36.2%). Significantly differences were found in 3-*O*-caffeoylquinic and 3,5-*O*-dicaffeoylquinic acids contents, according to geographical provenience and harvesting month.

Introduction. The importance of many plants as natural sources of polyphenols and as nutrition promoting human health is well-established [1].

Nowadays, quince fruit is recognized as a good, cheap and important source of health promoting compounds, especially due to its antioxidant, antimicrobial and antiulcerative properties [2,3]. Several studies suggest that phenolic compounds are the main responsible for these activities and consequently by the possible health benefits associated [2].

It has also been reported that the leaves and fruits of *Cydonia oblonga* Miller have some positive effects in the medical treatment of various conditions, including cardiovascular diseases, haemorrhoids, bronchial asthma, and cough [4].

As far as we know, for *C. oblonga* leaf, few phytochemical studies have been developed. So, in continuation of our investigation on this plant species, the work herein represents a contribution to the chemical composition of quince leaf, concerning its phenolic profile. It was also our purpose, to study the possible influence of factors, such as geographical origin and collection month, in the phenolics content.

Materials and Methods. *Samples.* 36 healthy quince leaf samples were collected in 3 geographical origins of Portugal (Bragança, Carrazeda de Ansiães and Covilhã), in the beginning of June, August and October of 2006. *Extraction of phenolic compounds.* Phenolics were extracted with methanol (40°C) and the extracts were purified by using SPE C18 columns, as previously reported [2].

HPLC/DAD system. 20 µl of the purified extracts were analyzed on an analytical HPLC unit, using a C18 Spherisorb ODS2 column. The solvent system used was a gradient of water-formic acid (19:1) and methanol, as previously reported [2]. Detection was achieved with a Diode Array Detector (DAD).

Results and Discussion. The leaf of *C. oblonga* presented a chemical profile composed by 9 phenolic compounds: 3-*O*-, 4-*O*- and 5-*O*-caffeoylquinic acids, 3,5-*O*-dicaffeoylquinic acid, quercetin-3-*O*-galactoside, quercetin-3-*O*-rutinoside, kaempferol-3-*O*-glycoside, kaempferol-3-*O*-glucoside and kaempferol-3-*O*-rutinoside (Figure 1). Comparing this qualitative profile with that of quince fruit there are some differences: pulp was characterized by the presence of only 6 of these compounds (3-*O*-, 4-*O*- and 5-*O*-caffeoylquinic acids, 3,5-*O*-dicaffeoylquinic acid, quercetin-3-*O*-galactoside and quercetin-3-*O*-rutinoside); peel contained 13 phenolics, the compounds presented in leaf, plus 4 not totally identified (2 quercetin glycosides acylated with *p*-coumaric acid and 2 kaempferol glycosides acylated with *p*-coumaric acid); seed presented 11 phenolics, the 4 hydroxycynamic acid derivatives presented in leaves and 7 *C*-glycosil flavones (lucenin-2, vicenin-2, stellarin-2, isoschaftoside, schaftoside, 6 *C*-pentosyl-8-*C*-glucosyl chrysoeriol and 6-*C*-glucosyl-8-*C*-pentosyl chrysoeriol) [2].

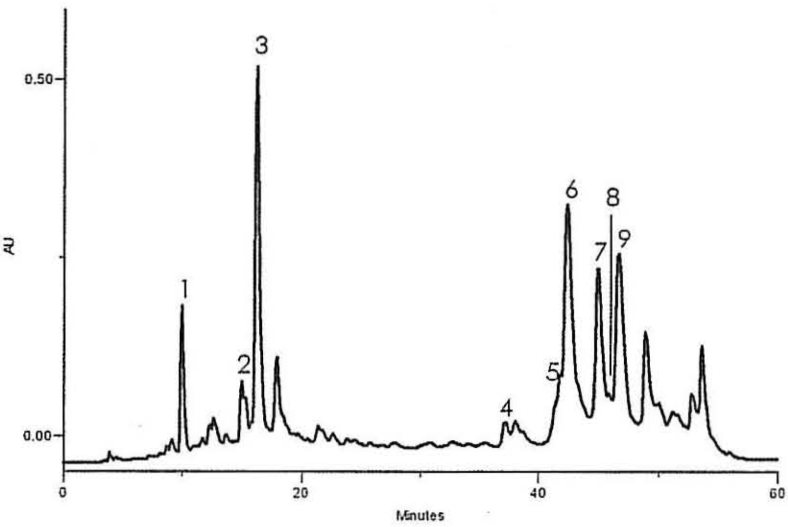

Figure 1. *HPLC phenolic profile of quince leaf. Detection at 350 nm. Peaks: (1) 3-O-caffeoylquinic acid; (2) 4-O-caffeoylquinic acid; (3) 5-O-caffeoylquinic acid; (4) 3,5-O-dicaffeoylquinic acid; (5) quercetin-3-O-galactoside; (6) quercetin-3-O-rutinoside; (7) kaempferol-3-O-glycoside; (8) kaempferol-3-O-glucoside; (9) kaempferol-3-O-rutinoside.*

C. oblonga leaf total phenolics content varied from 4.9 to 16.5 g/kg of dry matter and the most abundant compound was 5-*O*-caffeoylquinic acid (36.2%), followed by quercetin-3-*O*-rutinoside (21.1%). When compared with quince fruit, leaf is characterized by higher total phenolics content and relative concentrations of kaempferol derivatives, especially in what concerns kaempferol-3-*O*-rutinoside (12.5%). Generally, in pulp and seed, the most abundant compound was also 5-*O*-caffeoylquinic acid, representing ca. 59% and 21% of the total phenolics content, respectively, while the major compound in peel was quercetin-3-*O*-rutinoside (ca. 38%) [2].

Significantly differences were found in 3-*O*-caffeoylquinic and 3,5-*O*-dicaffeoylquinic acids contents, according to geographical origin and collection month, which indicates a possible use of these compounds as geographical provenience and/or maturity markers.

So, in conclusion, this study suggests that leaf from *C. oblonga* can be used as a great and cheap source of bioactive compounds and may have relevance in the prevention of diseases in which free radicals are implicated.

References

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