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SEED FATTY ACID COMPOSITION IN WILD FORM AND CULTIVARS OF *LAUROCERASUS OFFICINALIS* ROEM.

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Abstract

Seed fatty acid composition in the wild form and cultivars of *Laurocerasus officinalis* are reported. C18:1 and C18:2 chain length pattern were the dominant fatty acids in seeds of all species. C18:1 values in *L. officinalis* cultivars was higher than wild form whereas C18:2 value was higher in wild forms.

Introduction

The value of fatty acid patterns in deducing systematic relationships among plants is becoming increasingly apparent. Many recent studies in which phylogenetic and taxonomic aspects are considered in reletion to fatty acid composition suggest that fatty acids have evolutionary implication and taxonomic significance in higher plant systematics (Shortland, 1963; Harborne *et al.*, 1984; Hegnauer, 1989).

Laurocerasus officinalis Roem. (fam: Rosacae) [Syn: *Padus laurocerasus* (L.) Miller, *Cerasus laurocerasus* (L.) Lois, *Laurocersus vulgaris* Carr.] is an evergreen plant of upto 10-12 m length with bright blackish and bitter fruits (Davis, 1972). *L. officinalis* (Chery laurel) is distributed in North Ireland (Pamay, 1992), south west Europe (Flint, 1983), Bulgaria and Yugoslavia (Davis, 1965), minor Asia (Milan, 1984), Iran and west Caucasica (Davis, 1965). In Turkey, it is commonly distributed in the Black Sea Region, 20-1500 m above sea level and rarely in Balikesir and Hatay (Davis, 1965).

L. officinalis has been cultivated for its sweet and delicious fruits (drupe) which contain large oily seeds with hard seed coat. The wild form and cultivars are well known folk medicinal plants for their fresh leaves, fruits and seeds, since they posses calmative and cough regulator (Baytop, 1991; Baytop, 1989) and externaly used for anti-pruriginous and analgesic effect on local pains (Milan, 1984).

There does not appear to be any report on the fatty acid composition among the cultivars and wild form of *L. officinalis*. The present report describes the distribution of fatty acid composition in seeds of wild form and cultivars of *L. officinalis* of the Black Sea Region viz., *L. officinalis* Roem cv. 'Oxygemmis', cv. 'Globigemmis' and cv. 'Angustifolia'.

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Material and Methods

Seeds: Cherry laurel fruits, cv 'Oxygemmis' (Trabzon-Of), cv 'Globigemmis' (Trabzon-Of), cv' Angustifolia' (Trabzon-Vakfikebir) and the wild form of *L. officinalis* Trabzon-Akcaabat/Akcaköy were harvested in mid-August, 1994, approx. 10-600 m above sea level. Mature seeds were removed from the mezocarps and dried in open air in the Herbarium of University of Karadeniz Technical in Biology Department. For each species 1g seed was used for analysis.

Lipid Extraction: Seed samples of each plant were homogenized in porcelain mortar in 20 ml of hot isopropanol according to Kates (1972). The homogenate was filtered on a Büchner funnel and the residue from filter was suspended in 20 ml of chloroform/methanol (2:1, v/v), stirred 3 times with a magnetic stirrer for 30 min at room temperature under nitrogen and filtered. The combined filtrates were concentrated *in vacuo*, then the lipids extracted in 10 ml of chloroform/methanol (2:1, v/v), and the solution washed several times with 20 ml of 0.9% sodium chloride, according to Folch *et al.*, (1957). The lipid extract was kept in a freezer at -20°C.

Preparation of Fatty Acid Methyl Esters: The lipids were saponified and the liberated fatty acids methylated according to Folch *et al.*, (1957).

GC and GC-MS Analysis: The methylated sample solutions were analysed with Varian 3300 gas chromatograph (GC) equipped with flame ionisation detector (FID) and HP-1 silica capillary column (crosslinked methyl silicone gum, 0.17 μm film thickness, 25 m, 0.32 mm i.d.). Hydrogen was used as the carrier gas at a flow rate of ca. 40 cm/s, and the column oven temperature was programmed from 100 - 290°C at 6°C/ min., heating rate. The injector and detector temperatures were 260°C and 290°C, respectively. Peak areas were measured with Merck-Hitachi D-2000 integrator. Similar column with helium as the carrier gas was used at the same conditions in gas chromatography-mass spectrometry (GC-MS) analysis performed with an HP 5890-5970 GC-MS instrument. The mass spectra were recorded at 70 eV impact energy.

Result and Discussion

The presence of saturated (C16:0, C17:0, C18:0, C20:0, C22:0 and C24:0) and unsaturated (C16:1, C17:1, C18:1, C18:2 and C20:1) fatty acids were detected with C16:0, C18:1 and C18:2 being major fatty acids. The C18:1 and C18:2 acids were between 81 and 84.3% of the total fatty acid content. The dominant fatty acids in the wild form was C18:1 (50:6%) and C18:2 (32.7%). The cultivars of *L. officinalis* Roem. cv. 'Oxygemmis', cv. 'Globigemmis and cv. 'Angustifolia', showed higher content of C18:1 (69.1, 67.0 and 62.6%) and C18:2 (15.2, 16.3 and 18.4%), while the values for C18:1 were generally low in cultivars and wild form whereas the values for C18:2 were more in cultivars as compared to wild form (Table 1).

There does not appear to be any report on the seed fatty acid composition in the wild form and cultivars of *L. officinalis*, whereas studies have been made on the presence of glycosides and organic acids (Baytop, 1989: Mchedlidze *et al.*, 1989. Weings, *et al.*, 1991). From a chemosystematic point view, the present results indicate that

Table 1. Distribution of seed fatty acids in wild form of *Laurocerasus officinalis* and its cultivars.

	Fatty acids (w/w %)										
Species	16:0	16:1	17:0	17:1	18:0	18:1	18:2	20:0	20:1	22:0	24:0
Lauracerasus officinalis cv.'Oxygemmis'	10:5	1:4	0:1a	0:1	2:7	69:1	15:2	0:5	0:2	0:1	0:2
L. officinalis cv. 'Globigemmis'	11:0	2:1	0:1a	0:1	2:6	67:0	16:3	0:5	0:2	0:1	0:1
L. officinalis cv. 'Angustifolia'	12:9	3:2	0:1a	0:1	1:9	62:6	18:4	0:4	0:2	0:1a	0:1a
L. officinalis (wild form)	12:2	1:5	0:1a	0:1	1:8	50:6	32:7	0:5	0:3	0:1	0:1a

a = trace amounts <0.1%.

C18:1 and C18:2 unsaturated fatty acid composition are the main differences among the cultivars and wild forms. More detail lipid analysis may be useful in the taxonomy of *Laurocerasus officinalis* and its cultivars.

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